Contaminated Land Strategy

Carlisle City Council
2009

Environmental Quality Section
C O N T E N T S

EXECUTIVE SUMMARY

The Carlisle City Council Contaminated Land Strategy describes how the City Council will implement the provisions of Sections 78A to 78YC of the Environmental Protection Act 1990 (as amended) and the Contaminated Land (England) Regulations 2006.

The Strategy sets a framework for the inspection of the City Council's area Particularly through:

- detailing internal and external liaison procedures
- formalising procedures to identify contaminated land through desk-based studies
- setting down the reasons and procedures for the inspection and investigation of land that may be contaminated.

The principles of risk assessment guide the Strategy and are now reflected in the Statutory definition of contaminated land. "Contaminated land" will be taken to mean "any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances, in, on or under the land that: -

a) Significant harm is being caused or there is a significant possibility of such harm being caused or

b) pollution of controlled water is being, or is likely to be caused".

The definition only allows the determination of the land as contaminated land if there is significant harm or there is a significant possibility of harm being caused by a contaminant in, on, or under the land, or significant pollution of controlled waters is being (or likely to be) caused.

To be able to determine land as contaminated the three elements of a pollutant linkage (contaminant, pathway and receptor) must be present. Pathways may include service ducts or pipes, watercourses or geology. Receptors include humans, property, crops, livestock, ecosystems, watercourses and groundwater. The watercourses and groundwater in the Carlisle district are of high quality and of significant importance.

Issues surrounding contaminated land have many socio-economic and environmental impacts. With these in mind the objectives of the contaminated land regime are to introduce effective procedures to identify and deal with contaminated land ensuring that human health and the wider environment are protected while contributing to sustainable development through bringing damaged land back into productive use.

The contaminated land regime complements the aims of the City Council ‘s urban development plan as it promotes the regeneration of our built environment while promoting sustainable development and the protection of our natural environment. The remediation of contaminated land promotes both community well being and prosperity as the land can be brought back into economic use.

Our duty to inspect the City Area will be implemented initially through a desk evaluation of the current and historic use of land on the basis of Ordnance Survey records. From this a broad list of sites requiring further research will be drawn up. Each of these sites will have their previous uses and history examined through site plan and records, trade directories and information held by other bodies. The information will be stored on a paper system and will be placed on the Council’s GIS mapping system as soon as reasonably practicable.

Ultimately a prioritised schedule of sites requiring a site inspection will be drawn up. The site inspection will attempt to confirm the existence of pollutant linkages through a visual inspection and where necessary the taking of samples.
The site inspection may lead either to the determination of land as contaminated or to the commissioning of a more detailed intrusive investigation which will be able to identify and quantify the pollutant linkages present.

If land is identified as contaminated a remediation notice is to be served on the appropriate person, who will generally be the person who caused the contamination in the first place. If that person cannot be found then the notice (specifying what actions are to be taken and the time-scales required) will served on the owner or occupier of the land. If an appropriate person cannot be found then the City Council must take responsibility for remediating the land to a `suitable for use’ standard.

There are cases where a notice cannot be served, for example where remediation requirements would cause the appropriate person to suffer unnecessary hardship.

Actions required by the remediation notice must be practicable, durable, effective and reasonable in terms of cost and benefit. A remediation notice can only require remediation of contamination to a `suitable for use’ standard whereas action taken voluntarily can remediate land to a higher standard.

The City Council must maintain a register of contaminated land that contains particulars of the land as detailed in section 78R of the 1990 Act. This register will be held in the service implementing the Strategy with relevant details also held in the Land Charges section of the Town Clerk and Chief Executives Department.

A multi-disciplinary team co-ordinated through the Environmental Services will implement the Strategy. The Environmental Services will also consult with the Environment Agency who also have a major role to play within the contaminated land regime.

Where the Local Authority have determined a piece of land as contaminated, and

believe that the land should be designated as a special site, they will consult the Environment Agency before the site is designated.

Where a piece of land has been determined as contaminated land, but no owner or polluter can be identified, the land will be known as an “orphan site” and its remediation will be the responsibility of the enforcing authority.

Carlisle City Council will be audited annually against other Cumbria Authorities to determine its Performance. Former BVPI Indicators 216a and 216b will be used.

It is planned that all sites will have been prioritised by 2012, and if during prioritisation sites that show ‘significant possibility of significant harm’ will be considered for appropriate remediation. In addition sites that are brought up during the planning process will also be given priority consideration.

Public Access to Information

The Council will comply with the requirements of the Environmental Information Regulations 2004 and any other statutory legislation in relation to public access to information. The regulation entitles the public to gain access to environmental information held by the Government and Local Authorities. Information is also provided through the standard land charges, and specific contaminated land searches.

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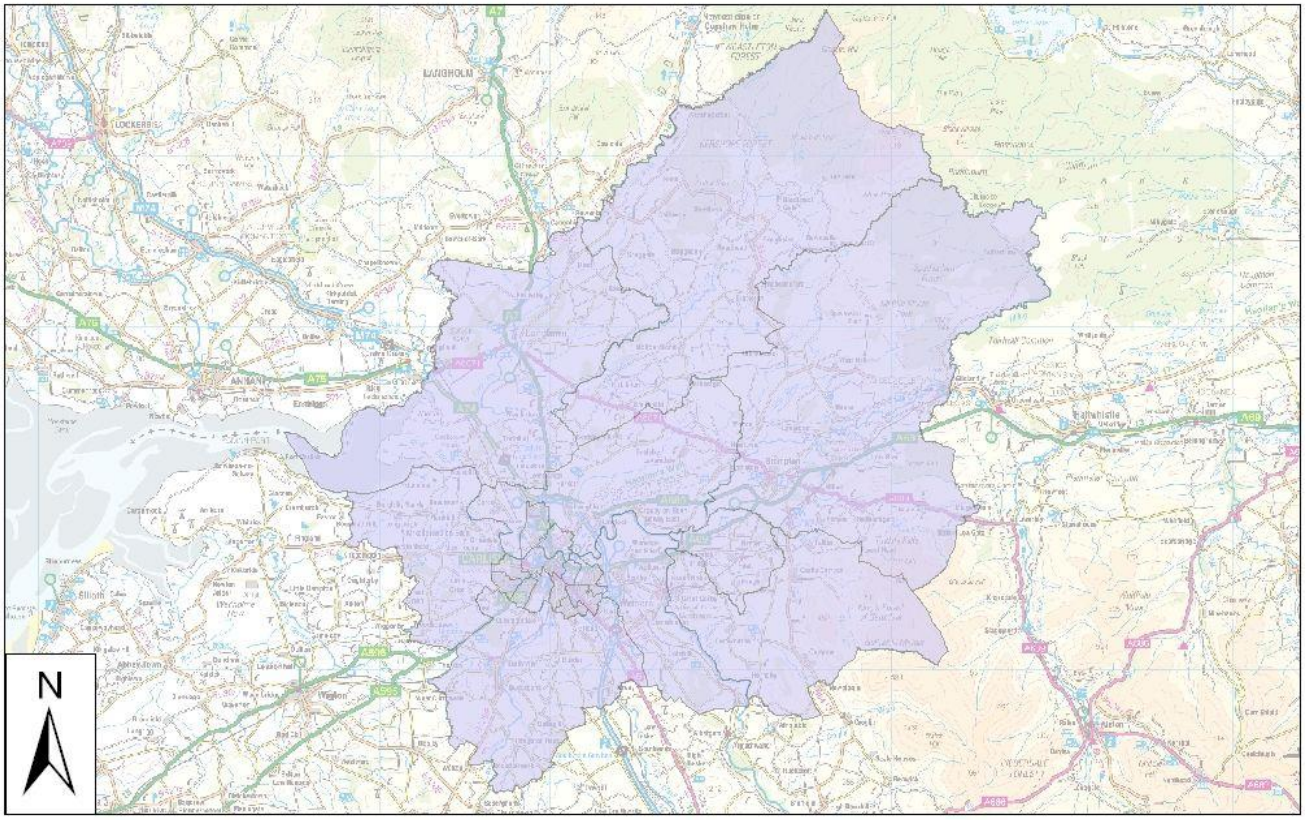
“MAP SHOWING THE EXTENT OF

Carlisle City Council
District Area



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CONTAMINATED LAND STRATEGY

1.0 INTRODUCTION

Carlisle City Council area stretches from Bewcastle in the North to Dalston in the South, from Burgh by Sands in the West to Gilsland in the East. The district covers approximately 1,030 square kilometres (104010 hectares), has a population of approximately 103100 people and has 46,125 properties (*see figure 1. Map of Carlisle City Council's District Area*)

1.1 General Policy of the Local Authority

The Council has published a Best Value Performance Plan 2006-2007.

In addition to this the Council are progressing Carlisle Renaissance which is a 10 to 15 year vision for Carlisle. The Council's key priorities are cleaner, greener, safer and Learning City. In it's widest sense; the cleaner greener safer priority encompasses healthy living for all Carlisle communities.

Carlisle City Aims to work with the public and business to improve the environment. Where an informal approach is impossible or inappropriate then the Council will use its legal powers to ensure that the environment is improved and maintained.

Land contamination is one of the environmental issues. Not only do we aim to improve the environment, Carlisle believes that waste costs money, produces pollution and uses up valuable natural resources. A sustainable Carlisle will require that today's waste is not tomorrow's problem.

The Council believes that the public has a right to information, and will attempt to provide any information requested provided that it does not breach confidentiality.

Carlisle City Council's mission statement (which is part of the Corporate Plan) is *"to ensure a high quality of life for all in both our urban and rural communities".*

1.2 REGULATORY CONTENT

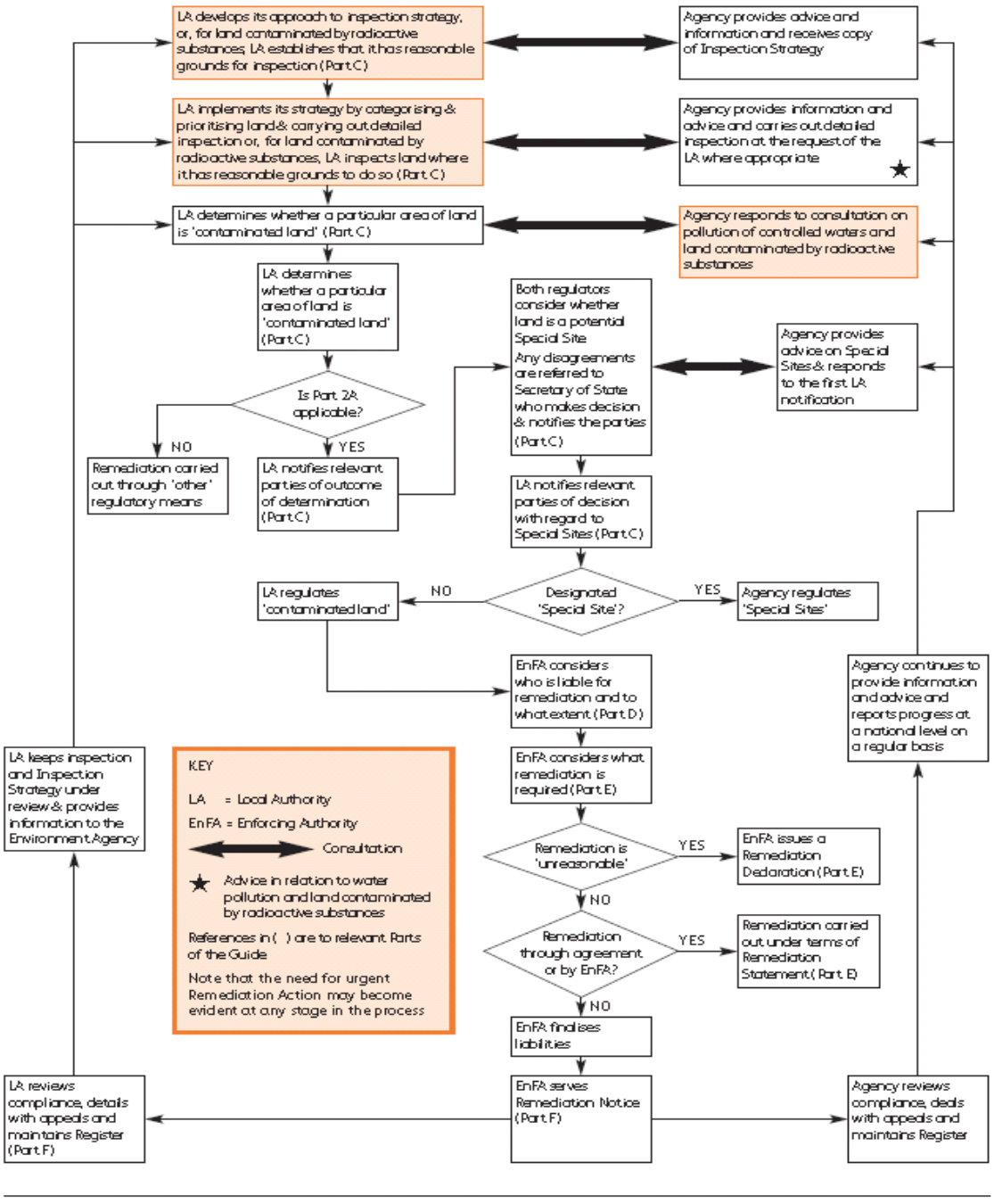
(i) Local Authority Role

Local Authorities are the main regulations for part 2A, but the "special sites" category has the Environment Agency as the regulator. Radioactive contaminated land will be a "special site". See figure 1 for key regulatory responsibilities for part 2A.

Fig 1
Key Regulatory Responsibilities For Application of Part 2A

Part B: Overview of Part 2A

FIGURE B1*: KEY REGULATORY RESPONSIBILITIES FOR APPLICATION OF PART 2A



Under the contaminated land provisions contained in Part IIA of the Environmental Protection Act 1990, each local authority has to "cause its areas to be inspected from time to time for the purpose of identifying contaminated land" and to enable the local authority to decide whether any land is land which is required to be designated as a special site.

The local authority has the sole responsibility for determining whether any land is contaminated (section 78B). The Secretary of State has issued Statutory Guidance to local authorities to take a "strategic approach" to inspecting their areas and to describe and publish this in a written strategy.

(ii) The Role of Enforcing Bodies

Once it has been determined that land is contaminated the enforcing authorities have five main tasks

(a) to establish who should bear responsibility for the remediation of the land
(b) to give notice to the appropriate owner, occupier, agency, or other body
(c) to decide, after consultation, what remediation is required in any individual case and to ensure that such remediation takes place, with through agreement, or by serving a remediation notice if agreement is not possible, or in certain circumstances through carrying out the works themselves
(d) where a remediation notice is served, or the authority itself carries out the work, to determine who should bear what proportion of the liability for meeting the costs of the work

(iii) Environment Agency Role

When consulted by the Local Authority regarding the designation of contaminated land as a special site, the Environment Agency must consider whether the contaminant is affecting groundwater or surface waters. If in the opinion of the Environment Agency the contaminant is significantly affecting the water environment, the Local Authority will designate the site as "special". Once a site has been designated as a special site, the regulator powers for remediation rest with the Environment Agency. If at any time the Environment Agency considers that any land that is brought to its attention should be designated it needs to notify the Local Authority in writing.

The Environment Agency is a statutory consultee and has also undertaken to give advice and support to Local authorities wherever possible. The areas where the Agency will give advice are in relation to the effects of contaminants on controlled waters and possible remediation measures that are needed to restore the controlled waters to a satisfactory quality.

(iv) Remediation

The serving of remediation notices will rest with the Enforcing Authority. The Enforcing Authority is the local Authority, in all cases except for sites that have been designated special sites and in these cases, responsibility lies with the Environment Agency.

(v) Contaminated Land Definition

The contamination land strategy for Carlisle covers the area administered by Carlisle City Council.

In this strategy "*contaminated land*" will be taken to mean:

"any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances, in on or under the land, that: -

(a) significant harm is being caused or there is significant possibility Of such harm being caused; or

(b) pollution of controlled waters is being, or is likely to be caused".

As defined in Section 78A (2) of the Environmental Protection Act 1990. The process of determination of whether the land is contaminated, shall be based on guidance produced by the DETR, namely "Contaminated land Part IIA of the Environmental Protection Act 1990".

(iv) Principles of Pollutant Linkages

Land can only be considered to meet the definition of "Contaminated Land" if a contaminant pathway and receptor exist. This is known as a pollutant linkage. There can be single pollutant linkages or multiple pollutant linkages.

A "pollutant linkage" means the relationship between a contaminant, a pathway and a receptor, and a "pollutant" means the contaminant in a pollutant linkage.

A contaminant is a substance which is in, on or under the land and which has the potential to cause harm or to cause pollution of controlled waters.

A receptor is either:

(a) A living organism, a group of living organisms, an ecological system or a piece of property which

(i) is in a category listed in Table A (in the DETR Circular 02/2000) as a type of receptor, and
(ii) is being, or could be, harmed, by a contaminant; or

(b) controlled waters which are being, or could be, polluted by a contaminant

A pathway is one or more routes or means by, or through, which a receptor:

(a) is being exposed to, or affected by, a contaminant, or

(b) could be so exposed or affected.

All three elements of a pollutant linkage must be identified before land is designated as contaminated land.

Contaminant	→ *pathway*	→	*receptor*
Example:			
Landfill Material	→ *leachate*	→	*water course*

There may be more than one pollutant linkage on any given piece of land.

In some cases the local authority may treat two or more substances as being a single substance where they are compounds of the same element or have similar molecular structures. However it must be noted that not all substances of similar molecular structure have similar properties, and the overriding approach will be to consider each pollutant separately, as the responsibility for each substance may lie with different liability groups.

(iiv) Principles of Risk Assessment

The definition of contaminated land is based upon the principles of risk assessment. Risk is defined as the combination of: -
(a) the probability, or frequency, of occurrence of a defined hazard (for example, exposure to a property of a substance with the potential to cause harm); and
(b) the magnitude (including the seriousness) of the consequences.
This Contaminated Land Strategy, follows established approaches to risk assessment, including the contaminant-pathway-receptor. (This is sometimes referred to as source-pathway-target).
The risk assessment procedure is covered in greater detail later, but will be based on the suitable for use approach.

Requirements for strategic approach

Carlisle Council is taking a strategic approach in accordance with DETR guidance.

The strategic approach is incorporated into this strategy and it will:

(a) be rational, ordered and efficient

(b) be proportionate to the seriousness of any actual or potential risk

(c) seek to ensure that the most pressing and serious problems are located first

(d) ensure that resources are concentrated on investigating in areas where contaminated land is most likely to be identified

(e) ensure that the detailed inspection requirements of a particular area of land is efficiently identified

1.3 DEVELOPMENT OF THE STRATEGY

(i) Inspection strategy - Overall approach

1 Use of Historical maps to locate past activity (archives library) (work now completed)

2 Contact with Environment Agency – for information on current and previous land fill sites. The applicability of other regulatory regimes, potential special site status, requests from the Local Authority for detailed inspection by the Agency and other procedures within the statutory guidance. (Work now completed)

3 Create files for each potential site identified by the desk top exercise (work now completed)

4 Preliminary site inspection – visit identified site and carry out a visual inspection. The following information will be recorded on the site inspection form, namely evidence of

- past industrial activity
- relics of past history on site
- visual emissions to air or temperature differences
- infill/land activity (i.e. differences in topography, vegetation)
- effects on vegetation
- evidence of surface contamination
- animal/Insect activity

- soil structure
- water quality around site
-

5 When a site is being risk-assessed consideration will be given to some or all of the following:-

a) Previous planning applications/decisions
b) Environmental reports held
c) Building Control reports held
d) Waste disposal licences
e) Water courses, presence and quality
f) Discharge consents to watercourses
g) Ground water vulnerability map
h) Monitoring data from site records
i) Site investigation -
    (i) visual and/or
    (ii) invasive (soil samples etc)
j) Ecological Sensitivity.
Stages 4 and 5 are currently being undertaken.

6. Those sites that are considered the highest risk will be investigated so that a decision can be made whether the criteria has been met to allow determination as contaminated land.

7. Written notification to the Environment Agency and the land owner stating Council's decision to determine land as contaminated

8. If notices are served, the land will then be registered in the contaminated land register.

9 Proposed action – in relation to the site remediation etc

(ii) Internal Team Responsible

The team responsible for developing the strategy will comprise the following members of the Environmental Quality Section of the Environmental Services Division:

Mrs J Blair – Assistant Environmental Quality Manager
Mr D J Ingham – Environmental Quality Manager
Mrs A. Shields – Technical Officer

Where necessary reports will be presented to Overview and Scrutiny Committee and the Executive.

(iii) Internal Liaison

Internal Liaison within the Authority has taken place with Planning Services,

Economic Development, Property Services and the Legal Department, to ensure that the content of the strategy which relates to their area of work is accurate.

(iv) Consultation

Has taken place with all relevant bodies and any observations made by consultees were previously considered. The relevant bodies include DEFRA (Department of Environment Food and Rural Affairs), Food Standards Agency (FSA).
The Environment Agency, English Heritage, Nature Conservancy Council and adjoining Local Authorities.

1.4 OBJECTIVES OF THE STRATEGY DOCUMENT

Since the first strategy was adopted in 2001, the Council have identified approximately 1,050 potentially contaminated land sites. Officers of the Council looked at historical maps and gathered evidence from Parish Councils, Council Records etc. to establish the sites of possible contamination.

The information is stored in paper files and on a database and the information is to be transferred to a GIS which holds information on the sites in a secure location. The number of sites may fluctuate as other sites are added or removed from the database.

The reviewed strategy will also be forwarded to the bodies mentioned in 1.3 (9.2) for observations.

The main objective is to provide a system for the identification and remediation of land where contamination is causing unacceptable risks to human health, or the wider environment, assessed in the context of the current use and future development of the land.

Carlisle City Council will use a strategic approach in undertaking the inspection duty under Regulation 78B(1) of the Contaminated Land (England) Regulations 2000. That is Carlisle City Council will cause its area to be inspected from time to time for the purpose of identifying contaminated land and to enable decision to be made on whether any such land is land that is required to be designated as a special site.

The Council will inform all stakeholders of its intention before resorting to statutory action and at all times the Council will opt initially for an informal approach.

The Council will at all times provide any site specific information it has available to its statutory consultee's and will abide by the informal agreement it has made with the Environment Agency in accordance

with the memorandum of understanding drawn up by the Environment Agency and the Local Government Association.

2.0 CHARACTERISTICS OF THE CARLISLE CITY COUNCIL AREA

2.1 CARLISLE'S INDUSTRIAL HERITAGE

The area remained essentially agricultural until the eighteenth century when the industrial revolution created significant changes, particularly to the then small border garrison market town of Carlisle. The presence of abundant water power from the Cities three rivers and coal from the South Eastern fells above Castle Carrock and Hallbankgate led to rapid industrial development and population growth, with the subsequent creation of a canal system which was eventually infilled. A large proportion of this land was used for the construction of a railway network. This network established Carlisle as a route centre, which encouraged the migration of workers into the area.

(I) The Industrial Revolution in Carlisle

The industrial revolution of the late 18th and the first half of the 19th centuries were arguably the most significant period in Carlisle's history.

(ii) Early industry and the growth of the factory system

Carlisle's textile industry began to develop in the 18th century. The first factory was part of the woollen industry and was set up in December 1724.

Wool as a material was not suitable initially for large-scale mechanisation of processing and became uncompetative when America's plantations started to pour out cheap cotton. In 1750, manufacture of a coarse linen cloth was started. Some year's later, fustian (a mixture of linen and cotton yarns) was made in Caldewgate. The soft waters of the River Caldew were suitable for bleaching, this process prepared cloth for printing. Cloth was exposed to sun and rain, and steeped in alkaline solutions. Much land was occupied around the city by printfields, in which the cloth was laid out. In 1794 there were four of them, that provided employment for about a thousand people. The development of bleaching powder *c*.1800 made the printfields obsolete, and on Jollies map of 1811 there are no references to them.

From 1758, Carlisle received an influx of wealth encouraging the development of industry which included breweries and an iron foundry as well as the burgeoning textile industry.

(iii) The Infrastructure of Twentieth-Century Carlisle

The Electric Light and Power Station was opened in 1899. In 1927 a new power station was erected at Willow Holme, and was connected to the national grid. The oldest municipal department, the gas-works adjoining Victoria Viaduct was purchased by the corporation in 1850 and was superseded by a new works at Boustead Grassing in 1922.
Electric trams started operating in 1900 and tram sheds were developed on London Road.

(iv) Industry 1945 – 1990

Carlisle's industry was drastically transformed after World War Two, with the disappearance of major firms and changing ownership of others.

The Railway industry is still a large employer, but has been slimmed down drastically since pre-war days. Losses in Carlisle's older industries have been counteracted to some extent by the growth of several new firms. These include Crown Bevcan, Pirelli and Nestle.

(v) Railways

Carlisle was in many ways a railway town. The 1921 Railway Act, which amalgamated the multitude of railway companies into four main groups, and the 1947 Transport Act, which nationalised the railway system. This affected Carlisle as it resulted in the closure of two unprofitable lines.

(vi) Ministry of Defence Land

A large area of land to the North of the City has been utilised by the Ministry of Defence for ordinance residential and training purposes. Past activities on the site has resulted in areas of land contamination. Large areas of this land has been remediated, prior to sale for residential development.

(v) Land owned by the City Council

The City Council owns land and non-housing based property assets with a current capital value of £84.6 million.

The Property Services section of the City Council has developed an Asset Management Plan 2005 which is updated annually and information contained therein is available for use in the process of examination of council holdings in the contaminated land survey and inspection process.

In addition to current ownership there is also the potential liability arising from historical ownership by the Council and predecessor authorities. Where the Council are shown to be the polluter of a piece of contaminated land, they will undertake the measures necessary to ensure the source, pathway receptor linkage is broken.

2.2 PROTECTED LOCATIONS

(I) Natural habitats

Within Carlisle District there are two designated Areas of Outstanding Natural Beauty (AONB). The landscape of the North Pennines Area of Outstanding Natural Beauty (AONB) is characterised by heather moorland, with remote river valleys. In the west, the Solway Coast AONB extends into the District and here the landscape is characterised by open salt marsh, dissected by river channels subject to frequent tidal inundations.

There are 34 Sites of Special Scientific Interest SSSI's in the District which are nationally important conservation sites (see Appendix 8). They range from large sites of international importance, such as the Upper Solway Flats and Marshes, and Butterburn Flow, the most important blanket bog in England, to small sites designated for their geological interest.

The Upper Solway is also designated under the RAMSAR Convention as a wetland of international importance, under the terms of the European Community Directive on the Conservation of Wild Birds as a Special Protection Area (SPA) and under the European Habitats Directive as a candidate Special Area of Conservation (SAC). These latter two designations are of European importance and together will form part of a network of internationally important wildlife sites within the European Union which will be known as Natura 2000.

In addition to SSSI's are a large number (55) of other important nature conservation sites in the District known as Wildlife Sites. These sites range from roadside verges to areas of woodland. The Cumbria Wildlife Trust designates these local sites. Carlisle has a rich biodiversity, not all areas of which are found in protected sites.

A further designation and a growing initiative are the Regionally Important Geologically/Geomorphologic Sites (RIGS) which aim to maintain and enhance specific features of rock and landform and the dynamic natural processes which create them. These sites range from quarries to river courses.

Within Carlisle District are two Local Nature Reserves - Kingmoor Nature Reserve and Kingmoor Sidings.

(ii) Historical Heritage

The oldest buildings in the district, such as the Carlisle Castle, the Cathedral, Naworth Castle and Lanercost Priory are medieval, with many other buildings such as Peel Towers and fortified houses dating back to the Border Reivers.

Carlisle City Council has currently designated fifteen areas as Conservation Areas. These are areas of specific character and appearance.

The Conservation Section of Planning Services provides advice on the most suitable approach to the repair, maintenance, alteration and extension of all properties within a conservation area and the entire City's listed buildings.

The Section also provides design briefs for development within conservation areas and works closely with English Heritage, the Civic Trust, and other organisations.

There are a number of archaeological sites around the city that are of significant importance, these include the monument on Burgh marshes of Edward II and Roman remains.

(iii) Redevelopment – History and Controls

The Government's commitment to the development of brownfield sites as is set out in planning policy guidance notes issued to Local Authorities are a principal consideration in dealing with planning issues. This commitment is set out generally in PPG 1, dealing with general policies and principles – "development is preferred on previously used sites where appropriate, before considering the use of greenfield land".

More specific advice is found in PPG 3 on housing where Local Authorities are urged to carry out urban capacity studies to identify the availability and suitability for development of brownfield sites, with the intention that local plans identify land in such a way as to maximise the use of brownfield land. Industrial planning decisions should reflect these principles.

The Carlisle District Local Plan was adopted in 1997, (it is currently being reviewed and a new plan will be published in 2006) before the current versions of PPG 1 and 3 were published. Nevertheless, the principles set out in the PPG's have been followed by the Council. In

due course the local plan will be reviewed and current advice will obviously be a principal consideration in deciding future land allocations.

The use of brown field sites has to take into account possible historical contamination and remediation. Consultation with the Environmental Protection Services Division and the Environment Agency are essential in ensuring the appropriate conditions are applied.

(iv) Key property types

Carlisle's property is mixed, at least a third of the City's residential properties are Edwardian and Victorian Terraces, a further third are semi-detached and detached properties built from 1920 – 1980's. Since the 1980's a large number of new properties have been built on derelict land sites within and at the edges of the City.

There are a few ancient monuments, the main ones being Carlisle Castle, the Roman Wall and the King Edward II monument at Burgh by Sands. A lot of Roman artefacts are found when building works take place in Carlisle as Carlisle was a centre for Roman activity. None of the ancient monuments are known to be affected by land contamination.

2.3 GEOLOGY

(i) Solid Geology

Figure 1.1 details the major divisions, which form the Carlisle Basin and surrounding area. As can be seen the area around Carlisle comprises sandstones and mudstones deposits. Interspersed amongst these deposits to the South and West of the district are older Permian sandstones and mudstones.

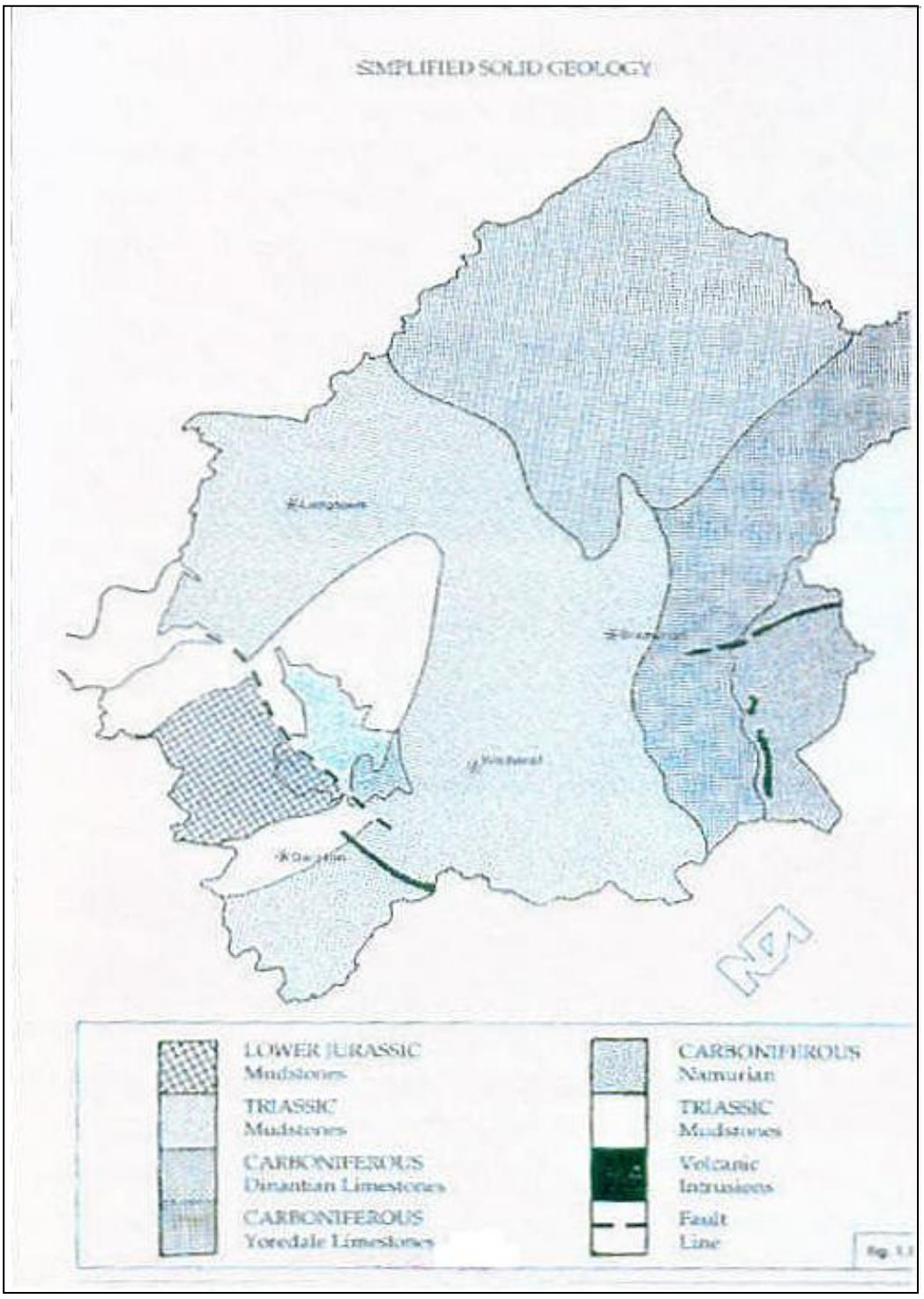

SIMPLIFIED SOLID GEOLOGY
LOWER JURASSIC
Mudstones
TRIASSIC
Mudstones
CARBONIFEROUS
Dinantian Limestones
CARBONIFEROUS
Yoredale Limestones
CARBONIFEROUS
Namurian
TRIASSIC
Mudstones
Volcanic
Intrusions
Fault
Line

Figure 1.1

The Eastern part of the district's Carboniferous period ranging from 280 to 345 million years ago. Millstone grits and lower coal measures developed in the Southern portion with limestones developing in the Northern portion.

The Carboniferous period laid down the only workable coal deposits in the area, extending from South of Castle Carrock through Midgeholme.

Following on the Carboniferous period, volcanic action gave rise to small areas of igneous (lava) intrusions and dykes, to the East of the Eden Valley with one dyke cutting through the valley from North West to South East.

(ii)Drift Geology

The drift geology is the result of the Southern advance of the polar ice caps.

The ice movements caused tremendous erosion of the solid geology and transported a mass of ground up rock and boulders for many kilometres. This mass was thickly spread over lower ground and when the ice retreated, sands and gravel's together with clays were washed out of the ice by the melt waters.
Our local rivers have carved out their present valleys and gorges and laid down silt on their flood plains.

(iii) Climate

The Northern end of the Pennines and the Bewcastle fells to the East and area of higher ground have not only a colder climate than the Carlisle Plain but as they principally face the predominant Westerly winds they influence the level of rainfall in the district.

(iv) The Carlisle Plain

This a low lying area which extends inland from the Solway Estuary some 12 kilometres on average before reaching the 30 metre contour. Within this area, which contains the flood plains of all the rivers in the area, are situated some of the richest and most productive agricultural lands. Due to the past glacial action soil types are variable with regions of sand and gravel interspersed amongst the heavier clays. These clays create difficulties of drainage, which can affect both agricultural production and housing development in unsewered areas.

(iv) Lowland Zone

A zone of land which steadily rises from the 30 metre to the 150 metre contour. Above 150 metres the landscape develops the characteristics of fell sides and hills.

(vi) Hills and Uplands

Subdivided into Bewcastle Fells in the North East and the Pennine plateau and foothills in the East. Both areas contain blanket bog, acid grassland and heather moorland.

(vii) Areas of Metal Enriched Soils

The British Geological Survey office has confirmed that there are no major areas of naturally occurring metal enriched soils in Carlisle. However there are some areas of metal enriched soils including the evaporate beds of Gypsum and Anhydrite in the Cotehill area and carboniferous and igneous intrusions are present to the North and East of the district.

2.4 **Climate**

Average monthly sunshine is shown in Fig 1.2 below.

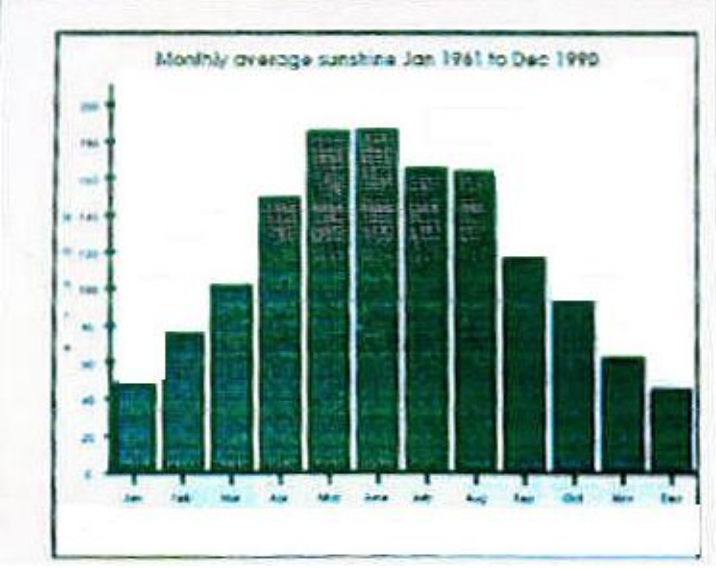


Figure 1.2

Rainfall averages over 30 years are displayed in Fig 1.3

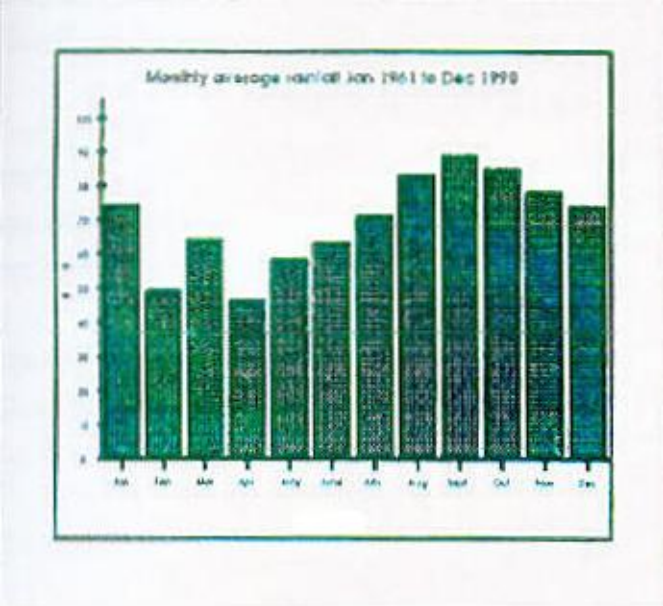


Figure 1.3

2.4 POPULATION

The population of Carlisle has risen to a figure of 103,100.
The population in the more remote rural areas continued to decline in the 60's and 70's but evidence indicates that it has now stabilised. Within the City itself population increase has been partially caused by migration into the area. The population of Carlisle City is 71,000. Other main population centres are the towns of Brampton, Dalston and Longtown (*see Figure 1*).

2.5 KEY WATER RESOURCE/PROTECTION ISSUES

A significant proportion of Carlisle City Councils distant rural population, are dependent on private water supplies, and thus water resource/protection issues in rural areas are very important. Three sixths of the City Councils area lies over a minor aquifer and two sixths over a major aquifer. The major aquifer is very environmentally sensitive, as it has a large abstraction potential, and has a greater yield and more freely available water (often of a higher quality) than the minor aquifer. (See Figure 2)

The greatest risk to water resources from land contamination are found in the urban areas and source protection zones therefore need to be considered, especially with the large number of abstractions in the area. (See Figure 3).
Carlisle is situated on the Permo – Triassic Sandstone Aquifer (this is a

major aquifer) and it is essential that where land contamination is identified that the Environment Agency is consulted regarding possible impact on controlled waters.

The River Eden, River Caldew and the River Petteril run through Carlisle. These are all good quality rivers, and a large proportion of Carlisle's drinking water originates from the River Eden.

2.6 CURRENT LAND USE CHARACTERISTICS

Carlisle City has a large rural hinterland, which is used primarily for grazing, with some forestry use.
The urban areas are mainly domestic and commercial with a number of industrial estates located at the extremities of the City Area. There are a few large industrial premises located within the City for historic reasons.

2.7 AREAS OF KNOWN CONTAMINATION

All old land fill sites and old industries, where known, have been listed as potential contaminated sites.

Carlisle's Historical Industries - were primarily linked with the cotton, wool, leather, iron and steel trades. The railways and associated land use also made a great impact on Carlisle.

Current industry - is limited, but includes rubber processing, metal coating, coal storage, vehicle industry and petroleum storage.
Where historical or current use is known to have deposited contaminants the information is recorded as part of the desk top study.

Foot and Mouth Disease – Carcass Disposal Sites
In March 2001 an outbreak of Foot and Mouth affected the district of Carlisle. The epicentre of the disease was Longtown and the effect of carcass burial, pyres and ash disposal have given rise to sites with contamination which may prove to be "contaminated land". To date none of these sites have been determined as contaminated land.

A list of disposal sites for carcasses and ash will be complied upon ceasation of the outbreak and receipt of information requested from DEFRA.

2.8 REDEVELOPMENT

Brownfield site development is being encouraged by Carlisle City Council and when brown field sites are developed planning control conditions ensure that a site survey is carried out to assess land quality.

On receipt of site survey reports the Planning Services will consult with the Environmental Quality Section who will make a decision as to whether action under the contaminated land legislation is required, or whether remediation is necessary and can be controlled under Planning or Building Control consent conditions. However whichever route is decided Environmental Quality Section will closely liase with Planning Services.

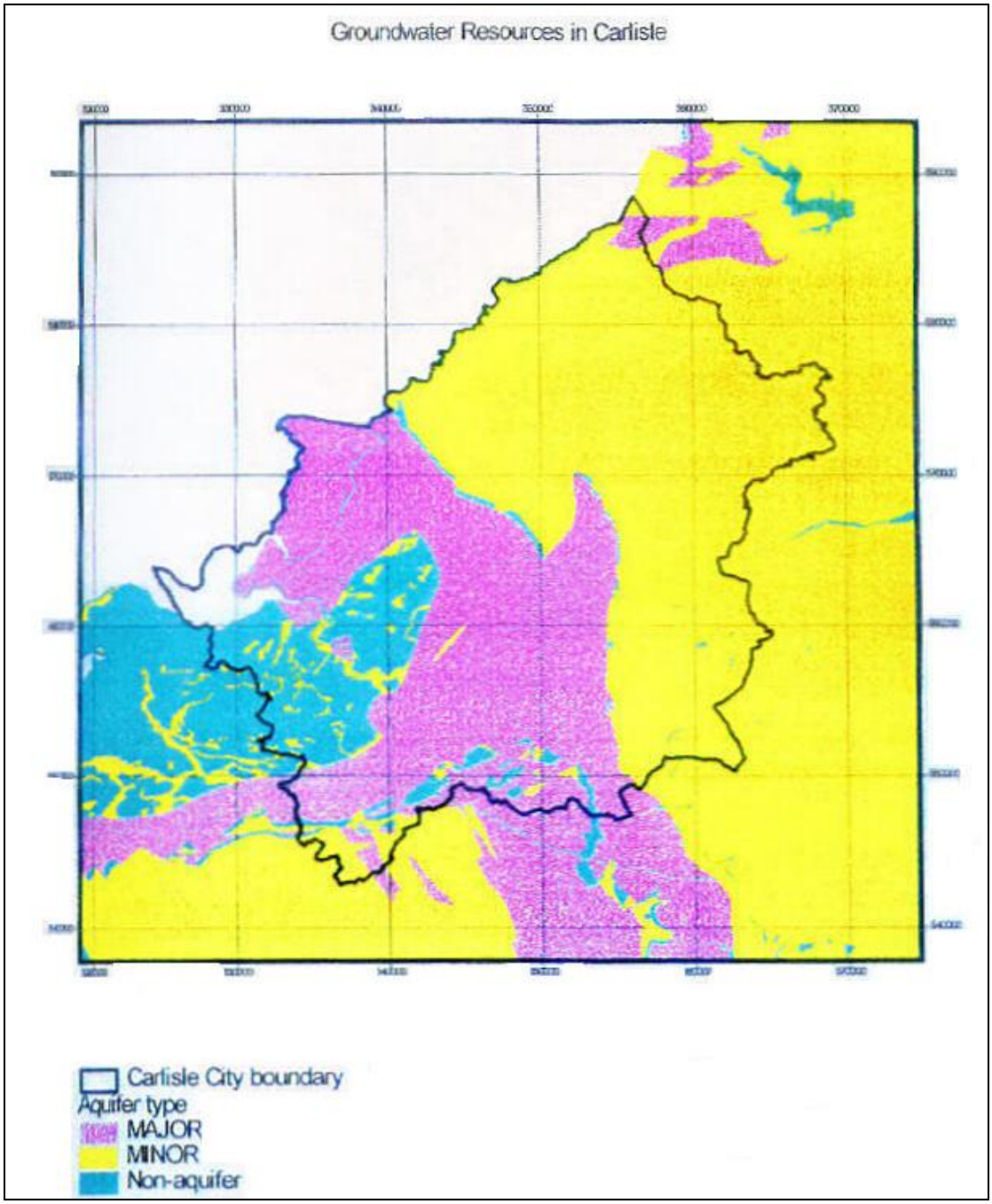


FIGURE 2

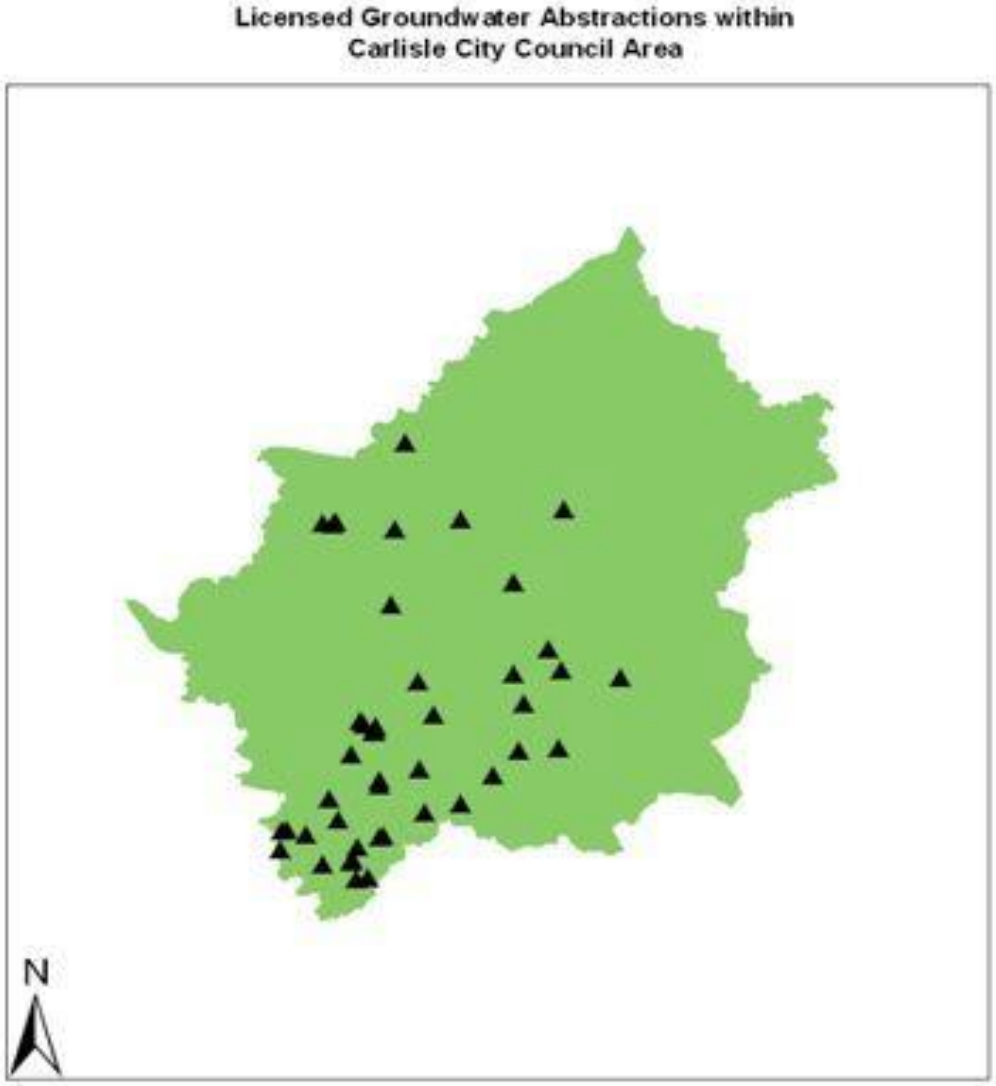

Licensed Groundwater Abstractions within
Carlisle City Council Area
N

FIGURE 3

3. THE LOCAL AUTHORITY STRATEGY - OVERALL AIMS

3.1 AIMS OF THE STRATEGY

The City Council will take a rational, ordered and efficient approach to the identification and inspection of contaminated land.
The Council will firstly determine the objectives of the investigation, which will at various stages include the characterisation of contaminants present, identification of pathways and receptors for the purpose of risk assessment.

An investigation strategy will be followed which will be relevant to the stage of the investigation i.e., preliminary, exploratory, main and supplementary.

The preliminary investigation will involve desk study, site reconnaissance, interpretation and an identification of any potential contaminant – pathway – receptor.

A risk assessment will be carried out and a risk rating given.

Objectives will be reviewed and if any further data is needed this will be sought.

A supplementary field investigation which will include fieldwork, intrusive investigation, laboratory analysis will be designed and planned. This will only be carried out where the risk assessment reveals a “category one site”, in some circumstances this might be carried out where a site is classed as a “category two” (see Section 4).

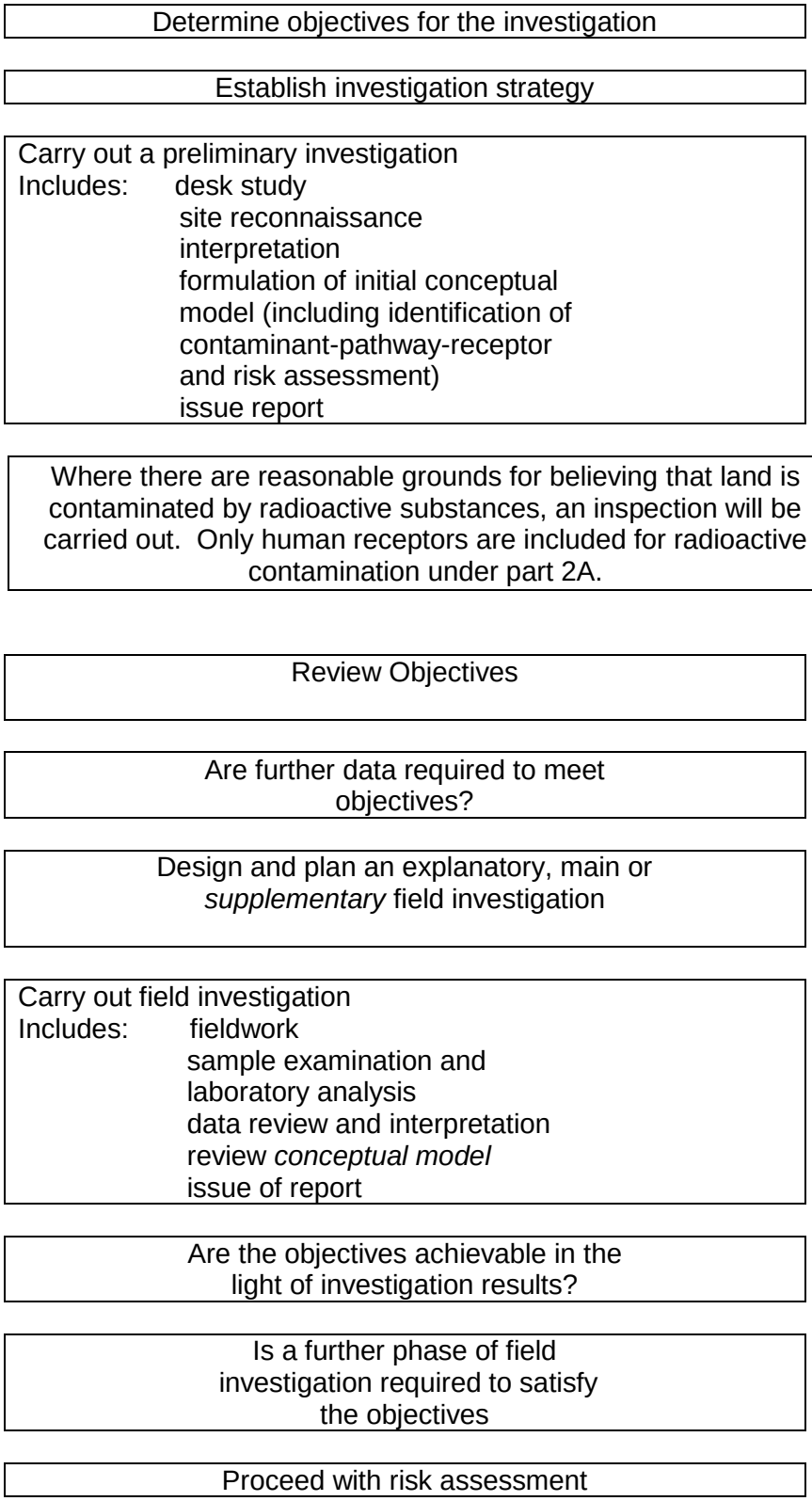
Only a small proportion of the total land within the Carlisle area is likely to be contaminated land. Even land that has been identified as potentially contaminated may not on investigation be found to be contaminated land.

Where radiation is considered to be the contaminant, the Council must first establish that there are reasonable grounds for believing that the ground is contaminated, before it inspects the land, to identify radioactive contaminated land.

The Council will require the owner or polluter to carry out the investigation at their own expense. Where the site is an “orphan site” the Council or the Environment Agency will carry out the investigation.

The typical approach to site investigations is shown in Figure4.

FIGURE 4 – SCHEMATIC APPROACH TO SITE INVESTIGATION



The time scale for completing the programme of work is as follows:

1. *Desk study on all sites currently held* - over half have been completed the rest will be finished by December 2008

2. *Risk assessment (Priority Rating)* - completed by July 2012

There will be an overlap between phase 1 & 2.

3. *Land to be developed* - immediate response, via the planning process

4. *Intrusive Investigation* (where necessary to prove significant pollution linkage) – by land owner or Local Authority/Agency if an orphan site. This will be done as soon as possible in response to a pollution linkage or in order of priority, based on the findings of the risk assessment.

5. *Contaminated land register* - was initiated on 1st January 2001 only sites where notices are served will be held on this register, although a record of determined sites will be held.

3.2 OBJECTIVES

Private Land & Local Authority land that may be contaminated is to be identified and assessed. A large-scale map showing land in the Councils ownership has been matched with historic usage and then will be risk assessed and land if private or no ownership has been identified from historic maps showing past usage, it will then be risk assessed.

Land identified as potentially contaminated will be further reviewed on a site by site basis.

Where there is evidence of water pollution, the Environment Agency will be notified immediately.

Evidence of actual harm will result in the land being determined as "contaminated land". Table A (Appendix 1) "Categories of significant harm" and Table B (Appendix 2) "Significant possibility of significant harm" will be used as guidance in determining whether actual harm exists.

The information on the possible presence of contamination will be evaluated and information exchanged with internal and external parties.

Where contamination is believed to be present and development is proposed, further investigations will be made. Developers will be required to submit a land quality assessment to the Planning Services and the Environmental Quality Section of Environmental Services.

Where new information comes to light then inspection priorities will be checked and time scales and assessments reviewed.

When searches or requests for site contamination information are received then the contaminated land register will be consulted. For more detailed queries the site under scrutiny will be compared with the Councils historical file and appropriate information given.

Efficient liaison and information exchange will be established with external and internal consultees and other parties.

Internal consultees will be contacted by telephone or e-mail and external consultees and other parties will be contacted by email and/or letter.

3.3 PROCEDURES FOR CONSULTING WITH THE ENVIRONMENT AGENCY

The Environment Agency will be consulted on an informal basis by the Council when they are seeking advice on an area of land that is potentially contaminating surface waters or ground waters. The advice sought will relate to the extent of contamination of surface and groundwater, remediation strategies, consultant's reports and other related issues. The mode of communication will be by telephone and email and confirmed by letter.

Formal communication will be conducted in accordance with the standard form for exchange (see appendix 4 and 5).

The key regulatory responsibilities for the application part 2A between Local Authorities and the Environment Agency can be seen in figure 1.

4.0. PROCEDURES

Carlisle City Council's area has been heavily influenced by its historical past, and its natural environment. Its rich history and high quality environment, requires that careful attention is given to each potential site. In general the older parts of Carlisle have a potential to be more contaminated than the newer areas of the City, due to their past industrial heritage. As mentioned previously the old industries were related to leather, cotton, and wool trade, thus tanneries were common. Carlisle also had hatters (mercury) , iron and steel, coal and the railway. The Cities potential sites have been listed as have those in Longtown, Brampton, and Dalston. Small rural villages have also had their potential sites recorded. Once all potential sites have been

identified, they will be risk assessed and the sites with the highest risk category will be investigated first.

If a pollution linkage is known or very likely, or where a pollution incident brings the land to the attention of the Local Authority, these sites would be investigated immediately.

Where a development is proposed on a piece of land that may be contaminated, the Environmental Quality Section of the Environmental Services will consult with Planning Division. It must be noted that however, that in this case the planning process will take precedent over any Part IIA work, unless emergency action is required.

4.1 INTERNAL MANAGEMENT ARRANGEMENTS FOR INSPECTION AND IDENTIFICATION

Departmental Responsibilities

a) Environmental Quality Section of the Environmental Services

This Service will be responsible for consulting with internal and external agencies and compiling land contamination information.

Environmental Quality Services will provide land contamination information to individuals or companies that request it for a small fee.

The Service will be responsible for declaring areas of contaminated land which they will record in a public register. It will be the duty of Environmental Quality Services to keep the register current.

The determination of contaminated land will be the responsibility of the Environmental Quality Manager and the Assistant Environmental Quality Manager in the Environmental Quality Section who will produce a report with their recommendations to determine a piece of land.

b) Planning Services

Will be responsible for ensuring that all developers on Brown Field Sites submit a land quality assessment report (desk study and/or intrusive investigation report). A copy of which is to be forwarded to Environmental Quality Section of the Environmental Services, who will advise on any remediation and/or control measures necessary.

c) Legal Services Section

Legal Services will be consulted for legal advice in relation to the responsibility for remediation and the content of notices.

4.2 CONSIDERING LOCAL AUTHORITY INTERESTS IN LAND

All land belonging to the Council will be inspected in relation to its historical usage in the same way as land in private ownership. Where potential contamination is identified, the same procedures used for land in private ownership will be implemented.

4.3 INFORMATION COLLECTION

Information will be collected from:

a) Historical data – from the archive library (this has already been completed)

b) Environment Agency records – supplied to the Council (this has already been completed)

c) Planning data – from Planning Services – this is ongoing

d) Private land assessments as and when they become available - this is ongoing

e) Data collected by Environmental Quality Section – from own surveys and risk assessments, this is ongoing.

4.4 INFORMATION AND COMPLAINTS

Carlisle City Council fully supports the right of the public, businesses and voluntary organisations to have free access to non-confidential environmental information. Requests for information in relation to possible land contamination will be provided (providing this information does not breach confidentiality). A standard charge will be levied if the information is required in writing. The information will include historical land use etc. It will not state contaminants as these can not be known until intrusive investigation has been made. Where a site investigation has been carried out the inquirer will be provided with the name and address of the person who owns the rights to the site investigation report.

Where a complaint is received regarding a piece of land, the local authority will investigate its status in accordance with the stated methodology. Where information is provided by a company, but is designated “confidential” then an enquirer will be supplied with the informants name and address, but will not be given any

information contained in the report.

Anonymously provided information will be checked for accuracy before it is placed on file.

The DETR guidance states that an approach to inspecting land should:

- be rational, ordered and efficient;
- proportionate to the seriousness of any actual or potential risk;
- seek to ensure that the most pressing and serious problems are located first;
- ensure that resources are concentrated on investigation in areas where the authority is most likely to identify contaminated land; and
- ensure that the local authority efficiently identifies requirements for the detailed inspection of particular areas of land.

The Council will attempt to fulfil these requirements when dealing with information and complaints. This will allow Carlisle City Council to identify the precursors and carry out further detailed assessment.

4.5 INFORMATION EVALUATION

All sites potentially contaminated, will be investigated in the following manner, by an Officer of Environmental Quality Section. Where a site has been categorised as “category one” the Officer will write a report which will be forwarded to the Environmental Quality Manager for his comments/observations. Where necessary another Officer will be asked to visit the site to carry out another assessment independently.

i) Inspection and Site History

The History of Carlisle City Councils area is to be studied, using historical maps to provide indicators of industrial sites that are potentially contaminated. Various historical maps will be consulted including OS maps, parish and tithe maps. Aerial photographs may also be useful, along with trade directories.

A record of all landfill sites (past and present) has been obtained From the Environment Agency (information has been supplied by the Agency on computer software). A GIS system will be used by the Environmental Quality Section, to record information regarding site location and site boundaries.

ii) The Physical Environment

A range of abiotic and biotic indicators can be used that are

detectable by sight or smell to indicate the presence of contamination.

It must be noted however, that there is no certain relationship between indicators and a threat to human health through contamination.

The physical environment will be surveyed in accordance with Contaminated Land Report no. 2 volume one 1994.

Historical, biological and geological evidence will be used on sites that have been highlighted through the site history. The form shown in Appendix 6 will be used to collect this information.

Once this has been done all the information will be placed on a site-specific file. The information will then be risk assessed.

A screening risk assessment of the site regarding contamination will be undertaken. This will be based on the severity of contamination present. The number of receptors present and the number of pathways present. This will generate a priority rating from 0 to 9. The sites with the highest priority rating will have further investigation undertaken first.

Risks to water environment will be considered as part of this assessment. Not all contaminated land will pollute surface/ground waters. The pollutant must make direct contact with waters and or dissolve and as a result of slow seepage or leaching, effect water sources. The type of water will also affect the risk of pollution, for example a large dilution capacity will dissipate harmful concentrations.

When Assessing water as a receptor the following information will be taken into account:

- Wherever possible the range of potentially polluting contaminants and especially those presenting the greater risk. The date of the contaminants release is significant.

- The ground water protection i.e. the nature of geology, thickness of unsaturated zone and nature of overlying soil.

- Information from the Environment Agency on controlled waters/aquifer vulnerability maps will be obtained.

- The waters vulnerability. The future impact of the pollutant and current situation will be noted.

- The effect changes in site use will have on the water environment

- The potential impact of the contaminants i.e. are contaminants leachable etc

The initial screening assessment is based on the methodology within CLR report no.6 1995, and the information will be placed onto a contaminated risk assessment sheet, which will allow scores from 0 to 9.

The scores will be given under the following headings:

a) Contamination present

b) Receptors present

b) Pathways likely

Following completion of the categorisation procedure the sites are to be prioritised for further investigation.

Sites will be investigated in order of priority rating with sites categorised as, 9 being first in line followed by sites categorised as 8 and 7 etc respectively. Sites categorised as 3 or below will not receive further investigation, unless a change in land use is proposed, or new information becomes available.

(iii) Effectiveness of Previous Actions or Other Regimes in Preventing or Dealing with Contamination

Effectiveness of previous actions or other regimes in preventing or dealing with contamination.

a) Statutory Nuisance

The Environmental Protection Act 1990 allowed local authorities to take action regarding contamination where it was considered to be prejudicial to health or a nuisance. This could be effective in dealing with the immediate problem, but the underlying cause may not have been effectively removed.

No cases involving statutory nuisance procedures to remediate contaminated land have been carried out in Carlisle in the past 15 years

b) Planning Resources

The planning Regimes only become effective when planning applications are made, but it is an essential part of the land clean up process.

For new developments, the Local Planning Authority needs to ensure that the developer will deal appropriately with land contamination, which may affect the development. Typically this is done by attaching conditions to the planning consent (PPS 23) and DoE Circular 11/95. In addition, under the Building Regulations 1991, Building control Officers can require measures to be taken to protect any building and future occupants, against the potentially adverse effects of contamination (Approved Document C)

c) Pollution Incidents

The Environment Agency can use their powers under the Water Resources Act 1995 to prevent the continuation of contamination to surface or ground water.

d) IPPC Integrated Pollution Prevention and Control

This system was introduced in 1999 and depending on the installation category, involves pollution to land, water and air. The legislation was intended to prevent future problems of land and water pollution, by ensuring that discharges were within permitted limits.

e) Waste Management Licensing

This system ensured that waste was deposited in a manner so as to prevent leachate effecting streams or ground water. The licensing also ensured that tips were used for certain waste streams only. Some tips could only be used for inert waste, where others could be used for municipal or industrial wastes. This system managed waste disposal from the tip construction to eventual closure. The license could only be surrendered when the tip was shown to be no longer gassing or leaching.
This system worked well for licensed sites, providing the license holder company did not go into liquidation. This system has now been incorporated into IPPC.

f) Discharge Consents

Industries that discharged their waste water into surface waters had to obtain consent to discharge from the Environment Agency. These consents ensured that any discharges did not significantly effect the quality of the water course into which these where emitted. Some companies were required to pre-treat the water before it could be discharged. Discharge consents are now included in the IPPC Regulations for

Industries in Category A.

Other Actions

In some circumstances, landowners or purchasers have employed their own consultants to carry out site inspections and advise on land remediation. This course of action may be taken where the land owner wishes to sell the land or a perspective purchaser wishes to assess its suitability for development.

iv) Identify any Key Geographical Areas

Carlisle City Council's area lies predominantly on a major aquifer (see figure 1) and it is essential that careful assessment of the risk to ground water is carried out at every site that is known to be affected by contamination. Liaison with the Environment Agency is essential where there are risks to controlled waters.

Other key geographical areas are the rural areas, where a significant number of households derive their water supply from springs and bore holes (see figure 2).

v) Identifying any Specific Potential Pollutant Linkages

The history of Carlisle would suggest that potential pollutants will include:

a) hydrocarbons and landfill leachates – *which can readily effect ground and surface waters*

b) landfill gas – *linkages often through pipework or fissures in the ground*

c) Industrial Remains/Heavy metals etc – *linkages due to the development of past industrial site*

vi) Specific Sites Considered to be Potentially Contaminated Land

A number of sites have been identified for further investigation, due to them coming to light via complaint, and/or the planning process.

a) heavy metals
b) hydro carbons
c) landfill gas and leachates

The sites will undergo full assessment before any decision is made to determine them as areas of “contaminated land”.

Determination of Sites

Two sites have been determined as contaminated land, but both have been voluntarily remediated and contaminants have either been removed or the pollution linkage has been broken.

vi) Information Gaps

Gaps in information are likely to be due to the lack of a full site investigation. In these circumstances if the information collected and the risk assessment indicates a high risk of pollution linkage to a receptor, then a full site investigation will be required, at the expense of the owner/lease holder, the local authority or in cases of special sites, the Environment Agency.

Wherever gaps in information exist further investigation will be carried out to identify and obtain available information from internal and external sources.

5.0 LOCAL AUTHORITY PRIORITY ACTIONS AND TIMESCALES

The authority’s approach will be to focus on known sites that have been used for industrial purposes and landfill sites that have been used for organic and inorganic wastes. Where a potentially contaminated site that is likely to have a pollution linkage is brought to the Local Authority’s attention, an inspection will be carried out as soon as practicable. In the case of radioactive contaminated land the council will only consider inspection where it has reasonable grounds to believe the site is contaminated. However the initial visit will be within 7 working days of notification.

The overall strategic inspection of the local authorities area will be completed within approximately 4 years (2012).

Detailed inspection of land will only be carried out where it is risk assessed as priority 9 to 4, the highest numbered sites being attended to first (for details of risk assessment refer to Section 4) or where the land that is contaminated is brought to the Councils attention. In cases where the contaminated land has been brought to the Councils attention the land will be inspected within 6 months, and the model procedures for the management of land contamination CLR11 will be used.

The strategy will be reviewed after 6 years to ensure that current guidance is included within the strategy, or where there is significant change in legislation. However an annual review will be undertaken to indicate the councils progress on contaminated land issues.

On occasion detailed inspection of land may occur before the scheduled preliminary inspection of the authorities area is complete.

The Council has opened a contaminated land register which is available to the public, and will be updated when notices are served.

6.0 GENERAL LIAISON AND COMMUNICATION STRATEGIES

6.1. GENERAL COMMUNICATION

A number of departments and agencies will be involved in the management of Contaminated Land, both within the Council and external bodies.

A contaminated land register and information relating to contaminated sites will be held by Environmental Protection Services. They shall take the lead role in the compilation of the strategy and the enforcement of the legislation. All enquiries from interested parties relating to contaminated land should be directed to the Environmental Protection Services.

Consultation on the content of the strategy will take place with the Planning Services and Economic Development of the Council and with the Environment Agency, DEFRA, FSA and the County Council.

The Chief Environmental Health Officers, Environmental Protection working group for Cumbria have set up a contaminated land working group. This group contains representatives from each Cumbrian local authority and a representative from the Environment Agency. This group facilitates inter-authority exchange of policy and protocols which helps to achieve consistency of approach in the County.

Informal contact and information exchange with other Local Authorities outside the County, is also seen as a beneficial mode of information gathering and utilisation of available expertise.

IDENTIFICATION OF ROLES AND RESPONSIBILITIES

Detailed inspection	-	Environmental Services
Data management	-	Landowner
Remediation	-	Landowner/outside agencies
Legal advice	-	Legal Services Division
Enforcement action	-	Environmental Services

Enquiries - Environmental Services
Liaison with external organisations - Environmental Services

6.2 COMMUNICATION AND LIAISON WITH STATUTORY BODIES

In order to obtain the most up to date information on contaminated land matters the City Council will endeavour to establish effective communications with the Environment Agency, English Heritage, English Nature and DEFRA.

Given its role as Government adviser on contaminated land it is envisaged the Environment Agency will be the organisation that the City Council consults with most often. The City Council will consult with the Agency at a number of points during the contaminated land process. These occasions will include:

a) information/consultation on contamination to controlled waters
b) before the Council designate a special site a consultation process where the Local Authority ask the Agency's opinion, will take place
c) advice/comment will also be sought from the Agency on remediation conditions that relate to the water environment.

The Environment Agency's Part IIA, EPA (1990) (England) Process Handbook details the responsibilities of Agency Officers. At a local level the Environment Agency has nominated an `Area Contact' within their contaminated land team who will be the first point of contact for the City Council. An effective working relationship has been established with this Area Contact to ensure that the objectives of the legislation are met by the Council. The Carlisle City council district borders two agency areas and each will have an Area Contact who will be the Environment Agencies representative for land in that part of the district.

As part of the assessment process, contact will be made with the other bodies to ensure that information is exchanged effectively and in a format that will assist the City Council in its duties.

6.3 Liaison with Landowners and Occupiers and Interested Parties

Enforcement Officers will seek the co-operation of landowners and occupiers when fulfilling their duties under the Contaminated Land regime. All risk assessments will be completed in a professional manner to ensure that unnecessary concern is avoided and in the full awareness of the sensitive nature of issues relating to contaminated land.

Once a `parcel' of land has been identified as requiring risk assessment all reasonable efforts will be made to contact the landowner or occupier through:

- Land registry records
- City Council records
- Trade directories
- Telephone directories
- Visiting premises
- Public and site notices

Once contact has been established with the landowner or occupier the reasons for a risk assessment of the land will be explained. This will include an explanation of the legislation and the reasoning as to why that land has been identified as requiring risk assessment. A convenient time will then be arranged with the landowner or occupier for the risk assessment. The landowner or occupier may wish to accompany the inspecting officer when the site investigation is being conducted and efforts will be made to facilitate such arrangements.

If the landowner or occupier is unwilling to allow a City Council Officer access to undertake the inspection the Council's powers of inspection under section 108 of the Environment Act 1995 will be explained.

Appropriate notice will be given but in an emergency these powers of entry may be exercised without notice if necessary.
If necessary the findings of any investigation will be communicated to an affected community and consultation undertaken on the best way to achieve the successful remediation of the contaminated land problem.

CONTACTS IN EXTERNAL AGENCIES

	Agency	**Contact**	**Number**
1	Environment Agency	Peter Bardsley	01768 215727
2	English Nature	Ian Slater/Gareth Deglish	01539 792800
3	DEFRA		02070828420
4	English Heritage		01228 591990
5	County Council		01228 606060
6	Food Standard Agency	(Contaminants Division) Tel. 02072768000	Ask for the enquiry line for contaminated land

7.0 PROGRAMME FOR INSPECTION

Once sites have been evaluated and risk assessed, they will be timetabled for inspection in order of greatest risk, as specified in section 5.5.

PROGRAMME OF ACTIVITIES

(i) Desk Study

This will take into account all landfill sites previous industrial use and any other perceived causes of land contamination. Site files will be set up for each site that appears at face value to be significant. All potential sites will be placed on the GIS system, in polygon form. Data will be added to the system as and when it is acquired.

(ii) Risk Assessment

Each site will be risk assessed using the criteria outlined in 5.5. The risk assessments will be placed on the site file. This will be completed by June 2012 for all sites currently identified and on the GIS.

(iii) Land Development

Where an identified historical site is to be developed, a fast track system will be initiated and a risk assessment will be carried out immediately.

(iv) Site Investigations

Where a site has been risk assessed as priority 9 to 7, full site investigations will be required using methodology in CLR11. The aim will be to commence investigations one at a time, until all 9 to 7 risk assessed land parcels have been completed The timescale for completion will be dependent upon the size and number of sites in this category. Where the sites have been designated as special sites, or potential special sites the Environment Agency will be requested in writing to undertake any detailed inspections or intrusive investigations that are required.

Where a lower priority 6 to 4 (inclusive) are to be developed a decision as to whether a full investigation is required will depend upon the pollutant and the proposed development, or any other change that has taken place from when the assessment was first carried out.

(v) Contaminated Land Register

A contaminated land register was opened on the 1st January 2001 and sites will be added to it as and when remediation notices or other notices are served.

7.1. ARRANGEMENTS FOR CARRYING OUT DETAILED INSPECTION

The detailed inspection of potentially Contaminated Land will follow the guidance in paragraphs B19 – 25, of the DETR circular 02/2000 on contaminated land. (see 4.5)

Where a site is identified as requiring inspection then specific liaison will take place with the owners. The Council will request the provision of a detailed site survey report relating to the site which identifies the contaminants present, concentrations and possible pathways and receptors where the site is an “orphan site”, either the Local Authority or the Environment Agency will be responsible for the investigation. Liaison with other appropriate persons may be necessary.

Appropriate persons, would be anyone who has, or had an interest in the land i.e. a previous occupier/owner who could have left a pollutant on the land.

The Environment Agency would be consulted where there was any risk of a contaminant effecting controlled waters.

English Nature and English Heritage would be consulted where the contaminate is on or adjacent to a site of SSSI, a nature reserve or a heritage site.

Methods of inspection would be as stated previously (see 5.5).

7.2 SAMPLING STRATEGIES (INTRUSIVE SITE INVESTIGATION)

Sampling is to be carried out on sites where contamination is known or suspected to be present. The sampling procedure is intended to discover whether:

- Contaminants are present on site
- Establish the distribution of contaminants on site
- Locate concentrations of contaminants which could lead to an unacceptable risk to human health or the environment (“hot spots”) and establish the size and shape of such concentrations of contaminants

The sampling strategy will use the information obtained from the desk study and visual site inspections.

The site investigation will be site specific and will include the, number of sampling points, their location on the site, and the number of samples and depth profile at each sample point.

Some sites will only be sampled where there is to be site development or change of use. Where this is the case the developer will be required

to provide a site assessment report, which has followed the sampling strategies for contaminated land guidance CLR11.

Once sampling has been done and the results received from the analyst, a decision on whether a second stage of sampling and analysis is required must be made. Second stage sampling will only be carried out where the results have proved to be inconclusive or revealed unsuspected contaminants. It may also be necessary to send samples for further analysis or different laboratory techniques to satisfactorily define contaminants

A report on the sampling will be compiled, which will contain the following information.

The overall objectives of the assessment.

The investigation strategy and the reason for choosing it.

The methods, techniques and standards used in carrying out the site investigation.

7.3. CONTAMINATED LAND REGISTER

Once potentially contaminated sites have been identified, investigation will be required to establish whether or not the land is “Contaminated Land” under the contaminated land regime.

All planning applications that are made for brown field sites in formerly industrial area, or in any area known to have had a former contaminate use, will be required under the planning permission to carry out a site investigation.

Environmental Protection Services will make a decision as to whether or not the land is contaminated using the procedures mentioned previously.

Land meeting the statutory definition of contaminated land, will be determined as contaminated land but it will not be entered on the Contaminated Land Register unless a notice is served.

Once a notice has been served the Contaminated Land Register will specify the site and it will show the boundary of land which is effected by contamination.

Where the boundaries are uncertain a note to this effect shall be recorded.

The record will list the site contaminants and record their potential effect on human health, ecology, development and water.
The register will also show any legal notices that have been served, and record any site remediation measures that have been carried out.

Information gathered relating to sites that may have some form of land contamination, but are not classified as contaminated land will be kept on file in the event of future development or use, which could effect the definition.

7.4. Health and Safety Procedures

All officers of Carlisle City Council are required to follow the Health and Safety procedures laid down in the Health and Safety manual.

Health and Safety protocols would be required from any contractor who is employed to carry out site investigations on behalf of the Council.

Care is to be taken at all times during site investigation and remediation as during these operations contaminants may be released.

7.5 POTENTIAL SPECIAL SITES

Where Carlisle City Council has identified a contaminated land site, that they believe to be a special site because of the presence of any contamination on MOD land or the likely contamination of a controlled water, the Council will write to the Agency providing them with details of why they believe the site to be a special site. A full list of sites which are classed as “special sites” can be found in the DETR Circular 02/2000 Section 18 and the Contaminated Land (England) Regulations 2006 Regulations 2 and 3). The Council will use the standard format for exchange of information (see Appendix 1 and 2).

The Council and the Environment Agency have agreed to a memorandum of understanding, which states that the agency and the local authority will consult with each other and co-operate wherever possible.

Both parties are committed to making their workings as transparent as possible to each other and to the public as a whole.

Where a site is orphaned and requires full investigation then either the Local Authority or the Environment Agency will appoint a consultant.

7.6 RISK COMMUNICATION STRATEGY

Where a piece of land is so contaminated that it poses a significant possibility of significant harm, the land will be placed on the contaminated land register.

Where the land is not to be immediately remediated or where it can not be securely fenced off the public will be notified by way of notices posted at the perimeter of the land, letters to adjacent homes that are effected and where necessary an announcement in the local press. The decision to place an announcement in the local press will rest with the Council's Overview and Scrutiny Committee.

7.7 FREQUENCY OF INSPECTION

Once all the land has been risk assessed, those sites in the priority rating of 9 will be inspected within 1 year, 8 within 2 years, 7 within 3 years and 6 within 4 years except where development is proposed or other changes have taken place which would precipate an earlier investigation.

7.8 FORMAT OF INFORMATION RESULTING FROM INSPECTION

Initial inspections will involve the completion of the contaminated land preliminary site inspection sheet and the contaminated land site risk assessment sheet. Both these documents (see Appendix 6 and 7) will be placed on the site file along with maps, photographs and any other information available.

8.0 REVIEW MECHANISMS

After each potential contaminated land site has been risk assessed and has been a priority rating below 3 then no further action will be taken in relation to this land unless the Planning Services receive an application to develop the said land or a new receptor is introduced (e.g. SSSI). At this time the situation will be reviewed to take into account the nature of the development or the new receptor and the need for more detailed site surveys
or intrusive site investigations.

The strategy document will be reviewed once every 6 years, unless there are changes to the legal framework, which will require the review to be brought forward, so that the new legislation/guidance can be incorporated in the strategy.

AUDIT OF INSPECTIONS

Risk assessments will be carried out by an officer of the Council and audited by the Environmental Quality Manager, on a periodic basis, not less than once a month. All files are to be audited by the Environmental Quality Manager and signed and dated where there is agreement with the risk assessment.

Where agreement is not reached the Officer and the Environmental Quality Manager shall review the risk assessment together.

9.0 INFORMATION MANAGEMENT

9.1. GENERAL PRINCIPLES

As previously stated the local authority has signed up to an agreement for transparency, and wherever possible site specific information will be provided on request, providing the information is not classified as confidential.

The Register will contain the items listed in Section 5, and will be set out in the format shown in Appendix 3.

Information relating to special sites will be held on the contaminated land register, but where specific details are required in relation to controlled waters or radio activity on MOD sites, the enquirer may be referred to the Environment Agency's contaminated land officer at Penrith.

Information collected regarding potentially contaminated sites will be stored in two formats:

A) Electronically – Information will be stored on the Geographical Information System (GIS) indicating the area considered to be contaminated, this will be linked to a database which records other information related to the site, including the file reference.

B) Site files – Hardcopies of site files will be kept by the Environmental Quality Section of Community Services.

This information which will not be held within the public register will be subject to the Environmental Information Regulation 2004 and other relevant legislation. This regulation underlines the obligation to make environmental information available subject to exceptions (eg relating to national defence or public security, legal or other proceedings and commercial or industrial confidential information)
Some information held will not be open for public access if the land is still under investigation and no determination of contamination has yet

been made. Access to other information, particularly public requesting details of determined sites, will be available during office hours by prior arrangement at the Civic Centre, Carlisle

9.2 PROVISION OF INFORMATION TO THE ENVIRONMENT AGENCY

The local authority is basing its correspondence and information exchange with the agency on the memorandum of understanding. The Local Authority will use the standard forms for information exchange to enable information to be easily processed (see Appendix 4 and 5).

The Local Authority and the Agency will also provide information and an informal basis where ever possible, via telephone and e-mail, computer discs. Access to paper based information at the Agency's office or at the Council offices can be viewed on request.

10. OTHER SUPPORTING INFORMATION

10.1 CONFIRMED CONTAMINATED LAND REMEDIATION OPTIONS

Once land has been found to be contaminated according to the legal definition the Council will consider various remediation strategies. These strategies must break the linkages between identified source, pathway and receptor to be effective options.

The redevelopment of contaminated land in the UK has relied heavily on conventional engineering based solutions including:

- Excavation and disposal of contaminated material to landfill
- Pump and treat systems for the abstraction, treatment, and disposal of groundwater
- In ground barriers and caps to contain contaminated soil, water or gas
- Cover systems to prevent exposure to contaminated materials of on – site users and building materials

These methods may not always represent the optimum solution for a contaminated site.

The Council believe that land should be made fit for its present use, not fit for any use.

All the following options will be considered:

(I) DIG AND DUMP

Historically this was the conventional approach to site remediation. Where there is only a small amount of contamination that can easily be removed this may be the most favourable option but for many sites in situ methods may be more appropriate.

Ex-situ techniques involve the excavation or abstraction of the contaminated material to the surface where it can be treated on-site or taken away to another location, such as central treatment or disposal facility.

(II) IN SITU – CLEANING

Where the contamination can be removed from land by an on site method, this should be done. For example the washing of soils

contaminated with oil can be conducted on site and the cleaned material retained on site.

In soil vapour extraction, air sparging and electro-remediation are other treatments which may be employed.

Six-phase heating, involving in situ heating of the soil and steam stripping of the volatile contaminants, has been used to remove chlorinated solvents from groundwater and may be utilised in appropriate circumstances.

In-situ techniques involve minimal site disturbance with the contaminated media redemption in place within the ground. In-situ methods may be appropriate where it is not technically feasible to excavate the contaminated soil or sediments either due to depth, cost, or the presence of buildings and services.

(III) TREATMENT TECHNOLOGIES

There are five broad classes of treatment technology: biological. Chemical, physical, solidification and stabilisation, and thermal.

To these should be added the collection of naturally occurring physical, chemical and biological processes that constitute natural attenuation.

a) **Biological treatments**

Biological treatments exploit one or more basic processes to treat contaminated soil and water:

- Degradation — The aerobic and anaerobic biochemical decomposition of a compound through the action of soil micro-organisms (bacteria, fungi and anctinomycetes)
- Transformation — The biochemically mediated conversion of a contaminant to a less toxic and/or less mobile form.
- Accumulation — The accumulation of organic and inorganic contaminants within plant tissues.
- Mobilisation — The biochemically mediated mobilisation of contaminants into a solution that is then separated from the contaminated soil and the contaminants recycled, treated, or

disposed of.

In general established commercial processes are limited to those based on biodegradation.

b) **Chemical treatments**

Chemical treatments destroy, fix or concentrate toxic compounds in contaminated soil or water by:

- Oxidation — The chemical valency of contaminants is increased.
- Reduction — The chemical valency of contaminants is decreased.
- Immobilisation — The mobility of contaminants is reduced by precipitating them as insoluble complexes, by adsorbing to a solid matrix, or by amending soil conditions.
- Extraction — Chemical extraction processes such as solvent flushing are used to transfer the contaminant from the soil to a leachate, which can be collected, concentrated and treated.

Leachants include acids, alkalis, surfactants, and organic solvents.

c) **Physical treatments**

Physical treatments separate contaminants from the soil matrix by exploiting differences between the soil and contaminant, such as volatility or magnetism, or between contaminated and uncontaminated soil particles, such as particle density or particle size. Enriched residues then need further treatment or disposal.

d&e) Solidification and stabilisation

These treatments are commonly used in tandem. Solidification technologies involve adding chemical agents to contaminated soil to create a mixture that sets as a firm mass with enhanced structural integrity and reduced permeability, or using high temperatures to melt soil until if forms a strong and impermeable glassy matrix.

Stabilisation technologies are chemical agents to react with soil contaminants to convert them into a less toxic and/or mobile form. Stabilisation does not necessarily result in improved physical characteristics for treated waste.

g) Thermal Treatments

Thermal treatment is a two-stage process. First contaminants are volatised from contaminated soils at temperatures of up to 600^{0}c. Then, the gaseous contaminants are either collected and concentrated by a combination of condensers, scrubbers and filters or are combusted at a higher temperature.

- Incineration involves the direct or indirect application of heat to contaminated soil at high temperatures (typically 800-$2{,}500^{0}$c) to destroy contaminants.

(VI) CONTAIN AND COVER

Some types of contamination can be safely contained on the land especially in circumstances where the land is to be completely covered with concrete. For example car parks, factories etc.

Each remediation strategy should be seriously considered in the light of the type of contamination present and the proposed future use of the site.

The end use of the site will also have a role to play in determining the remediation strategy to be followed.

The Council will not rule out any remediation strategy, but believe that "dig and dump" should be used as sparingly as possible.

10.2 REMEDIATION COSTS

The cost of remediation depends on many factors over and above the volume of ground treated or area covered. Costs can be broken down into mobilisation, running cost per unit volume or area treated, demobilisation, monitoring and verification. Consequently site specific advice is needed. Nevertheless indicative equivalent costs are still useful when assessing remediation options (*see table*).

I) LOOKING AHEAD

Throughout the world, industry and regulators are recognising that more remediation needs to be carried out in situ.

The pollution prevention and control system deepen that need. As monitored natural attenuation becomes more widely understood and accepted it will be used to deal with a large proportion of petroleum hydrocarbon contamination problems and a significant proportion of chlorinated hydrocarbon problems.

It must be noted however that requirements for proving monitored natural attenuation as a remediation technique are often underestimated. The amount of data required for even a small scheme is far more than even a detailed ground investigation provides.

Indicative remediation costs	Approximate
Remediation technology	Price
Excavation and disposal to landfill	£15-30/m2
Enscapulation (shallow cut-off wall)	£50/m2
Enscapulation (deep cut-off wall)	£40-60/m2
Typical landfill gas control system	£200,000
Typical grout curtain/vent trench	£200,000
Bioremediation	£35-45/t
Vitrification	£40/t
In-situ vitrification (5t/hour)	£150-215/t
Dechlorination	£100-300/t
Soil vapour extraction	£40-6-/me vadose zone
Soil Washing	£30-35/t
Enhanced thermal conduction	£35-45/m3
Six phase heating	£20-30/m3
In situ chemical oxidation	£40-80/m3
Pump and treat	£20-30?m3
Free product recovery	£10-20/m3 vadose zone
Air sparge	£45-55/m3 groundwater
Oxidation of cyanide	£400/t
Solvent extraction and incineration	£400/t
Thermal dessoption (inc. evcavation and pre-treatment)	£35-150/t

(II) POLLUTION PREVENTION

To help prevent future contamination of land the Council will actively pursue its duties under the Environmental Protection Act 1990 and Pollution Prevention and Control Act 1999 and work with other agencies to further that end.

(III) LANDOWNERS, OCCUPIERS AND OTHER INTERESTED PARTIES

Where it has come to the attention of the Council that land is potentially contaminated the Authority will endeavour to contact the owner, occupier and all other intended parties to hold a site meeting to discuss relevant issues.

Initial contact will be on an informal basis. Formal action will only be taken if there is a lack of co-operation from the aforementioned parties or the land has to be "determined as contaminated land" and requires remediation under the provisions of the regime.

(IV) THE WIDER COMMUNITY

The public will have access to environmental information regarding contaminated land and the Council's strategy will be available to the public. Any queries can be directed to Environmental Protection Services who will respond to requests for information, provided these do not breach confidentiality.

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Appendix 1

Extract from Environmental Protection Act 1990: Part 11AContaminated Land DEFRA circ01/2006

Table A – CATEGORIES OF SIGNIFICANT HARM		
	Type Of Receptor	**Description of harm to that type of receptor that is to be regarded as significant harm**
1	Human Beings	Death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. For these purposes, disease is to be taken to mean an unhealthy condition of the body or a part of it and can include, for example, cancer, liver dysfunction, or extensive skin ailments. Mental dysfunction is included only insofar as it is attributable to the effects of a pollutant on the body of the person concerned. This description of significant harm is referred to as a "human health effect"
2	Any ecological system, or living organism forming part of such a system, within a location which is: • An area notified as an area of special scientific interest under section 28 of the Wildlife and Countryside Act 1981 • Any land declared a national nature reserve under section 35 of that Act; • Any area designated as a marine nature reserve under section 36 of that Act; • An area of special protection for birds, established under section 3 of that Act; • Any European site within the meaning of regulation 10 of the Conservation (Natural Habitats etc) Regulations 1994 (i.e. Special Areas of Conservation and Special Protection Areas);	For any protected location: • harm which results in an irreversible adverse change, or in some other substantial adverse change, in the functioning of the ecological system within any substantial part of that location; or • harm which affects any species of special interest within that location and which endangers the long-term maintenance of the population of that species at that location In addition, in the case of a protected location which is a European site (or a candidate Special Area of Conservation or a potential Special Protection Area), harm which is incompatible with the favourable conservation status of natural habitats at that location or species typically found there. In determining what constitutes such harm, the local authority should have regard to the advice of English Nature and to the requirements of the Conservation (Natural Habitats etc) Regulations 1994
3	• Any candidate Special Areas of Conservation or potential Special Protection Areas given equivalent protection • Any habitat or site afforded policy protection under paragraph 6 of Planning Policy Statement (PPS 9) on nature conservation (i.e. candidate Special Areas of Conservation, potential Special Protection Areas and listed Ramsar sites) • Any nature reserve established under section 21 of the National Parks and Access to the Countryside Act 1949	This description of significant harm is referred to as an "ecological system effect".
4	Property in the form of: • Crops, including timber, • Produce grown domestically or on allotments , for consumption • Livestock • Other owned or domesticated animals • Wild animals which are the subject of shooting or fishing rights	For crops, a substantial diminution in yield or other substantial loss in their value resulting from death, disease or other physical damage. For domestic pets, death serious disease or serious physical damage. For other property in this category a substantial loss in its value resulting from death, disease or other serious physical damage. The local authority should regard a substantial loss in value as occurring only when a substantial proportion of the animals or crops are dead or otherwise no longer fit for their intended purpose. Food should be regarded as being no longer fit for its purpose when it fails to comply with the provisions of the Food Safety Act 1990. Where a diminution in yield or loss should be regarded as a benchmark for what constitutes a substantial diminution or loss. This description of significant harm is referred to as an "animal or crop effect"

5	Property in the form of buildings For this purpose "building" means any structure or erection, and any part of a building including any part below ground level, but does not include plant or machinery comprised in a building	Structural failure, substantial damage or substantial interference with any right of occupation. For this purpose, the local authority should regard substantial damage or substantial interference as occurring when any part of the building ceases to be capable of being used for the purpose it which it was intended. Additionally, in the case of a scheduled Ancient Monument, substantial damage should be regarded as occurring when the damage significantly impairs the historic architectural, traditional, artistic or archaeological interest by reason of which the monument was scheduled This description of significant harm is referred to as "building effect"

Appendix 2

Extract from Environmental Protection Act 1990. Part 11a contaminated land DEFRA circ 01/2006

Table B – Significant possibility of significant harm		
	Descriptions of significant harm (as defined in Table A)	**Conditions for there being a significant possibility of significant harm**
1	Human health effects arising from: The intake of a contaminant Other direct bodily contact with a contaminant	If the amount of the pollutant in the pollutant linkage in question • Which a human receptor in that linkage might take in, Or To which such a human might otherwise be exposed, as a result of the pathway in that linkage would represent an unacceptable intake or direct bodily contact, assessed on the basis of relevant information on the toxicological properties of that pollutant. Such an assessment should take into account The likely total intake of, or exposure to, the substance which form the pollutant, from all the sources including that from the pollutant linkage in question; The relative contribution of the pollutant linkage in question to the likely aggregate intake of, or exposure to, the relavant substance or substances; and The duration of intake or exposure resulting from the pollutant linkage in question The question of whether an intake or exposure is unacceptable is independent of the number of people who might experience or be affected by that intake or exposure
2	All other human health effects (Particularly by way of explosion or fire)	If the probability, or frequency, of occurrence of significant harm of that description is unacceptable, assessed on the basis of relevant information concerning: That type of pollutant linkage; or That type of significant harm arising from other causes, In making such an assessment, the local authority should take into account the levels of risk which have been judged unacceptable in other similar contexts and should give particular weight to cases where the pollutant linkage might cause significant harm which • would be irreversible or incapable of being treated; • would affect a substantial number of people • would result from a single incident such as a fire or an explosion; or • would be likely to result from a short-term (that is less than 24-hour) exposure to the pollutant.
3	All ecological system effects	If either: • significant harm of that description is more likely than not to result from the pollutant linkagein question Or There is a reasonable possibility of significant harm of that description and if that harm were to occur, it would result in such a degree of damage to features of special interest at the location in question that they would be beyond any practicable possibility of restoration. Any assessment made for these purposes should take into account relevant information for that pollutant linkage, particularly in relation to the ecotoxicological effects of the pollutant.

4	All animal and crop effects	If significant harm of that description is more likely than not to result from the pollutant linkage in question, taking into account relevant information for that type of pollutant linkage, particularly in relation to the ecotoxicological effects for the pollutant linkage.
5	All building effects	If significant harm of that description is more likely than not to result from the pollutant linkage in question during the expected economic life of the building (or, in the case of a scheduled Ancient Monument, the foreseeable future) taking into account relevant information for that type of pollutant linkage.

Appendix 3

Contaminated Land Register Contents

FILE REF	NAME OF LAND AND GRID REF.	CONTAMINATION IDENTIFIED	NOTICES SERVED	REMEDIATION	DEVELOPMENT

APPENDIX 4

SOCL/LA/FORM 1-Standard Form For Exchange of Information Between Local Authorities and Environment Agency When a Site is Determined As Contaminated Land

Please append this summary to the written record of determination the local authority is required to send the Agency (under Section 78c(3). This summary form does not replace that written record.

Local Authority Name	

Part II A Contact name	

Site Name & Address	

Local Authority unique reference (if relevant)	
Grid Reference:	

Date the Determination Notice was Issued?	

	0-5ha	5-10ha	10-15ha	15-20ha	>20ha
Approximate Area of Site					

Is the site a potentially special site?	**Y/N**

Contaminants the determination was based on. Can be more than one group (see Note 1 below)	Metals and metalloids	Inorganic compounds	Organic compounds	Others
	Y/N	**Y/N**	**Y/N**	**Y/N**

Industry that caused contamination, if known. Can be more than one group. (see Note 2 below)	**Energy Industry**	**Metal Industry**	**Mineral Industry**	**Chemical Industry**	**Waste Management Industry**
	Y/N	**Y/N**	**Y/N**	**Y/N**	**Y/N**
	Textiles, printing and coating Industry	Paper Industry	Timber processing industry activities	Food and animal processing industry	Other (please specify)
	Y/N	**Y/N**	**Y/N**	**Y/N**	**Y/N**

Receptor at risk	Human Beings	Controlled waters	Ecological systems	Property in the form of buildings	Other property
	Y/N	**Y/N**	**Y/N**	**Y/N**	**Y/N**

Current Land Use	Derelict	Housing	Commercial Premises	Industrial Premises	Agricultural	Forestry	Open space	Other
	Y/N	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**

Is a change in Land Use intended at the site That might effect the determination?	Y/N

If yes What is The Intended New land use	Derelict	Housing	Commercial Premises	Industrial Premises	Agricultural	Forestry	Open space	Other
	Y/N	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**

Please add any other information about The site that you think might be useful for reporting purposes	

For Agency Use Only

Environment Agency Reference Number	

Note 1 – Contaminant Groupings

Metals and metalloids

Arsenic	Cadmium	Chromium
Copper	Lead	Mercury
Nickel	Zinc	Selenium
Beryllium	Silver	Thallium

Inorganic Compounds

Ammonium	Chloride	Cyanide
Sulphate	Sulphide	Sulphur

Organic Compounds

Aromatic hydro carbons	PAH	Phenols
Fuel/hydrocarbons	Aliphatic hydrocarbons	Aromatic halocarbons
Chlorinated phenols	Dioxins and Furans	Organometallics
PCBs		

Others

Asbestos	Carbon dioxide	Methane
Loss on ignition/C	pH	Soil organic matter
Explosives	Pesticides	Radioactivity
Radon		

Appendix 5

SOCL/LA/FORM 2 – Standard Form For Exchange Of Information Between Local Authorities And Environment Agency When Remediation Is Taken For A Site

This summary forms part of the local authority duty (under Section 78U) to provide the Environment Agency with information for the state of contaminated land report.

Local Authority Name	

Local authority Part II contact name	

Site Name And Address	

Local Authority unique reference (if relevant)	
Grid Reference	

What date was the (complete appropriate box)	Remediation Notice Served?	Remediation Statement published?	Remediation Declaration Published?

Have previous notices, statements or declarations been produced for this site?	Y/N	If yes, please give date(s) of issue or publication for		
		Notice:	Statement:	Declaration:

Is Remediation being done, or was it done, under a voluntary agreement?	Y/N

How many appropriate persons have been identified	In total	Group A	Group B

Is the local authority the appropriate person?	Y/N	If yes, is that solely or with others?	

When is remediation expected to start?	<1 year post determination	1-3 years post determination	>3 years post determination

How long is the remediation expected to take?	<6 months	6 months – 1 year	1-2 years	> 2 years

What action does the notice, statement or declaration referred to in this form cover?	Assessment Action	Remediation Action	Monitoring Action
	Y/N	Y/N	Y/N

Is a change in Land Use intended at the site as part of the remediation process?								
If YES, what is the intended new land Use?	Derelict	Housing	Commercial Premises	Industrial Premises	Agriculture	Forestry	Park and recreational	Other
	Y/N	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**	**Y/N**

If other please specify:

What type of remediation action is proposed? (see Note 3) Use more than one if appropriate.	

For Agency Use Only

Environmental Agency Reference Number	

Note 3: key to remediation Technology Types

Possible remediation classes would include, but would not be limited to:

- Containment
- Excavation and off-site disposal
- In-situ bioremediation
- Ex-situ bioremediation
- In-situ chemical treatment
- Ex-situ chemical treatment
- In-situ physical treatment
- Ex-situ physical treatment

APPENDIX 6

CONTAMINATED LAND: PRELIMINARY SITE INSPECTION

Record Identifier: CL/ Site Name:
Address: Geocode:

1. Past Industrial activity

1a. Any relevant street, house, pub or locality names within 500m?

1b. Any site features or relics indicating past history?

1c. Any steam, smoke or other indications of temperature differences?

2. Landfill activity

2a. Site markedly different from *surroundings* regarding topography, vegetation, drainage, soil type etc?

2b. Any discontinuities *within* site regarding topography, vegetation, drainage, soil type etc?

3. Adverse effects on vegetation

3a. Any areas of bare or sparsely vegetated ground compared to rest of site?

3b Any trees or present on site?

3c. Any trees stressed, stunted or diseased?

3d. Are young seedlings or sapling trees regenerating naturally?

3e. Does vegetation appear healthy?

4. Evidence of contamination

4a. Any surface staining or soil or deposits/seepage from soil?

4b. Any obvious stains or coloured layers within soil?

4c. Any odours present (particularly associated with 4a and 4b above)

5. General soil characteristics

5a. Any soil dwelling animals present?

5b. Any areas of soil compaction or waterlogging?

5c. Depth of organic matter on surface of soil?

6. Water quality onsite

6a. Any obvious signs of water contamination?

6b. Is water clear or cloudy?

6c. What are pH values of water and soil samples onsite?

7. Investigation Record Officer: Date:

Follow up action:

APPENDIX 7

CONTAMINATES LAND: SITE RISK ASSESSMENT

Record Identifier: CL/ _____ Site Name:_____

Address:_____ Geocode:_____

Part 1. Information Considered

1. Planning applications/decisions:

2. Environmental Health reports

3. Building Control reports.

4. Waste Disposal Licences

5. Water supply and waste water drainage:

6. Consents to Discharge on-site:

7. Groundwater Vulnerability map:

8. Surface water and groundwater abstractions:

9. Monitoring data:

10. Site investigation data and report

11. Remediation

12. Report of significant events:

Appendix 8

Contaminated Land Risk Assessment

	Sheet	Points
1	Contamination present	
	Severe 3 Moderate 2 Slight 1 None 0	
2	Receptors present	
	4 plus 3 2 to 3 2 1 to 2 1 0 0	
3	Pathways	
	Very Likely 3 Likely 2 Unlikely 1 None 0	
	Priority Rating	

Officer: Date:

Checked by: Date:
Environmental Quality Manger

APPENDIX 9

List of SSSI's

NAME	GRID REF
Birky Cleugh	grid ref 359100 575400
Bolton Fell Moss	grid ref NY 489690
BUTTERBURN Flow	grid ref 367300 576300
Walton Moss	grid ref 350400 566700
Cairnbridge Sand Pit	grid ref 350600 554200
Caudbeck Flow	grid ref 358600 572700
Christianbury Crags	grid ref 357900 582800
Cotehill Pastures and Ponds	grid ref 346500 551700
Cumwhinton Moss	grid ref 351400 551900
Gelt Woods	grid ref 352700 558600
Geltsdale & Glendale Fells	grid ref NY 612545
Gowk Bank	grid ref 367900 573900
Irthing Gorge	grid ref 363500 568500
Kershope Bridge	grid ref 349900 583400
Kingwater	grid ref 360800 569700
Mollen Woods (4 sites)	grid ref 356100 570900
Moorthwaite Moss	grid ref 351100 551100
Orton Moss	grid ref NY 340545
Penton Linns	grid ref 343300 577400
Scaleby Moss	grid ref 343000 563500
Thurston Lough	grid ref 332000 556300

Unity Bog	grid ref 352900 559000
White Moss/Crosby Moor	grid ref 346200 560600
Finglandrigg Woods	grid ref 321800 557000
Lyne Woods (2 sites)	grid ref 350100 574300
Upper Solway Flats and Marshes	grid ref NY 160 610
Black Snib	grid ref NY 423676
Spadeadam Mires	grid ref 598717 616742 619719 645715
Jockies's Syke	grid ref NY 424755
Kielder Mires	grid ref NY 670800
Whitberry Burn	grid ref NY 521741
Oakshaw Ford	grid ref NY 510761
River Eden and Tributaries	grid ref 490302
Ellery Sike	grid ref NY 546757