PG01 Risk Prioritisation Methodology for sites of potentially contaminated land

Purpose: **A preliminary procedure for identifying broad areas and sites of geographical coincidence or close proximity between sources, pathways and receptors of contamination, and prioritising these identified sites for more detailed assessment using a risk scoring system.**

Description: The local authority must identify the existence of all three elements of a pollutant linkage to determine whether any land appears to be contaminated land, as defined in section 78A(2) of EPA 1990. To fulfil this requirement, detailed risk assessment will be necessary, but to first identify the most serious and pressing problems, a preliminary screening tool is required to identify and prioritise sites where a coincidence exists between a source of contamination, a pathway and a receptor.

Procedure PG01 has been developed, using several references, as a preliminary (Phase 1) procedure for prioritising sites where potential pollutant linkages exist, for further phases of investigation work identified in @. The ranked order will place sites according to their potential, but not actual, risk since the assignment of scores is empirical only. Site rankings are not absolute, although pilot tests have attempted to ensure that the worst types of sites are accentuated upwards and vice versa. Following a phased approach aims to meet the requirement for a rational, ordered and efficient approach to inspection, as stated in B.9 of Circular 02/2000.

Steps 1 to 5 of PG01 are followed to prioritise potential sites based on existing information. Step 6 suggests reference methods to identify new sites, and by repeating Steps 2 to 5, each new site is processed to assign and rank its risk score. The output will be a continually updated list of sites in ranked order of priority, for further, more detailed assessment (Phase 2) in line with @'s aims.

Step	Inputs	Action	Output
1	Files, maps, plans, datasets, and/or GIS	Organise information sources and decide on the order of assessing files (alphabetical, wards, etc)	Rational plan of work which will determine method of data storage
2	Files, maps, plans, datasets, and/or GIS	Process site files through each of the Risk Scoring Tables, evaluate information and assign scores.	Sequence of numerical scores for each site on a scoresheet
3	Sequence of scores for each site	Create suitable database, spread-sheet or table, & record scores.	Auditable record of scores (decisions)
4	Sequence of scores for each site	Calculate total score for each site using IT or manually; record totals.	Total score for each site
5	Total scores for all sites	Use IT facilities or manual method to rank the total scores	List of sites in ranked order of priority for further assessment
6	Historical maps, archives, Industry Profiles, CLR3	Identify potential sites from archives, then repeat Steps 2 to 5.	Continually updated list of sites in ranked order of priority

References: Listed on Page 15 of this note PG01.

PG01: Risk Prioritisation Methodology for sites of potentially contaminated land

Scope of methodology

On undertaking the preliminary prioritisation, the aim is to start with the files retained by the team or unit that has responsibility for contaminated land, recognising that other files may exist elsewhere within the authority. Such new site information will need to be gathered in a systematic way and processed and scored in conjunction with Step 6, which entails the identification of new sites by the process of scrutiny of historical maps, archives and records. Step 6 would need to be undertaken as a second phase, within the timeframe indicated by @ (your) Inspection Strategy and using published references such as CLR 3: *Documentary research on industrial sites* (RPS Ltd., 1994, for DoE).

Method

1 Start with internal files and records relating to contaminated land. Decide on how to tackle going through each file and record, using the simplest system. Options include alphabetical street name or site name paper files, or ward by ward files, and so on, depending on office filing structure.

2 Decide how to record the risk scores on a scoresheet (page 14), spreadsheet, or database.

3 Have available the reference maps, plans and datasets, as listed on page 15 of this note PG01.

4 Consider sources of contamination first by attaching scores to the inherent hazards on a site. Instances of absent or incomplete data are accommodated by a mid-range default value within each table, which is intended to ensure that such sites will not defer to the bottom, nor to the top of the ranking list, although the use of defaults is minimised by use of reference data. Work through Table 1.01, the highest scores are applied to those factors about a site that would give rise to the highest hazards. Then consider, in Table 2.01, evidence of any circumstances which may mitigate risks.

5 The remaining risk scoring tables have been devised for receptors and pathways. These tables have been designed for simplicity and ease of use, aiming to briefly characterise the conditions at the site and on adjacent land. Site visits could confirm or support most desk assessments, but would slow down the processing of sites, and are perhaps more appropriate to a later phase of investigation when considering specific sites in more detail.

6 Once all scores for the site are obtained, they are summed up following the protocol below and using the scoresheet on page 14. Weightings have been applied so as to ensure that harm to human health is always a higher priority than risks to other types of receptor, and uses cascaded scores with increased distance of receptors from site. During later phases, identified receptors influenced by more than one source site, will need to be noted spatially (map or GIS) and prioritised further.

7 The summing protocol is as follows: *(Example: S2.01 = score from Table 2.01)*

GRAND TOTAL :=
(S2.01 * S1.01) * (S3.01 + S3.02 + S4.01 + S5.01 + S6.01 + S6.02 + S6.03 + S7.01 + S8.01).

8 Step 5 requires that the risk scores for each site are ranked into order, highest first. A suitable calculating system will be required, via spreadsheet or database (*Note that each LA will need to develop its own system).*

Risk Scoring Tables

SOURCES

1: LAND USE ASSESSMENT

The assessor will need to take into account the worst case land use evident on the land under assessment, as determined from present day and historical maps, aerial photographs and other substantiated information sources. Other files and databases may exist elsewhere within the authority, but in order to quickly produce a prioritised list of sites, and not get delayed in waiting for responses from its retainers, such additional information will need to be considered during a second phase of work

Note that present day boundaries may not conform to past contaminative land use boundaries, and so the assessor will need to decide which boundary they will use in classifying land. Using present day boundaries fits well with comparisons against Development Plans (UDP) and current premises databases used for other inspection and service request work undertaken by Council departments.

However, historical industrial premises or landfills may now be built over and occupied by several different premises with different landowners and possibly with different sensitivities of receptor. Further, contaminative uses may have overlapped on a site over time, and similarly, development of large plots of land may have been undertaken in a piecemeal manner.

The variety of possible scenarios will complicate the picture of resultant ground conditions on site for which there will be no straightforward single approach, so the assessor will need to err on the side of caution, and to be as clear as possible in recording their decisions.

Table 1.01 Risk-based classification of predominant land use

Where to find the information: ***(references on Page 15)***

- Present day maps, historical maps and other documentary sources, following CLR No. 3 (RPS Consultants, 1994).
- Aerial photographs: present day and historical.
- Supporting information in the DoE Industry Profiles (DoE, 1996).

Also be aware of:

- Discontinued and subsidiary uses.
- Pollution Control officers' notes, records of anecdotal evidence or information from the public, newspaper articles and so on.
- Major pollution incidents, flytipping and other illegal activities such as cable burning.

Table 1.01 – PREDOMINANT LAND USE CLASSIFICATION	Land-mark usage codes	Per-ceived risk category	RISK SCORE
1 Asbestos manufacture, abrasives and related products.	ML	HIGH	50
2 Chemical works (organic & inorganic) Manufacture of cosmetics, bleaches, manure, fertilisers & pesticides, detergents, oil, organic based pharmaceuticals, other chemical products incl. Glues, gelatins, recording tapes, photographic film. Dyes, pigments. Paint, varnishes, printing inks, mastics, sealants and creosote.	CH . . DY PA		
3 Radioactive materials processing and disposal.	N/A		
4 Gas works, coke works, coal carbonisation and similar sites. Production of gas from coal, lignite, oil or other carbonaceous material other than waste.	GA .		
5 Refuse and waste disposal sites, including hazardous wastes, incinerators, sanitary depots, drum and tank cleaning, solvent recovery.	RF .		
6 Oil refining and bulk storage of oil and petrol. Gasometers which are not gas works.	LL .		
• **LANDFILL SITE – KNOWN TO BE ACTIVELY PRODUCING GAS**	LA		
7 Abbatoirs and animal slaughtering; Animal products processing into animal by-products e.g. soap, candles & bone works. Tannery, leather goods and skinnery.	AB AN TY	HIGH	40
8 Engineering (heavy and general). Manufacturing of distribution, telecomms, medical, navigation, metering and lighting. Manufacture & repair incl. Ships, aerospace, rail engines and rolling stock. Heavy products manufacture - rolling and drawing of iron, steel & ferroalloys – includes tube works. Manufacturing of electrical and electronic domestic appliances. Manufacture of cars, lorries, buses, motorcycles, bicycles. Manufacturing of engines, buildings & general industrial machinery, including nuts & bolts, gas fittings, wire rope/cable and ordnance accessories.	HE HT HM . HS LT MA .		
9 Metal smelting and refining. Includes furnaces and forges, electroplating, galvanising and anodising. Ferro and aluminum alloys-manganese works, slag works	. FY PL		
10 Civilian manufacture & storage of weapons, ammunition, explosives & rockets including ordnance. All military establishments including firing ranges (if not specified as civilian).	MG MD .		
11 Recycling of metal waste incl. Scrapyards and car breakers.	SP		
12 Natural and synthetic rubber products including tyres and rubber products. Tar bitumen, linoleum, vinyl and asphalt works.	RB .		
13 Paper, card etc. products (packaging). Pulp, paper and cardboard manufacture.	PD PR		
• **UNDERGROUND STORAGE TANKS ON SITE**	UST		
• **LANDFILL SITE – STRONGLY SUSPECTED TO BE PRODUCING GAS, based on available information on age and content of fill.** .	LB . .		
• Manufacture of clay bricks & tiles, including associated activities e.g. brickfields, also solitary kilns (other than lime kilns)	BK .		
• Extraction of alluvial sediments (sand, stone, clay, peat, marl and gravel	PT		
• Quarrying of all stone (including limestone, gypsum, chalk and slate) and ores, includes all opencast mining and slant workings – also slate/slab works, flint works, flint works, stone yards	QU		
Continued….			

14 Airports and similar (Air & space transport)	AP	MEDIUM	30
15 Concrete, ceramics, cement and plaster works. Concrete, cement, lime & plaster products, also including solitary lime kilns. Tableware & other ceramics.	. CE CR		
16 Dry-cleaning & laundries (larger scale, not usually "High Street")	LY		
17 Flat glass products manufacture	GL		
18 Photographic processing			
19 Coal storage/depot. Coal mining (and the manufacturing of coke and charcoal) – areas include associated surface activities in area, & coal mine shafts. Areas of mining and single or groups of shafts other than coal, or not specified – including levels, adits, etc also areas associated with mineral railways.	CC CY MN .		
20 Electricity generation and distribution, including large transfer stations Power stations (excluding nuclear power stations). Batteries, accumulators, primary cells, electrical motors, generators & transformers.	PW . BT		
21 Printing of newspaper. Printing works other than news print and bookbinding (usually excludes "High Street" printers)	NW PN .		
22 Railway land, including yards and tracks. (Railway tracks – up to 4 tracks wide or 30m)	RW RL		
23 Sale of automotive fuel. Road vehicle fuelling, transport depots, road haulage and commercial vehicle fuelling, local authority yards and depots. Repair and sale of cars & bikes, parts and motorway services. Transport depots – road haulage, corporation yards.	FU . GG DP		
24 Sewage treatment works. Sewerage, septic tanks, effluent – including all filter beds.	SW		
25 Textiles manufacturing - Natural and man made textile manufacture and products including hemp rope and linoleum	TX .		
26 Timber treatment works and manufacturing. Sawmills, planning & impregnation (i.e. treatment of timber), wood products, telegraph works, timber yard e.g. veneer	WD .		
27 Computers, office machinery, business/industrial electrical goods. Insulated wire & cable for electrical/tel purposes.	LE WR		
• **LANDFILL SITE – GAS PRODUCTION IS POSSIBLE, based on historical map evidence of infilled quarry, water body or other void.**	LC .		
• **DEFAULT** setting where information is absent about a site or landfill.			
28 Plastic products manufacture, moulding and extrusion; building materials; fibre glass, fibre glass resins and products. Manufacturing of Tar, Bitumen & Asphalt	PS .	MEDIUM / LOW	20
29 Dockyards and wharves. Boat-building, wharf and quays, cargo/transport handling facilities – marine or inland.	DK .		
30 Brewing and malting. Spirit distilling & compounding. Major food processing, includes large dairies.Exceptionally large scale corn/flour milling.	BW DL FD		
31 Constructional steelwork, metal structures & products & building materials	MP		
32 Cemetery, modern burial ground and grave yard	GV		
33 All hospitals including sanatoriums but not lunatic asylums	HL		
• **LANDFILL SITE – GAS PRODUCTION UNLIKELY, based on available information on age and content of fill**	LD		
None of the above uses noted – enter a suitable score based on other research or knowledge about the land uses on site. **DEFAULT = 30, MEDIUM RISK** **or = 1, LOW RISK**		**Enter** **Default/ LOW**	**Enter** **30** **1**

References: Syms, 1998; DoE Industry Profiles 1996; historical land use classification used by Landmark Limited in their land use data base (comprising digitised land uses from 1:10,360 and 1:10,000 scale maps).

Sum score: 1.01 =

2: RISK EVIDENCE

Table 2.01 – Risk evidence

Where to find the information:

- Site investigation reports, land condition records, completion reports, Waste Management Licence surrender documents, planning files (development control) and other supporting information on file, where it is readily available.

Table 2.01 - Risk evidence	**Risk score**
CONTROLLED RISKS – Satisfactory remediation undertaken on site	0.1
Site file exists, but contains satisfactory evidence that the site is not a source.	0.2
Remediation undertaken on site – 1990 or later	0.4
Remediation undertaken on site – pre-1990	0.6
NO EVIDENCE OF CONTROL OF RISKS – No information available either way – Default setting.	1.0

Sum score: 2.01 =

PATHWAYS

3: GEOLOGY

Table 3.01 – Solid geology

Where to find the information:

- Geological Survey 1:50,000 scale map (or better). *Date @*. England and Wales Sheet *No. @*, *Area @* (Solid edition). Ordnance Survey.
- Digitised geological information.

Table 3.01 - Solid geology	**Risk score**
LOW RISK – e.g. Low permeability solid rock	1
MEDIUM / LOW RISK	2
MEDIUM RISK	3
MEDIUM / HIGH RISK	4
HIGH RISK – e.g. Permeable, fractured or fissured rock. By default where receptor situated on site	5
No data – default = 5	Enter

Table 3.02 – Drift geology and made ground

Where to find the information:

- Geological Survey 1:63,360 scale (or better). *Date @*. England and Wales Sheet *No. @, Area @*, (Drift edition). Ordnance Survey.
- Digitised geological maps.

Table 3.02 - Drift geology	**Risk score**
LOW RISK – e.g. Predominantly deep clay across site (low permeability)	1
MEDIUM / LOW RISK	2
MEDIUM RISK	3
MEDIUM / HIGH RISK	4
HIGH RISK – e.g. No drift present, or Made ground, or Natural sand, peat, gravels (high permeability) By default where receptor situated on site itself.	5
No data – default = 5	Enter

Sum score: 3.01 + 3.02 =

4: MINES, DRAINS AND SERVICES

Table 4.01 – Mining, drainage and services on or near to site

Where to find the information:

- Site investigation reports, planning files (development control), and other supporting information.
- Present day and historical maps.
- Aerial photographs: present day and historical.

Table 4.01 - Mining, drainage and services	**Risk score**
No drainage, services (including culverted rivers), wells or suspected mining/quarrying activities across site.	1
The presence of drainage, services (including culverted rivers), wells or suspected mining/quarrying activities across site is **unlikely** given the historical use of the site.	2
	3
The presence of drainage, services (including culverted rivers), wells or suspected mining/quarrying activities across site is **likely** given the historical use of the site.	4
Drainage, services (including culverted rivers), wells or suspected mining/quarrying within parts of the site where contamination is believed to be present.	5
No data – default = 3?	Enter

Sum score: 4.01 =

@: AIR

A risk scoring table for the air transfer pathway has not been produced for this methodology, but it is recognised that further research will have to be undertaken prior to undertaking the detailed assessment of sites. Two main transfer pathways include:

- Deposition on land of atmospheric fallout from process vents and chimney stacks.
- Deposition on land from the wind blowing across land which has contamination present at the surface. The contaminated soil particles or other volatile compounds could be deposited on land further away, which may be occupied by sensitive receptors.

5: ACCESSIBILITY TO SITE SURFACE

Table 5.01 – Accessibility to site surface

There are two main considerations here. Firstly, the likelihood of access to, and direct human contact with, any contaminants on the site surface or within the upper soil strata that may be handled during sport, recreation, gardening and so on. Secondly, and of a lower order of priority than health risks, a soft surface may be more susceptible to rainwater infiltration and leachate formation (water pollution risk).

Where to find the information:

- Aerial photographs.

Table 5.01 – Accessibility to site surface	**Risk score**
Concrete hardstands, car parking or derelict buildings on site.	1
Concrete hardstands, car parking and buildings that are occupied. *Or:* Gravel, bare soil or other soft surface areas, where public access is restricted by secure perimeter fencing (ideally signposted).	2
Gravel, bare soil or other soft surface areas: The land may be in partial or full use, but site occupiers are probably *seldom present* in those areas. Public access is generally restricted by some form of fencing, possibly signposted.	3
Gravel, bare soil or other soft surface areas: Access onto private land is inadequately restricted (incomplete or broken fencing). Public open space, unrestricted access.	6
Gravel, bare soil or other soft surface areas: Part or all of the land is fully in use and site occupiers are probably *often or normally present* in those areas.	10
No data – default = 3?	Enter
Sum score: 5.01 =	

RECEPTORS

6: LAND OCCUPATION TYPES

PEOPLE

Table 6.01 - Present day occupation of site and adjacent land

Where to find the information:

- Present day maps, also UDP.
- Aerial photographs.
- Environmental Health, Planning, Leisure and Housing Department records, (possibly also Housing Associations and related).

Table 6.01 - People: Present day occupation of site and adjacent land	**Risk score**
50-250m Outdoor industrial or commercial yards	5
0-50m Outdoor industrial or commercial yards ***50-250m*** Industrial or factory buildings, well-vented or open sided	10
On site Outdoor industrial or commercial yards ***0-50m*** Industrial or factory buildings, well-vented or open sided	20
On site Industrial or factory buildings, well-vented or open sided	40
50-250m Office, leisure, commercial/retail buildings (LFG risks) Public open space for recreational use (c/l risks) Agricultural land and buildings (c/l and LFG risks)	50
50-250m Schools, nurseries, hospitals, institutional buildings (LFG risks)	55
50-250m Managed housing with gardens (c/l and LFG risks) Managed housing no gardens (LFG risks) Private domestic dwellings with gardens (c/l and LFG risks) Private domestic dwellings no gardens (LFG risks) Allotments (c/l risks)	60
0-50m Office, leisure, commercial/retail buildings (LFG risks) Public open space for recreational use (c/l risks) Agricultural land and buildings (c/l and LFG risks)	70
On site Office, leisure, commercial/retail buildings (LFG risks) Public open space for recreational use (c/l risks) Agricultural land and buildings (c/l and LFG risks)	(Critical point) 80

0-50m Schools, nurseries, hospitals, institutional buildings (LFG risks)	80
0-50m Managed housing with gardens (c/l and LFG risks) Managed housing no gardens (LFG risks) Private domestic dwellings with gardens (c/l and LFG risks) Private domestic dwellings no gardens (LFG risks) Allotments (c/l risks)	90
On site Schools, nurseries, hospitals, institutional buildings (LFG risks)	170
On site Managed housing with gardens (c/l and LFG risks) Managed housing no gardens (LFG risks) Private domestic dwellings with gardens (c/l and LFG risks) Private domestic dwellings no gardens (LFG risks) Allotments (c/l risks)	190
None of the above uses noted – enter a suitable score based on other information about the occupation of the site. **For LOW RISK (eg derelict sites), enter 10.**	Enter

NATURAL ENVIRONMENT

Table 6.02 - Present day occupation of site and adjacent land

Where to find the information:

- Present day maps, also UDP.
- Aerial photographs.
- Planning Department, GM Ecological Unit, English Nature.

Table 6.02 - Natural Environment: Present day occupation of site and adjacent land	**Risk score**
No designations	1
50-250m Sites of Biological Importance (SBI) designated by the Local Authority	2
50-250m Statutorily Designated Sites (eg SSSI)	3
0-50m Sites of Biological Importance (SBI) designated by the Local Authority	10
On-site Sites of Biological Importance (SBI) designated by the Local Authority	15
0-50m Statutorily Designated Sites (eg SSSI)	20
On-site Statutorily Designated Sites (eg SSSI)	25
Uncertainty – seek specialised advice (English Nature)	Enter

PROPERTY & HERITAGE SITES

Table 6.03 - Present day occupation on site

Where to find the information:

- Present day maps, also UDP.
- Aerial photographs.
- Planning Department, GM Archaeological Unit, English Heritage, DEFRA, Food Std's Agency.

Table 6.03 – Property /Heritage Sites: Present day occupation of site	Risk score
No designation	1
Sites within conservation areas Other sites and monuments recorded by the local authority Wild animals that are the subject of shooting or fishing rights	4
Ancient monuments, archaeological sites, listed buildings (all categories) Owned or domesticated animals	6
Produce grown domestically, or on allotments, for consumption Crops, including timber	8
Uncertainty – seek specialised advice (E. Heritage, DEFRA, Food Std's Agency)	Enter

Sum score: 6.01 + 6.02 + 6.03 =

7: SURFACE WATER

Table 7.01 – Surface water courses and abstractions on site and adjacent land

The following table has been devised to quickly obtain scores for surface water courses (rivers) using readily available datasets, which in practice, tends to be the General Quality Assessment classes A - Good to F – Bad. However, note the paper describing the current framework for surface water classification (issued by EA February 2001) and bear in mind the following advice provided by the Environment Agency:

> *Prioritising surface waters based on classification A-C and D-F is not really appropriate, as these are the GQA classes, which are just a description of the current surface water quality. It would be more beneficial to consider the River Quality Objective set using the River Ecosystem classes and to take account of any uses/designations such as salmonid/coarse fisheries, bathing waters (few inland ones actually designated) and type of abstraction as an indicator of sensitivity.*

Where to find the information:

- Present day maps and aerial photographs.
- Digitised Land Line map for "blue line" surface water dataset.
- Environment Agency water abstractions list - digitised dataset (CD-ROM, October 2000).
- River quality classes (GQA classes: A - Good to F - Bad) via Environment Agency website ("*What's in my back yard?*") [on-line]. Available internet: http://www.environment.agency.gov.uk/ What's in my back yard?
- River Ecosystem (RE) River Quality Objectives (RQOs) - short term and long term - via your area's Local Environment Agency Plan (LEAP) document(s) and via the disk issued by EA February 2001.

Table 7.01 - Surface water courses on site and adjacent land	Risk score
No surface waters. No surface water abstractions for any purpose within 1,000 metres of the site.	1
50-250m River with Classification D, E or F. (Long term RQO = RE 3 or RE 4) Pond, lake, reservoir	5
50-250m River with Classification A, B or C. (Long term RQO = RE 2 or better) Any surface water abstraction between 500 & 1,000 m downstream from the site	6
0-50m River with Classification D, E or F. (Long term RQO = RE 3 or RE 4) Pond, lake, reservoir	13
0-50m River with Classification A, B or C. (Long term RQO = RE 2 or better) Any surface water abstraction for drinking water less than 500 m downstream from the site.	16
On-site River with Classification D, E or F. (Long term RQO = RE 3 or RE 4) Pond, lake, reservoir	22
On-site River with Classification A, B or C. (Long term RQO = RE 2 or better) Any surface water abstraction from the site or immediately adjacent to the site.	25
Uncertainty – seek specialised advice from the EA.	Enter

Sum score: 7.01 =

8: GROUND WATER

Table 8.01 – Ground water vulnerability and Source Protection Zones

Where to find the information:

- Groundwater Vulnerability Map 1:100,000 scale. Sheet *No @, Area @*. Environment Agency.
- Digitised groundwater vulnerability map.
- Groundwater Source Protection Zones (SPZ) via Environment Agency website (“*What’s in my back yard?”*). [on-line]. Available internet: http://www.environment.agency.gov.uk/ What’s in my back yard?

Table 8.01 - Ground water vulnerability and SPZs	Risk score
Non-aquifer	1
Minor aquifer – low risk	5
Major aquifer – low risk Minor aquifer – medium risk Zone III (Source Catchment)	8
Zone II (Outer Source Protection) Major aquifer – medium risk Minor aquifer – high risk	15

Zone I (Inner Source Protection) Major aquifer – high risk	25
Uncertainty – seek specialised advice from the EA.	Enter

Sum score: 8.01 =

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SCORE SHEET

Scores for the site are assigned by working through the risk scoring tables. They can be recorded on the scoresheet below, and scores are summed following the given protocol. The resultant total scores can then be sorted into ranking order, highest first, to produce a prioritised list of sites.

	RISK SCORING TABLES		SCORE
SOURCES	**1**	**Land Use Assessment and Classification**	
	1.01	Risk-based classification of predominant land use	**@S1.01**
	2	**Risk evidence**	
	2.01	Risk evidence	**@S2.01**
		SUB-TOTAL 1	
PATHWAYS	**3**	**Geology**	
	3.01	Solid geology	**@S3.01**
	3.02	Drift geology	**@S3.02**
	4	**Mines, drains and services**	
	4.01	Mining, drainage and services on or near site	**@S4.01**
	5	**Accessibility to site surface**	
	5.01	Direct human contact and access	**@S5.01**
		SUB-TOTAL 2	
RECEPTORS	**6**	**Land occupation types**	
	6.01	People: present day occupation of site and adjacent land	**@S6.01**
	6.02	Natural environment: present day occupation of site and adjacent land	**@S6.02**
	6.03	Heritage sites: present day occupation of site	**@S6.03**
	7	**Surface water**	
	7.01	Surface water courses and abstractions on site and adjacent land	**@S7.01**
	8	**Ground water**	
	8.01	Ground water vulnerability and Source Protection Zones	**@S8.01**
		SUB-TOTAL 3	
	GRAND TOTAL:= (S2.01 * S1.01) * (S3.01 + S3.02 + S4.01 + S5.01 + S6.01 + S6.02 + S6.03 + S7.01 + S8.01)		**GRAND TOTAL: @** ____

REFERENCES

References required to work through the following risk scoring tables:

All:

- Ordnance Survey 1:1,250 and 1:2500 maps: present day and post-1945 editions.
- Aerial photographs – Greater Manchester Digital Aerial Photography Dataset 1997-2000 (AGMA/ Cities Revealed/ Greater Manchester Geological Unit) and earlier editions (GMGU).
- Unitary Development Plan (UDP) map or Development Plans.

Table 1.01 - Classification of predominant land use

- County series historical maps and other documentary sources, following CLR No. 3: Reference: RPS Consultants Limited. 1994. Contaminated Land Research Report No. 3: *Documentary research on industrial sites. London.* Department of the Environment (now under The Stationery Office).
- Supporting information in the DoE Industry Profiles (DoE, 1996). Reference: DoE: Department of the Environment. 1996. *DoE Industry Profiles*. 47 volumes, sponsored by Department of the Environment. London. HMSO (now The Stationery Office).

Table 3.01/3,02 – Solid geology AND Drift geology and made ground

- Geological Survey 1:50,000 scale (or better). *Date @*. England and Wales Sheet *No. @, Area @* (Solid edition). Ordnance Survey.
- Geological Survey 1:63,360 scale (or better). *Date @*. England and Wales Sheet *No. @, Area @*, (Drift edition). Ordnance Survey.

Table 6.01 – People: Present day occupation of site and adjacent land

- Environmental Health, Planning, Leisure and Housing Department records, (possibly also Housing Associations and related).

Table 6.02 – Natural Environment: Present day occupation of site and adjacent land

- Planning Department, GM Ecological Unit, English Nature.

Table 6.03 - Present day occupation on site

- Planning Department, GM Archaeological Unit, English Heritage.

Table 7.01 – Surface water courses on site

- Present day maps, also UDP map, aerial photographs as above.
- Digitised Ordnance Survey Land Line map for "blue line" surface water dataset.
- Environment Agency water abstractions list - digitised dataset (EA CD-ROM, October 2000).
- River quality classes via Environment Agency website ("*What's in my back yard?*") [on-line]. Available internet: http://www.environment.agency.gov.uk/ What's in my back yard?
- Local Environment Agency Plan (LEAP) document(s) by Environment Agency

Table 8.01 – Ground water vulnerability and Source Protection Zones

- Groundwater Vulnerability Map 1:100,000 scale. Sheet *No @, Area @*. Environment Agency.
- Digitised groundwater vulnerability map.
- Groundwater Source Protection Zones (SPZ) via Environment Agency website (*"What's in my back yard?"*). [on-line]. Available internet: http://www.environment.agency.gov.uk/ What's in my back yard?

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