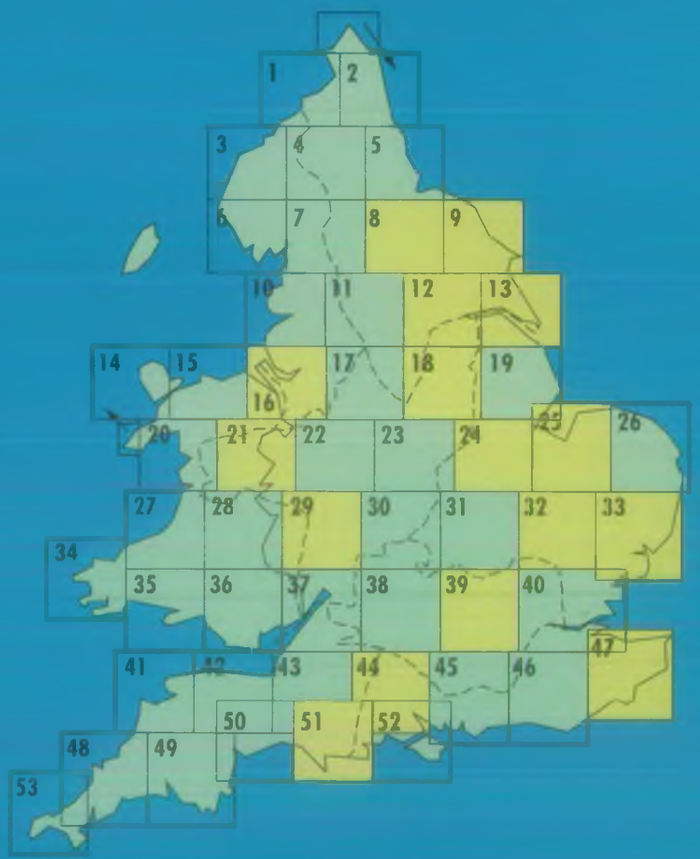
THE POLICY DOCUMENT

The policy document contains the background behind the ideas and concerns. It also contains standard policy statements which deal with specific types of new development in each of the three zones, in addition to other areas where groundwater is generally at risk.

The policy statements, together with the defined source protection zones, the groundwater vulnerability maps and their associated manuals will all help potential developers, landowners, indrustrialists and others to gauge the likely response of the NRA to a particular proposal or activity which might affect groundwater.

All of us have a role to play in protecting groundwater. The more we understand groundwater and the potential threats to its availability and purity, the better we will be able to protect this valuable resource.



Groundwater Vulnerability Map production schedule 93 - 98

93/94												47	13	39
94/95		16	32	44	9	25	24	18	51	8	29	33	21	12
95/96	45	19	37	38	40	31	30	42	52	46	35	10	17	36
96/97	1	41	14	15	23	22	4	7	11	20	34	53	5	2
97/98	48	3	28	27	6	43	49	50	26					

Sheets completed by May 1995

The NRA is publishing a series of groundwater vulnerability maps to provide developers, planners and the general public with a means of checking whether proposed developments are likely to have an adverse impact on local aquifers.

POLICY AND PRACTICE FOR THE PROTECTION OF GROUNDWATER

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National Rivers Authority

Guardians of the Water Environment

HO-6/95-10k

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Awarded for excellence

The NRA is committed to the principles of stewardship and sustainability. In addition to pursuing its statutory responsibilities as Guardians of the Water Environment, the NRA will aim to establish and demonstrate wise environmental practice throughout all its functions.

HMSO

Copies of any NRA publications relating to groundwater protection can be obtained from HMSO

HMSO Publications Centre
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GROUNDWATER-

OUT OF SIGHT -

BUT NOT OUT OF MIND

When it rains have you ever wondered what happens to all that water? Some of it runs off the land surface into streams, rivers, lakes and ponds, some gets drawn up by plants, some evaporates into the atmosphere but much of it becomes groundwater, soaking away underground into waterbearing rocks called aquifers. In many parts of the country groundwater is everywhere beneath us. Because we can't see it we mustn't disregard it.

THE IMPORTANCE OF GROUNDWATER

Groundwater stored in aquifers is the principal source of our drinking water supply in many places. It is pumped from wells and boreholes or collected from springs and provides over one third of the total public demand for water in England and Wales. In some local areas it is the only source of water both now and for the future.

Groundwater is also widely used by industry and in agriculture providing water for brewing, hospitals and for the watering of livestock and the irrigation of crops. Where properties are not supplied from the mains the vast majority obtain their drinking water from private wells.

Groundwater does not stay underground for ever. Through springs and slow seepage into the beds of rivers it continuously feeds surface watercourses. If this did not happen many of our rivers would dwindle or even disappear altogether in dry weather. Groundwater also supports wetlands and marshes, increasingly rare habitats for many wild plants and animals which depend upon those particular conditions for their survival.

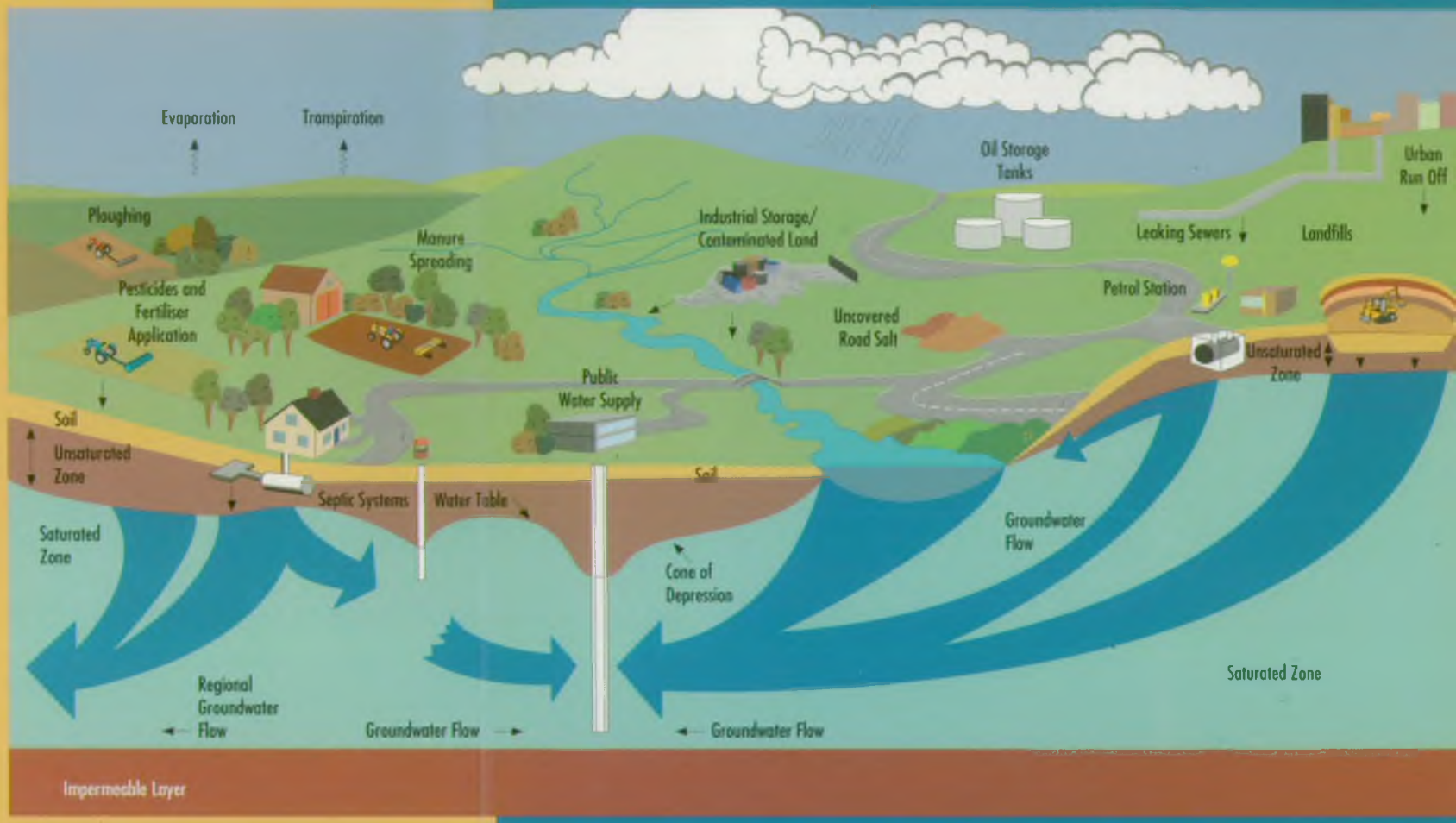
The haphazard storage of chemicals can lead to groundwater pollution.

THE RISK TO GROUNDWATER

Groundwater is increasingly under threat in our densely populated, highly industrialised country. Because groundwater and surface waters are so intimately linked, a threat to one can affect the whole water environment.

Pollution threats arise from many activities that we carry out on, or under, the land surface.

Diagrammatic representation of the water cycle showing groundwater and the surface realtionships and groundwater pollution risks.



They can come from one particular place or be widespread over large areas. Examples of pollution from a specific place include spillages of chemicals from industrial sites which give rise to intensive but localised effects. In contrast pollution from diffuse sources can build up over many years and affect significantly large areas. Often it is difficult to tell exactly where this sort of pollution comes from. A good example is the leaching of nitrate from soils where the land is intensively farmed.

Groundwater moves slowly through the layers of rocks and we cannot see it except where boreholes have been sunk or where springs discharge to the surface. For this reason problems can take many years to appear. By this time the pollution may be widespread and prove impossible to clean-up.

Some groundwaters are more vulnerable to pollution than others. It depends upon such things as the type of rocks, the soils that overlie them and how far the water table is below the surface. Different pollutants pass through different soils and rocks at different speeds and some are diluted or stopped altogether.

However pollution is not the only problem. We can also affect the availability of groundwater if we prevent the aquifers from being refilled. This can happen when there are physical land use changes on the surface or if we allow too much water to be pumped out than is replenished through the natural rainfall. Abstracting too much water in this way will lower the water table and thereby affect streams and wetlands.

PROTECTING GROUNDWATER

Rivers can dry up completely if excessive groundwater abstraction causes lowering of the water table.

Both the quality and the quantity of groundwater are legally protected. Because so much of our groundwater is used for drinking water, its quality must be maintained at all times. Many aquifers store huge amounts of high-quality water which requires little treatment before it is used. If this widely available, low-cost source of water were damaged or lost, then more expensive alternatives would have to be found. In some areas the costs would be very large.

If groundwater becomes polluted it is very difficult and expensive to clean-up again. In some cases clean-up at the place where the pollution took place is impossible. So it is much better to prevent or reduce the risk of groundwater contamination in the first place, rather than deal with the consequences.

Groundwater must also be protected from over-use. If too much water is taken there simply won't be enough to go round. If groundwater levels drop too far, unacceptable damage can be done to rivers, wetlands and the environment in general.

THE NRA'S ROLE

It is the duty of the National Rivers Authority in England and Wales to monitor and protect groundwater and conserve it for water resource usage. It is also the NRA's duty to maintain and conserve surface waters, which in many cases depends upon the proper management of groundwater. The NRA's powers and duties are set out in the Water Resources Act 1991.

To protect groundwater **quality** the NRA has to:

- achieve and maintain specific targets for water quality (Water Quality Objectives);
- control potentially polluting discharges from for example, industrial and agricultural premises, by issuing special consents;
- prevent pollution wherever possible;
- take remedial action if pollution occurs;
- take action against polluters.

To protect the **quantity** of groundwater the NRA has to:

- make sure water resources are used properly;
- manage groundwater so that acceptable flows are maintained in rivers;
- control the pumping of groundwater by issuing special licences;
- take action against people who remove groundwater illegally;
- take action to re-distribute and increases resources where needed.

An abandoned ironstone excavation in Northampton Sand. The excavation has reached the Limestone aquifer, intercepting the water table.

The NRA can influence planning decisions which may damage groundwater. As the way the land is used and developed is one of the greatest and most consistent threats to the quality of groundwater, land use planning can play a key role in protecting groundwater. Therefore the NRA must keep in close contact with Local Planning Authorities.

A NATIONAL POLICY

The NRA has a comprehensive national policy for groundwater. It sets out a framework of guidance within which it hopes everyone will work to ensure groundwater resources are safeguarded for the future. The policy covers all types of threats to groundwater and helps the NRA and other organisations to implement the laws which can be used for protection.

To help people understand the policies better and to show where the areas that are most vulnerable to groundwater pollution are the NRA has published groundwater vulnerability maps and drawn up source protection zones around sensitive borehole sites.

GROUNDWATER VULNERABILITY MAPS

When completed there will be 53 maps published at a scale of 1:100,000 covering the whole of England and Wales. The diagram shows the publication dates of the series, which are available through HMSO. The maps will help to increase awareness of those places where groundwater is most at risk. Those responsible for the planning of land use will find them useful in learning about the potential impact their, or others, proposals could have on groundwater. They also show those areas of the country where the NRA is at most pains to protect groundwater from potentially polluting activities.

Best practice at landfill sites can minimize groundwater pollution problems through careful siting and appropriate engineering

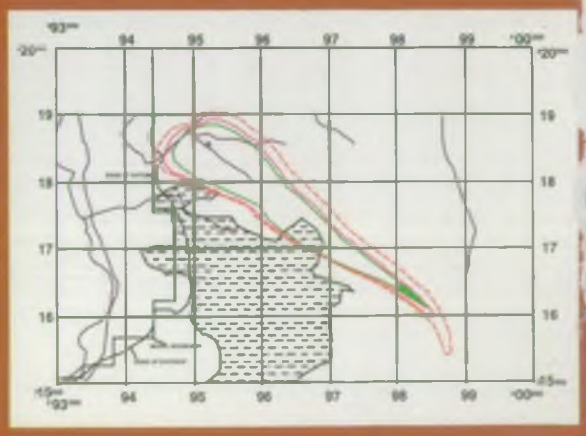
A guide is available which describes the basis on which the maps have been drawn up together with their limitations.

SOURCE PROTECTION ZONES

The closer an activity is carried out to a well, borehole or spring, the greater the risk of the water being polluted. The risks are therefore more immediate on people.

Around each groundwater source the NRA is defining three Source Protection Zones. These vary in their size, shape and relationships according to the particular situation at any one place. The geology, the rainfall, the land use and the amount of water pumped out of the ground all have to be considered. The zones have been produced using computer models. They need to be regularly reviewed since the way groundwater is used may change and additional data may become available.

The zones, superimposed on 1:25000 background maps, will be available on request from NRA Regional offices. The methods by which the zones are defined are published by the NRA in the Groundwater Protection Zone Guide and so anyone can attempt to redraw particular ones if they think they could be improved.



Source protection zones designed to protect individual groundwater supply sources are currently being defined.