The Water Framework Directive and Groundwater

Peter Pollard
<table>
<thead>
<tr>
<th>Year</th>
<th>River Basin Planning Requirements</th>
</tr>
</thead>
</table>
| 2003  | Transpose Directive  
Identify river basin districts and the competent authorities |
| 2004  | **Characterisation and risk assessment**  
Economic analysis of water use  
Register of protected areas |
| 2006  | **Monitoring programmes**  
Work programme for first RBMPs |
| 2007  | Interim overview of the significant water management issues |
| 2008  | Publish draft RBMPs for consultation |
| 2009  | **Finalise and publish first RBMPs** |
| 2012  | Measures fully operational  
Work programme for second RBMPs |
| 2013  | Review characterisation and risk assessment  
Review economic analysis of water use  
Interim overview of the significant water management issues |
| 2014  | Publish second draft RBMPs for consultation |
| 2015  | **Achieve environmental objectives in first RBMPs**  
Finalise and publish second RBMP |
| 2021  | **Achieve environmental objectives in second RBMPs**  
Publish third RBMPs |
| 2027  | **Achieve environmental objectives in third RBMPs**  
Publish fourth RBMPs |
River Basin Planning Cycle

1. Identify water bodies at risk
2. Set appropriate environmental objectives and design measures
3. Implement programmes of measures
4. Achieve objectives

Characterise river basin districts
Assess risk from pressures

Develop monitoring classification systems
Monitor to check risk assessments
Monitor to establish status
Monitor to assess effectiveness of measures

Monitoring

KEY
- Principal Annex II tasks
- Principal Annex V tasks
Groundwater & groundwater bodies

Groundwater

Aquifers

Bodies of groundwater
Groundwater Objectives

- Prevent deterioration in status
- Achieve good status

- Achieve Protected Area Objectives
- Reverse significant and sustained upward trends
- Prevent and limit inputs of pollutants
Status Objectives

Groundwater chemical status

Groundwater quantitative status

Prevent deterioration

Restore
Promotes sustainable water use

Prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on

Quantitative Status

Groundwater quantitative status

Promotes sustainable water use
Provision for:
Quality standards applicable under other RELEVANT Community legislation

Daughter Directive
Concentrations of pollutants are not such as **WOULD** cause:

1. A failure to achieve one of the surface water objectives
2. Significant diminution in the chemical or ecological quality of a surface water body
3. Significant damage to a terrestrial ecosystem
1. Surface water objectives

- Prevent deterioration in status
- Restore to good status
- Achieve objectives for Protected Areas
- Progressively reduce pollution by priority substances
- Cease discharges, emissions and losses of priority hazardous substances
- Achieve objectives for Groundwater

A failure to achieve one of the surface water objectives

- No or minimal
- Slight
- Moderate
- Major
- Severe

Environmental Quality Standards

Prevent deterioration

Restore

GOOD
MODERATE
POOR
BAD

ECOLOGICAL STATUS
Relationship to groundwater status

Groundwater status

<table>
<thead>
<tr>
<th>Groundwater chemical status</th>
<th>Status of associated surface water body</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOOD</td>
<td>HIGH</td>
</tr>
<tr>
<td></td>
<td>Non synthetic pollutants: Background levels</td>
</tr>
<tr>
<td></td>
<td>Synthetic pollutants: Close to zero</td>
</tr>
<tr>
<td>GOOD</td>
<td>GOOD</td>
</tr>
<tr>
<td></td>
<td>Environmental Quality Standards</td>
</tr>
<tr>
<td>MODERATE</td>
<td>MODERATE</td>
</tr>
<tr>
<td></td>
<td>Consistent with moderate impacts on biology</td>
</tr>
<tr>
<td>POOR</td>
<td>POOR</td>
</tr>
<tr>
<td></td>
<td>Consistent with major impacts on biology</td>
</tr>
<tr>
<td>BAD</td>
<td>BAD</td>
</tr>
<tr>
<td></td>
<td>Consistent with severe impacts on biology</td>
</tr>
</tbody>
</table>
A body of groundwater would be at poor status if the concentrations of pollutants in that body have:

- *Lowered the status that would otherwise be achieved by a surface water body*
- *Compromised the restoration of a surface water body*
- *Significantly increased the risk of one the objectives for a surface water body being compromised*
Implications of surface water criteria

- Poor status groundwater body
- Moderate status river
- Good status river
- Good status groundwater body

Same pollutant concentrations
3. Damage to terrestrial ecosystems

**Significant damage to a directly dependent terrestrial ecosystem**

**Definition of significant damage?**

- **Groundwater chemical status**
- **Groundwater quantitative status**

**Importance of ecosystem**

**Extent of damage**
Changes to chemical composition would result in significant adverse effects on:

1. surface water ecosystems
2. terrestrial ecosystems
3. a Protected Area objective; or
4. other uses of the body of groundwater.
Objective Setting

**RIVER BASIN PLAN**

**Why?**

- Technically unfeasible or disproportionately expensive
  - Extend deadline up to 2027
  - Set less stringent objective

**Groundwater chemical status**

**Groundwater quantitative status**

Least possible changes to good status given the impacts that could not reasonably have been avoided.
Protected Area Objectives

Achieve Protected Area Objectives

DRINKING WATER PROTECTED AREAS
Used to provide, or intended to provide,
- 10 m³ day average
- 50 persons

Avoid deterioration in order to reduce the level of purification treatment.
Level of purification treatment

Protected Area Objectives

Good Groundwater Status
Trend Reversal Objective

Reverse any significant and sustained upward trend in the concentration of any pollutant...

What is a significant trend?

What is the end point of trend reversal?

... in order to progressively reduce pollution of groundwater

Risk of harm to:
Human health; aquatic ecosystems; terrestrial ecosystems; material property; uses of water environment
Criteria for defining significant trends

- cause or significantly increase the likelihood of, **deterioration in groundwater or surface water status?**
- prevent, or significantly compromise, **restoration of groundwater or surface water status?**
  - Yes
- prevent, or significantly compromise, **achievement of a Protected Area objective (e.g. NVZ, Drinking Water, etc)?**
  - Yes
- cause harm to human health; damage to material property; or impair other uses of the environment?
  - Yes

Trend is significant
Trend is not significant
Prevent or Limit Inputs Objective

*Prevent or limit the input of pollutants into groundwater*

- No equivalent to List 1 and List 2
- Purpose of ‘limit’ not specified

**Daughter Directive?**

*Proposals end of 2002*