CHAPTER SIX

DISCUSSION AND CONCLUSIONS

The assessments, set out in the preceding chapters, are considered to give a comprehensive picture of the quality of the groundwater and surface waterbodies in the State for the period 2004-2006. These assessments are based on data collected at on 1,151 rivers (13,240 km of river and stream channel length), the four principal canal systems, on 449 lakes, on 69 estuarine and coastal waterbodies and at some 137 groundwater sampling locations. The waterbodies examined, including most of the larger systems in the State, can be considered representative of adjacent systems not sampled.

The sampling locations are representative of both unpolluted sites and of those waters at risk of pollution from both point and non-point waste discharges and other sources of anthropogenic pollution. Detailed information is presented on the suspected sources of pollutants.

The data have been generated primarily by the water quality monitoring programmes carried out by EPA and the local authorities and are complemented by those provided by a number of other bodies, in particular the Central Fisheries Board and the Marine Institute. In some instances the data have been taken from published reports, cited in the text, these reports can be consulted for more detailed information.

A synopsis of the assessments in the four water categories viz. rivers, lakes, estuaries and groundwater, suggests an overall improvement in the quality of surface and groundwater in the State since the previous assessment period.

The results of the 2004-2006 biological survey of rivers and stream channel length, indicate that 71.4% (9,451km of channel length) is assigned a satisfactory Class A quality status. This represents an increase in such waters since the previous assessment period and gives substance to the suggestion that the trend of increasing river pollution, evident in the 1980s and 1990s, has been halted and reversed. However, a substantial length (18 per cent or 2401.5 km) is assessed as being slightly polluted/eutrophic indicating a further unwelcome increase in this category. While a decline in the channel length assigned to both the moderately polluted (10 per cent or 1324 km) and seriously polluted (0.6 percent or 63.5 km) is

encouraging, concern must be expressed at the number of new instances of serious pollution, particularly associated with local authority discharges, recorded in the current assessment period.

Of the 449 lakes examined, the majority (383 or 85.3%) were of satisfactory water quality, i.e. oligotrophic or mesotrophic status. Twenty one lakes were assigned to the moderately eutrophic status and a further 30 to the strongly or highly eutrophic categories, compatible with a strong to high level of pollution and a marked degree of impairment of beneficial use. The remaining 15 lakes were classified as hypertrophic, i.e. the most enriched status, characterized by very high levels of algal growth consistent with a very high level of pollution and impairment of use. The proportion of lakes with an overall satisfactory water quality status has increased in the latest period (85.3%) compared to the previous period of assessment (82%).

The percentage of lake surface area classified in each trophic status has remained relatively stable since 1998-2000. However, there has been a small rise in the percentage area assessed as hypertrophic in the current sampling period. The most striking change in lake quality over the last 15 years is the decline in the percentage of surface area classified as strongly or highly eutrophic and the increase in the oligotrophic/mesotrophic category. This change, due in large measure to the reduction in planktonic algal growth in Loughs Derg and Ree, may be attributable to the impact of the Zebra mussel infestation on these lakes

The total number of fish-kills in surface freshwaters (rivers and lakes) reported by the Central Fisheries Board in the period under review was 122. This represents a marked improvement over the previous period when 147 such events were recorded but it is still unacceptably high.

The results of the most recent trophic status assessment of estuarine and coastal waters indicate that of the 69 water bodies included in the assessment, 13 (18.8%) were classed as eutrophic, 2 (2.9%) as potentially eutrophic, 27 (39.1%) as intermediate and 27 (39.1%) were unpolluted.

The status assessment of tidal waters has changed little since the previous assessment. The condition of just over 85 per cent, or 60 of the 69 water bodies assessed, has remained unchanged and as a result the proportion of water bodies in each status category is similar to

the last assessment. Of the 9 water bodies that have changed in status 6 have shown a decline in status while 3 have shown an improvement. Of the 12 water bodies classed as eutrophic in the 1999-2003 assessment, 11 remain so, with only one, having improved in status.

There are currently 131 designated bathing areas in Ireland comprising both seawater (122) and freshwater (9) sites. In general, the standard of water quality at marine bathing areas in Ireland has remained high and compares very favourably with that in other EU Member States. Over 96 per cent of the sites monitored complied each year with the minimum mandatory standards laid down by EU legislation. The proportion of sites complying with the more stringent EU guideline standards increased during the review period from 88 per cent in 2004 to 91 per cent in 2006. These results are an improvement over the previous 2001-2003 reporting period where the maximum proportion of sites complying with the more stringent values was 84 per cent.

Yet, while the quality of water at designated bathing sites is high, the number of sites remains low in comparison to other European countries. To ensure adequate protection of those using bathing areas, the current number of 131 designated sites needs to be increased.

The majority of shellfish waters were assigned to Class B in the period 2004–2006 with the remainder in Class A. No Class C waters were reported in this period. The shellfish production areas were monitored on a weekly or monthly basis for phytoplankton and the presence of marine biotoxins. In 2004, levels of Diarrhetic Shellfish Poisoning (DSP) and Azaspiracid Shellfish Poisoning (AZP) were low and did not lead to the closure of any shellfish production areas. However, 23 per cent of all mussels were tested positive for toxins in 2005 and this increased to 29 per cent in 2006 resulting in prolonged closures due to the presence of DSP and AZP toxins in coastal waters around Ireland. There is evidence to suggest that the unpredictably occurring toxin releasing algae are oceanic in origin and are blown onshore rather than developing in Irish inshore waters due to nutrient enrichment.

A total of 1,362 individual groundwater monitoring samples were analysed at 137 monitoring stations in the period 2004-2006. The data indicate that the chemical quality of groundwater is generally good, with only a small number of monitoring points having concentrations greater than the drinking water standards. However, nitrate and phosphate concentrations are significantly higher than background concentrations at certain locations, thereby having the

potential to contribute to surface water eutrophication. There have been slight increases measured in the concentrations of these compounds in groundwater between 1995 and 2006, with elevated nitrate concentrations observed in the east and south-east of the country and elevated phosphate concentrations in the Karst Limestone areas of the west. Also, microbial pathogens are now more prevalent, largely from organic waste sources, and can pose a threat to human health. Therefore, greater attention needs to be given to groundwater protection, and in particular to prevention of pollution at source.

While the results of the monitoring programmes indicate that a high and increasing percentage of surface in the State is in a satisfactory condition, nevertheless there are a significant number of waterbodies impacted in varying degrees by pollution. This situation is, for the most part, the result of inputs of nutrients above background levels arising from activities in the catchments. In the case of point sources of pollution such as discharges from wastewater treatment plants or silage effluent discharges, the sources of these nutrients are clear. However, in the case of river pollution from non-point or diffuse sources the situation is less clear. In these instances a number of approaches are taken to identify the pollutant source. These include examining smaller inflowing streams, examination of land-use and aerial photography.

Of the 2985 river sampling locations examined in the period 2004–2006, 1011 locations were assessed as polluted, the principal effect being nutrient enrichment or eutrophication. Municipal discharges (369) and losses from agriculture (330) are suspected as being the main sources of these nutrients. Other suspected sources include industrial discharges, losses of nutrients from forestry, fish farming activities and bog development, on-site wastewater treatment systems, dredging, quarries, landfills, civil works, thermal and oil pollution. In the case of the 122 fish kills recorded in this period agriculture was suspected as being responsible for some 34 fish kills, with 28 attributed to municipal discharges and a further 15 to industrial discharges.

The intensive agricultural activities in the south-east suggests that diffuse, agricultural sources are the cause of the elevated nitrate concentrations in groundwater, while the vulnerable nature of the Karst Limestone aquifers in the west may explain the elevated groundwater phosphate in that region. In these areas nutrient enriched groundwater may be contributing to eutrophication of surface waters.

The European Union (EU) formally adopted the Water Framework Directive (WFD) (2000/60/EC), establishing a framework for Community action in the field of water policy, in October 2000. The objectives of the directive are to prevent the deterioration of the status of all bodies of water and to achieve good status, in water bodies that are currently of lesser status, within the timeframe set out in the directive. There are provisions also for artificial water bodies such as canals and heavily modified waterbodies. The WFD provides a new approach to achieve these objectives through river basin management planning supported by new assessment and monitoring programmes.

The existing monitoring programmes in most cases relied on single biological parameters along with selected physico-chemical parameters to assess the status of waterbodies. The WFD requires a comprehensive and expanded schedule of parameters to be examined at selected representative water bodies and at an increased frequency. The aim of this programme is to establish a representative, coherent and comprehensive overview of water status within each river basin district. The programme will also assess the efficacy of any measures instituted and assist in determining the causes of any failure of particular waterbody to meet the quality objectives. The implementation of this programme commenced in 2007. This new monitoring programme replaces the existing national programmes on which this report is largely based.

In 2006 the EPA published the new WFD compliant monitoring programme, covering surface and groundwater and including sub-programmes for protected areas and for waterbodies used for abstraction for human consumption. The programme specifies a broad range of parameters describing the four biological quality elements viz phytoplankton, macrophytes, invertebrates and fish along with a wide selection of supporting physico-chemical and chemical substances and hydromorphological parameters to be considered in the overall status assessment. New classification systems are being developed for the biological parameters for rivers, lakes and transitional and coastal waters and standards are being developed for each of the chemical parameters. Separate standards and other criteria are also being developed for the purpose of assessing groundwater status.

These new classification systems and standards will be applied to the data collected in the course of the monitoring programme in order to assign an overall waterbody status. For this

purpose, the WFD describes five status categories: high, good, moderate, poor and bad. This status assessment will be the key factor in deciding on the measure(s) required for each waterbody to achieve the objectives of the WFD. Waters classified as high or good will have measures applied to prevent status deterioration while those classifies as less than good will have measures applied, designed to restore the waters to at least good status within the specifies timeframe.

In broad terms those surface waters described in this report as being in a satisfactory condition can be considered as being in either the "high" or "good" status, while those described as being in an unsatisfactory condition fall into moderate poor or bad status. Thus, from the water quality assessments made for this report, the scale of the task of achieving the objectives of the WFD is apparent. Furthermore, it is considered that the expanded number of parameters to be considered in the more exacting WFD classification will cause a greater number of waterbodies to fall into the less than good categories and thus require remedial measures. The interim classifications of surface waterbodies based on the results of the 2007 monitoring, the first year of the implementation of the new WFD monitoring programme and using the new classification systems and standards, support this view.

The decline in the quality of surface waters noted in the last decades of the 20th century has been halted and there are indications of a reversal of this trend in the past decade. This stabilisation or improvement in the condition of surface waters can be attributed to a number of new measures and facilities put in place to reduce nutrient losses to water in recent years. It is apparent also however, that the rate of improvement, where it is occurring, is not sufficient to ensure good status in all surface waters by 2015.

This Report indicates that discharges from municipal waste water treatment works and from agricultural activities are the principal suspected causes of less than satisfactory water in the State. Industrial discharges and discharges from several other activities have also been identified as contributing to a lesser extent. It is clear, therefore, that in order to achieve the objectives of the WFD within the given timeframe, that priority must be given to reducing the polluting impact of these discharges and in particular to reduce their nutrient content.