

Vermuyden and the Bedford Level Corporation

Watercourses such as the Forty Foot, Sixteen Foot and Twenty Foot well as the New and Old Bedford, or Hundred Foot Rivers were cut as part of Vermuydens scheme. In addition, since at times the rivers would not be able to contain the flows coming down them, the Ouse or Hundred Foot Washes were constructed between the two Bedford rivers, to contain these flows. By the time Vermuyden left the Fens in 1656, the benefits of drainage facilitating arable cropping were becoming evident.

The newly constructed drainage network that served the Great Level needed an organisation to maintain it and, as it crossed several counties, it was decided to create a new organisation, the Bedford Level Corporation, to have jurisdiction over the system. Originally established under the Commonwealth, the Corporation was subsequently recreated in 1663, following the accession of Charles II.

The Corporation evidently considered that the construction of the drainage system marked an end to the need for significant capital works, with routine maintenance only being the required order of the day. However, by the end of the seventeenth century, problems with gravity drainage was becoming more difficult and suggestions began to be made that the rivers were 'rising'. However, it was not the rivers were rising but that the land was shrinking. Within a matter of forty years, windmills and occasionally 'donkey mills' were being established and, as the shrinking peat exposed roddens, clay ridges and other areas less prone to shrinkage, individual catchments within the Level developed, which prompted groups of landowners to erect larger more communal pumps, usually under Acts of Parliament, which set up local Commissioners, with powers to levy taxes to pay for the upkeep of the pumps and watercourses. These in time became the internal drainage boards that still exist today.

Initially the Bedford Level, was divided into North, Middle and South Levels. It includes the lower drainage basins of the River Nene and the Great Ouse, and covers approximately 500 sq mi (1,300 km²). In general, the South Level lies to the southeast of the Ouse Washes and is outside the study area. The Middle Level lies between the Ouse Washes and Morton's Leam. The North Level includes all of the fens in Cambridgeshire and Lincolnshire between the Nene and the River Welland.

What is an Internal Drainage Board

Internal Drainage Boards are statutory flood defence bodies created within areas of special flood defence need, usually low lying areas, that derive direct benefit from drainage operations and which provide a flood defence service within those areas, which are called 'Districts'. The Board's District is a statutory area, within which the Board provides a service to confer benefit or avoid danger through appropriate water level management operations. The role of the IDBs, who undertake works under the permissive powers conferred by the 1991 Land Drainage Act and, in some cases, older private legislation, is to provide a more local flood defence and water level management service.

Each of the Boards designates from their local knowledge the watercourses which they consider most important for the arterial drainage of their District and on which they will normally carry out work required. These watercourses are designated on the Board's District Plan.

As well as the statutory District, (which is sometimes also called the "ratable area") the IDBs are sometimes also able to control certain operations in the catchment area draining to, but outside the statutory District. This part of the catchment area is called "the highland area". To provide this service they maintain and improve watercourses and operate other assets, such as pumping stations and sluices.

The high-level land drainage system, the Environment Agency's Main rivers or, where appropriate, the Middle Level Commissioners river system, receives pumped discharges of flows from low-level Internal Drainage Board systems within its area and gravity flows from those at a higher level.

All of these authorities have produced policy statements indicating the levels of service that they will provide.

The Middle Level Commissioners

Towards the end of the eighteenth century the Middle Level felt that more local works and greater local expenditure was required within that area than the Bedford Level were willing or able to undertake.

Between 1810 and 1862, a series of Acts of Parliament were passed which initially gave more powers, including fund raising, to the Middle Level and finally legally separated the Middle Level from the Bedford Level, thus creating the present Middle Level Commissioners as a legally separate entity.

The Middle Level Commissioners are a statutory corporation which also operates under the Land Drainage Act 1991, the Flood and Water Management Act 2010 and the Nene Navigation Act 1753.

The Middle Level Commissioners are responsible for 120 miles (192 km) of major watercourses the majority of which are embanked. A continued programme of bank surveying and, where necessary, raising, is undertaken to ensure that the standard of protection (SoP) provided by the Commissioners' system of watercourses is a flood with a 1% Annual Exceedance Probability (AEP) - 1 in 100 chance of a flood event occurring in any year.

The Middle Level Commissioners consist of representatives from both the agricultural and non-agricultural sectors.

Occupiers of agricultural property receive a rate demand direct from the Commissioners. The "rates" on non-agricultural properties, such as houses and factories, are paid through a special levy issued to the District Councils within the Commissioners' area. These Councils, Fenland DC, Huntingdonshire DC and the Borough Council of King's Lynn and West Norfolk are, therefore, able to appoint representatives as Commissioners in respect of the payment made in relation to these properties.

All of the Middle Level area is dependent on artificial pumped drainage to evacuate excess rainfall.

Discharge directly to the high-level MLC drainage system is generally **not** permitted unless there is no alternative outfall point to an IDB area.

In addition to their flood defence function, the Commissioners are also, by length of available waterway, the 4th largest navigation authority in the UK, with 100 miles (160km) of navigable channel. The Middle Level waterways also include the Link Route between the neighbouring Gt Ouse and Nene systems of the Environment Agency.

There are 6 locks within the Middle Level system including the entrance/exit locks at Stanground (near Peterborough) and Salters Lode (near Downham Market) the latter being the former northern discharge channel. Much of the Commissioners' navigation function is still governed by the Nene Navigation Act 1753 and historically there were separate drainage and navigation commissioners within the Middle Level system. The difficulties of having two separate sets of Commissioners exercising competing jurisdiction over waterways which needed to be very closely managed with water levels managed in an integrated way led, however, to the creation of the present Commissioners, with responsibilities for both flood defence and navigation in 1862. This enables integrated water management to occur and proper overall control to be maintained within a system totally dependent on daily management of water levels.

The Commissioners have also certain conservation duties to fulfill when undertaking their functions.

Middle Level Strategic Study and St. Germans Pumping Station.

The major event of Easter 1998, which was contained within the Commissioners area with no flooding, prompted a review and an opportunity to investigate the potential/actual effects of climate change, land shrinkage, increased run off and social (development) changes on its system.

To justify the long term benefit of the high cost of implementing and sustaining these major improvements, a Strategic Study was carried out. This looked at the whole cost of providing, and continuing to provide, a satisfactory flood defence system in the area over the next 100 years.

To ensure that all the possible effects and options for long term requirements were properly considered, a mathematical model, using much more sophisticated equipment and techniques than were available in the 1970's when the last major assessment was carried out, was commissioned. Up-to-date data of the channels obtained from new surveys, and rainfall and run-off information from the Flood Estimation Handbook, were incorporated in an ISIS model, which computed flows within the various channels, and the required capacities of pumping facilities, for a variable range of scenarios and determined the improvement measures associated with each. The model showed that significant benefit would be gained from larger capacity pumps at St Germans in addition to other improvements.

A further full assessment of the standard of service that the St Germans station could provide, and its likely remaining useful life concluded that major improvements were required. The replacement of the station in its entirety was recommended and demonstrated that the financial commitment was well justified with a benefit/cost ratio of 18.5:1.

Following consideration of various options a new St Germans pumping station was therefore built just downstream of the original facility with a discharge capacity of up to 100 cumecs (7,830 tonnes per minute). Construction work on site began in December 2006 and the station came on line in April 2010, at a cost of £40 million. The new station contains 6 concrete volute type pumps powered by electricity but each with a diesel powered generator since because of the size of the pumps only up to 3 pumps can be run from the mains electricity at any one time.

The new station currently protects 26,000 properties as well as high grade agricultural land, transport systems and utilities.

Associated Internal Drainage Boards

In addition to looking after its own system, the Commissioners provide services to thirty three independent Internal Drainage Boards within the Middle Level Catchment

Many of these IDBs are administered from the Middle Level Offices and their administrative and financial work is carried out by Middle Level staff. In addition, Middle Level staff also undertakes engineering and Development management consultancy work for a large number of Boards.

Whittlesey Consortium of Internal Drainage Boards

Within the Middle Level Area are a Group of Internal Drainage Boards administered from the Office of Mr Russell Wright and Mrs Marilyn Wright of 28 Thornham Way, Eastrea PE7 2AS.

The Boards that form the group are:- Feldale IDB, Holmewood & District IDB, Whittlesey & District IDB and Woodwalton Drainage Commissioners.

The membership of the IDBs are drawn from the same sectors as that of the Commissioners at a more local level and they levy their own rates and set their own special levies to meet their own local expenditure within or relevant to their District

Most internal drainage board systems generally protect agricultural land to a lower standard of about a 5% AEP - 1 in 20 chance of a flood event occurring in any year. It should be recognised, however, that the very large number of watercourses maintained by the IDBs provide some protection against flooding from even the less frequent flood events by the very nature of their large water storage capacity.