



**The Role of Internal Drainage Boards
in the 21st Century**

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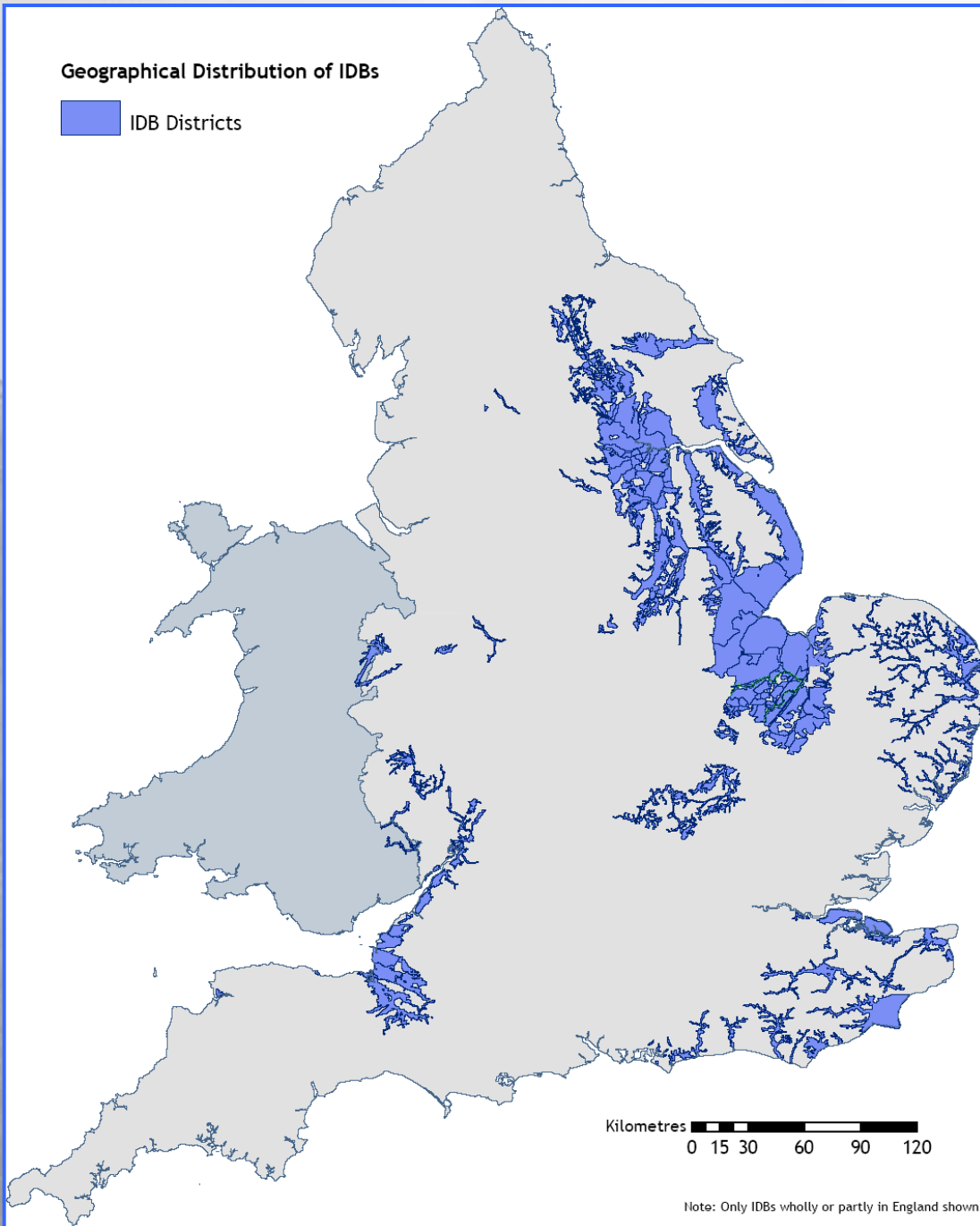
INTRODUCTION

- Description of IDBs
- Significance of water level management to Transport and Infrastructure
- Summer 2007 Flood Event



Geographical Distribution of IDBs

 IDB Districts



- **179 Internal Drainage Boards in England & Wales**
- **Internal Drainage Boards cover a 10th of England's total land area**
- **1.2million hectares**
- **None in Scotland and Northern Ireland.**

Internal Drainage Boards:

- Statutory Bodies
- Land Drainage Act 1991
- Pumped and gravity
- Funding
- Board Membership



Water level management every day

IDBs' Vital Statistics

- Average annual expenditure over £49 million
- Operate and maintain:
 - 500 pumping stations
 - 22,000 km of watercourse
 - 174 automatic weed screen cleaners
- Employ 600 staff
- Assets in excess of £145 million



Providing water level management to:

Social people
properties

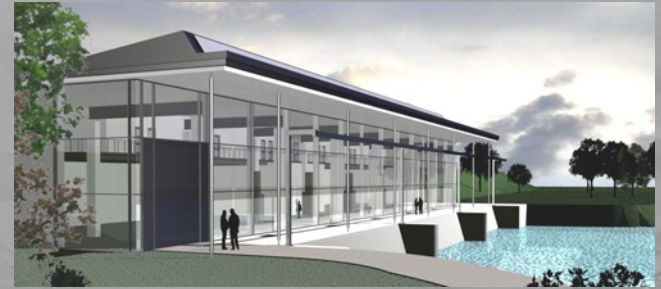
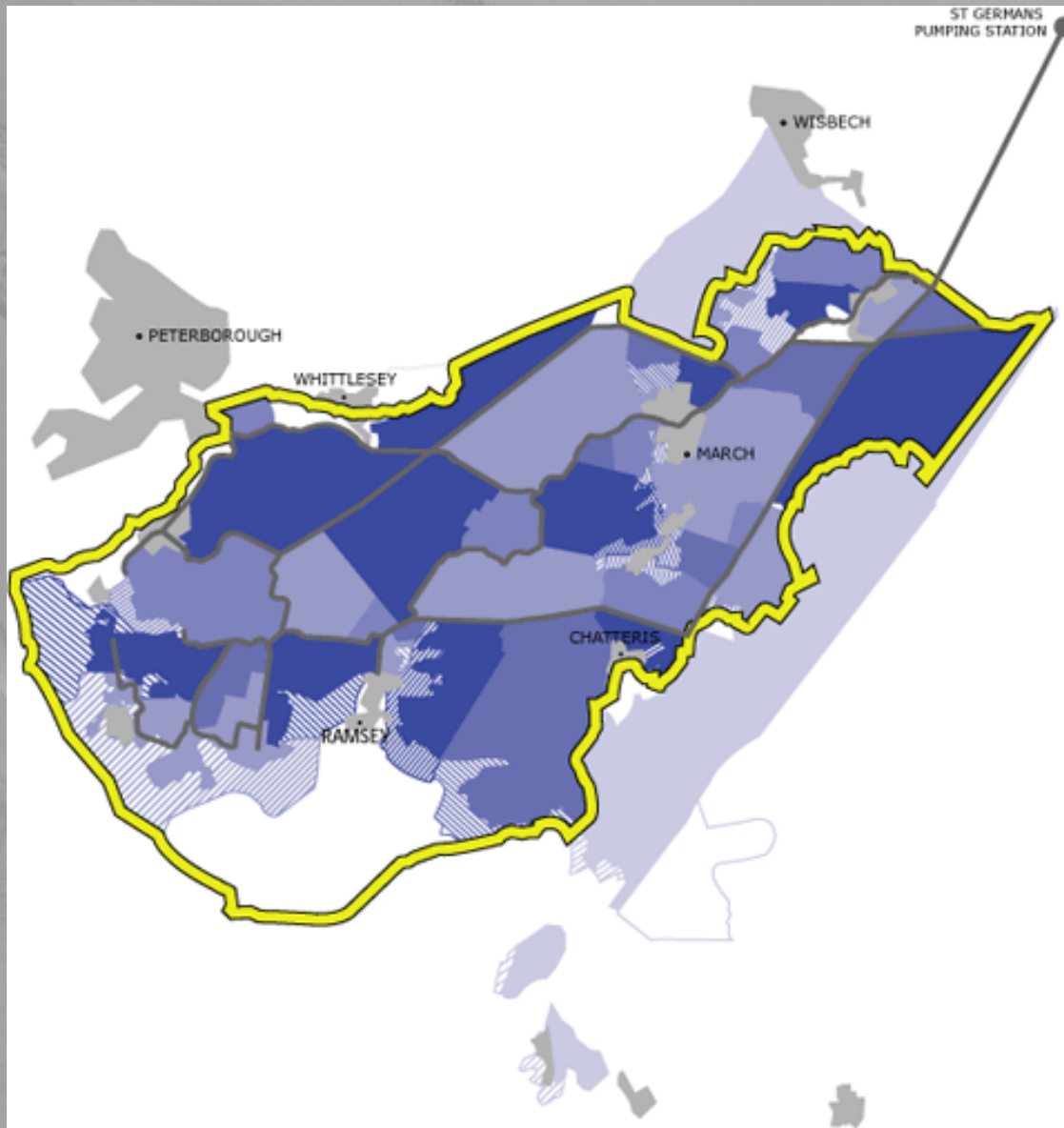
Economic 20 Power stations &
Power lines
Oil refineries
Major industrial premises
Transport: railways, roads, airports,
including > 200km of Motorway
Utilities
Food production

Environment SSSIs
Habitat





Construction begins on St Germans Pumping Station



The Pumping Station Protects:

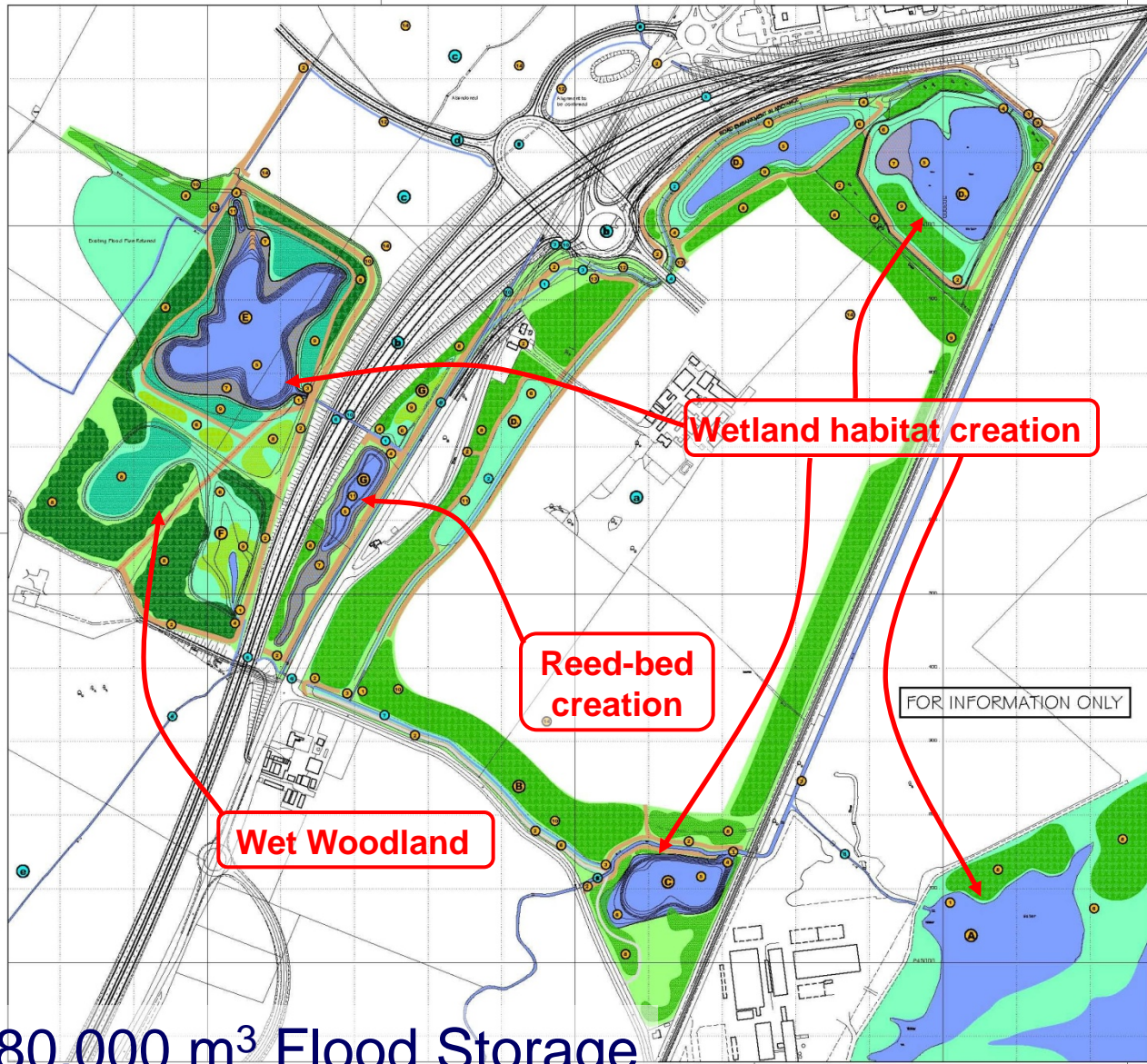
- 300 square miles of land
- 25,000 homes
- including Ramsey, March, Chatteris and parts of Peterborough.
- 1,000 businesses

Construction begins on St Germans Pumping Station

The Environment & Biodiversity

- Responsibilities associated with 398 SSSIs
- Water Vole Mitigation Measures Guidance
- Working in conjunction with Natural England, Wildlife Trusts, RSPB etc
- IDBs involved with Integrated Urban Drainage pilot projects, part of Defra's 'Making space for water' initiative





NOTES

1. DO NOT SCALE - USE FIGURED DIMENSIONS ONLY
 2. ALL PROPOSALS SUBJECT TO DETAILED DESIGN, LOCATION OF EXISTING SERVICES APPROVAL OF SANITICIDES & FURTHER HYDRODYNAMIC MODELING OF WATERCOURSE AND CATCHMENT

A KEMPSTON STORAGE LAKES
 Purpose: to land recharges and detailed design
 NET STORAGE CAPACITY: NOT INCLUDED

B MANOR ROAD DIVERSION CHANNEL
 Design Storage Level: 31.5m
 Back-Retained Water Level: 29.0-30.0m
 Low of Existing Flood Plan: Not applicable
 Design Storage Capacity: 4,500m³
 NET STORAGE CAPACITY: 4,500m³

C HARDWICK BRIDGE FLOOD RESERVOIR
 Design Storage Level: 31.5m
 Back-Retained Water Level: 29.5m
 Low of Existing Flood Plan: Not applicable
 Design Storage Capacity: 18,000m³
 NET STORAGE CAPACITY: 18,000m³

D MARSH LEYS FARM FLOOD RESERVOIR (Phase 1 Marsh Leys, Phase 2 BCC land)
 Design Storage Level: 30.0m
 Back-Retained Water Level: 28.5m (phase 1), 28.3m (phase 2)
 Low of Existing Flood Plan: 3,400m³ (phase 1), 29,200m³ (phase 2)
 Design Storage Capacity: 30,000m³ (phase 1), 60,000m³ (phase 2)
 NET STORAGE CAPACITY: 26,600m³ (phase 1), 50,400m³ (phase 2)

E WOUBURN ROAD WETLANDS
 Design Storage Level: 31.50m
 Back-Retained Water Level: 29.50m
 Low of Existing Flood Plan: 23,100m³
 Design Storage Capacity: 104,900m³
 NET STORAGE CAPACITY: 91,400m³

F VAN DIEMANS WOODLAND
 Design Storage Level: 31.50m
 Back-Retained Water Level: 30.25m
 Low of Existing Flood Plan: Not applicable
 Design Storage Capacity: 16,500m³
 NET STORAGE CAPACITY: 16,500m³

G WOUBURN ROAD REED BEDS
 Design Storage Level: TBC
 Back-Retained Water Level: TBC
 Low of Existing Flood Plan: Included in E above
 Design Storage Capacity: 10,000m³
 NET STORAGE CAPACITY: 10,000m³

STORAGE GENERATED: 127,400m³

H MARSH LEYS FARM DEVELOPMENT
 Loss of Existing Flood Plan: 1,400m³
 Additional Surface Water Run-off: 84,000m³ (based on 84% of impermeable area)
 NET STORAGE REQUIREMENT: 85,400m³

I A42 DIVERSION & DUALLING
 Loss of Existing Flood Plan: (included in pond area)
 Additional Surface Water Run-off: 1,000m³ (Downcut), 7,000m³ (Dwelling)
 NET STORAGE REQUIREMENT: 8,000m³

J DEVELOPMENT WEST OF KEMPSTON
 Loss of Existing Flood Plan: 75,700m³
 Additional Surface Water Run-off: 14,800m³ (including southern area)
 NET STORAGE REQUIREMENT: 90,500m³

K WESTERN BYPASS
 Loss of Existing Flood Plan: Included with West of Kempston estate
 Additional Surface Water Run-off: 2200m³ (based on 2.2ha impermeable area)
 NET STORAGE REQUIREMENT: 2200m³

L WOOTTON EXPANSION
 Loss of Existing Flood Plan: 15,000m³
 Additional Surface Water Run-off: 22,500m³ (based on 22ha of impermeable area)
 NET STORAGE REQUIREMENT: 37,500m³

STORAGE REQUIRED: 169,400m³

Additional notes: based on a typical storage allowance of 100m³ per impermeable hectare, which includes provision for FDI works, drainage basins and 20% allowance for future change.

Legend:

- Water Level Sensor/Tide-gauge Station (refer to IDPs standard detail 01)
- IDP Access Point (7m width)
- Flow Control Structure / weeping baffle
- Inflow / Spillway / Outlet Pipe (as shown)
- Permanent Wet Pond
- Freemasonry Dry Pond or Fringe
- Shallow Reedbed Fringe
- Dense Tree Planting
- Controlled Planting, min. 6m separation, flood tolerant, slow propagating network
- Embankment Reinforcing Flood Flow
- Sediment Settlement Pond
- Reinforcement of Both End Embankment
- Side Drainage Channel
- Ground raising (to provide FFL freeboard)
- Triangular channel, bed width 1.5m, side slope 1:1.5, gradient 1:1000 approx., depth varies (approx 1.5m), FFB allows flow to flood plain
- 2-stage channel, low level berm 1m approx height, bed level width 1.5m, side slope 1:1.5, gradient 1:1000 approx.
- 2.10 x 1.20m culvert (1.0m), s/s IL 28.65 (phase 1), 28.4 (ph. 2), 28.3 (ph. 2), bed levels 20.0m above IL
- Clear span over two-stage channel, soft level bed
- 2.10 x 1.20m culvert (1.0m), s/s IL 28.05, s/s 27.95, bed levels 2.00m above IL
- Culvert (dimensions subject to detailed design)
- 2-stage channel: high level berm (B3), 0m, 5m width (RFB Access strip incorporating grade path), flow channel approx 1.5m depth, gradient 1:500, 1m bed width, 1:1.5 slope
- Ditch to be widened (subject to detailed design)
- Cycle bridge to be clear span above flood level
- Temporary route prior to A42 projects

Client: Bedfordshire & River level IDB
Project: Developments West of Bedford Strategic Flood Facility
Title: Master Plan

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180,000 m³ Flood Storage

West of Kempston SuDS

Summer Floods 2007

Reviews:

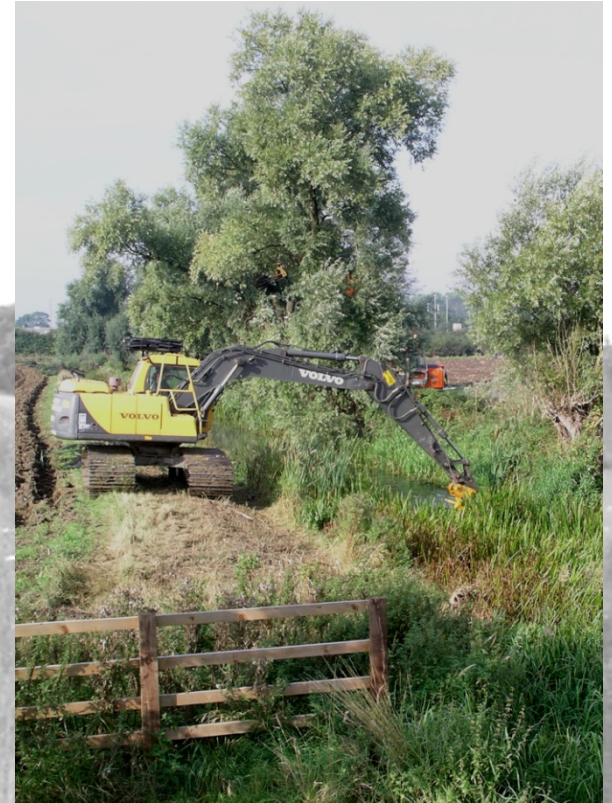
- Pitt
- Efra Select Committee
- Audit Commission



Conclusions

Internal Drainage Boards manage water levels every day for:

- **Flood risk management**
- **Infrastructure protection**
- **Irrigation and drainage**
- **Habitat management**



Thank you

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