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Holbeach Marsh Abstraction Licensing Strategy

(March, 2013)

A licensing strategy to manage water resources sustainably

LIT 7852

ea/br/e/std/v1

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1. About this licensing strategy

This abstraction licensing strategy sets out how we will manage water abstraction in the Holbeach Marsh area. It provides information about whether water is available for abstraction, outlines the typical abstraction methods required, and provides an overview of the licensing principles that will apply when determining and managing both new and existing water abstraction licences in the area.

This abstraction licensing strategy should be read in conjunction with the Welland and/or Nene Catchment Abstraction Management Strategy (CAMS). All our CAMS documents are available from our Publications Catalogue. Once you have read this strategy and the accompanying CAMS document, if you want to abstract water, you should contact us to find out if you need an abstraction licence. If you do require a licence we will provide advice on the likely reliability of a proposed abstraction and any issues that could affect the likelihood of a licence being issued.

1.1 When is an abstraction licence required?

You need a licence from us if you want to abstract more than 20m^3/day (4,400 gallons) of water from a:

- river or stream
- reservoir, lake or pond
- spring or
- an underground source

Whether or not a licence is granted depends on the amount of water available after the needs of the environment and existing abstractors are met, and whether the justification for the abstraction is reasonable.

If you want to apply for an abstraction licence or make changes to a licence that you already have then please contact us:

- by telephone on 03708 506 506
- by email at enquiries@environment-agency.gov.uk
- or visit our website at www.environment-agency.gov.uk.

1.2 Why have we produced a separate abstraction licensing strategy for the Holbeach Marsh area?

Holbeach Marsh falls within both the Nene and the Welland Catchment Abstraction Management Strategy (CAMS) areas. CAMS documents are strategies for the management of water resources at a local level. They provide information on water resources and licensing practice, and ensure a suitable balance between the needs of abstractors, other water users and the environment is achieved. The background, aims and principles of CAMS in addition to the over-arching principles that we follow when managing water resources are detailed in our document Managing Water Abstraction. How we apply these principles in the Holbeach Marsh area is outlined in this document.

Despite falling within both the Nene and the Welland CAMS areas, Holbeach Marsh was not assessed during the first CAMS process as there has been limited abstraction in the area. Therefore, until now there has not been a defined licensing strategy for the area, or an assessment of the availability of water for abstraction.

Until recently farmers in the Holbeach Marsh area have relied on mains supply water to irrigate their vegetable crops, largely due to the salinity levels in the drains and the perception that the groundwater in the area is saline and unusable. In recent years local farmers have been investigating alternative sources of water, primarily an extensive layer of low-salinity groundwater that overlies deeper saline groundwater (see Section 3.2). Due to the increased

interest in water resources in Holbeach Marsh it was decided that this strategy document should be written. The aims of this strategy document are to:

- ensure that all applications for water abstraction are treated consistently, and;
- provide background information for those looking to use water resources in the Holbeach Marsh area.

1.3 Summary of the Holbeach Marsh abstraction licensing strategy

Any applications for water abstraction will be assessed on a case-by-case basis. When assessing applications for water abstraction in the Holbeach Marsh area, consideration will be given to the possible impact of the proposed abstraction upon:

- the Wash Special Protection Area (SPA) and Special Area of Conservation (SAC);
- saline groundwater pull-up and the salinisation of soils;
- local surface water features (including saline lagoons).

Because of the nature of the water resource in this area, and the unique abstraction techniques required (see Section 3.2), applicants for groundwater abstractions are likely to need a consultant to undertake pre-application groundwater investigations and to specify adequate operational monitoring routines (see Section 4.2).

The abstraction of high quality groundwater could open up the possibility of abstracting lower quality water from surface drains for blending. Applications for surface water abstraction from the local drainage network will be considered and assessed on a case-by-case basis. To support an application for surface water abstraction you are likely to be required to undertake a period of pre-application environmental monitoring and survey (see Section 4.3).

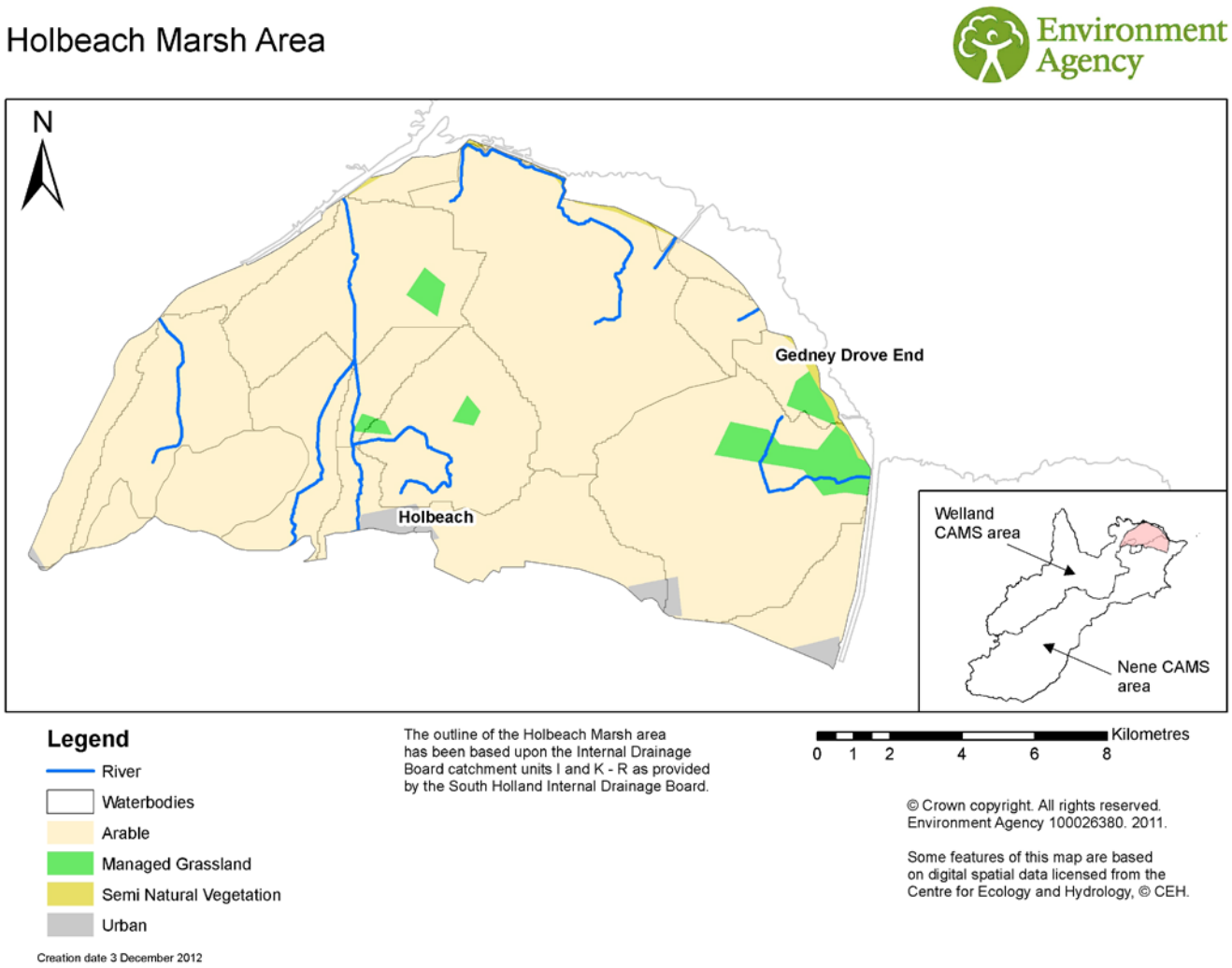
2. The Holbeach Marsh area

Holbeach Marsh is an area of low-lying agricultural land to the east of Holbeach, north of the A17 (see Map 2.1). Lying to the west-south-west of the Wash Estuary, Holbeach Marsh is bordered to the east by the tidal Nene and to the west by the tidal Welland. The geology of the area is dominated by a continuous surface layer of marine alluvium which is composed of silt, sand and clay deposits. This marine alluvium is underlain by glacial boulder clay, sand and silt deposits within which sand-filled creeks and some peat horizons can be found.

Surface water in the area is primarily derived from rainwater or land drainage sources. Holbeach Marsh is characterised by a network of drainage ditches. However, as the drains do not receive water from high level feeder rivers the area is not considered to be a true level dependent environment (see Appendix A). Consequently, the Holbeach Marsh has not previously been assessed as part of the CAMS process. The area does however lie within the South Holland Internal Drainage Board (IDB) who manage a number of drains in the area.

The nearby Wash bay is a designated SSSI within The Wash SPA and The Wash and North Norfolk Coast SAC, and is the largest estuarine system in the UK. The rivers Ouse, Nene, Welland and Witham discharge into the bay and between them drain an area of approximately 15,000 km^2. The Wash plays an extremely important role in relation to the wider coastal and marine environment of the region. The Wash is of outstanding importance for wildlife and is also a valuable natural resource that people have long benefited from. It supports many different species and, as well as its large-scale sub-tidal and inter-tidal habitats, the Wash has a number of valuable fringing habitats of conservation significance, such as saline lagoons and shingle structures.

The impact of freshwater flows and abstractions on the Wash was assessed during the Review of Consents process. It was concluded that freshwater inputs have very little effect on the SAC interest features that occur within inter-tidal areas of The Wash, and a limited effect on sub-tidal features.



Map 2.1 The Holbeach Marsh area.

3. Water resource availability in the Holbeach Marsh area

This section describes the availability of water for abstraction in the Holbeach Marsh area and discusses our recommended approach for water abstraction.

3.1 Resource availability

If you want to abstract water (from either the ground or surface water sources), you need to know what the water resource availability within a catchment is and where abstraction for consumptive purposes is allowed. When assessing resource availability for abstraction we need to consider the environmental requirements for water and the rights of other licensed water users. We'll add any conditions necessary to protect water resources to a new or varied licence during the licence determination procedure (see Section 4.4).

3.1.1 Groundwater availability

A simple groundwater balance model has been used to determine whether or not there is groundwater available for abstraction in the Holbeach Marsh area. The groundwater balance model calculates the difference between how much water is input into the Holbeach Marsh system (rainfall) and how much water leaves the system (through evapo-transpiration, groundwater recharge, surface water abstraction etc, see Figure 3.1).

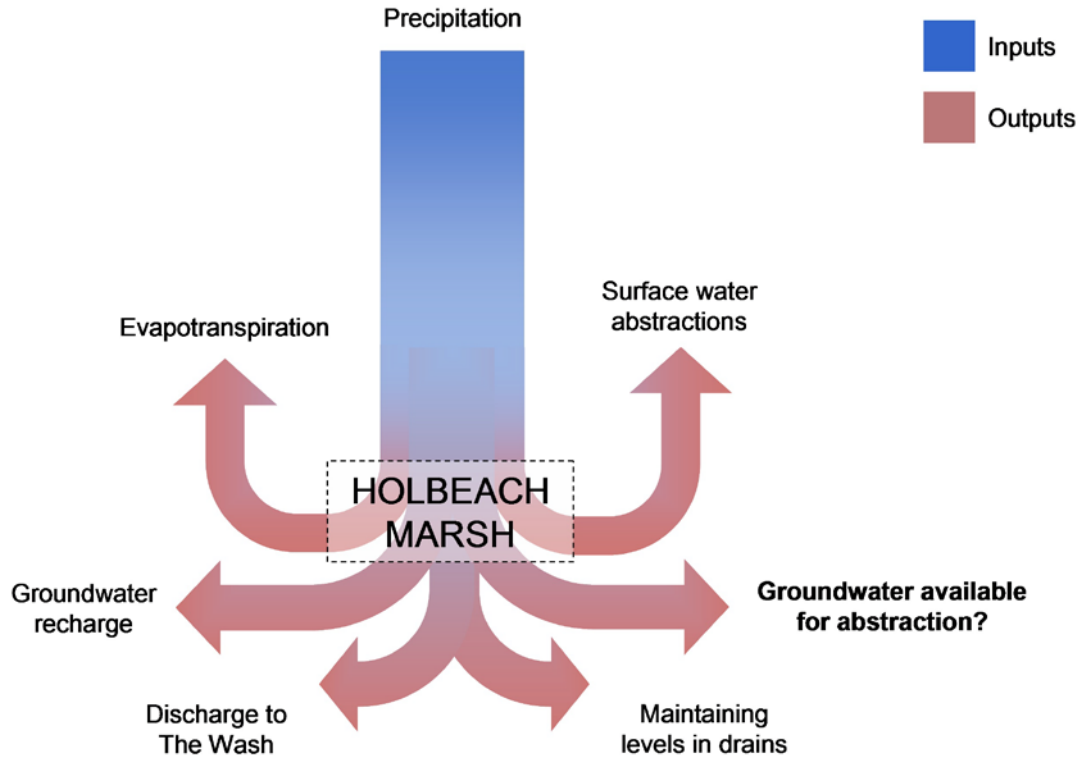


Figure 3.1 Water balance model to determine the availability of groundwater for abstraction.

The resource availability assessment concludes that there is currently groundwater available for abstraction in the Holbeach Marsh area.

It should be noted that there are limitations associated with the groundwater balance model and the data used in the calculation. Consequently, although this approach constitutes our best understanding of groundwater availability in the Holbeach Marsh area, the figures obtained are estimates.

3.1.2 Surface water availability

In addition to proposals which involve the abstraction of shallow groundwater, customers may develop surface water abstraction proposals to take water from the local drainage network. There is water available for abstraction in the surface drains in the Holbeach Marsh area, but it is typically highly saline. Customers may wish to consider the possibility of blending lower quality surface water from the drains with less saline groundwater (abstracted using the methods outlined in Section 3.2), subject to quality control and monitoring (see Sections 4.2 and 4.3).

3.2 Water abstraction methods in the Holbeach Marsh area

Until recently there has been only limited water abstraction in the Holbeach Marsh area due to the salinity of water in the drains. The possibility of taking surface water from neighbouring main rivers has previously been explored, but has not resulted in a successful abstraction agreement to date.

Recently, there have been several successful applications for groundwater abstraction in the area. These abstractions make use of a layer of useable low salinity groundwater that overlies deeper, highly saline groundwater. The depth of this usable groundwater is variable, but it is generally no deeper than 10 m and is often considerably shallower. The usable groundwater is intercepted by a series of catch-pits which are allowed to fill 'naturally', collecting groundwater as it flows horizontally (and to some extent vertically) through the sand and silt layers (Figure 3.2). Water is subsequently recovered from the catch-pits for use in irrigation and/or to fill storage reservoirs.

When abstracting from catch-pits, particular care must be taken to avoid the pull-up of deeper saline groundwater as, once induced, saline contamination of the catch-pit cannot be readily mitigated. By maximising the horizontal flow of groundwater and restricting the vertical movement of groundwater, catch-pit abstraction reduces the chance of saline pull-up. To further reduce the chance of saline pull-up multiple catch-pits are sometimes used in rotation to allow water levels in individual catch-pits to recover before repeat abstraction.

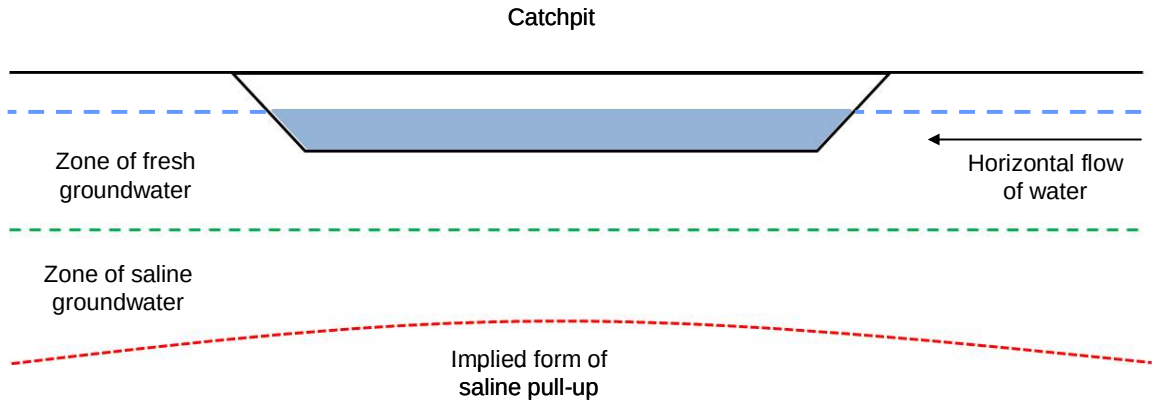


Figure 3.2 Abstraction of groundwater using shallow catch-pits.

Abstraction from the catch-pits may be seasonally variable with reduced or limited yields occurring during dry periods. Furthermore, the individual catch-pits are unlikely to have sufficient capacity to provide irrigation water directly, and to use them in this manner with sustained drawdown would risk saline contamination, particularly in the drier seasons. Therefore, it is recommended that catch-pit abstraction is used to charge winter storage reservoirs which can subsequently be used as a resource in the drier summer months.

Since the first licence was issued several other water users in the area have expressed an interest in the catch-pit technique. Early indications suggest that when the catch-pits are managed appropriately the risk of saline pull-up is minimised. Therefore, it is highly likely that this method of abstraction will be the preferred and most acceptable technique/approach in the Holbeach Marsh area. It should be noted, however, that the salinity levels and depth of usable groundwater will vary with location. Consequently, each applicant/enquirer will have to undertake their own investigations to determine the levels of fresh groundwater available in their locality. They would also have to commission a Section 32 survey of water features on the site (see Section 4.2 for further details).

The long term sustainability of water abstraction in this area needs to be considered in relation to future sea level rise predictions. Further information about climate change and case studies of how to adapt to sea level rise and coastal change are available at the following websites:

www.environment-agency.gov.uk/homeandleisure/climatechange/

www.environment-agency.gov.uk/research/planning/108361.aspx

4. How we manage abstractions in the Holbeach Marsh area

The document Managing Water Abstraction outlines the over-arching principles that we follow when managing water resources. These national principles are summarised in Section 4.1. How we apply these principles in the Holbeach Marsh area is outlined in this chapter. Further information relating specifically to applications for groundwater and surface water abstraction can be found in Sections 4.2 and 4.3 respectively.

4.1 National licensing principles

Anyone wanting to take more than 20m^3/day (4,400 gallons) from a 'source of supply' (river, stream, lake, well, groundwater, etc) must have an abstraction licence. The application process for abstraction is similar to the planning process in that we may require the application to be advertised and may require supporting environmental information. When considering the application we check that the quantities applied for and the purpose of the abstraction are reasonable, that there is sufficient water available to support it and that the potential impacts on the environment and other water users are acceptable. Depending on the outcome of our investigations we will issue a licence either as applied for, or with conditions that restrict the abstraction to protect the environment or other users. In certain cases we may have to refuse the application. Any applicant who is not happy with our determination (decision) has the right to appeal against it.

Each application is determined on its own merits

Whilst this document may say that water is available for further abstraction, this does not guarantee that all applications will be successful. We'll determine each application upon its own merits and any local impacts.

A licence does not guarantee that water is available

Although there is currently water available for abstraction, the reliability of water availability in future years cannot be guaranteed. It's important to understand that when we issue a licence we do not guarantee the supply of water. We have to protect the environment and rights of other abstractors. To do this we may add constraints to licences. Licence holders need to understand the implications of this as it affects the reliability of supply. For example, in drier years it's more likely that conditions will come into effect and abstraction is more likely to be stopped.

Abstractions are managed to protect the environment

To protect the environment we may issue a licence with conditions. See Section 4.4 for more information.

No ecological deterioration

We assess the impact of new applications for water abstraction to make sure that the resultant river flows:

- will maintain a good ecology or, if the ecology is not good, will not deteriorate the ecology of our rivers further;
- will maintain the near pristine condition of high hydrological status water bodies (water bodies where, due to the need to maintain the near pristine nature of the water body, further abstraction is severely restricted).

We'll also take action if necessary to limit the increase in current abstraction, if we think this will lead to deterioration of the ecology or the near pristine condition of our high hydrological status water bodies.

These principles apply to the water body in which the abstraction is located and also to all downstream water bodies that may be affected by any reduction in abstraction related flow. Doing this means that we will maintain the water body status as reported in the River Basin Management Plans (2009) and ensure compliance with the European Union Water Framework Directive.

Habitats Directive

When assessing any new or variation to an existing licence, the impact the abstraction may have on freshwater flows into the Wash SPA and SAC needs to be considered and an appropriate assessment undertaken. The importance of locally important habitats (such as saline lagoons) and environmental features will also need to be considered.

Time limited licences

Time limits are applied to all new water abstraction licences (see Appendix B). Whilst we are confident that the catch-pit strategy outlined in this strategy achieves a good balance for water for people and the environment, some uncertainties remain since historically there have been very few applications for surface water abstraction in the Holbeach Marsh area. Consequently, new licences for surface water abstraction are likely to be initially issued on a relatively short time scale with the presumption of renewal (see Appendix B). This will allow us to review the impact of the abstraction and make adjustments where necessary.

Water efficiency and demand management

We need to make the best use of our existing water resources. Adopting water efficiency and demand management measures can help us achieve this goal. Water efficiency is one of the tests that will need to be satisfied before we grant a new licence or renew a time limited licence. We provide advice to encourage the wise and efficient use of water and actions to limit demand (and reduce leakage), to curb the growth in abstraction, and limit the impact on flows and any consequent impact on the ecology. For further details on our general approach to licensing please see the document Managing Water Abstraction. The supply of water is limited, so we make sure that it's managed and used effectively to meet the needs of people and the natural environment. All abstractors are encouraged to showcase their water efficiency measures and enter the Environment Agency's UK Water Efficiency Awards.

4.2 Local licensing principles for groundwater abstractions in the Holbeach Marsh area

Applicants must complete a groundwater investigation

Prior to applying for a groundwater abstraction licence, potential abstractors will need to carry out groundwater investigations to determine:

- whether groundwater is available;
- whether the water is suitable for its intended purpose, and;
- the impacts of abstraction on other water interests in the area.

To conduct a groundwater investigation a Groundwater Investigation Consent must be granted under Section 32/3 of the Water Resources Act 1991. Customers should speak to the local Groundwater and Contaminated Land team at the Environment Agency for further information and to obtain the relevant forms.

Monitoring impact on surface drain levels

The abstraction of groundwater from catch-pits could affect water levels in neighbouring drains. In this situation a local hands-off level condition will need to be applied to the licence. This is a condition which allows the Environment Agency to reduce or stop abstraction when the water levels in the drain fall below a specified threshold (see Section 4.4). Where no local water level information is available the applicant may be required to install local gauge boards and monitor water levels to inform the setting of a local level condition.

Biodiversity and environmental enhancement

Applicants are encouraged to design and construct catch-pits with a consideration for local biodiversity and environmental enhancement. Guidance can be found in Thinking about an Irrigation Reservoir (pages 14 & 15).

Monitoring of salinity (Chloride) levels

It is in the interest of both the Environment Agency and landowners to prevent saline groundwater pull-up and soil salinisation. Therefore, any landowner granted an abstraction licence will be required to undertake suitable monitoring of the salinity levels of the water in the catch-pits. Licence holders will be required to send this information to the Environment Agency. Licences may contain a condition which restricts abstraction if the total dissolved solid concentration exceeds a specified threshold.

Protecting water levels in the aquifer

To ensure that the background water levels in the aquifer are not adversely affected, it is likely that one or all of the following conditions will be applied to new abstraction licences:

- Catch-pit minimum water level conditions – applicants may be required to install local gauge boards and undertake suitable monitoring to ensure that water levels in the catch-pit do not fall below a certain level (to be agreed with the Environment Agency).
- Catch-pit recovery conditions (1) – applicants may be required to install appropriate equipment to measure the background water level in the aquifer. Abstraction may be limited to periods when the water level in the catch-pit is equal to or exceeds a certain water level in the aquifer (to be agreed with the Environment Agency).
- Catch-pit recovery conditions (2) – licences may contain a condition which requires abstractors to allow a certain number of days to pass since the end of the previous abstraction cycle before repeating abstraction from the same catch-pit (to be agreed with the Environment Agency). Over time there is likely to be limited upward creep of the saline layer. Consequently, protracted recovery periods for individual catch-pits may be necessary.

Additional controls

There may be a requirement to introduce a tiered groundwater level control arrangement whereby newer licences are given more restrictive controls in order to protect other licenced users and the environment.

4.3 Local licensing principles for surface water abstractions in the Holbeach Marsh area

We will consider proposals for surface water abstraction on a case-by-case basis following discussion with the local Internal Drainage Board (IDB). The following conditions will apply to all new surface water abstractions in the Holbeach Marsh area:

- Abstraction will be limited to periods of high flows and/or levels (normally the winter period);
- All licences will have a hands-off level/flow which will be set following discussion with the IDB.

Pre-application requirements

In order to support a formal application for a surface water abstraction you are likely to be required to:

- Liaise with the South Holland IDB to discuss, and agree, the proposed means of abstraction. In most cases where an IDB drain is the source of supply the abstractor

will be required to construct an off-take from the drain by means of a pipe and abstraction point set back a specified distance from the IDB drain. This arrangement will minimise disruption to the IDB in carrying out it's maintenance and other flood risk management duties;

- Collect level (and/or flow) and salinity data at your proposed point of abstraction;
- Undertake an environmental survey to determine the presence of any environmental features which may require protection, in consultation with the local Fisheries and Biodiversity team at the Environment Agency, and Natural England.

It is recommended that you discuss your proposed abstraction and confirm the necessary survey requirements with the relevant teams at the Environment Agency and staff at the local IDB before starting any pre-application surveys or monitoring.

Monitoring of salinity (Chloride) levels

It is in the interest of both the Environment Agency and landowners to prevent saline groundwater pull-up and soil salinisation. Anyone granted a surface water abstraction licence may be required to undertake suitable monitoring of the salinity levels of the abstracted water. Licence holders will be required to send this information to the Environment Agency.

4.4 Abstraction restrictions

When issuing a licence we have to protect the environment and the rights of other licensed abstractors and water users. To do this we may add conditions to licences, usually in the form of hands-off flow (HOF) or hands-off level (HOL) conditions. Further explanation of how we set and manage HOF and HOL conditions can be found in our document Abstraction licence conditions.

4.5 Compliance and enforcement

It is vital that you comply with your licence conditions to protect the environment and to ensure that others can take and use the water they are entitled to. Local Environment Officers will carry out on-site inspections and check your abstraction returns to make sure you are complying with the conditions on your licence. These site visits will also provide you with the opportunity to get advice and guidance to help you comply with your licence. More information on compliance and the enforcement measures the Environment Agency can take when we encounter a breach or offence can be found in our document Managing water abstraction – How we maintain a level playing field.

Appendix A – Level dependent environments

Level dependent environments are characterised by a network of river channels flowing above the level of the surrounding land. The low-lying land has a network of drainage ditches, which remove water from the low-lying land into the main river channels during high flows and provide an irrigation resource during the summer/low flows (see Figure A.1).

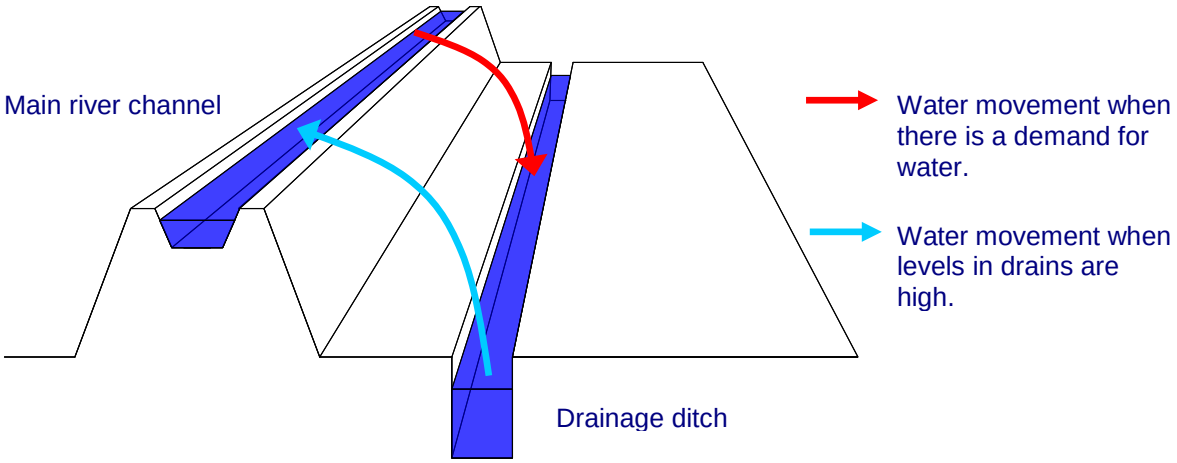


Figure A.1 The main features of a characteristic level dependent environment.

Both the Welland and the Nene CAMS contain level dependent environments (LDE). Each LDE has been divided into units, known as level dependent management units (LDMU). Internal Drainage Boards (IDBs) are responsible for maintaining the drains and controlling the water levels in each LDE/LDMU.

We have completed a water resource assessment on each of the units. For more information about the LDMUs in the Welland and Nene CAMS areas please see the relevant CAMS document (available from our Publications Catalogue).

Appendix B – Time limited licences

In recognition of the changing pressures on water resources all new licences and variations (other than downward variations or minor variations having no environmental impact) will have a time limit imposed. This allows for the periodic review of and changes to abstraction licences where circumstances have changed since the licence was granted.

Most licences within a CAMS have a common end date (CED) so the licences can be reviewed at the same time. When an application is made within six years of the CED, we will generally apply the subsequent CED to any licence granted. This is to avoid issuing shorter and shorter duration licences as the CED approaches. This means that the initial CED on a licence may be between six and 18 years duration. On replacement the normal duration will then be 12 years. However, where we are uncertain about the long term impacts of an abstraction (as in the Holbeach Marsh area) we may grant a short term licence during which time the potential impacts are monitored.

The expiration date applied to abstraction licences in the Holbeach Marsh area will depend upon which CAMS area the abstraction falls within (see Map 2.1). The next CED for Welland CAMS is 2014 and the subsequent one is 2026. The next CED for Nene CAMS is March 2017 and the subsequent one is March 2029.

There is a presumption of renewal with time-limited licences provided that the renewal tests can be satisfied and there are no other legal obstacles. The renewed licence will be subject to conditions considered necessary for the sustainable management of the resource. The three renewal tests are:

- environmental sustainability;
- continued justification of need;
- efficient use of water.

We will try to give six years notice where we won't be able to renew a licence, or where we will only be able to replace a licence on significantly more restrictive terms. However, there may be circumstances which prevent us being able to give this amount of notice. Additional information about the replacement of time limited licences is available in Managing Water Abstraction.

Glossary of terms

Abstraction	Removal of water from a source of supply (surface or groundwater).
Abstraction licence	The authorisation granted by the Environment Agency to allow the removal of water.
Aquifer	A geological formation that can store and transmit groundwater in significant quantities.
Catchment	The area from which precipitation and groundwater will collect and contribute to the flow of a specific river.
Consumptive abstraction	Abstraction where a significant proportion of the water is not returned either directly or indirectly to the source of supply after use. For example for the use of spray irrigation.
Compensation release	Water released from reservoirs to maintain a flow in the river downstream.
Discharge	The release of substances (i.e. water, sewage, etc.) into surface waters.
EU Water Framework Directive (WFD)	First major review of European water policy. Seeks to improve water quality in rivers and groundwater in an integrated way (see Integrated River Basin Management)
Groundwater	Water that is contained in underground rocks.
Habitats Directive	A European directive on Conservation of Natural Habitats and of Wild Flora and Fauna. The Directive is implements in the UK by the Conservation (Natural Habitats & c.) Regulations 1994 – commonly known as the 'Habitats Regulations'. The Directive created a network of protected areas across the European Union known as 'Natura 2000' sites.
Hands-off flow (HOF)	A condition attached to an abstraction licence which states that if flow (in the river) falls below the level specified on the licence, the abstractor will be required to reduce or stop the abstraction.
Hands-off level (HOL)	A river flow or borehole (groundwater) level below which an abstractor is required to reduce or stop abstraction.
Internal Drainage Board (IDB)	A local land drainage authority with powers to raise finance and do works.
Irrigation	The artificial distribution and application of water through man made systems in order to stimulate crop growth.
Level dependent environment (LDE)	A network of river channels flowing above the levels of the surrounding land. The low-lying land has a network of drainage ditches, which remove water from the low-lying land into the main river channels during the winder and provide an irrigation resource during summer.
Licence determination	A decision by the Environment Agency on what terms to grant or refuse a licence application, by reference to regulatory powers and duties.
Review of Consents	The procedure by which the Environment Agency as a competent authority will apply the Habitats Regulations to review all relevant existing discharge consents, abstraction licences, permission and activities which are likely to affect a designated European site.
River Basin Management Plan	The method by which the EU Water Framework Directive will be implemented to ensure that all requirements and pressures on the water environment are taken into account.
Site of Special Scientific Interest (SSSI)	An area given a statutory designation by Natural England of the Countryside Council for Wales because of its nature conservation value.

Special Area of Conservation (SAC)	An area classified under the EC Habitats Directive and agreed wit the EU to contribute to biodiversity by maintaining and restoring habitats and species.
Special Protection Area (SPA)	An area classified under the EC Birds Directive to provide protection to birds, their nests, egg and habitats.
Time limited licences	Licence with specified end date.

List of abbreviations

CAMS	Catchment Abstraction Management Strategies
CED	Common End Date
HOF	Hands off Flow
HOL	Hands off Level
IDB	Internal Drainage Board
LDE	Level Dependent Environment
LDMU	Level Dependent Management Unit
Ml/d, Ml/day	Ml = megalitres = 1,000,000 litres = 1,000 cubic metres = 1,000 m^3 = 220,000 gallons Ml/d = Ml/day / Ml per day, = thousand cubic metres per day
RBMP	River Basin Management Plans
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest

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