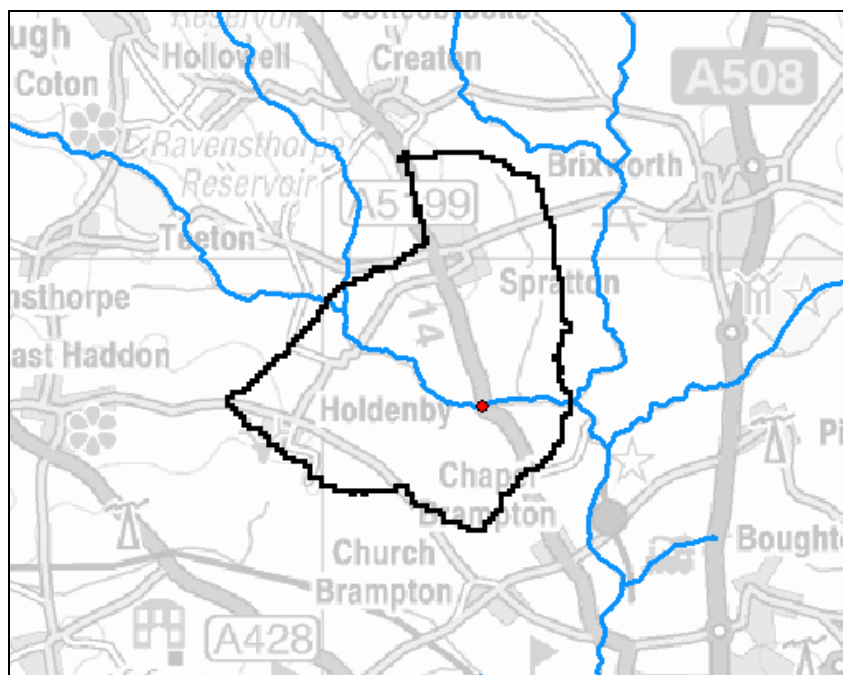


Nene Catchment Partnership - Your Water Catchment

River Nene – Spratton Brook

Spratton Brook is a tributary of the River Nene. The water catchment of Spratton Brook is highlighted in black on the map below.



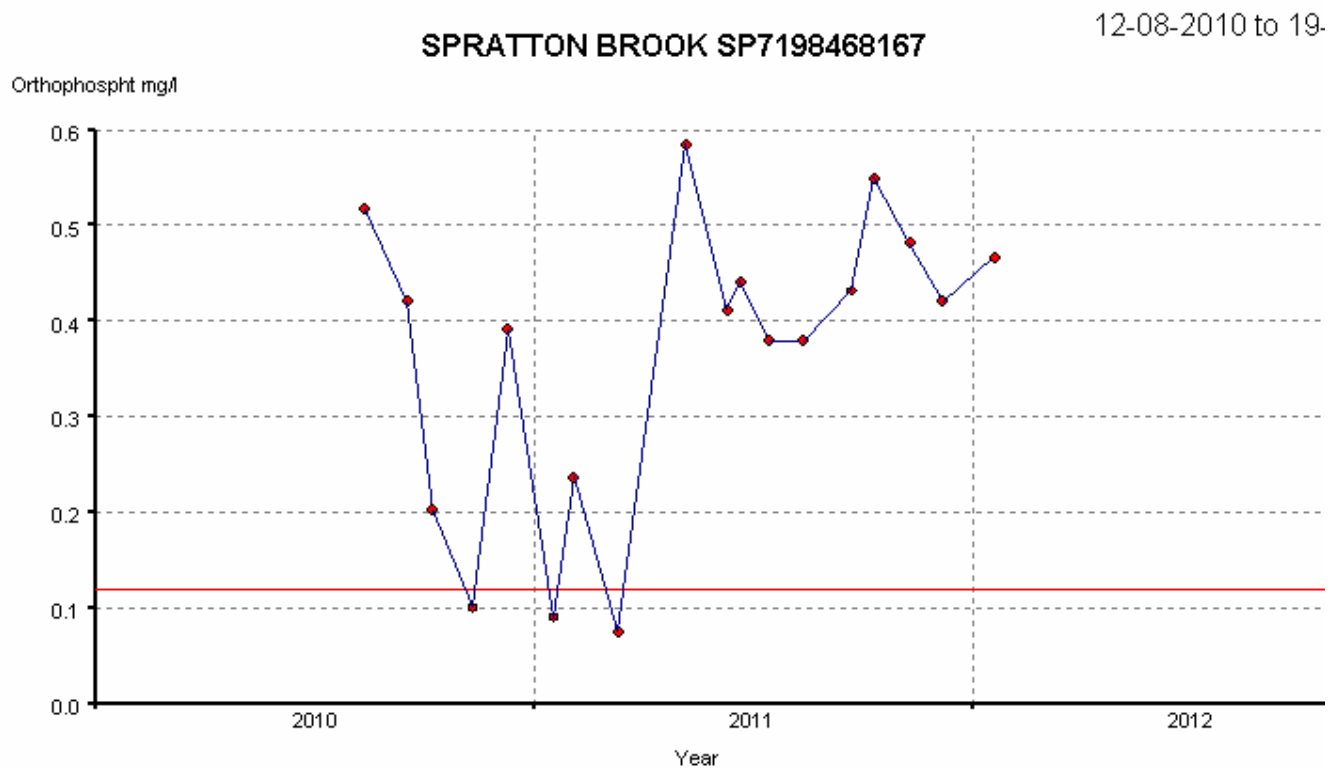
This bulletin provides a summary of the available water quality data for the catchment, and some of the key environmental features and issues.

The villages of Spratton and Holdenby are located within this rural catchment. The Hollowell Arm flows from Hollowell reservoir entering the catchment from the northwest and joining Spratton Brook flowing from Ravensthorpe Reservoir. Spratton Brook then continues to the east of the catchment with a number of feeder streams entering the main channel along its length. The topography is steeply sloping with gentler slopes within the floodplain of the main channel. Agricultural practices consist of predominantly arable with semi improved and improved grasslands for grazing.

Spratton Brook is currently classified at Moderate status by the **Water Framework Directive (WFD)**. However, the WFD requires that all waterbodies meet Good Ecological Status by 2027, and the Nene

Catchment Partnership is working with the Environment Agency to achieve this. The Environment Agency has two permanent sampling points relevant to this catchment which monitor the water quality on a monthly basis. One sampling point is located on the Hollowell Arm and another on Spratton Brook.

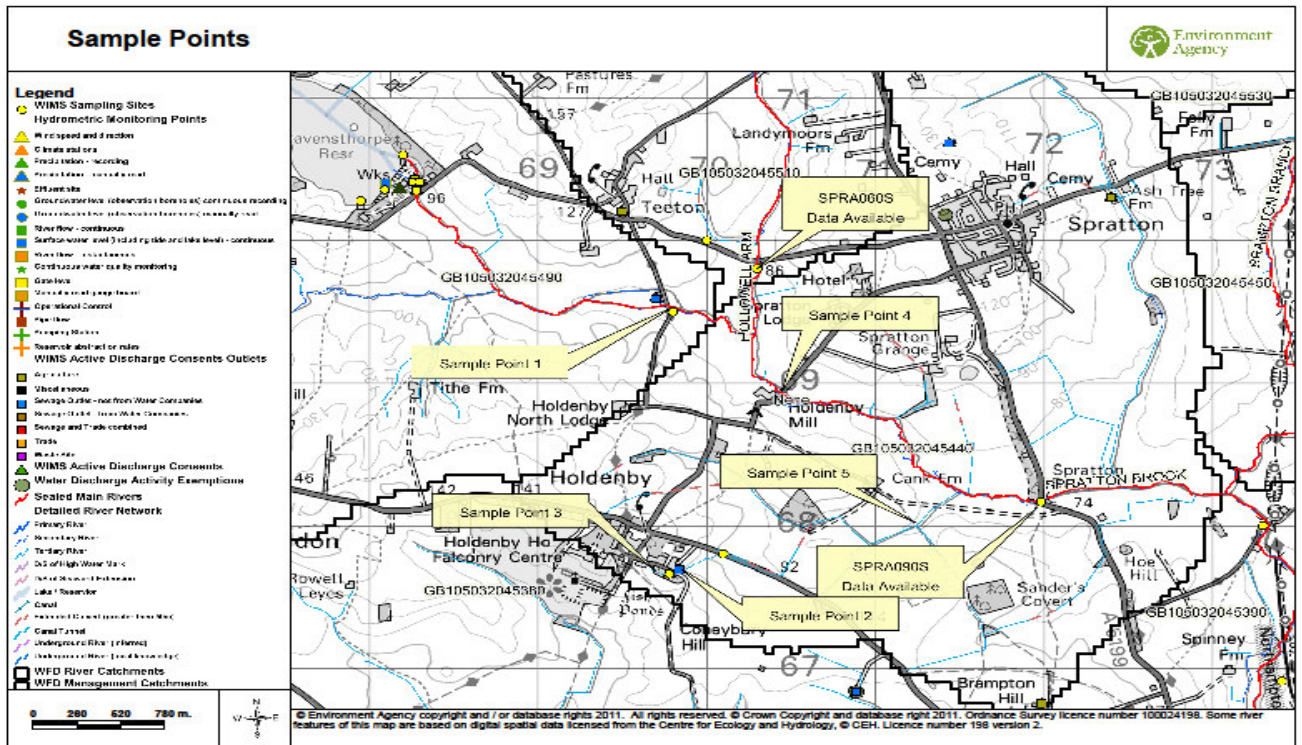
The moderate classification relates to phosphates levels within the water body. Ammonia, pH and dissolved oxygen exceed good criteria (classified as High). **Phosphate** is the most common failing element nationally under WFD. The WFD target for phosphate is 0.12mg/l, the graphs below shows that Spratton Brook exceeds this target with the annual average being 0.36mg/l.



Phosphate exists in both the organic and inorganic form, but it is organic phosphate that is the limiting nutrient for plant growth in freshwater ecosystems. An excess of organic phosphate results in eutrophication of freshwater ecosystems with resulting algal blooms which limits light and oxygen levels leading to a reduction in the variety of habitats and subsequent aquatic flora and fauna.

Phosphates are a waste product from protein breakdown and are found in human and animal waste, as well as some industrial effluents (food and drink, fire retardants). As an important plant nutrient, diffuse sources of phosphate also include agricultural fertilisers and the subsequent run-off from agricultural land of both organophosphate and phosphate bound to soil particles. Sediment itself affects the habitat of rivers by smothering riffles used by fish to spawn and changing river morphology. Other sources of phosphorus include sewage treatment works (STWs) and septic tanks, both of which are being assessed as part of meeting the WFD targets.

The map below shows the location of the two permanent Environment Agency sampling points and 5 further spot sample points taken within the catchment to provide an indication of potential sources of phosphates:



The 'Moderate' phosphate classification has been confirmed by both routine and spot monitoring. As the Hollowell Arm enters the catchment it is carrying an average of 1.44mg/l of phosphate this is approximately 12 times the target level. It should be noted that routine sampling of at this point only commenced in August 2011 and further analysis is required to establish long-term trends.

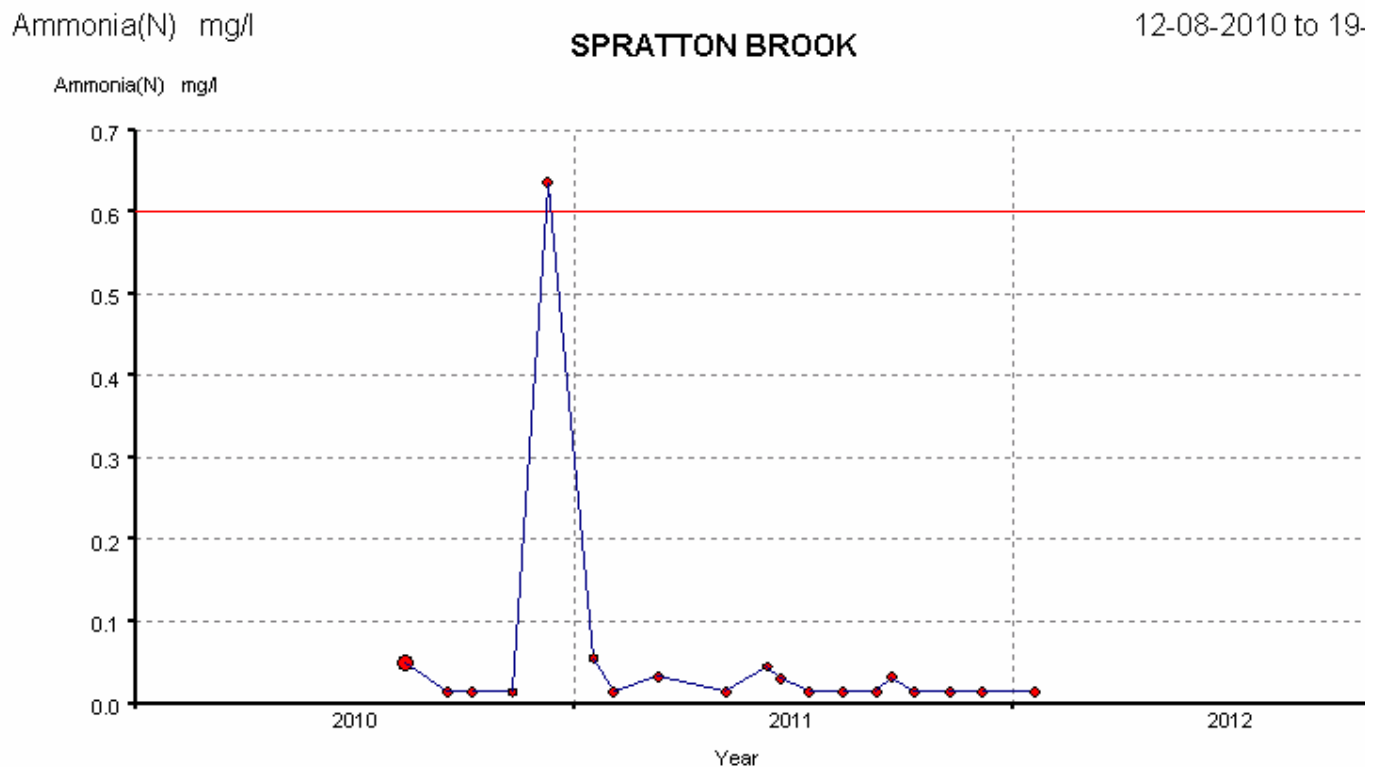
A spot sample (sample point 1) showed 0.467 mg/l of phosphate recorded in the Spratton Brook as it flows from Ravensthorpe reservoir before it joins the Hollowell Arm. Further downstream a spot sample (sample point 4) was taken from Spratton Brook adjacent to Holdenby Mill Farm which showed 0.376 mg/l which is consistent with the recorded average of 0.36mg/l.

A spot sample (sample point 2) was taken downstream from Anglian Water sewage treatment plant at Holdenby, the first sample returned phosphate levels of 3.2 mg/l. It should be noted that upstream of the discharge point was dry and the sample consisted of treated effluent only. Upstream (sample point 3) and downstream spot samples were taken following a rain event which showed upstream phosphate levels of 0.093mg/l and downstream 1.03 mg/l. The flow rate within this channel is minimal and is predicted to enter Spratton Brook only during times of heavy rainfall. The discharge is channelled through a series of field ditches and roadside channels discharging into Spratton Brook upstream of the routine sample point. A sample was taken from this tributary (sample point 5) which showed phosphate at 0.109 mg/l. The overall contribution of phosphate from this source is predicted to be low do to the low flow rate.

The initial investigations show the main sources of failure in relation to phosphate within this catchment originates from the Hollowell Arm flowing from Hollowell Reservoir (catchment GB30538132). Immediately downstream of the Hollowell Reservoir is a Anglian Water Storm Sewage Overflow and a consented discharge from the Sewage Treatment Works (STW). A sample of the consented discharge returned phosphate levels of 3.2mg/l at a flow rate of approximately 9.1 l/s. Neither of the STWs in this catchment have phosphate stripping and we are investigating how this impacts on the phosphate concentrations in the catchment. All catchments are different, but as a general rule it is thought that, in rural catchments, agriculture inputs about 35% of phosphate into the water and STWs about 60%.

Ammonia

Ammonia is found in sewage, manures and fertiliser. It is highly soluble in water and toxic to fish. The graph below shows ammonia concentrations in mg/l, WFD has a limit of 0.6mg/l therefore Spratton Brook currently exceeds good status in relation to ammonia levels.

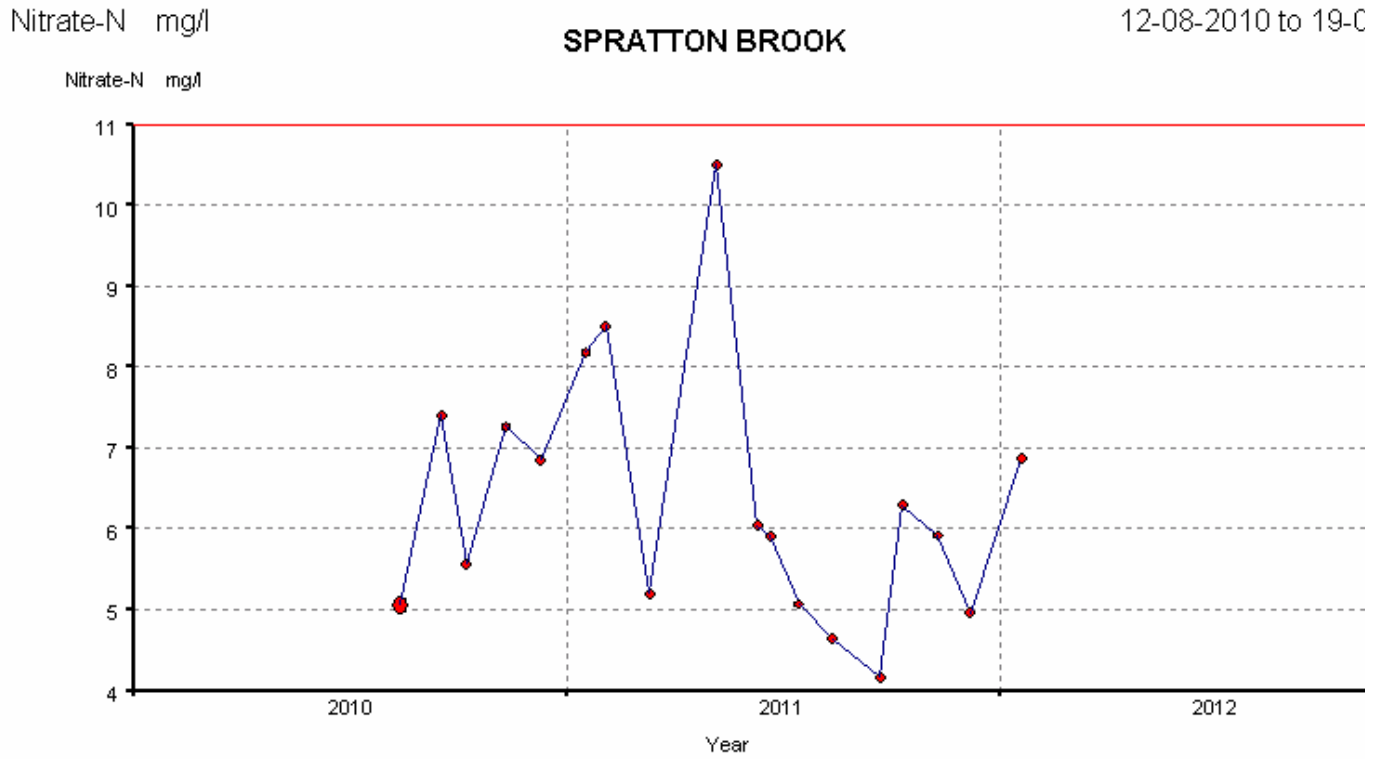


Nitrate

The Spratton Brook, along with most of England, is in a Nitrate Vulnerable Zone (NVZ). Nitrate pollution problems occur when too much chemical fertiliser is applied to the land. The excess runs off and can find its way into drinking water sources, rivers and lakes. Some experts believe that high levels of nitrate in drinking water may pose a threat to health. A European directive states that drinking water should not contain more than 50 milligrams of nitrates per litre of water.

In rivers, streams, ponds and lakes, too much nitrate can create a 'pea soup' effect. The water becomes clogged with fast-growing plant life like algae and weeds. This is a major problem especially in some areas of England such as East Anglia. In problem areas, some farmers voluntarily control their

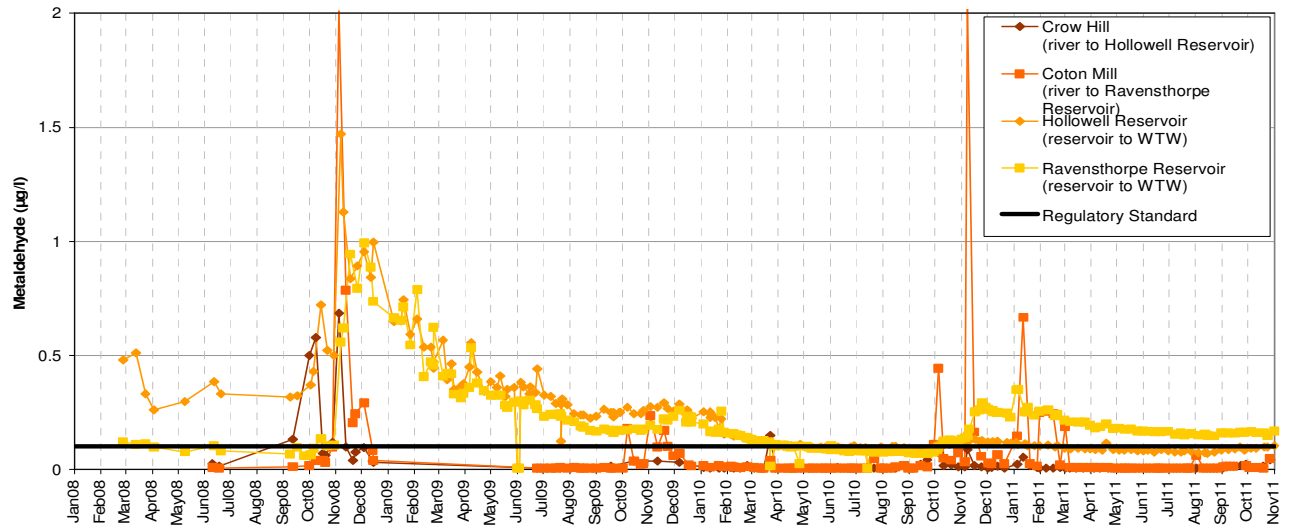
use of nitrogen. Nitrate levels in the Spratton are have decreased through the implementation of the NVZ rules.



Metaldehyde

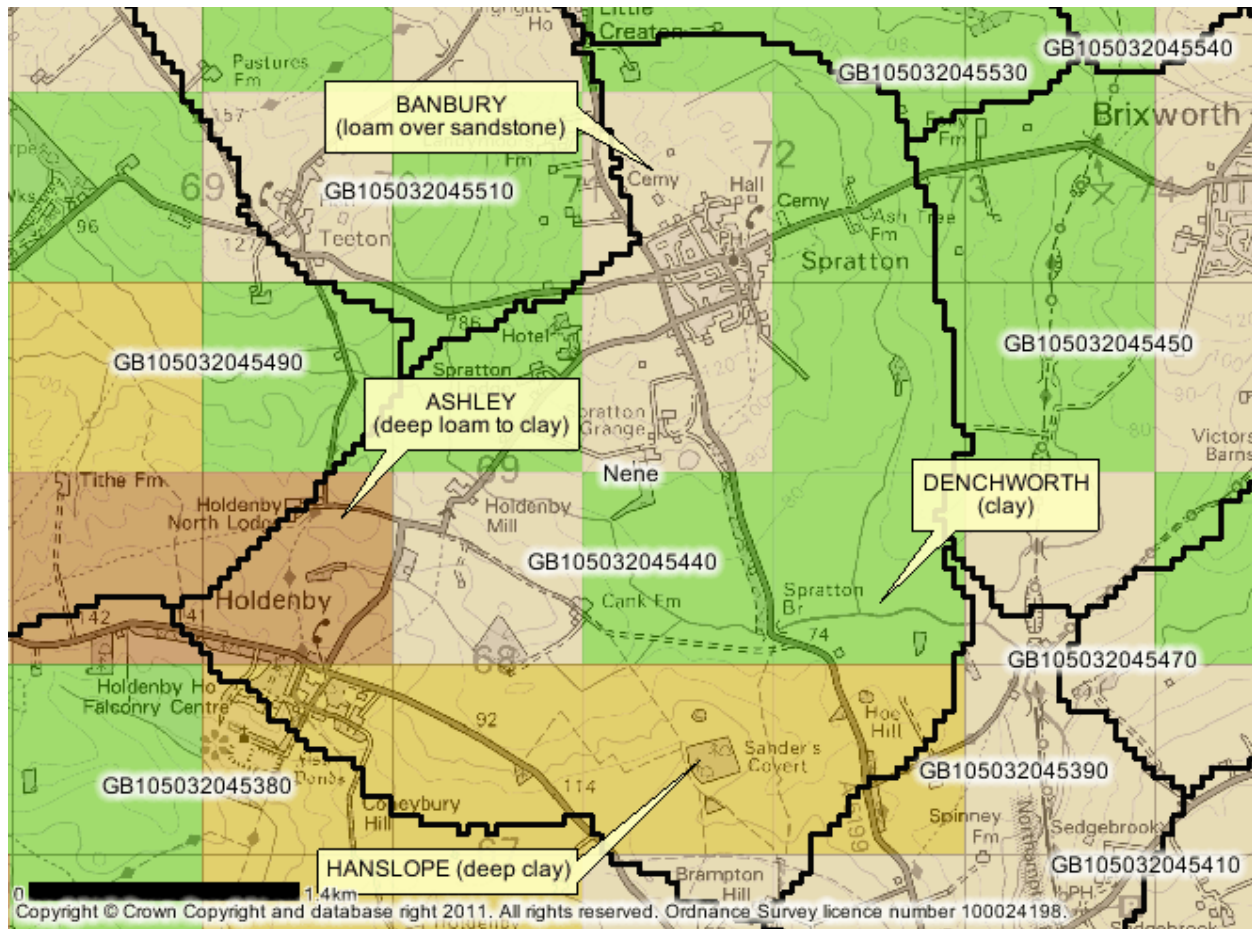
The drinking water limit for metaldehyde is $0.1\mu\text{g/l}$. Metaldehyde is the most widely used pesticide for slug control. Ravensthorpe Reservoir is monitored for metaldehyde and is failing. Concentrations of metaldehyde in the Ravensthorpe Reservoir (see graph below) have generally been decreasing since the peak in 2008, but peaks are still appearing in winter (2009 and 2010), following autumn applications. A single slug pellet could contaminate 1000 litres of water to above the drinking water limit (this could be up to 23 miles of a small brook), so careful use is vital if we are to stop this valuable pesticide being banned.

Ravensthorpe Water Treatment Works - Metaldehyde



Soils

The soil is a farmer's most valuable resource. Soil security is vital if we are to ensure future food production. The map below shows the main soil types (1 km squares) for the Spratton Brook area.



Map colour	Soil Name	Description	Leaching potential
Green	Denchworth	Clay	Low
Yellow	Hanslope	Deep clay	Intermediate
Beige	Banbury	Loam over sandstone	Intermediate
Brown	Ashley	Deep loam to clay	Intermediate

Groundwater

The bedrock beneath the soil is connected and can store water (underground reservoirs known as aquifers). Limestone generally holds water the best and is therefore classed as a major aquifer, ironstone and sandstone are minor aquifers and mudstone has no aquifer. Predominant geology in this catchment is mudstone.

This means farmers in this catchment have access to free advice, workshops and training events to assist with soil, nutrient and pesticide management, as well as priority access to funding through the CSF Capital Grant Scheme.

To find out more Tel: 01604 236764
 Email: RNRPN@northamptonshire.gov.uk
 Web: <http://www.rnrp.org/CSF>

Catchment Sensitive Farming (CSF)

The Slade Brook is in a CSF area under the Nene and Ise Catchment Partnership. CSF aims to reduce diffuse pollution from agriculture.

Campaign for the Farmed Environment (CFE)

The priority in Northamptonshire is surface water protection. The ELS options that contribute towards this are:

Buffer strips - to slow, filter and trap pollutants (soil, nutrients and pesticides) before they enter the watercourse

Cover crops - to reduce leaching of nutrients

Field corners - to reduce overland flow and erosion of soil

To find out about free events or to get more information, contact your local CFE Advisor, Alex Butler (01572 718763).

What can you do next?

If you would like to collect some of your own water quality data, arrange a free Catchment Sensitive Farming visit, or simply to discuss the issues further then please contact the Nene Catchment Partnership team at the RNRP offices (see CSF section for details).