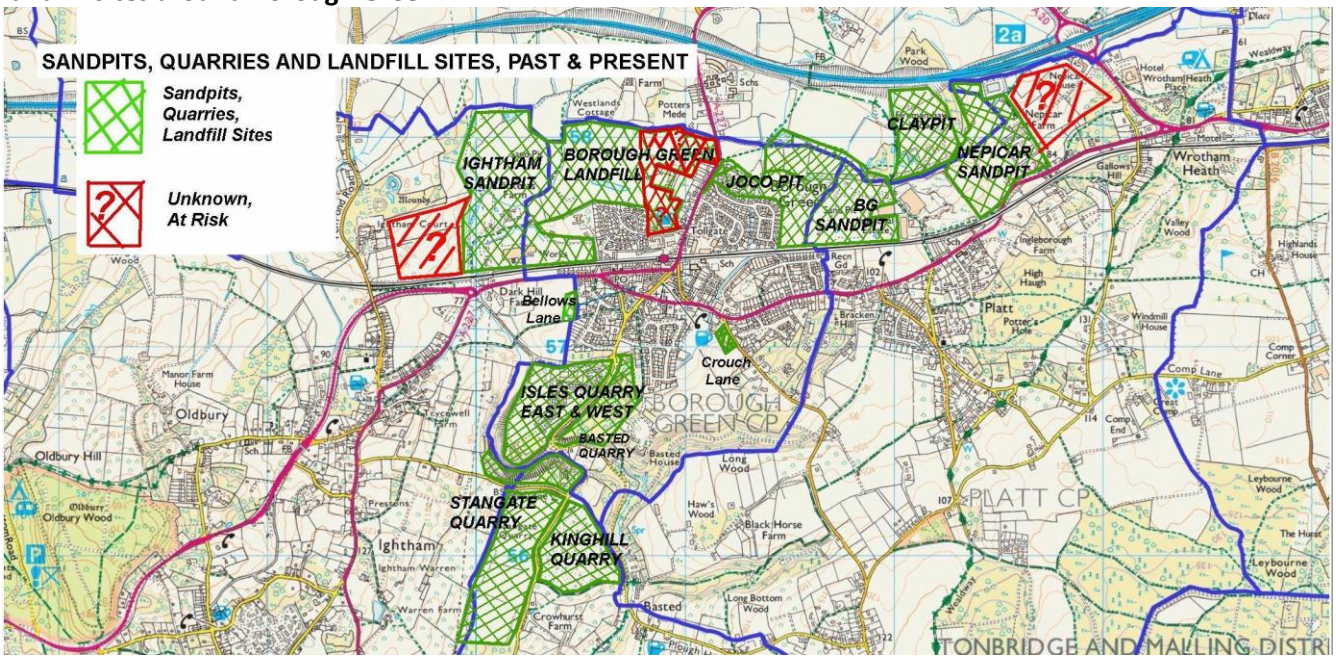
**Landfill sites around Borough Green**




## LANDFILL SITES USED FOR HOUSING

**Tolsey Mead and Eaglestone Close** were built in the 1980s on Joco Pit (John Naylor & Co), a site that had been excavated decades ago and filled with general and household waste since the war. There was an incident in the 70s when significant amounts of rejected meat products were dumped there. Because of the unknown nature of the fill, the houses were built on piles with gas membranes in the oversites. TMBC EH still monitor the site for Methane, but apart from occasional spikes, no large amounts of gas have been released. The only significant problem is subsidence on extensions, conservatories and garages.

**Tillmans** was a sandpit, before Tillmans Furnitue factory was built, hence the old name of Sandy Lane. As far as we know, this was never excavated below ground and there is no landfill

**Isles Quarry West**. Quarrying began at the north end probably after the First World War moving south, and "jumping" the Bourne and becoming Stangate in post 1945 period. Landfilling with general waste followed the excavations south, being completed by the late 50s. WWe have a planning permission for the main workshop in 1960, but Hanson and TMBC assured Crest Nicholson that the site was an "Engineered Landfill Site" filled in the 70s and 80s. Deep piling was used as protection against subsidence, and band drains to drain perched water pockets and other voids. Some subsidence may still occur as putrescible material rots, and whilst TMBC do not monitor landfill gas it was recorded in the Geological Surveys.

**A-Z Houses** (Pearsall Place). Excavations began around 1860, but only really took off moving north when the railway came through in 1870, allowing industrial amounts of sand to be exported, and sidings used to run under Fairfield Road into the sandpit. Again, landfilling followed excavation, and Novellos built a factory on the A-Z site in the 60s. This was later demolished and the A-Z Company took over, until 2016 when the factory was demolished and houses built on the site. The problems with this historic landfill site were exacerbated by the burial of much of the Novello factory waste on site, including asbestos.

**Allingham Way** (Millbourne) Whilst this was 1900-1920 era quarry, it was backfilled in two stages, completed in the 1980s, but as far as we know it used hassock, a low grade inert friable limestone produced as a (large) byproduct of limestone quarrying.

## LANDFILL HAZARDS

Borough Green and Platt are surrounded by Landfill sites, the remains of past mineral excavations. TMBC in their past thirst for ever more houses, viewed these sites with relish, seeing them as "despoiled land" and Brownfield sites. They are not, everyone of these sites is approved in Greenbelt because the expectation is they will be reinstated and returned. *(LANDFILL MAP)*
If a landfill has been filled with inert, non-putrescible waste, compacted in thin layers, it stands an excellent chance of providing a stable platform for housing.

If it is a historic general waste site, it is unlikely to have any compaction except for natural settlement, and will contain voids, perched pockets of water and other liquids, solid materials such as old truck bodies with voids underneath, but crucially pockets of putrescible organic matter. (Fig 3 Below)

TMBC have already built on Joco Pit, and is having to take action about raised Methane Levels. Isles Quarry had significant methane levels, but was built without any monitoring, as was A-Z. And yet they want to build on3 more historic landfill sites *(BGGC MAP)*

**TYPES OF LANDFILL SITES - ARE THEY SAFE TO BUILD HOUSES ON? And the engineering required**

Borough Green and Platt are surrounded by old quarries and sandpits, many of which have been landfilled over the decades. There are several different types of landfill site. (landfill map)

**HISTORIC LANDFILL** A century or more ago, our ancestors realised that the holes from which they had extracted sand and rock from, were ideal depositories for their waste as well. These historic landfills were typically filled by tipping waste over the edge until the hole was filled. The problem with this is that the loose fill settles with time, and a lot of general waste will rot to nothing leaving voids and further subsidence.

Most of the old pits and quarries in this area are historic landfills in total or in part. This means no-one knows what is buried or when it was buried. Whether or not these sites will suffer from landfill gas, subsidence or sinkholes is improbable, but not impossible, no one can guarantee that. In the light of those risks, that are starting to become apparent at Tolsey Mede

**ENGINEERED LANDFILL**. Since the late 70s, engineered landfill involves building up thin layers of fill and compacting it with spike wheeled shovels or bulldozers, meaning the entire fill is consolidated and unlikely to subside. However, as there were no restrictions on the fill used, often putrescible material was used, which slowly rots, leaving voids and subsidence.
Because of the subsidence risks, Local Authorities introduced rules to differentiate between general waste landfills and Inert Waste Landfills

**GENERAL WASTE LANDFILLS** build up the waste in cells lined with clay to prevent seepage of rotted material and effluents, but still heavily compacted. They often have methane extraction running electricity generating plants as at Stangate and Kinghill, and a long term scheme to top up and cap off the site as the waste rots and subsides.

**INERT WASTE LANDFILL**. As it says only inert waste such as builders rubble and soil are allowed, materials that do not rot. Even leaves and garden waste are banned, and most operators these days use CCTV and high level visual checking stations, as well as a constant watch as vehicles unload that no banned materials are slipped in. By building up and compacting layer by layer, these pits are inherently stable and resistant to subsidence. All current local landfill sites subscribe to these criteria.

**METHANE** and other landfill gases can occasionally have a mineral source, but are largely the result of rotting organic waste. Methane itself is not a problem except when enclosed in a confined space, where at concentrations between 1% and 25% it is explosive. In landfills such as Stangate and Kinghill with deliberately large amounts of domestic putrescible waste that are suitably capped and enclosed, it can become a valuable resource fuelling diesel engines to produce electricity.

**PILING** hammers concrete pillars into loose landfill down to the bedrock to support houses, and prevent damage by subsidence. (FIG 4 below)

**VERTICAL BAND DRAINS** are drilled into loose landfills to release trapped air and moisture (Fig1 below). Once band drains are installed, hundreds of tonnes of spoil are heaped onto the area, a process called "surcharging". The theory is that the imposed weight compresses the soil and squeezes out the trapped moisture and air, closing voids, and compacting soil grains closer, achieving compaction without actually mechanically compacting the ground. That is the Theory anyway, no-one has ever been down to investigate. I accept that it is successful where earth bunds and banks are built and stabilised, but I have my doubts that it works on the unknown and unknowable material in a landfill. I watched a Crest Piledriver one day, as it battered a pile into the ground, 3-4" at a time, when it suddenly dropped 6-7 feet ! I bet that's not supposed to happen
Even the Council's Environmental Consultants admit this method can only compact the top 3-4 metres.

**PROBLEMS OF PILING AND BAND DRAINS**. In an untouched landfill these pockets of air water and organic material can sit quietly for decades. TMBC know that things can shift naturally, exposing new material that rots producing a spike in Methane as at Joco. They even say that piling and band drains assist the dissipation of methane - clearly a good thing.
But if piling and band drains allow methane to escape, they can also allow oxygen to get into the landfill, triggering more methane generation, more rot, more voids. If Band drains allow moisture to travel down and out of the landfill, they also create a path for surface runoff water to get into the landfill, perhaps leading to:……

**SUBSIDENCE AND SINKHOLES**
The escape of methane, and the ingress of water and oxygen, triggers more rot and more voids, exposing new areas to rot. The flow of water through these voids can lead to erosion and subsidence. Subsidence is not a problem to the houses, they are all safe on their pilings. But what about roads, footpaths, sewers , gaspipes, conservatories and even garden sheds.

There is another hazard to be born in mind here, and that is sinkholes. Sinkholes occur when surface water finds pathways through the ground, and slowly leaches away subsoil, increasing voids. Sometimes those voids collapse leaving a hole on the surface, as they did on the crossroads in the 70s, and at Hillview a few years ago.

There are several types of strata that make sinkholes likely, according to the British Geological Society, gypsum, chalk, rocksalt and limestone. The rock under Borough Green is actually quite a hard limestone, but in fractured beds, hundreds of cracks, and it is only 35-50% limestone, the rest is hassock, a loose friable limestone that you can almost crush in your hand, easily eroded. *(BG Limestone Fig 2)*

I am not saying we are all at risk of falling down caverns at every step, but it is clear that landfills and limestone make Borough Green a much higher risk than other places, so why take the risk?

BELOW FIG 1 Vertical Band Drains at Isles Quarry West

FIG 2 Borough Green Limestone Face at IQW showing deep fissuring

FIG 3 - Buried Debris removed from the first few feet of fill at IQW. Weighbridge platform, old HGV trailer, and ?

FIG 4 PILING RIG on what is now Isles Quarry Rd