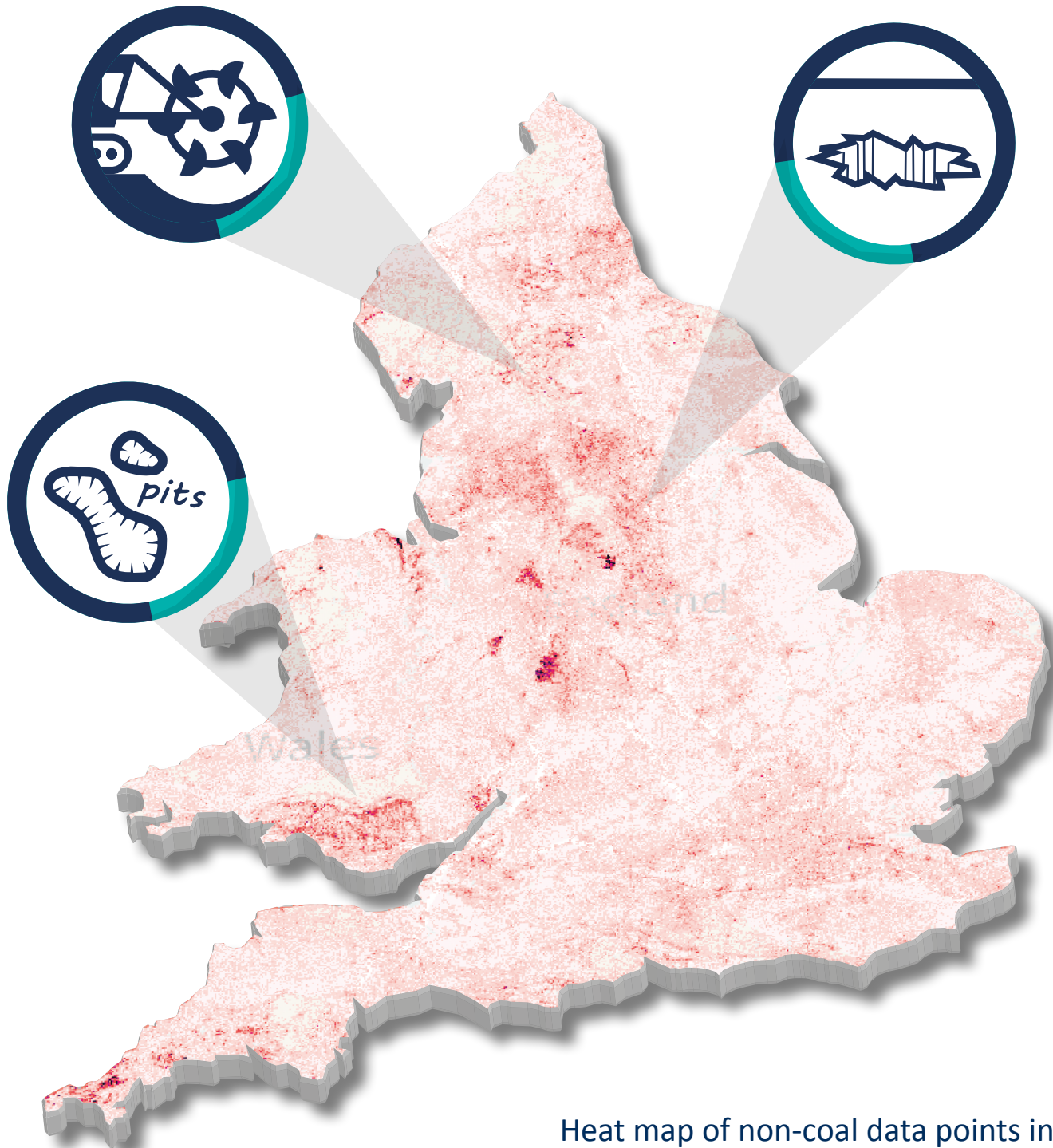


HIDDEN HAZARDS: UNDERSTANDING NON-COAL MINING PROPERTY RISKS



Heat map of non-coal data points in England and Wales - October 2021

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Introduction

For many years, property transaction due diligence has included a set of searches, some considered mandatory, others optional and based on location. This selective approach has been, in part, influenced by conveyancers following Law Society guidance and practice note updates which have, over time, been revised and updated.

Some searches carry clear liabilities to both the client and the conveyancer, such as contaminated land risks where a failure to advise the client of the potential for cost recovery could become significant. Others, like flood risk, could impact the client in terms of insurance and mortgage availability.

Searches on ground stability risks from past mining have been dominated by coal mining thanks largely to the Law Society CON29M format questions, so that it is understood as a prescribed search in relevant areas affected by coal mining. Because the Coal Authority provides some liability for remediation under the 1991 Act from coal mine subsidence impacting a client's property, conveyancers are naturally more comfortable that there is redress for their client down the track.

But to look at coal mining for this primary reason, is to miss a far wider risk picture for their client to which there is little or no redress and as such could impact on the quiet enjoyment of the home. It could also become prohibitively expensive to insure and reduce a lender's appetite to offer security against the asset.

The purpose of this paper is to outline the clear and present risks from past mining hazards for minerals other than coal, and demonstrate that their influence extends into some of the most populous parts of our major cities affecting significantly more households and properties than coal mining.

Thinking beyond Coal Searches

Many identified coal mine shafts have been known entities for decades and their age, depth, structure and the type of any remediation applied usually means they are more predictable and less likely to cause significant subsidence risks. The biggest challenge lies with the identification of shallower, older, more informal mines or adits feeding into the shaft system which could be affected by ground movements closer to the surface. Coal mining data has improved significantly in recent years to highlight these risks, especially given the amount of development over these redundant shafts in the last half century.

But it is important to consider just how significant past coal mine risk really is when compared to non-coal mineral mines throughout the country.

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Infographic: The Potential Scale of Non-Coal Mining Risk in England & Wales



390,482
Recorded quarries



74,000
Sinkhole features



866,266
Recorded pits



8.2M
Residential properties
could be affected by a non-coal
mining alert



35,777
Specified non-coal
mines in England and Wales
from historic land use data



2.8M
Reported non-coal
mining reported features

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The above infographic clearly reveals the extensive nature of non-coal mining features across England and Wales. Each of these data points identify an area of our land that has been worked to extract resources across the centuries. This has then been filled, covered over or built on and so is no longer visible.

When we compare these features to those of coal mining in our datasets and overlay those with property locations, our analysis shows that, for England and Wales:

- 22% of all properties will need a non-coal report
- An additional 17% of all properties would need an additional CON29M coal mining report

This shows a clear majority of properties affected by some kind of mining hazard to be of non-coal in type. This is due to them being more prevalent across the country, whereas coal is confined to discrete areas.

Understanding Non-Coal Mining Risk

The UK has a long history of surface and underground extraction, with over 60 different minerals being mined, quarried and extracted at some point in time. Among the most well-known include limestone, sandstone, ironstone, chalk, tin, clay, as well as an assortment of metalliferous and semi-precious materials. Each has its own different characteristics and can pose their own unique problems.

For conveyancers, non-coal mines present very clear and present risks because:

- A) They are usually shallower and more informal workings than coal seams, so closer to the foundations and gardens of properties.
- B) While homeowners may be able to get insurance cover for their property, with a very high excess or renewal for known subsidence, this does not apply to their gardens in the main.
- C) As our climate changes with locally heavier downpours, old mines are being revealed through collapses and sinkholes. Lenders are now responding with greater concern to their longer-term exposure to the security on their lending.
- D) Many of these are located in urban areas and were built over many years ago so they are not obvious in the way a coal slag heap, pit head or a river would be. Conveyancers cannot and should not rely on "local knowledge", and just because it hasn't moved in the past doesn't mean it won't in the future.

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Living Over The Risk

City Region	No. of properties affected by non-coal mining risk	Percentage of properties affected – non-coal risk	No. of properties affected by coal mining risk	Percentage of properties affected – coal mining risk
City of Lincoln Council	50769	35.27	0	0
Norwich City Council	81074	37.36	0	0
Birmingham City Council	156717	20.6	46885	10.8
Leeds City Council	899891	45.74	282743	59.43
Liverpool City Council	85211	16.35	493	0.32
Manchester City Council	155298	29.52	106835	48.96
Newcastle-upon-Tyne City Council	117422	31.26	121761	100
Sheffield City Council	197986	34.59	236811	80.16
Bristol City Council	170652	15.75	135962	28.74
City of York Council	67886	43.29	5078	25.82
Caerdydd - Cardiff Council	63704	23.95	1737	8.8
Greater London	1090056	18.05	0	0
Nottingham City Council	169491	41.2	121034	90.8

The table above shows the number of properties affected by non-coal mining activity in a number of major cities across England and Wales. This analysis is derived from Groundsure's extensive non-coal mining datasets included in their residential and commercial search data.

It shows how the risk of former non-coal mining can be up to 2 to 3 times greater than coal mining in cities such as Birmingham, Cardiff and York and that overall, there is a significant additional percentage of non-coal mining risk within the same council area.

So, while CON29M's are automatically obtained for coal affected areas in and around these cities, as conveyancers have ordered this as standard, it misses a wider pool of risk from other types of mining for their client.

Conveyancers may point to CON29M reports that also include non-coal mineral data, but they only highlight where this was mined close to the coal seam and does not pick up the wider distribution of other types of mining across the rest of the city.

Equally, the table highlights other cities well away from the coal mining risk areas, such as Norwich and Bristol which have an extensive history of chalk and stone mining respectively, that could be completely missed as they would not select a CON29M for these areas.

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Why are Non-Coal Mines a Problem?

Older mines were dug on a domestic scale with picks and shovels on a speculative basis. These tend to be shallow, localised and unmapped, making their location difficult to predict. The risk is magnified as they are near the surface and their stability can be affected by a number of factors.

Some may have had shallow shafts with adits at the surface, but others were just dug out from the topsoil. Minerals were extracted whilst they were viable and were then closed once exhausted with little consideration given to making the workings safe.

Many open features such as shafts, bell pits or linear surface workings, were backfilled with a mixture of mineral spoil, felled timber, prop supports and any general waste available to the miners from the extraction process to prevent entry, provide a degree of safety and was part of moorland reclamation in the 19th Century.

The issue with using organic, unconsolidated material to secure a hole is that, by its very nature, pockets of air remain within the fill. Add to this the fact that the properties of organic materials such as wooden timbers, felled fauna and in some cases dissolution-prone minerals like limestone, means that at some point in the future, natural decay will set in.

The filled hole then becomes progressively unstable as wood supports and shaft caps rot and the fine soils wash away. Because the fill is poorly constructed, it becomes a pathway for the rainfall and increases the speed that the loose soil and rock is dissolved. This reduces the ability for the soils above to support any over-laying structures and makes them prone to catastrophic collapse without warning.

The first that anyone may know about these voids from the surface could be sagging in the garden or tarmacked road surface, before a crownhole or sinkhole could open up indiscriminately in and among properties built over and around it decades before.

The Impact of Climate Change

Climate Change is affecting the UK in a number of ways. Even with immediate, sustained and very rapid reductions in greenhouse gas emissions globally, the latest UK climate projections (UKCP18) suggest the country will experience an additional warming of around 0.6°C between now and 2050 to an average of 1.7°C warmer at the maximum.

Summers will be much drier than they are today, putting more stress on already parched regions such as the South and East. Winters will be generally wetter in the north and west. A combination of very dry, followed by very wet periods appear to be opening up more mine features, as our Geology team has witnessed, especially in the south west of England.

But in general, the amount of moisture causing rain is increasing due to atmospheric heating. This can create locally heavier downpours almost anywhere. It is already understood that high volumes of water through soluble rocks results in faster erosion, so an increase in climate change related rainfall is highly likely to make matters worse.

These collapses could now accelerate due to the impact of climate change. Bad engineering, poor quality and decayable materials in these holes, together with increased rainfalls, we can expect former mining structures to weaken faster.

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Where chalk has been mined, natural pillars were often left in place to support the roofs of the more recent workings. Because chalk is prone to naturally dissolve, an increased flow of water into abandoned workings may, over time, eat away at these supporting pillars, calling into question their future structural integrity.

Following periods of exceptionally high rainfall, there has been a corresponding increase in the number of crown holes revealed, exposing old mines and pits.

The winter of 2013-14 was especially bad, potentially the wettest since Met Office records began nearly 250 years ago. For South East and Central Southern England 238% of the average rainfall fell.

During this period, the British Geological Survey (BGS) reported that they were called out to a five-fold increase in sinkhole collapses since the storms had begun. Half of these were due to natural ground conditions like soluble rocks and running sand eroding within the rock structure, but the other half was due to man-made activity, much of which came from non-coal mining activity that had revealed itself following rainfall.

During three weeks in late February/early March, more than 25 sinkholes appeared across southern England, compared to half a dozen at most in a normal year.

These included:

- A 30ft sinkhole opened up in a driveway in [Walter's Ash, near High Wycombe](#), Buckinghamshire, and swallowed a Volkswagen Lupo.
- A 17ft-deep hole appeared next to a child's trampoline in a back garden in [Barnehurst, south-east London](#).
- On the 11 February: a 10-mile stretch of the [M2, near Sittingbourne, in north Kent](#) was closed after a 15ft hole appeared in the central reservation. This was followed by [two more sinkholes](#) within a mile shortly afterwards.
- A family car was left hovering over a gas pipe when a sinkhole opened up in a driveway in [Upper Basildon, west of Reading](#). The home is near the site of a former brick yard.
- A sinkhole appeared near the sports hall of [Rainham Mark Grammar School, in Gillingham, Kent](#). On inspection, it was a collapsed denehole (chalk mine shaft) from a mine dating back to medieval times. A second hole appeared in nearby [Darland Avenue, Gillingham](#) on a pitch used by the Anchorians Rugby Club.
- 17 homes were evacuated when a 35ft-wide hole opened up in a cul-de-sac in [Hemel Hempstead, Hertfordshire](#). Amateur video captured the extent of the damage.

Other examples include:

- [The gable end of a house in Camborne, Cornwall](#) collapsed after a succession of storms and heavy rain crossed the county. The house stood on a back-filled shaft leading to one of the many tin mines that riddle the area.
- Storm Christoph brought havoc and destruction across the country in early 2021, including a dramatic rise in sinkholes in Manchester. One swallowed a car, while another led to [the collapse of the frontage](#) of at least two terraced properties as a result.

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Conversely, periods of drought, more likely in the south and the east of the UK with the 2050 climate projections, will accelerate cracks in the soil, allow water to penetrate quicker and form new pathways for subsidence and eventual collapse.

Are Things Becoming Worse?

There are some 32,000 recorded naturally occurring sinkholes in the UK and the ecosystem will respond to the changes in climate placed upon it. There are also hundreds of thousands of natural weaknesses in the soil and rock geology dotted across the country, which are perhaps best demonstrated by landslides and coastal erosion. There are many more cavities waiting to reveal themselves due to man-made activity. Humans are exacerbating the process, of that there is no doubt.

Development over former mine areas can sometimes concentrate surface waters into the underlying mine drainage systems and contribute to increased flooding where these mine waters discharge. As adit systems continue to deteriorate and fill with silt, and increased rainfall events flood them, we could see more issues with rising groundwater and flooding from old mine features.

Removing groundwater through abstraction permits can also, ironically, be to blame. This takes out the buoyancy in the cavity and can lead to a collapse. Construction and development can also be a potential trigger, either by adapting the surface drainage or adding a load without the right underpinning or support. Leaking, poorly maintained utilities are often a key cause of other sinkholes as the leak removes the fine soils around the pipework and as a result weakens the ground below the surface.

The Insurance Conundrum

Until recently, collapses due to sinkholes had been very rare and these had not tested the insurance market greatly. Now they are clearly moving at pace and gaps are being revealed in provision. Typically, an insurer would pay out on any direct damage to the property, which could be to cover the cost of remediating through concrete fill or underpinning by a specialist geotechnical contractor. But that may be the extent of it, as one unfortunate resident of Barnehurst in Bexleyheath discovered.

In Feb 2014, a hole 17ft deep and 10ft wide suddenly appeared in the garden of Gretel Davidson's 1930s house. She contacted her insurer Halifax, presuming she'd be covered by her buildings policy. However, five days later, she received a letter stating: "Damage to garden features is excluded under your policy unless your home is damaged by the same cause and at the same time. In this instance as there is no damage to your home the cost of filling the void is not covered under your policy."

She was left with a £10,000 bill to fill in a hole that was getting bigger by the week. It is a response that is common among many insurers, as following a geotechnical survey, the sinkhole posed no threat to the fabric of the property. There is little or no extra insurance cover for sinkholes in the market, to which the Financial Conduct Authority has left to the market to resolve.

This leaves the homebuyer open to a high degree of risk – to be caught in a trap of a subsidence history affecting future insurance premiums or high excesses with perhaps a more limited pool of insurers to renew with. As current policies do not cover sinkholes, mine entrances or adits, this could affect a homebuyer's ability to maximise the value of their plot for increasingly popular garden offices, or for hot tubs or swimming pools.

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Guidance for Conveyancers

UK Finance advises borrowers to get the best building insurance cover they can, be sure exactly what the insurance covers and that “there is no historic mining activity or subsidence.” This suggests that member lenders may withhold finance without adequate insurance cover in the same way as for flood risk.

This puts the onus on the client understanding the risk from past mining of all types and, by definition, that it is examined as part of the property transaction through due diligence searches. The market has changed significantly in recent years for mining searches for conveyancers. The historic assumptions that a search should only be undertaken for CON29M compliant assessments – and therefore miss out anything else – no longer holds true. There is a natural inclination to avoid multiple searches to chase finding risks, but information is more comprehensive and simplified, with the risks more tightly defined.

Section B 25.17.6 of the most recent edition of the Law Society Conveyancing Handbook states that “A property should be searched to identify whether further investigation of site-specific ground instability risks is required.”

And in section 25.17.7 “If a property is located within an area where ground instability risks are likely to occur, solicitors should consider further investigation of the risks present. This may include obtaining a site-specific report from a commercial search company; residential and commercial search products are offered by a number of search providers.

Search providers often offer an initial risk assessment of the information provided in the report. An assessment should include a professional opinion of whether the property will be affected by mining or natural ground stability and whether there is likely to be any effect on the value or enjoyment of the property.”

The Importance of Protecting Asset Value

For the client, the final sentence in the above guidance is absolutely pivotal. It should underpin why conveyancers need to examine mining of all types and not just the CON29M in relevant coal mining areas.

It is for this reason, and to protect the client’s asset and any impacts on insurance and valuation that the clearest possible analysis for non-coal mining needs to be obtained.

Avista is the most comprehensive environmental search report available comprising ten key searches for residential property transactions. The unique and powerful Groundsure IQ engine analyses over 110 million data points to produce every report, including comprehensive data on all of the major non-coal mining types and features.

By using Land Registry polygons and our intelligent filtering tool, ensures only relevant results are returned while giving conveyancers the clearest possible due diligence on conditions below ground for ALL mining types across the country.

For more information visit www.groundsure.com/avista or email info@groundsure.com

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Finding Solutions for the Homebuyer

A key point to make here is that a detailed ground stability search that includes extensive non-coal mining data is not just about spotting the hazards, it is finding solutions for the homebuyer.

Here at Groundsure, we have a team of expert geologists, historians and archaeologists on hand who analyse and advise on the degree of risk. Following the acquisition of Mining Searches UK by Groundsure in 2020, the team is fully integrated into the wider search and consultancy support service. They have particularly extensive experience with mining in the south west, including tin and other metalliferous and stone mining, as well as access to one of the UK's leading mining data catalogues.

The team can either undertake a closer examination of the records and advise on the telephone, or provide a more detailed site investigation. It may be that on closer inspection the likelihood of collapse due to the depth and type of mineral means that it may have a limited impact on the homebuyer, in which case the transaction can continue as planned, subject to other matters.

Please visit: www.groundsure.com/mining

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