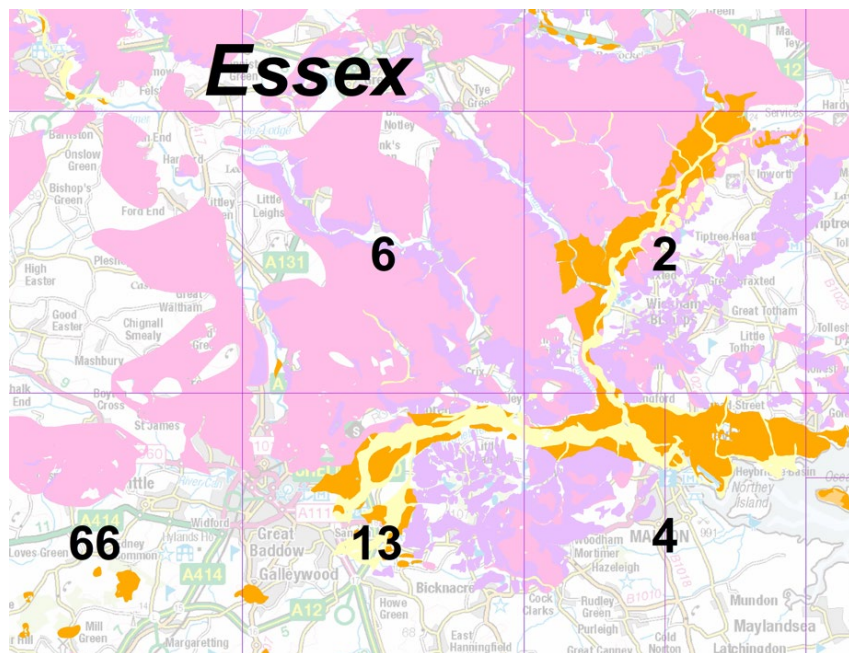




British
Geological
Survey

Updating of Mineral Safeguarding Areas for Essex

Minerals and Waste Programme
Commissioned Report CR/22/008



BRITISH GEOLOGICAL SURVEY

MINERALS AND WASTE PROGRAMME

COMMISSIONED REPORT CR/22/008

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Foreword

This report describes the work involved by the British Geological Survey (BGS) in compiling an updated set of Mineral Safeguarding Areas (MSAs) commissioned by Essex County Council. The study involved use of the BGS Digital Resource information to delineate the MSAs as well as digital information supplied by Essex County Council. The MSAs were supplied to Essex County Council as ESRI Shapefiles.

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Summary

This report describes the work undertaken by the British Geological Survey (BGS) to update Mineral Safeguarding Areas (MSAs) for mineral resources in Essex. The project was commissioned by Essex County Council. The project involved use of the BGS Digital Resource information to delineate the MSAs as well as digital information supplied by Essex County Council. The updated MSAs were supplied to Essex County Council as ESRI Shapefiles.

This report details the compilation of MSAs for certain mineral resources in Essex. The area covered includes Essex, Southend-on-Sea and Thurrock as requested by Essex County Council . Mineral resource areas were derived from the BGS Digital Mineral Resource data (2021).

The project was assisted by staff of Essex County Council, who provided various data to assist in the delineation of the MSAs for Brick Clays and Brickearth, Chalk, and Sand and Gravel .

The Authors would like to thank Dr Joseph Mankelow for advice in the compilation of this report and data using ESRI ARC GIS.

1 Introduction

Mineral Safeguarding Areas (MSA) are required for planning purposes by local authorities. The MSAs delineate areas surrounding mineral resources at various distances from the edge of the resource in order to ensure that the resources are not sterilised by incompatible forms of development.

As part of their review of the Essex Minerals Local Plan 2014, Essex County Council requested a refresh of their Mineral Safeguarding Area (MSA) designations to ensure that they matched the current BGS Digital Mineral Resource Data. This exercise highlighted a number of discrepancies, which are at least in part considered to be due to the fact that the underlying BGS Digital Mineral Resource Data has received two updates to their licensed dataset since 2012 when the MSA designations were originally made. Where there are differences between the old and new dataset, these are explained on a per-mineral basis in Section 2. The majority of these differences are mainly in the form of extra areas included in the original MSAs around the boundaries of BGS Sand and Gravel assessment areas.

The work undertaken in the current project consisted of ensuring that MSAs for Essex are compiled using the current version of the Digital Mineral Resource Data as provided by BGS. Any updates have also retained any specific modifications that were explicitly detailed in documentation accompanying the original MSAs as produced by Mouchel in 2012 (these are detailed in the relevant section on specific minerals below).

New MSAs for the following commodities were commissioned by Essex County Council:

- Brick Clay / Brickearth
- Chalk
- Sand and Gravel

The new MSA polygons have been based on the latest version of the BGS Digital Mineral Resource dataset (V3). In some instances, this may have slight differences to the latest geological mapping data (BGS Geology 50K). These differences are minor, mainly noticeable only beyond the scale (1:50 000) of this data and are due to recent updates to mapped geology not yet being incorporated into the mineral resource dataset.

The coverage requested by Essex County Council was that of 'Greater Essex' comprising Essex, Southend-on-Sea and Thurrock. A buffer of 2 km has been applied to the boundary of these authorities to ensure continuity with neighbouring Mineral Planning Authorities (MPAs). The median line of the River Thames replaces this buffer distance where the MPAs have a shoreline on the River Thames (Figure 1). For convenience this buffer will be referred to as the '2km buffer'.

Buffers of 100m and 250m have been applied to all the resource areas as specified by Essex County Council based on the results of a separate consultation exercise. These buffered areas are provided to aid Essex County Council with definition of Mineral Consultation areas as they deem appropriate.

Detailed information regarding the mineral resources of Essex, Southend-on-Sea, Thurrock and the neighbouring London Boroughs, formerly part of Essex, can be found in the in the BGS mineral resource map and accompanying report for the county:

Bloodworth, A J, et al. 2002. Mineral Resource Information in Support of National, Regional and Local Planning: Essex (comprising Essex, Southend-on Sea, Thurrock and the London Boroughs of Barking and Dagenham, Havering, Redbridge and Waltham Forest). British geological Survey Commissioned Report CR/02/127N.

<https://www2.bgs.ac.uk/mineralsuk/planning/resource.html#MRM>

Detailed surveys of Sand and Gravel resources were carried out by BGS in various parts of East Anglia in the 1970s and 1980s and the reports containing the results can be found in the

following Mineral Assessment Reports available here:

<https://www2.bgs.ac.uk/mineralsuk/mines/IMAU.html>.

2, 4, 6, 7, 10, 14, 16, 34, 36, 46, 52, 66, 68, 82, 85, 102, 104, 109, 133.

The results of these surveys were used for delineating the resource areas in the Bloodworth et al. (2002) report above and have been subsequently incorporated into the BGS Digital Resource data. Subsequently, as part of the ongoing updating of the BGS geological mapping series, these data have also been incorporated in the BGS Digital Geological mapping layer – BGS Geology 50K.

The BGS Digital Mineral Resource Data may be examined here:

<http://mapapps2.bgs.ac.uk/geoindex/home.html?topic=Minerals>

2 Mineral specific changes and considerations

For more detail regarding specific commodities and how the BGS mineral resources dataset has been created please refer to the original county reports and maps for Essex (and where relevant Kent) on the BGS MineralsUK website, as contained in Bloodworth et al. (2002).

For the purposes of constructing MSAs, the BGS Digital Resource data was limited by the 2km buffer around 'Greater Essex'.

2.1 SAND AND GRAVEL RESOURCES

2.1.1 Superficial Sand and Gravel Resources

Essex County Council requested that only a single layer of Superficial Sand and Gravel resources should be used in the construction of the relevant MSAs and as a result, the different superficial sand and gravel categories were combined before the MSA was defined. A separate MSA has been maintained for bedrock sand and gravel resources.

The most significant differences between the original MSAs and updated MSAs are the removal of several large areas of sand and gravel near Matching Green and Thaxted it is not clear what these areas were based on in the original MSAs and they do not correspond to resources areas as mapped by BGS and, as such, there is no justification for them to be included. There are also large areas around Colchester that do not appear on the new resource map, this is due to the area being re-mapped post the development of the original work. The areas are now mapped as 'variable pebbly sandy clay' and are not considered resources. This re-mapping has also caused other changes such as the areas of sand and gravel around Southend increasing slightly. There are also numerous small differences around the county due to re-mapping of glacial deposits and the inclusion of beach deposits in the latest BGS Digital Resource Data. Some additional areas that have been added in the updated MSAs include areas to the north east of Southend. These areas of resources are defined as 'discontinuous spread of minerals beneath overburden' as proved in boreholes by historic sand and gravel studies.

A new area of River Terrace Deposits has been added around Epping, this additional area was included as the Digital Resource area was updated due to re-mapping.

Industrial, or silica sands, are also known to be worked in Essex from one quarry, Martells. This is a co-products of sand and gravel production from glaciofluvial sands. Insufficient geological information is available to differentiate the resource areas for silica sands specifically. More data on silica sands within Essex can be found in Bloodworth et al. 2002.

It is also noted some urban areas have been removed from the original MSAs. This has not been reflected in the updated MSAs.

All the Sand and Gravel resource areas have been further processed to limit areas to only those greater than three hectares in size. This is to ensure it meets the criteria set out after consultation in the initial safeguarding exercise, namely: *“Sand and gravel is a crucial economic resource within Essex. All BGS identified Glacial Sand and Gravel resources, Glaciofluvial Sand and Gravel resources and River Terrace Deposits greater than 3 hectares have been designated as MSAs. The decision not to include individual deposits less than 3 hectares in total area as MSAs was made in discussion between Mouchel and ECC.”*

2.1.2 Bedrock Sand and Gravel Resources

In the BGS Digital Resource data Bedrock sands and gravels have been differentiated from Superficial deposits.

There are no bedrock sand and gravel deposits within Essex, however areas do occur in neighbouring Thurrock and Havering (which is covered by the 2km buffer) from the Thanet Sands Formation. MSAs for bedrock sand and gravel have not changed in the new version in Thurrock but a new small area has been added to Havering (added to ensure consistency with neighbouring areas in the latest version of the BGS Digital Mineral Resource Data).

2.2 CHALK RESOURCES

Updated MSAs for Chalk are based on the BGS Digital Mineral Resource data and remain largely unchanged from the original version. The updated data contains an area of chalk resources around Thurrock. This matches the BGS Digital Mineral Resource linework Data, it is unknown why it was omitted in the original work. There are several areas in the northwest of the county which were previously included in the chalk MSA but are known to be overlain by Quaternary clays and silts, and as such, have now been discounted as a resource. These have now been removed from the BGS Digital Mineral Resource Data. It is unlikely that these low-value resources would be extracted if significant amounts of overburden were required to be removed.

2.3 BRICK CLAY / BRICKEARTH RESOURCES

Brick Clay and Brickearth are terms that have been used interchangeably in the past. Specifically, Brickearth is a term used to describe a specific material used to make bricks comprised of the silty clays associated with sandy gravels around the Thames Estuary. Typically, they have been used as a feedstock for the golden yellow 'London Stock' brick. Brickclay is more of a generic term for any clays that can be used for the production of bricks (and similar products such as tiles and pipes). In Essex, Brickearth is extracted from the clay and silt deposits associated with the First River Terrace of the Thames, as seen in known workings in the area. The area of Brickearth subset of the brick clay resource, defined in Essex, has been slightly reduced in the current (2021) version of the BGS Digital Mineral Resource Data to reflect this restriction of this resource to the First River Terrace. This has been done to exclude other terrace deposits which are extensive in this area and do not have the history of extraction. These areas, that have been removed, are now mapped in the latest BGS geological mapping data as 'river terrace deposits' and, as such, are no longer included in the Brickearth subset of the brick clay resource areas. They are, however, included in the sand and gravel resource areas. This change has also resulted in several small areas of brickearth being included between Chelmsford and Witham. These small areas have been included in the BGS Digital Mineral Resource Data as it is defined as the same geological unit as those known to be worked further south, around Southend; there is no history of working in these particular small areas.

Brick Clay resources in Essex are noted from an area of glacial clays to the west of Colchester. For these areas there is no change from the original MSAs.

Brickearth and Brick Clay resources have been distinguished in the key of the updated MSA maps, as they were split in the original MSA areas. The difference between them is the type of bricks that can be produced. Whether this merits separation in the keys of the MSAs is dependent on the importance of operations to brick supply from the two discreet geological units within Essex.

dependent on the importance of operations to brick supply from the two discreet geological units within Essex.

3 Methodology

The resource areas for each set of minerals were selected from the current BGS digital resource dataset and cut to the 2km boundary around the Greater Essex area. The resulting areas of resource were then used to produce the Mineral Safeguarding Areas as requested by Essex County Council.

The Sand and Gravel resource layer used to produce the associated MSAs differs from the BGS Digital Mineral Resource layers as, for simplicity, different categories (split by BGS based on geological attributes) have been amalgamated and also those bodies less than 3 hectares have been removed (as noted above). The resulting layer was used to create the MSA.

Each resource was plotted in the GIS and, in addition to the defined resource area, two buffers were applied with the aim of providing baseline data for the definition of Mineral Consultation areas by Essex County Council . These were at 100m and 250m from the edge of the resource and in some cases where there was an overlap, the resulting buffer areas were combined. The 100m buffers are not illustrated below due to scale issues with the illustrations showing little difference between these and the 250m buffered areas. The final step was to remove the resource area from the buffer to leave a 'ring' feature at either 250m or 100m as shown in the figures contained in Appendix 1.

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