

A HISTORY OF N-S FAULTING IN THE WESSEX BASIN INCLUDING NEW EVIDENCE FROM THE CLAY VALE

C. ELAINE BURT¹ AND HUGH C. PRUDDEN²



Burt, C.E. and Prudden, H.C. 2007. A history of N-S faulting in the Wessex Basin including new evidence from the Clay Vale. *Geoscience in south-west England*, **11**, 305-308.

Recent remapping of the Sidmouth and Wellington areas by the British Geological Survey has demonstrated a large number of faults orientated in a North-South direction. In the Sidmouth area these faults complicate the pattern of Jurassic and Triassic strata beneath the Cretaceous. The pattern of faulting continues onto the Wellington sheet to the North, where the faults appear to terminate against prominent WNW-ESE faults such as the Hatch Fault. The N-S faulting is thought to be driven by regional E-W extension of the Wessex Basin, causing subsidence from the mid Triassic into the Jurassic, with in places later reactivation.

¹British Geological Survey, Forde House, Harrier Way, Sowton, Exeter, EX2 7HU, U.K.

²2, Yeovil Road, Montacute, Somerset, TA15 6XG, U.K.

(E-mail: C.E.Burt@bgs.nerc.uk).

INTRODUCTION

The Clay Vale is an area around Ilchester, dominantly underlain by clays of Lower Jurassic age, belonging to the Blue Lias Formation and the Charmouth Mudstone Formation. The area lies to the East of Wellington on the junction of the Yeovil and Glastonbury geological map sheets. Few faults are currently shown within these formations on the published Geological Survey maps. New evidence of abundant small scale N-S faulting is presented from the Clay Vale, demonstrating the continuation of the same structural regime in this area. The new data from the Clay Vale has also been used to test the viability of using NEXTMAP digital images to locate faults in low-lying ground where traditional field techniques for mapping structure are difficult.

NEW EVIDENCE OF N-S FAULTING IN THE JURASSIC GEOLOGY OF THE CLAY VALE

The Clay Vale is located in South Somerset near to the towns of Yeovil, Ilchester and Ilminster. The area is largely underlain by clay-rich formations of Lower Jurassic age (Figure 1). The formations dominant in this area are the Blue Lias Formation and the Charmouth Mudstone Formation; both of which belong to the Lias Group. The area under review lies on the boundary of the Yeovil and Glastonbury geological map sheets, where few faults are currently shown on the published Geological Survey maps.

Much of the area is low-lying with semi-wooded valleys and there are few distinct topographic features, so small stratigraphic displacements are difficult to spot in the field unless a clear section can be viewed. Within this area much of the geology is also obscured by overlying drift deposits.

Research work carried over the last 40 years in and around the Clay Vale in south Somerset has involved the logging of four major gas and water pipelines, and extensive roadwork's on the A303. During the summer of 2006 continuous sections were exposed by the excavation of a new pipeline across the region. The Ilchester to Barrington natural gas pipeline is a 16 km, underground pipeline connecting two surface stations. During construction, detailed geological mapping and logging of the

pipeline trenches has produced a wealth of new data including the position of previously unknown faults along the length of the trench.

Figure 2 shows faulting from the currently published BGS maps in solid linework, whilst new data are shown as stippled. New data shown which does not lie along the position of the trench was also collected by Mr Hugh Prudden during his research over the last 40 years. The approximate route of the Ilchester to Barrington pipeline is shown as an inset map (Figure 2).

A significant number of the new faults recorded in the Clay Vale are orientated approximately N-S. This is important to note as it helps to give an idea of the structural history of this area in the wider context of tectonic activity in South West England.

FAULT MAPPING USING NEXTMAP

The mapping of faults in low-lying, relatively featureless ground, underlain primarily by clay formations still remains a difficulty for the field geologist. Only in areas where ground has been newly excavated can small-scale structures be noted with any degree of accuracy. However, the British Geological Survey is currently testing methods where structure not visible on the ground may be picked out from the air by the production of a digital shaded relief map using a software application called NEXTMAP. These images differ from the more conventional aerial photography as the scales can be altered to suit a range of different applications and the image can be lit from different angles to best show any slight variation in topography.

Figures 3a and 3b show a small area of the Clay Vale near to Martock. Figure 3a is a digital shaded relief map, produced by the British Geological Survey using NEXTMAP. The ridges apparent on the image seem to correspond with the general trend of faults shown on the conventional map image (Figure 3b). The British Geological Survey is currently using the NEXTMAP data alongside conventional methods to test out the reliability of results. Further work will be needed, but this may be a way in which structural data can be inferred in areas of difficult ground.