



Oil & Gas
Authority

Regional Subsurface Seismic Analysis

3rd October 2018

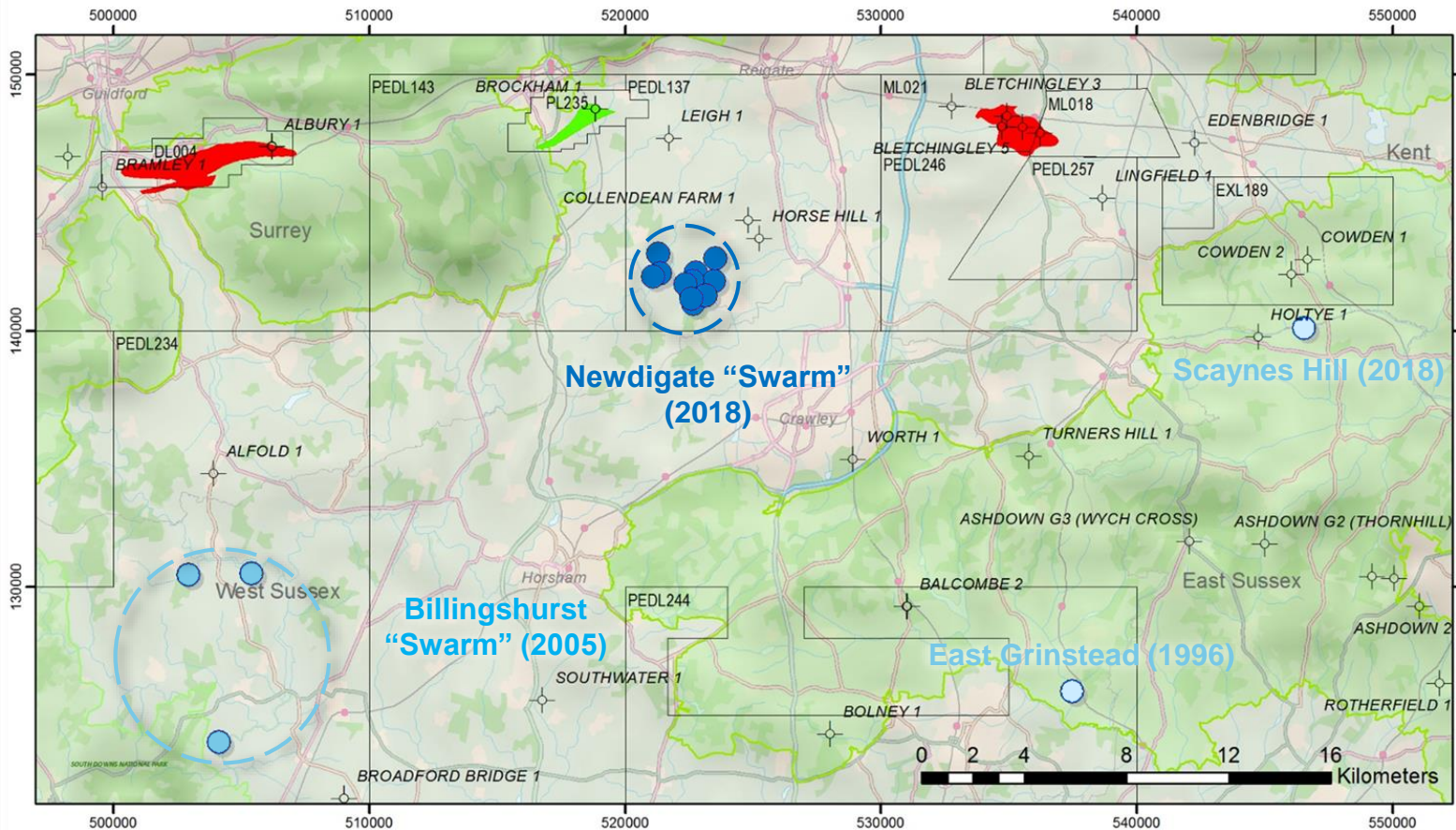
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History of regional seismicity



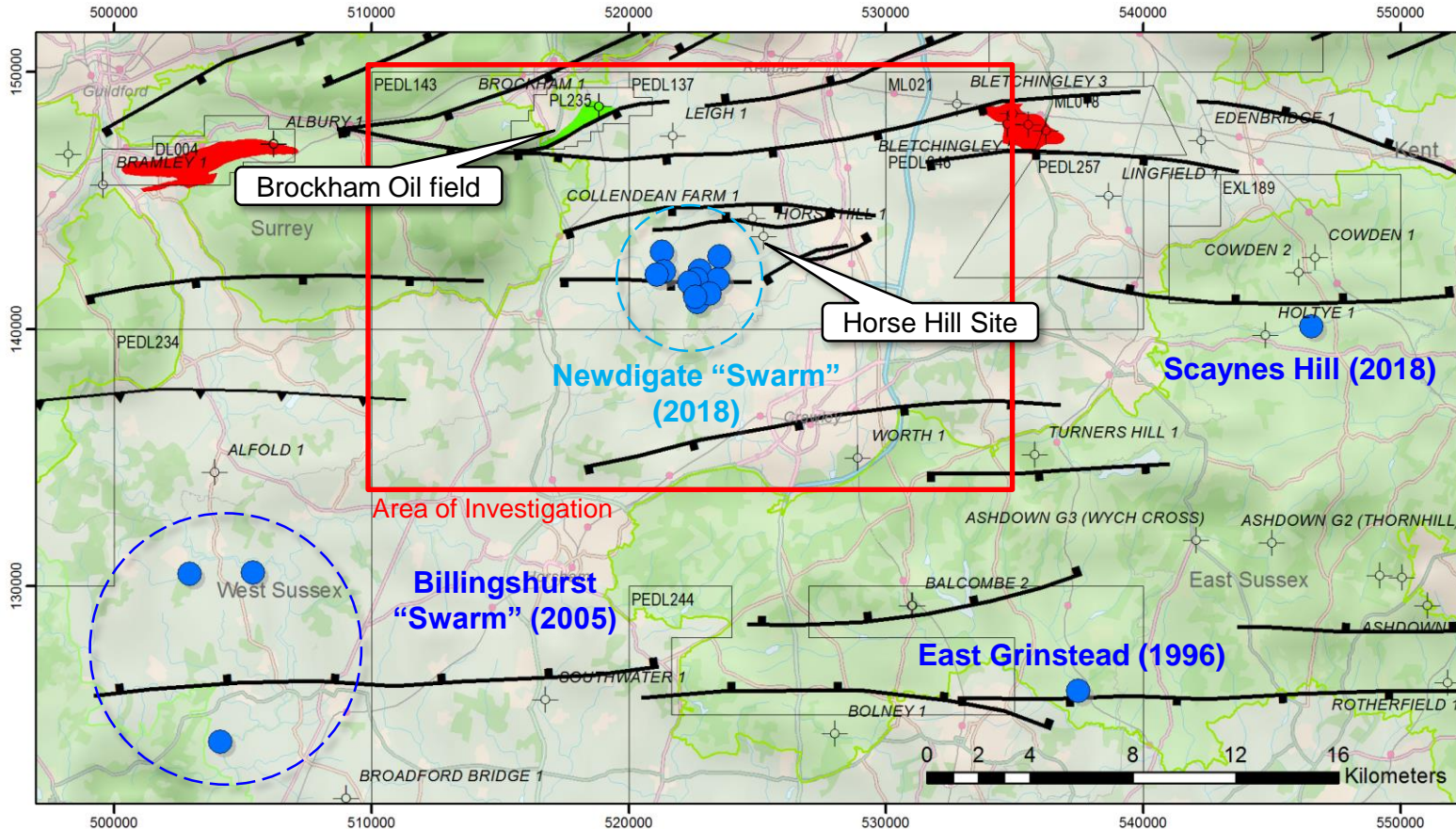
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Date	M _L	locality
15/08/1996	1.4	E GRINSTEAD
18/06/2005	1.4	BILLINGSHURST
19/06/2005	1.5	BILLINGSHURST
16/07/2005	2.1	BILLINGSHURST
01/04/2018	2.6	NEWDIGATE
01/04/2018	1.8	NEWDIGATE
01/04/2018	1.7	NEWDIGATE
08/04/2018	1.6	SCAYNES HILL
28/04/2018	1.5	NEWDIGATE
27/06/2018	2.6	NEWDIGATE
29/06/2018	2.4	NEWDIGATE
05/07/2018	3	NEWDIGATE
10/07/2018	1.9	NEWDIGATE
18/07/2018	1.9	NEWDIGATE
18/07/2018	0.4	NEWDIGATE
18/07/2018	2.4	NEWDIGATE
18/07/2018	0.9	NEWDIGATE

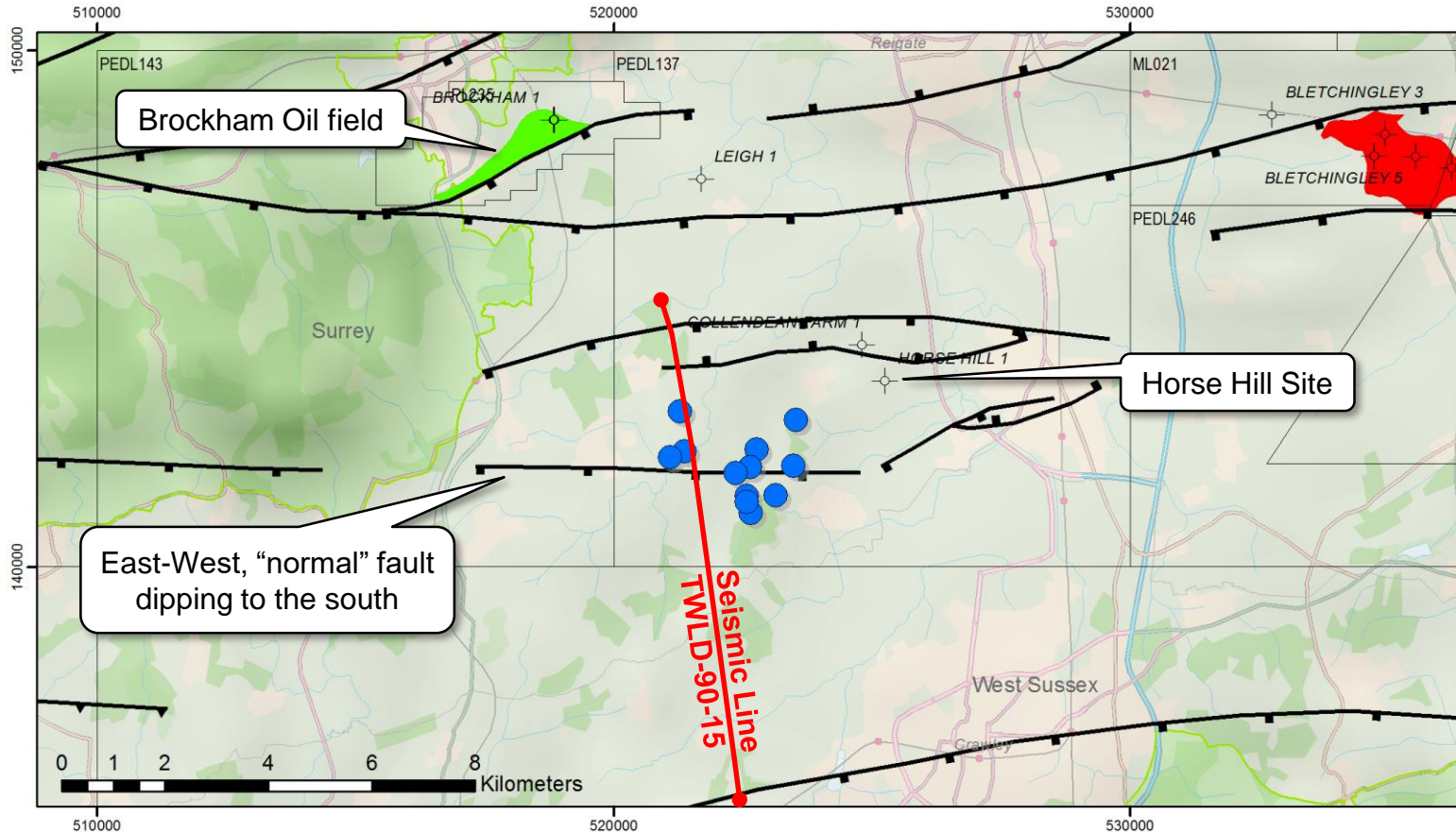
Source: BGS Historical UK seismicity

Regional Faulting



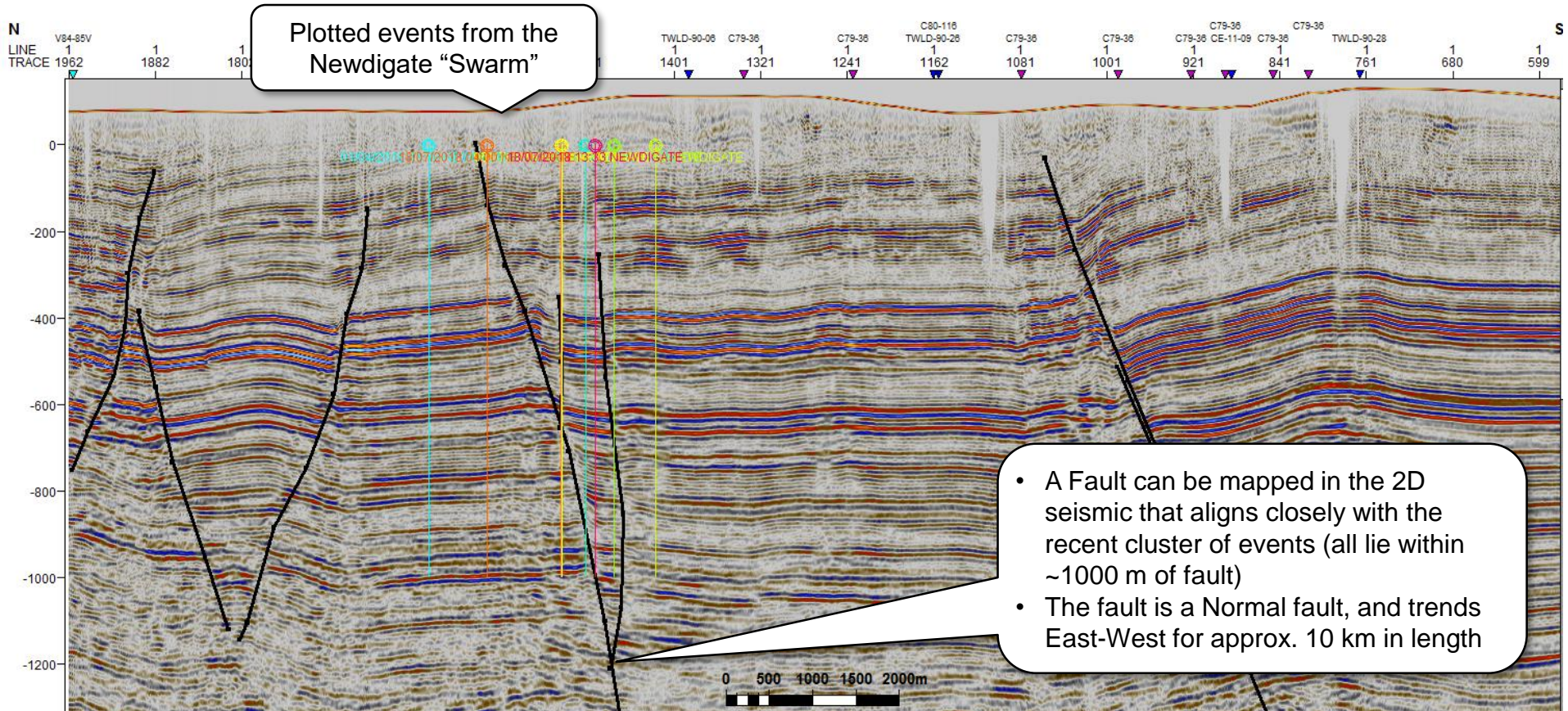
- OGA structural interpretation of regional scale faulting across the Weald Basin, with BGS historical seismicity overlain OGA (2018), Modified from Magellan (2012), UKOG (2013), Pullan & Butler (2018)
- Note the relationship between E-W trending faults and historical seismicity

Fault related to seismicity?



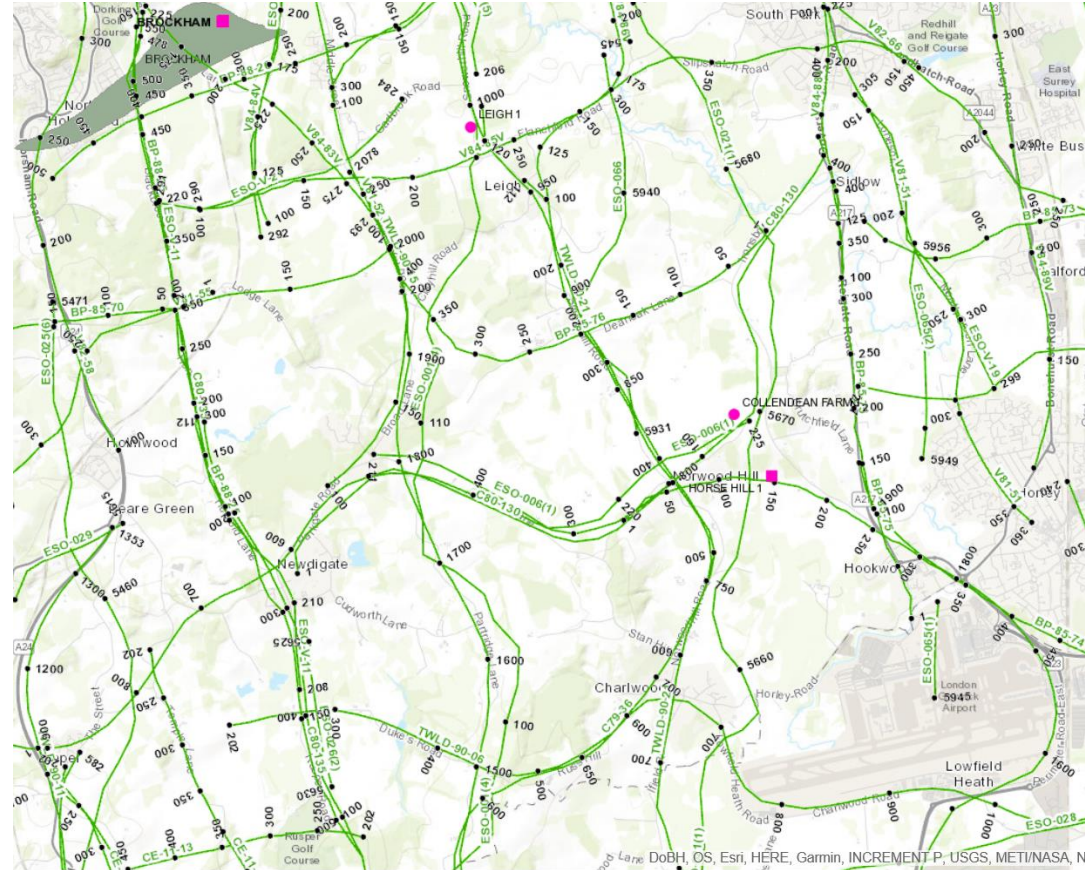
- Zoomed map of Regional Weald structure
OGA (2018), Modified from Magellan (2012), UKOG (2013), Pullan & Butler (2018)
- Previous regional work has mapped surface-faulting, but only limited seismic used
- Detailed 2D seismic mapping now identifies a previously unmapped E-W normal fault, close to the Newdigate Events

Seismic Line TWLD-90-15



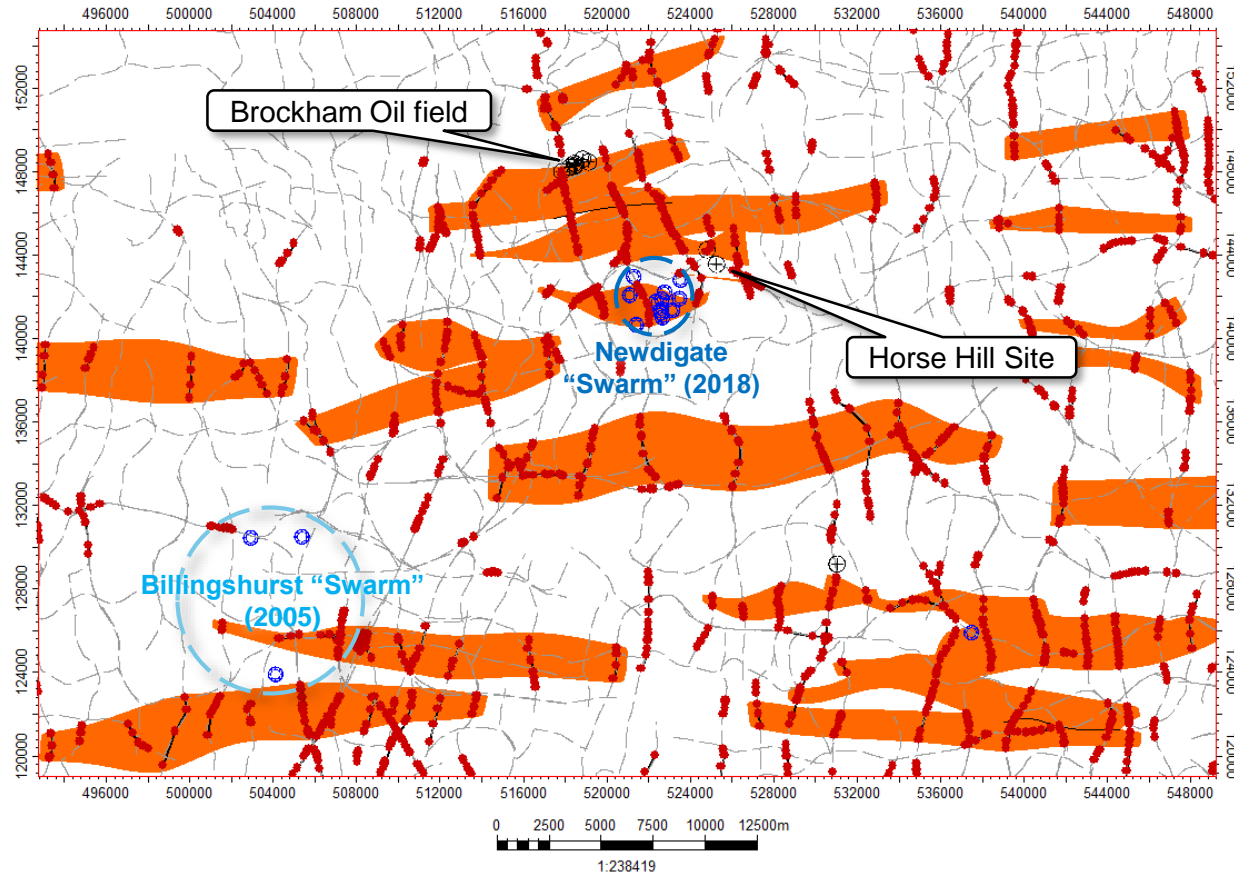
Seismic Database

- Licences grant the OGA powers to request well and other subsurface data
- OGA holds access to 2D Seismic database across the Weald Basin
- Further OGA work has now reinterpreted 2D seismic across the Weald Basin to map faulting in detail



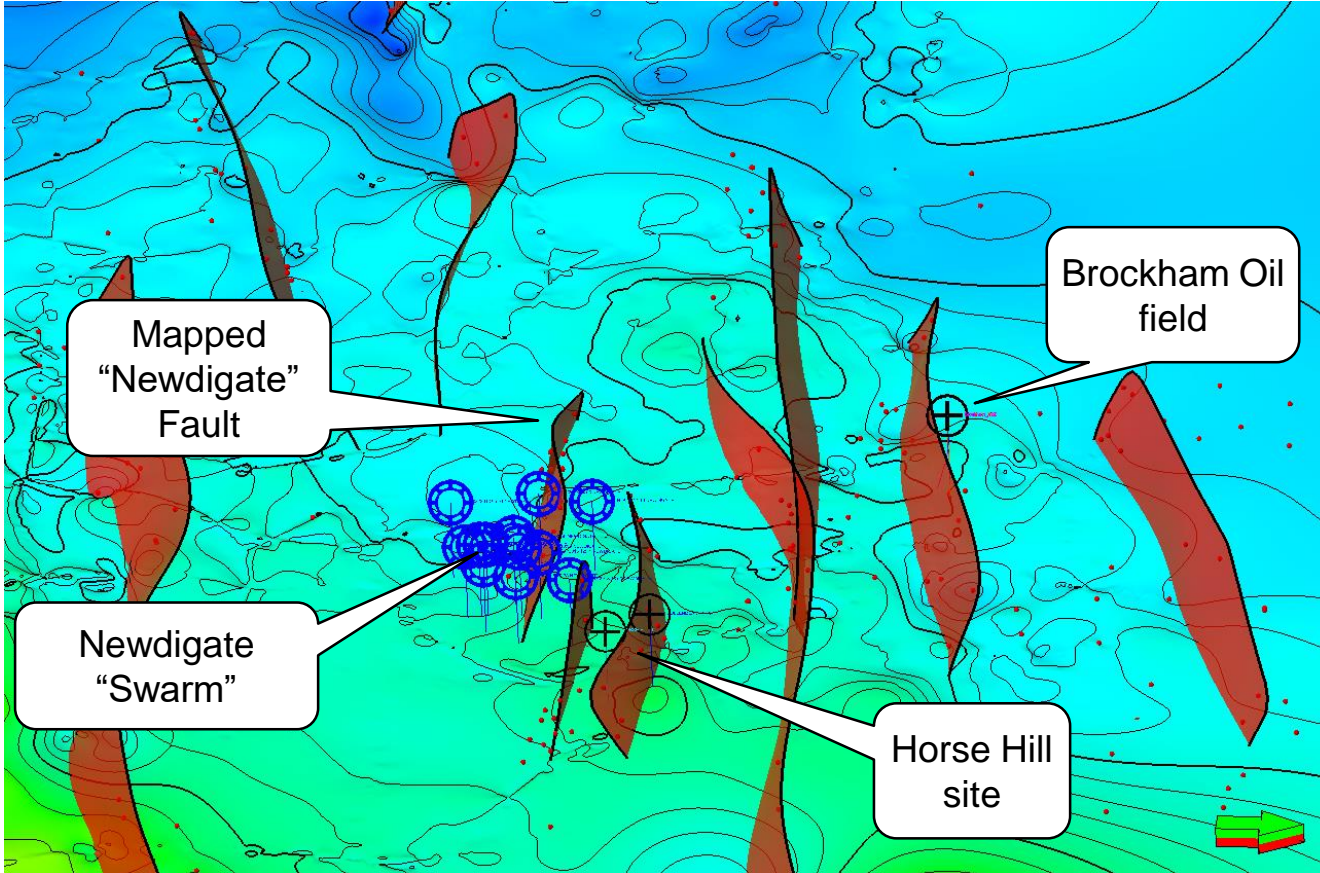
Location map with Seismic Database (UKOGL, 2018)

Project Interpretation



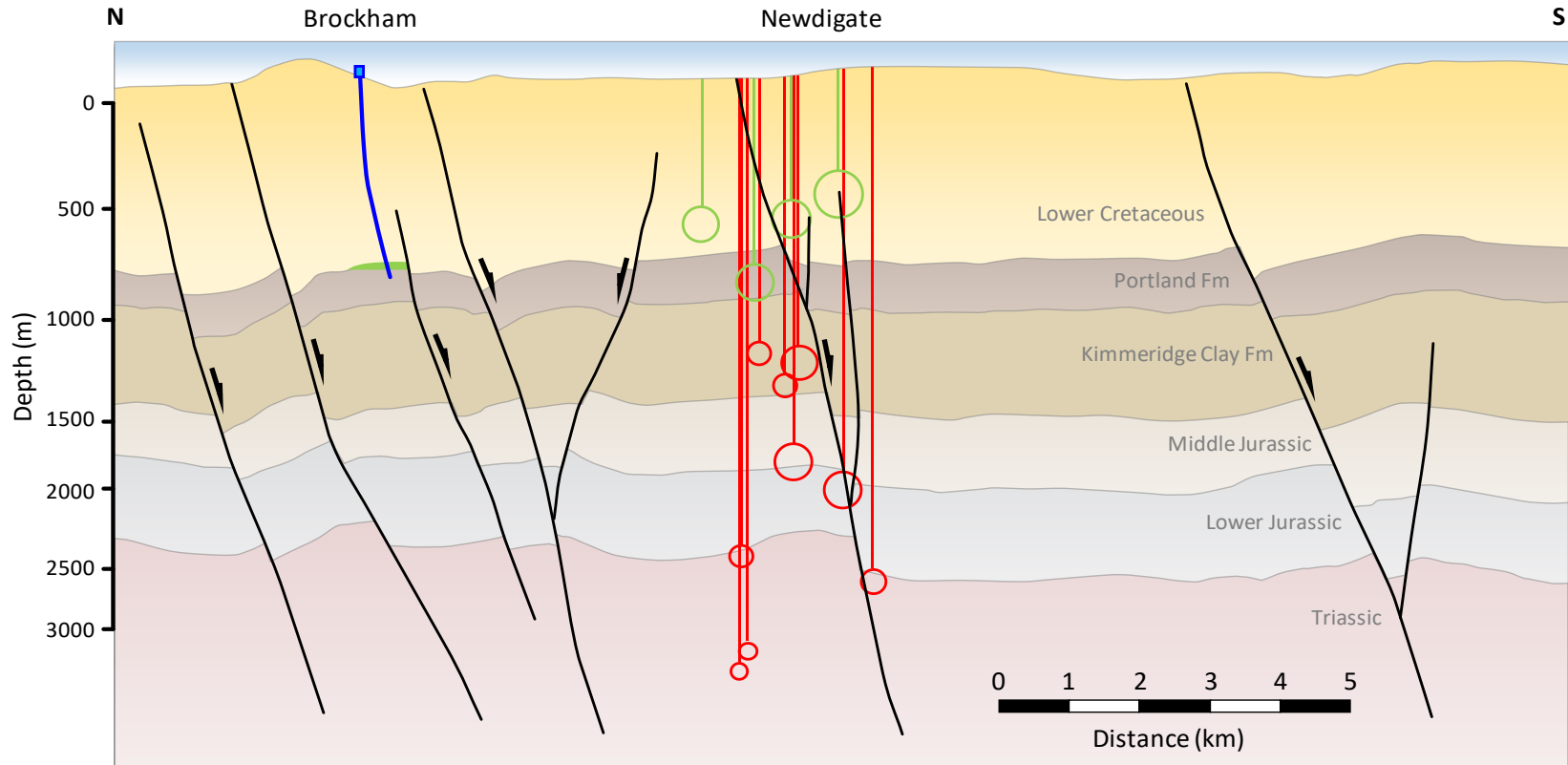
- 2D seismic lines (dashed grey) were interpreted across the region
- Faults were mapped by building a regional volume of fault sticks (dark red) where all offsets were identified in seismic
- Fault model (orange) was generated using faults which could be mapped with a high certainty

Portland Fm view looking west



- 3D view looking westwards along the regional E-W fault trend
- Top Portland Fm surface interpreted across area
- Seismic events plotted in 3D space, to show relative position to Oil developments and faults
- Brockham Field is separated from the Newdigate seismic events by a series of significant E-W faults

Brockham to Newdigate geology



Geological cross section from Brockham through to the Newdigate Fault. Seismic event locations plotted from Hicks (2018).