

EGS Energy's interest in the Tellus SW survey

Presented by

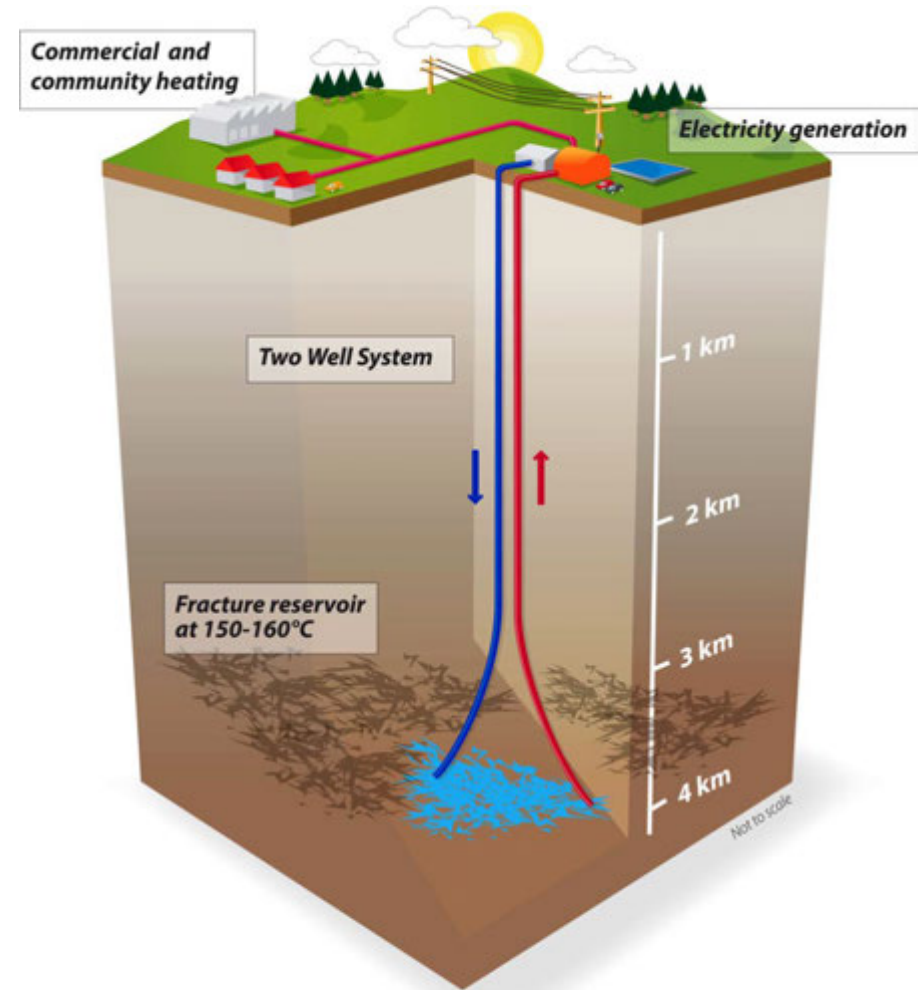
Tony Bennett

Operations Manager - EGS Energy Ltd

The EGS concept

The basic concept of EGS comprises the injection of water down one well, circulation through an artificially stimulated reservoir within hot rock and the return of heated water to surface through the production well(s). The hot production water is used for combined heat and power.

Once the hot water has been used and cooled at surface it is re-injected into the reservoir at 60°C.



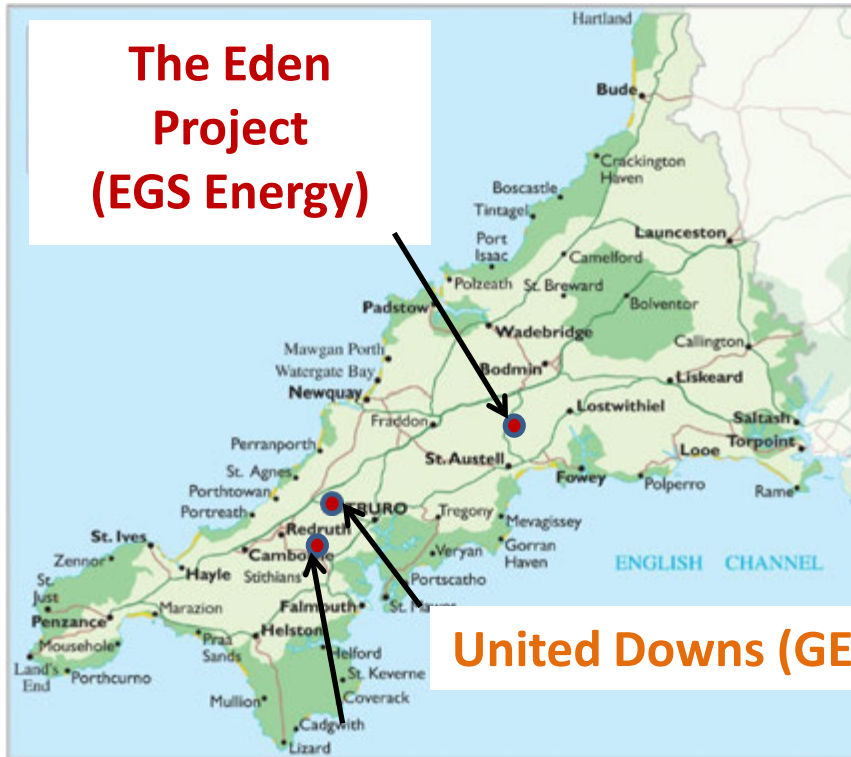
© EGS Energy Limited 2009

UK Geothermal Resource

- UK Government body ETSU (1992) - review of resource estimations for the UK of “accessible” resource. Conclusion: the total UK electrical resource is 1,880TWh; and of this, Cornwall alone has 900TWh.
- These figures amount to a power output of ~4.3GW for the UK, of which ~2.1GW would come from Cornwall.
- **Recent study of selected areas puts this total ‘resource’ at nearer 9.5GW of baseload renewable electricity, which equates to 20% of the UK’s annual average electricity generation capacity (SKM, 2012)**



Sources of information

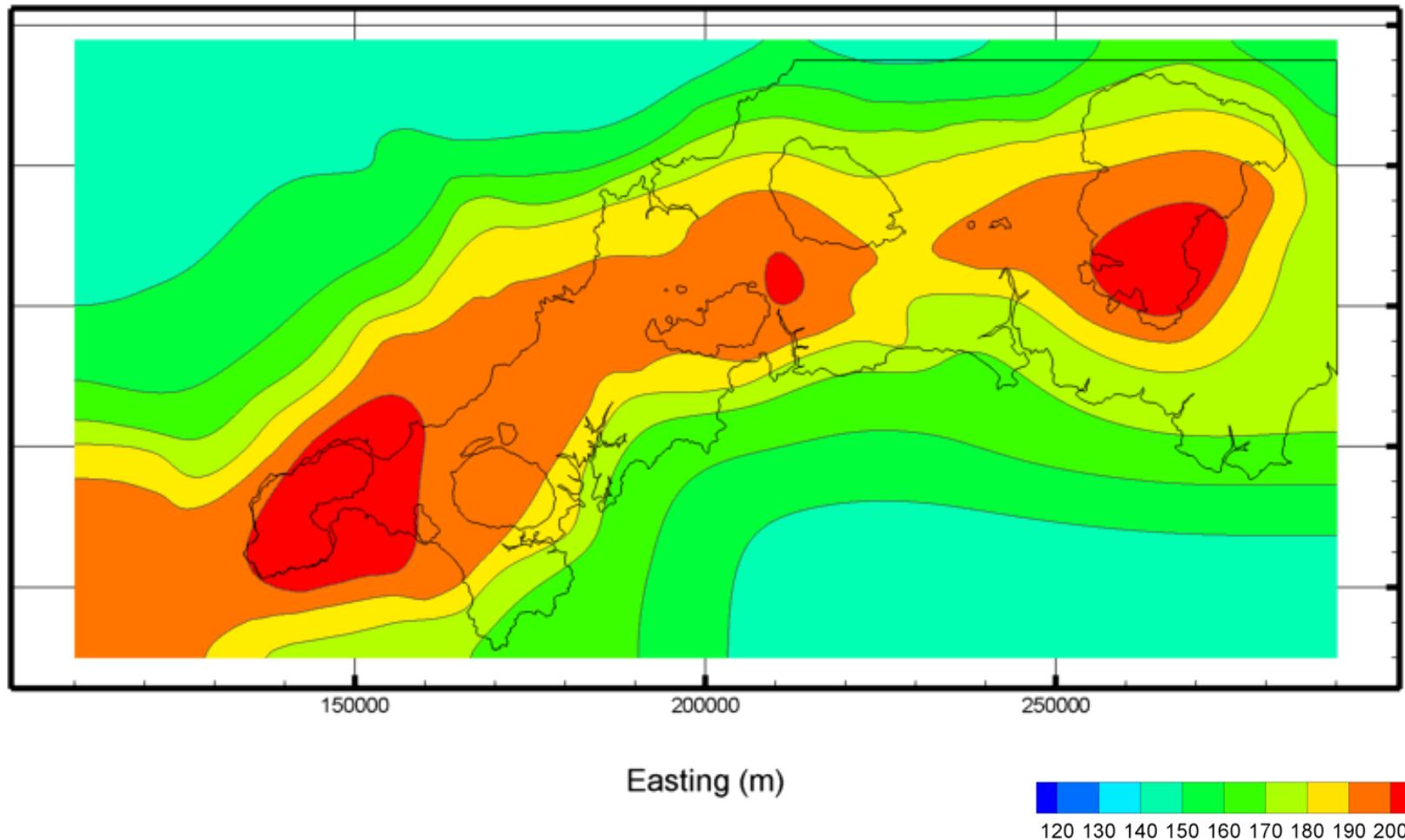


Geological information from the county's extensive historic mining industry.

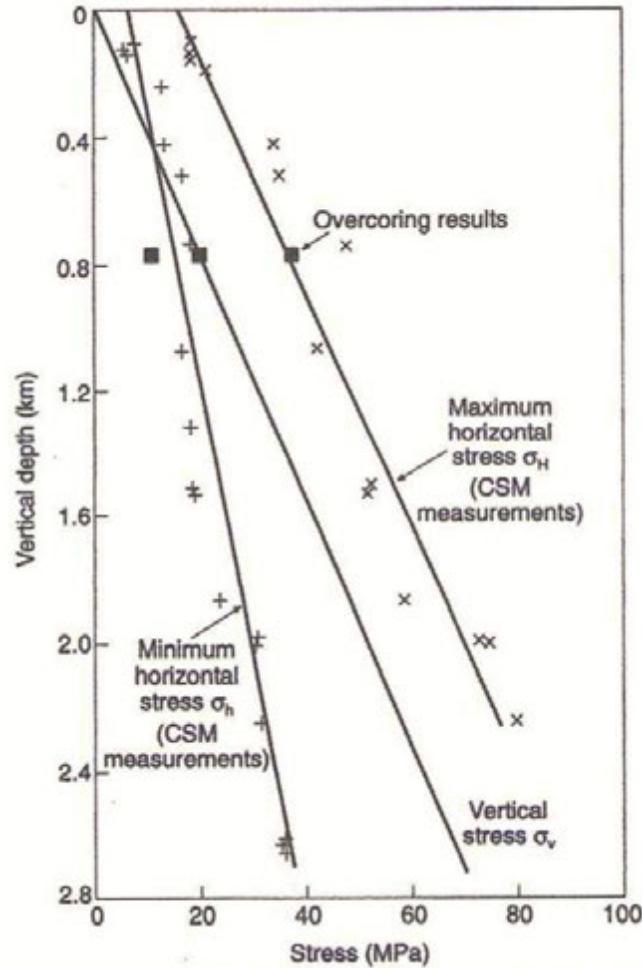


The geothermal research project (1977 to 1991) provided a large amount of data to a depth of 2,500m.

Subsurface temperature at a depth of 5,000 metres

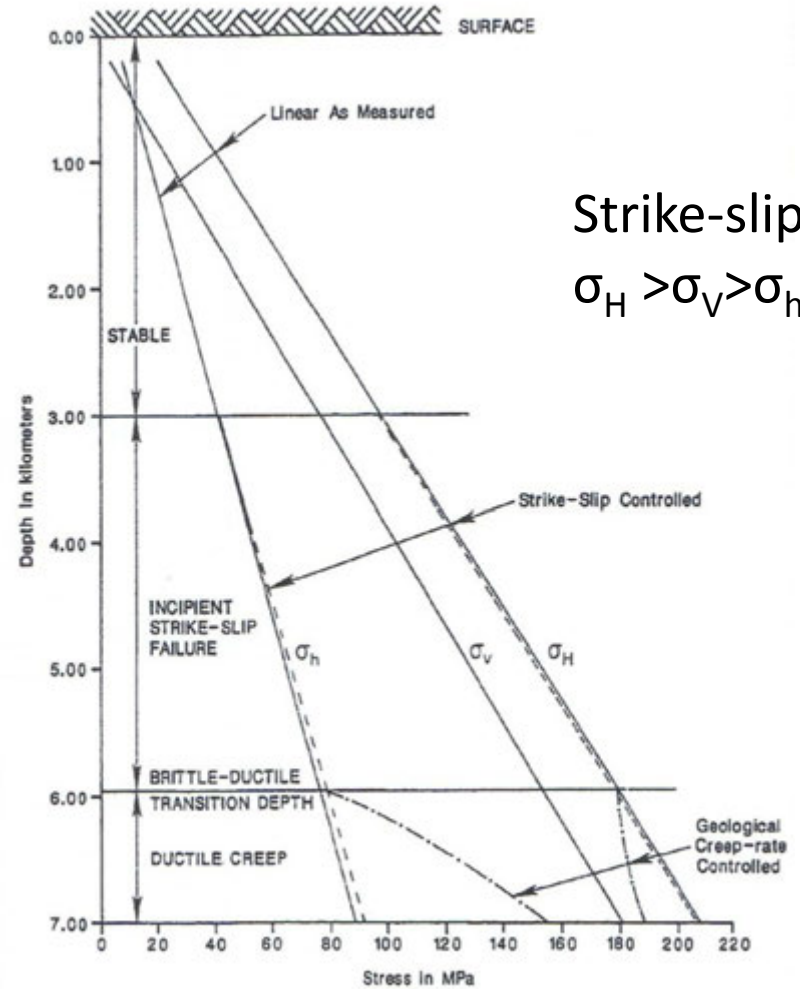


Stress regime



(ETSU, 1992)

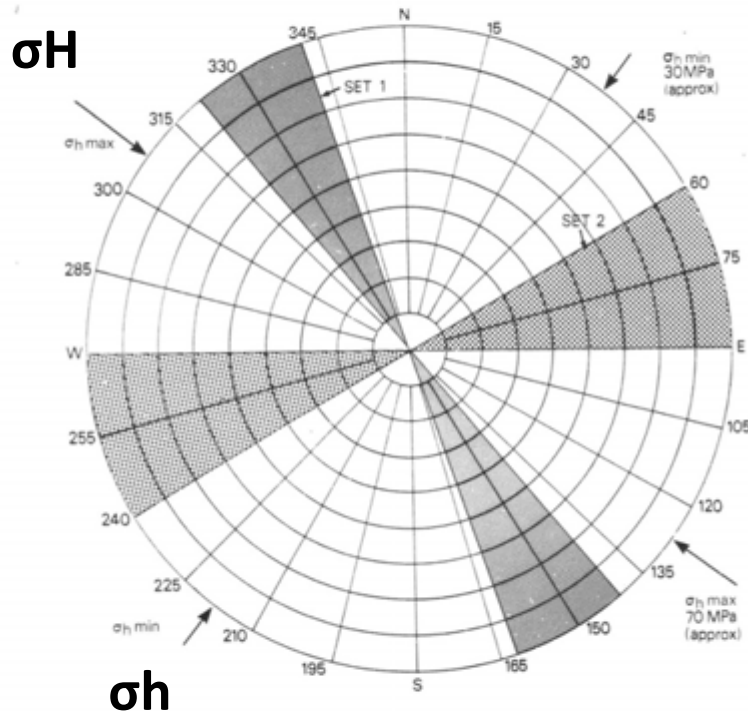
Measured



Strike-slip
 $\sigma_H > \sigma_v > \sigma_h$

Extrapolated

Joint Orientation



The **crosscourse** structures (NNW – SSE) correspond to the Set 1 joints and lie almost orthogonal to the minimum horizontal stress direction.

The **Sn/Cu mineral lodes** (ENE – WSW) correspond to the Set 2 joints and lie almost parallel with the minimum horizontal stress direction.

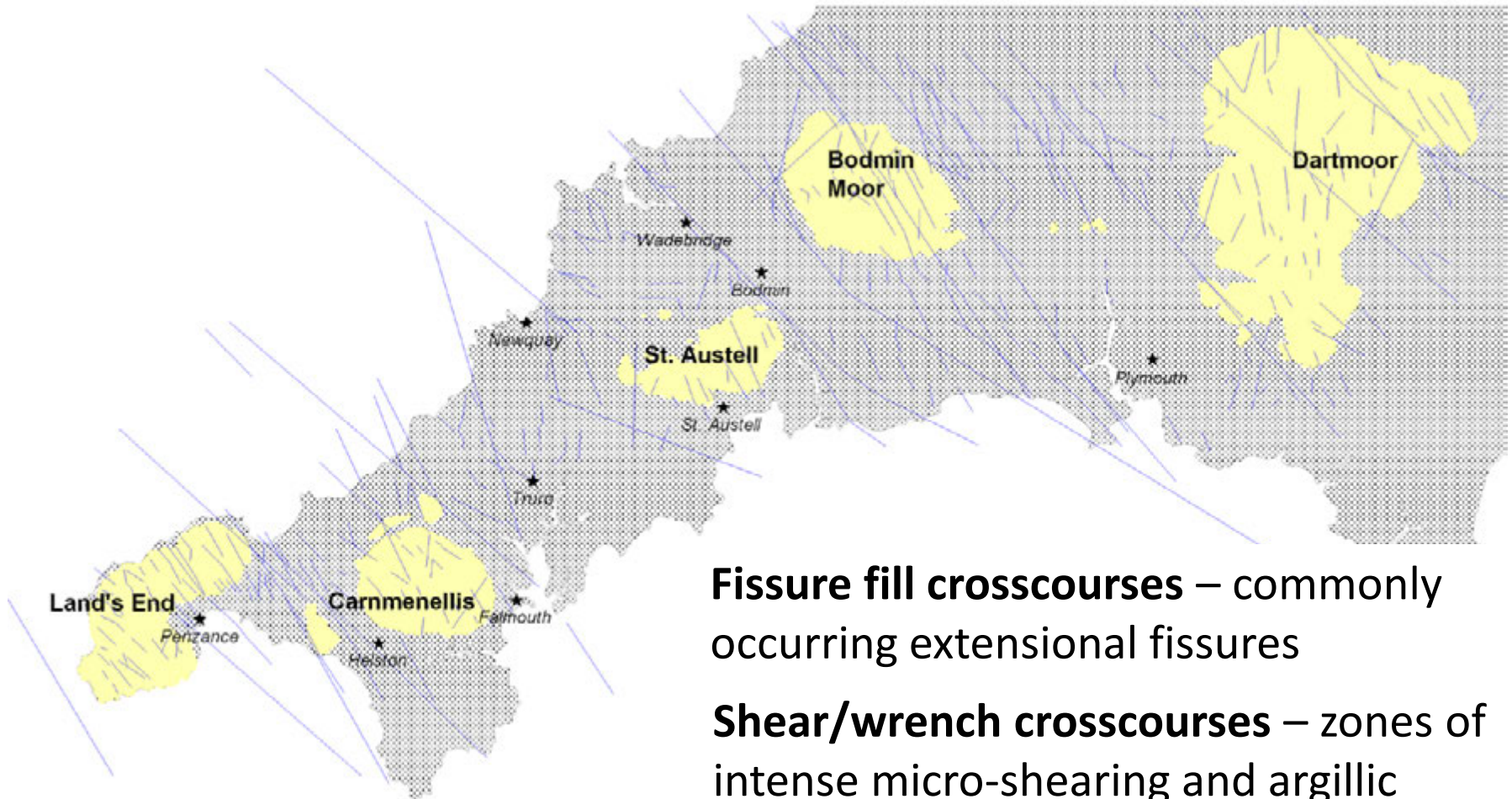
Extrapolation of the observed stresses indicates the relationship with depth:

$$\sigma_H = \text{NE} - \text{SW}$$

$$\sigma_h = \text{NW} - \text{SE}$$

(σ_v is proportional to depth)

Major fault zones (crosscourses)



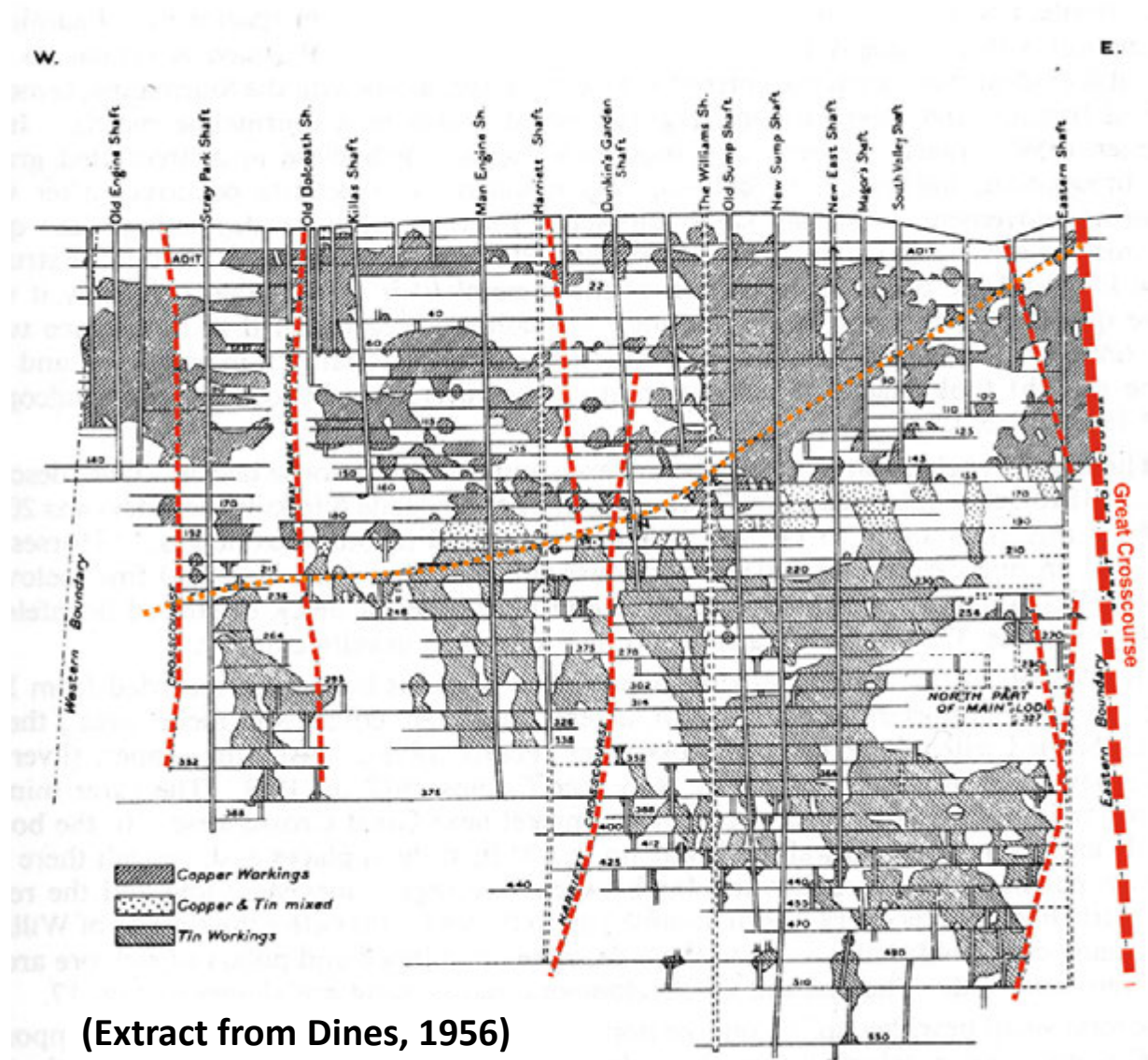
Fissure fill crosscourses – commonly occurring extensional fissures

Shear/wrench crosscourses – zones of intense micro-shearing and argillic alteration (locally known as 'fluccans').

Observed crosscourses



Typical crosscourse exposure (cliffs at Perranporth)

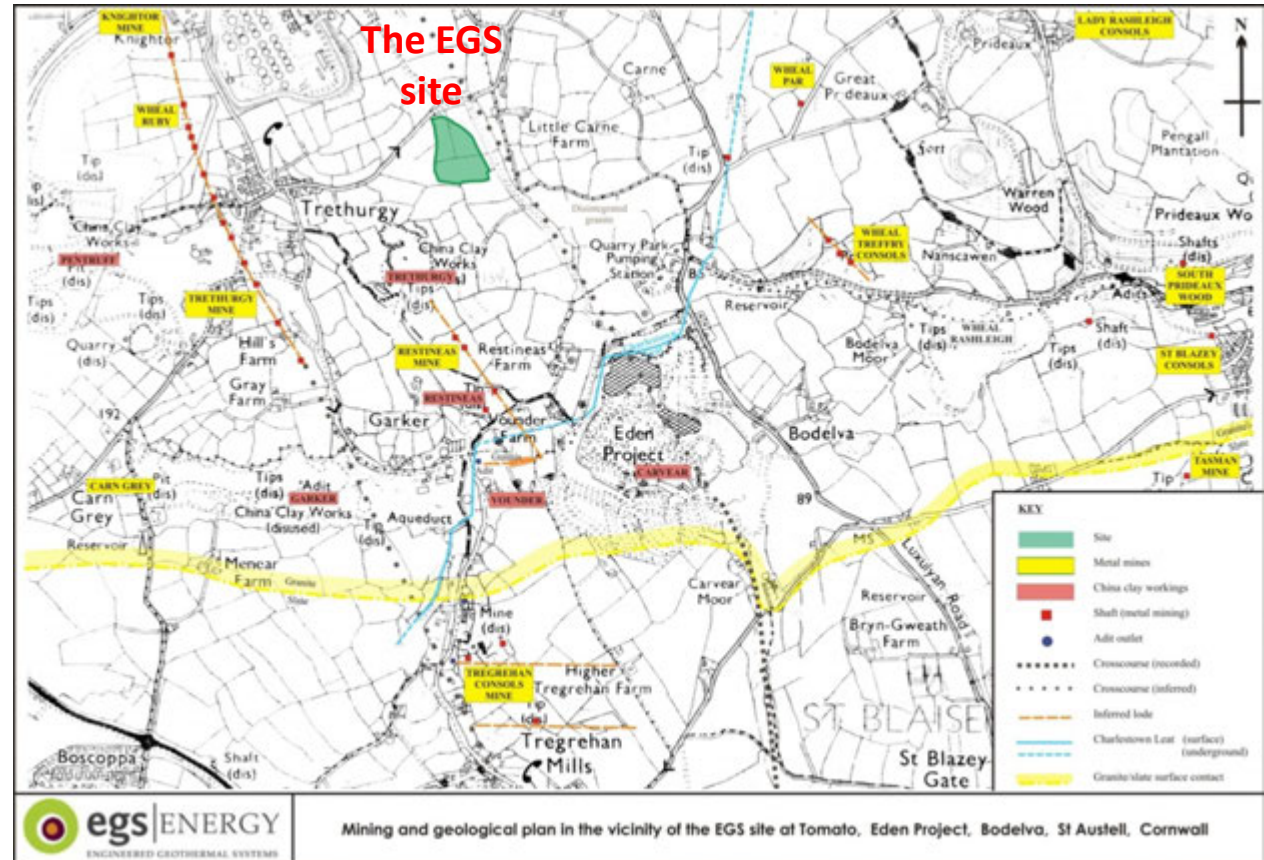


Desk-top and pre-drilling studies

Desk-top studies provide a variety of useful geological information at relatively shallow depth.

Field studies:

- Visual surveys
- 3D seismic
- magnetotelluric



Aeromagnetic and radiometric information from the Tellus SW survey could significantly enhance our knowledge of major structural features.