

SUBSIDENCE & OLD MINEWORKINGS

Reference: CS-25

GWP has a well established reputation for its understanding of the effects of both abandoned and active underground excavations on surface structures and mineral workings. Much of this experience is pertinent to built development and advice is regularly sought by developers, local and national government as well as by mining and quarry companies. A wide range of mineral types and methods of underground working have been investigated, and the firm has developed its own in-house computer programs to assess subsidence, strains and tilts.

Services provided include:

- Research on mining and geological records.
- Site investigation of workings and mine entrances by drilling, geologging and other techniques.
- Computation of subsidence strains and tilts including numerical analysis of related ground movements and fissuring.
- Subsidence prediction and back analysis of slope failures and design of remedial measures
- Advice on subsurface control measures including grouting and backfilling.
- Assessment of impacts on surface mineral workings including excavated slope, tip and lagoon stability.
- Advice on subsidence avoidance or control.
- Health and Safety auditing

Selected projects

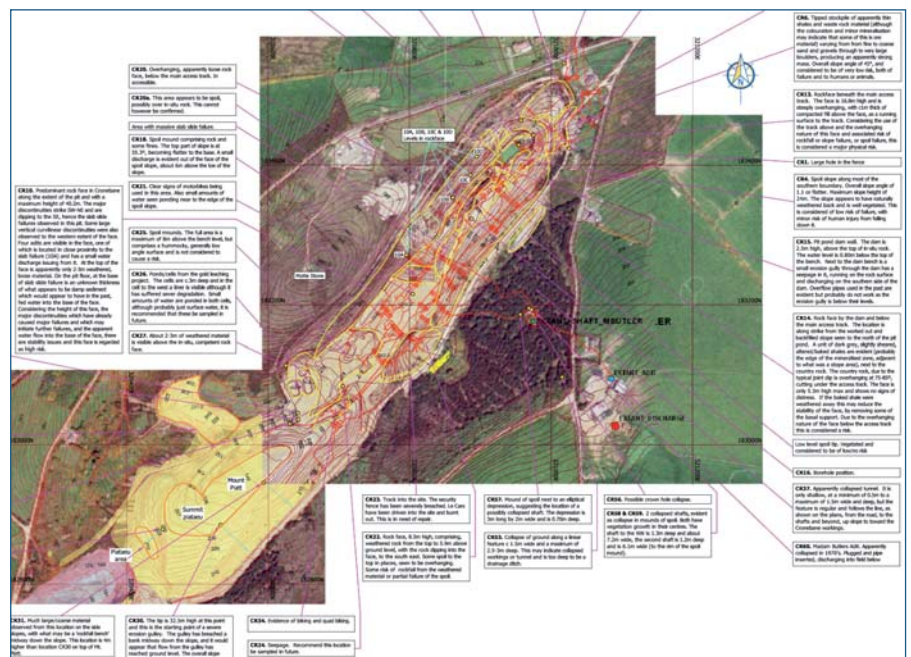
Case Study:

Avoca Mine site Health and Safety appraisal and audit

GWP was appointed (as sub consultants to CDM (Ireland)) to undertake a Health and Safety audit for the Feasibility Study for Management and Remediation of the Avoca Mining Site. The centuries old mine had been abandoned in 1982 and left derelict.

GWP reviewed the entire mine site (covering some 3.5km²) checking on stability of open pits, tips, shafts, adits, lagoons, reservoirs, buildings and structures.

Hazard appraisal forms were produced for all areas. Detailed plans itemizing all physical hazards and the location of all known mine workings were produced.



Case Study: Subsidence beneath landslide as consequence of coal mine workings

Dr Alan Cobb was appointed as a geotechnical expert to compute the subsidence displacements and strains due to coal mining, beneath the Back Hills area of Bolsover.

This expertise was required to establish the extent of underground mining for coal and other minerals, and the effects of these upon the ground surface and near surface strata in the vicinity of the landslide and to give opinion on the likelihood of coal mining subsidence having induced the landslide.

Evidence was given in the Lands Tribunal (case reference LCA/29-56/1996, before His Honor Judge Dennis Levy QC).



Case Study: Tower Colliery

GWP computed the potential subsidence beneath a number of old tips and streams near Glyncorrwg for proposed workings from Tower Colliery.

Calculations involved horizontal and vertical displacements computed on a 10m grid over some 5.8km². The development of the subsidence troughs as the 5 panels were worked was also calculated.



Case Study: Calculate future subsidence that may occur at World Heritage Listed site

To quantify the amount of subsidence which has occurred at Creswell Crags and the Whitwell railway tunnel as a result of the underlying mine workings.

A detailed study of old mine plans and mine working layouts was undertaken. The expected subsidence from the different workings and extraction methods were calculated and related to historic ground level information.

In addition the hydrogeological conditions have been considered as part of the prediction of delayed subsidence dynamics. A programme of detailed and precision levelling has been executed which indicated such delayed subsidence movements had occurred. Monitoring is ongoing.



Case Study: Stability of Wilnecote Brick Pit

The effects of abandoned underground mine workings on the stability of a brick pit have been assessed.

There have been a number of failures in the pit walls which can be traced to subsidence effects on the rock mass and hydrogeology by the flooded mine workings which are only 20m below the floor.

Key contacts

For details and to discuss your requirements, please contact:

Dr. Alan Cobb, Joint Senior Partner and Chief Geotechnical Engineer. Extensive experience in mining subsidence, materials handling and the environmental impacts arising from mining and quarrying and blasting.

E-mail: AlanC@gwp.uk.com