

Client:

Forest Oil CMI

Location:

Comune Di Bomba, Italy

Services Provided:

- Instrumentation & Monitoring
- Predictive Modeling

Value Provided:

- Providing risk monitoring that satisfies Dam Safety authorities that gas withdrawal does no harm
- Providing real-time performance data to control rate of gas withdrawal to meet commitments for maximum

Background & Project Challenges

Forest Oil CMI prepared to extract gas from the Monte Pallano Field in Comune Di Bomba (Chieti) located in the Abruzzo region of Italy.

Removal of gas from the producing zone located some 1,200 to 1,350 m below the ground surface

had the potential to cause subsidence of the ground surface. Such subsidence could possibly impact the 57.5 m high earthen dam located at the southern edge of the producing field and other surface improvements, such as roadways and utilities.



Geocomp Role & Accomplishments

Geocomp produced a predicted subsidence report of the valley in addition to an instrumentation plan to monitor subsequent performance. Predicted subsidence using advanced models indicated an expected subsidence of up to 15 mm using best available information on compressibility of the rock formations in the gas producing zone and predictions of pore pressure reduction associated with gas withdrawal.

To check the validity of the predicted subsidence and to provide advanced notice of any unexpected surface effects caused by gas withdrawal, Geocomp provided Forest Oil CMI with automated Global Positioning System (GPS) technology and microseismic sensors designed to continuously monitor 3D surface displacements and subsurface faulting and seismicity.

This system provides continuous measurements that engineers use to monitor instantaneous motion and long-term deformation trends. GPS sensors are ideally suited for this type of long-term monitoring since the technology is not affected by any long-term sensor drift. Additionally, the timing signal from the GPS is used to synchronize vibration events measured by the co-located microseismic sensors. Geocomp identified 15 locations or stations within the valley and on the Bomba Dam to be instrumented with GPS and microseismic sensors which will be maintained for the anticipated 20-year life of the gas field, and will provide a continuous data stream via radio back to an on-site control facility. Using Geocomp's *iSiteCentral*[™], a web-based data collection and reporting system, each reading is compared to pre-defined alarm levels, and seismic events are automatically triangulated and presented on a geological site map.

All sensor data is reviewed by Geocomp at a pre-determined schedule so that unexpected subsidence or long-term trends that could undermine the stability of the adjacent earthen dam may be identified.