

TECHGEA SRL

APPLIED GEOPHYSICAL DESIGN AND SURVEY



Company profile

Techgea Srl

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1. Presentation

Techgea Srl is a service company specializes in non-invasive methods for the exploration of the subsoil and the non-destructive diagnostics of structures and civil engineering works.

With a qualified team of geologists and engineers, Techgea operates both in Italy and abroad with independent organizational skill.

It is addressed to public bodies, production and service companies, construction companies, to professionals (engineers, geologists and architects).

Techgea Srl (up-grade of Techgea Servizi, founded in 1999) has a qualified staff of geophysicists, specialized in the near-surface geophysical techniques, including:

- Electromagnetics (Frequency Domain and AMT)
- ERT (Electrical Resistivity Tomography)
- Seismic (refraction, reflection, borehole seismic and MASW)
- Ground Probing Radar

The company provides all data acquisition, processing, interpretation and final reporting. These services are supported by:

- Highly experienced field crews and data processing geophysicists
- High quality of our geophysical equipment and processing software
- Our extensive research and development programs with the Geophysical Department of the Polytechnics of Turin (Engineering University)

The main field of application are listed below:

- Soil characterization for geotechnical purposes
- Seismic soil classification
- Utilities mapping
- Concrete structures characterization (thickness, rebar detection, void location, fracture detection, etc.)
- Geologic assessment (deep investigations) for
- Tunneling excavation
- Groundwater characterization
- Cavity detection
- Landfill characterization (detection of unknown landfill, thickness, leachate plumes, etc,)

2. General Information

Office location:

1) Head office - Via Carlo Viola 78 11026 Pont Saint Martin (AO) ITALY

2) Operative site - Via Modigliani 26/a 10137 Torino ITALY

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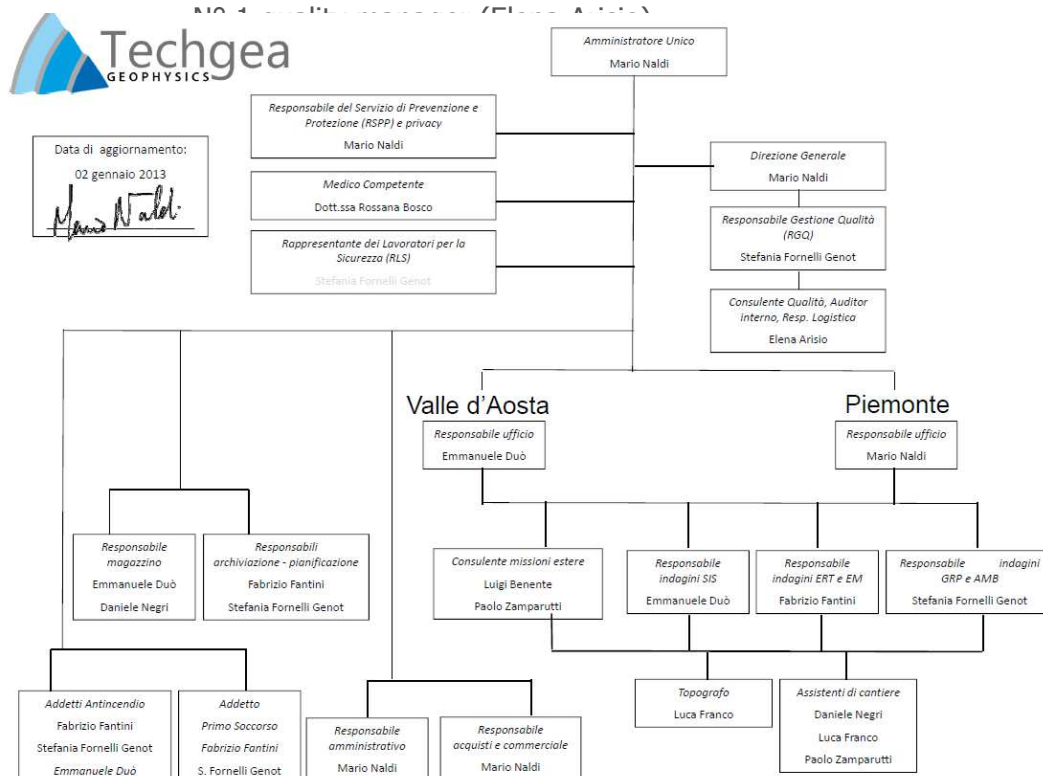
Web site www.techgea.eu

Quality certification ISO 9001:2008 Accredia IT246983 (expiration date 03/01/2016)

3. Human resources

Techgea S.r.l. general manager / technical director (Mario Naldi)

- N° 3 project manager (Stefania Fornelli, Fabrizio Fantini, Emmanuele Duò)
- N° 4 field technicians (Luigi Benente, Paolo Zamparutti, Daniele Negri, Luca Franco)
- N° 1 accountant (Elena Ciavarella)



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The responsible for the **electromagnetic and geoelectrical method** is Fabrizio Fantini (33). He has got the Geophysical Engineer degree at the Polytechnic of Turin. In 2006 he attended the XVI International Summer school of archeological geophysics (Grosseto,

Italy). He has followed many projects abroad (Turkey, Libia, Sant Martin - Caribbean sea, Serbia). Spoken languages: French (fluent) and English (fluent).

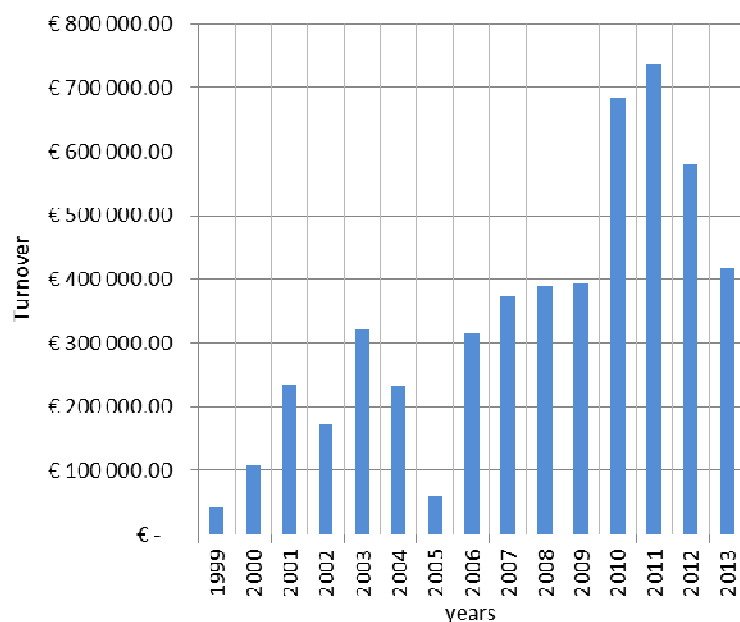
The staff for field data acquisition is given by geologists with different skill and experience. Luigi Benente (35) and Paolo Zamparutti (28), geologists with expertise of ERT and AMT techniques. Luigi speaks fluently English and Spanish. Paolo speaks French as second language, and speaks fluently English and Spanish. Despite the quite young age, they travelled all over the world for projects in Uzbekistan, Colombia, Ecuador, Nigeria, Mexico, Thailand, Turkey.

Luca Franco (33) is a surveyor for topographic measurements both with GPS and with optical survey equipment.

Daniele Negri (26) and Paolo Zamparutti (28) have the Italian certification for Rope Access works (in difficult terrain conditions).

4. Financial Information

- VAT Number: IT01154560070
- Average Turnover (2010-2012): 650000 €
- Investments: 15% of the turnover
- Fiscal residence: Italy



Remarks:

2013 updated to June

5. Survey equipment

To obtain the best results we use the best geophysical equipment (of our property and always available):

- **Resistivity meter** Syscal Pro 72 channels (Iris – France – 2009) with cables of 3, 5 and 10 m takeout. Software for data acquisition and processing: Prosys, Electre, Res2DINV
- **Resistivity meter** Lippmann with 100 active electrode (Lippmann – Germany – 2011) with cables of 5 m takeout. Software for data acquisition and processing: Geotest, Res2DINV). Light and dismountable equipment for airplane transportation
- **GPR SIR3000** (GSSI-USA, 2006) with antennas 270 Mz, 400 Mz e 1 GZ. Software for the data acquisition and processing: Radan, ReflexW, GPRprocess
- **GPR IDS multiarray** (2012) with antennas 400 and 900 MHz, concrete inspection antenna of 2 GHz. Software for the data acquisition and processing: IDS GRED (full license for pipe mapping), ReflexW, GPRprocess
- **Borehole GPR antenna** IDS 300 MHz with 40 m cable (2006)
- **Seismic Unit DakLink III** (Seismic Source – USA) 2 units at 48 channels (2010), with more than 200 geophones at 4.5, 10, 40 e 100 Hz and connection cables with spacing of 5 and 10 m. Software for the data acquisition and processing: Vibroscope, ReflexW (reflection), Rayfract /refraction), CGTOM (SIRT method for crosshole), SurfSeis Kansas Geological Survey (MASW and surface waves survey)
- **Elettromagnetic meter Profiler** (GSSI-USA, 2007). Software for the data acquisition and processing: MagMap, Surfer.
- **Pipe locator RD4000** (Radiodetection – UK, 2007)
- **Optical total station** Geomax ZTS 602 LR. Software geomax suite
- **Magnetotelluric meter** receiver MTU-5 (Phoenix, 2011) with magnetic sensors 1-10000 hz. Software 1D and 2D for resistivity inversion Winglink (data processing in partnership with GG Service)

6. Main References

- ESSO Italiana (Exxon Mobil company). GPR survey in more than 55 petrol stations in Italy for UST and pipe locations in the last 2 years (decommissioning and retail)
- FENICE SpA (EDF company). GPR survey in various car factories (Italy and France). Supplier number: 163803
- Geodata SpA (major engineering firm for hydro and road tunnels and dam design, offices all over the world. Head office in Italy). Geophysical deep survey for geotechnical and geological modeling for many projects in South America (Ecuador, Colombia). 2010-2013
- Nestlè Waters (Switzerland), Nestlè Food (Switzerland), Perrier Vittel (France). Geological and geophysical survey for medium depth groundwater exploration in several countries (Nigeria, Uzbekistan, Thailand, Brazil, Turkey). 2008-2013
- Studio Speri Srl (engineering firm for bridge and dam design under seismic effects). Geophysical monitoring for seismic characterization for more than 100 road bridges in Italy (Toscana, Puglia, Umbria). 2009-2012

- IREN energia SpA (Energy producer company, Italy). Dam inspection with geophysical method (seismic tomography, borehole gpr, wall gpr). Seismic classification. Geological and tectonic assessment. Concrete inspection (rebar location, thickness, etc). 2000-2013
- ENEL SpA (Energy producer company, Italy). Dam inspection with geophysical method (seismic tomography, borehole gpr, wall gpr). Seismic classification. Geological and tectonic assessment. Concrete inspection (rebar location, thickness, etc).
- Terna Rete Italia SpA (High Voltage Electricity distributor, Italy). Geophysical and geological survey for new High voltage power lines; resistivity measurements of ground. Environmental due diligence. 2002-2013 (framework agreement from 2011).

7. Papers

1. "Monitoraggio geofisico per la progettazione di interventi di consolidamento di terreni di fondazione" - Workshop Geofisica Rovereto, 2012. Mario Naldi, Carlo Alessio.
2. "Phoenix AMT for Tunnel Survey" - The Phoenix, Phoenix Geophysics Limited, September 2011.
3. "Geophysical investigation of a mineral groundwater resource in Turkey". Hydrogeology Journal , 2010. A Godio, D. Boiero, M. Naldi, E. Yigit
4. "Integration of Electrical and Electromagnetic Investigation for Contaminated Site"- American Journal of Environmental Sciences 5(4): 561-568 , 2009 - A. Godio, M. Naldi
5. "Approccio geofisico multidisciplinare per la verifica di discariche" - Workshop Geofisica Rovereto, 5 dicembre 2008. "Indagini geoelettriche per lo studio di sorgenti in ambito montano". Atti del Convegno di Geofisica di Rovereto 2006, Museo Civico di Rovereto (TN), M. Naldi, F. Fantini
6. "Caratteri geochimici, isotopici e mineralogici dei suoli di Muravera". Estratto da "Geobasi - Il foglio IGMI n° 549 - Muravera", Ottonello G. Ed., 2008 (S. Fornelli Genot)
7. "Analisi del contenuto in rame e altri metalli nei suoli agricoli lombardi". Quaderni della Ricerca n. 61, febbraio 2007, ERSAF Lombardia, Università degli Studi di Pavia (S. Fornelli Genot) - presentato con poster al Convegno Internazionale Consoil 2008, 3-6 giugno 2008, Milano.
8. "The georadar as a successful planning and budgetting tool to the engineering reclamation and reconversion of dismantled industrial site", proceedings 4th meeting environmental and engineering geophysics, Barcelona (Spain), sep. 14-17, 1998, M. Naldi, P. Chiara.
9. "Copper accumulation and behaviour in Piemonte vineyard soils". Rendiconti Geoitalia 2003 – 4° Forum italiano di scienze della Terra – Bellaria, 16 – 18 settembre 2003, pg. 403-404 E. Beno, S. Fornelli Genot, A. Facchinelli
10. "Two-dimensional electrical imaging for detection of hydrocarbon contaminants", Near Surface Geophysics, 2003, 131-137, A. Godio, M. Naldi

11. "Tecnologie geofisiche nella caratterizzazione di siti contaminati" Siti contaminati, Luglio-agosto 2002, Torino, A. Godio, M. Naldi
12. "Un esempio di rilievo georadar per l'individuazione di presenze archeologiche non palesi" GEAM, n. 100, Giugno-Settembre 2000, V. Socco, M. Naldi, T. J. Guo
13. "A combined geophysical survey for hydrogeological purposes in north-eastern Italy ", proceedings 4th meeting environmental and engineering geophysics, Barcelona (Spain), sep. 14-17, 1998, A. Godio, C. Conforto Galli, P. Chiara, M. Naldi
14. "Tunneling near the San Pellegrino thermal springs (Italy)", proceedings EUROCK '96, 1996, Vol. II, pp. 1425-1432, Balkema (Rotterdam), G. Barla, M. Naldi
15. "The crystalline basement of the Canavese Zone (Internal Western Alps): new data from the area west of Ivrea (Northern Italy)", Geologie Alpine, 1996, Vol. 72, R. Compagnoni, A. Borghi, M. Naldi
16. "Tunneling near the San Pellegrino thermal springs (Italy)", proceedings EUROCK '96, 1996, Vol. II, pp. 1425-1432, Balkema (Rotterdam), G. Barla, M. Naldi
17. "The Canavese Zone near Ivrea (Western Alps)", Memorie Società Geologica Italiana, 1988, R. Compagnoni, G. Biino, M. Naldi