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# TERT OVERVIEW



In the world of depletion, rising costs of exploration and market instability, TERT's technologies address some of the most difficult challenges of modern exploration, enabling the Company, its clients, and partners to identify and explore natural resource deposits accurately, cost effectively, and quickly.

**TERT**

# TERRA ENERGY & RESOURCE TECHNOLOGIES (TERT)



## About the Company

Terra Energy & Resource Technologies, Inc. ("TERT") is a publicly listed, space age, natural resource exploration Technology Company, specializing in the application of innovative and proprietary exploration technologies.

TERT utilizes various independent processing methods of satellite-derived data sets, which provides a fresh approach to exploration that enhances today's exploration methods and can help to find geological resources in uncharted and challenging geological areas.

By incorporating innovative methods of exploration in the early and intermediate stages of exploration, it allows the traditional tools of exploration to become confirmation tools instead of exploration tools.

TERT improves the exploration success rate, while significantly reducing the time, cost and risk of exploration that is associated with today's high-risk exploration methods.

TERT will high-grade any area for hydrocarbons, minerals, geothermal and other prospects that lie within the subsurface structure and when appropriate, recommend drilling locations and target depths faster and more cost effectively as compared with traditional methods.

TERT interpolates surface data, which is generated from the Earth's subsurface processes such as tectonics and connects them to the subsurface structures with indications of content.

**TERT will deliver results that will exceed expectations, whilst at the same time reducing the exploration period from years to months, the cost by 50 - 90% and the risk for exploration by 70% or more.**

We provide High-quality, oil and gas, mineral, geothermal and other prospectivity analysis, onshore and offshore, for exploration companies worldwide, using innovative but proven methodologies which are suitable for Greenfield, Brownfield, and Mature areas as well as offering a second opinion (Drilling Location Validation) before the decision is taken to drill.

TERT's main process is **STeP®**, which is short for **Sub Terrain Prospecting**

**STeP®** interprets satellite, cartographic, and geological data with various unique models to delineate contours of prospectivity.

The application of a REMOTE innovative exploration tool such as **STeP®** is very important, especially within **ecologically sensitive and difficult to access regions**. **STeP®** is **non-evasive**, and **environmentally** friendly that produces **conclusive** (including **prospective** and **non-prospective**) results.

### TERT's other applications are:

Naturally Adsorbed Gas Survey's (**NAGS**), is a geochemical-based tool that uses an innovative model of the gas fields of the Earth characterized by analysis of adsorbed gases.

## Innovative Exploration

- ▶ **STeP® – Sub-Terrain Prospecting**
- ▶ **NAGS – Naturally Adsorbed Gas Survey**
- ▶ **SVSL – Side View Seismic Locator**
- ▶ **SLEC – Seismic Location of Emission Centers**



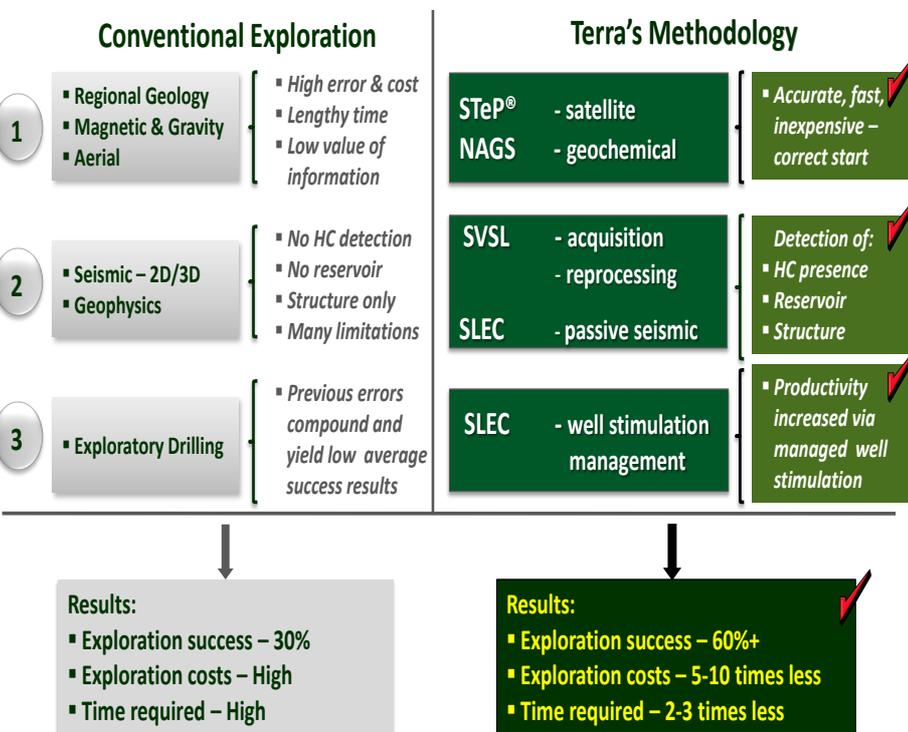
# TERRA ENERGY & RESOURCE TECHNOLOGIES (TERT)



TERT's Side View Seismic Locator (**SVSL**) determines reservoir quality by identifying zones of open fracturing that are known for superior productive potential. SVSL is suitable for Geothermal, Oil & Gas, Coalbed Methane, anywhere where fracturing occurs. Existing or new seismic data can be processed by scattered waves. SVSL determines and ranks drilling locations with the highest potential production rates.

Seismic Location of Emission Centers (**SLEC**) directly determines the presence and nature of fluids in the subsurface (onshore only).

## Compare Conventional to Innovative Exploration Methods



TERT has carried out 170 plus exploration projects varying in size from 10 to 70,000 plus sq. km around the world and is supported by an In-house science team of 30+ accomplished PhD's and geoscientists and 3rd party consultants (18 - 20 part time specialists).

### Case Study 1

A project for a major international oil company in West Africa in an offshore block was carried out. Several dry holes had been drilled in the past, hydrocarbon shows of 50-55 meters were correctly predicted, this was in 1,500 meters of water with 1,300 meters of rock down to the located point at 4,500 meters beneath the seabed. It was confirmed by drilling.

### Company Highlights

Reputable industry participant with hundreds of successful projects worldwide

STeP® technology is TERT's flagship, proven technology, responsible for numerous discoveries in oil & gas and minerals

Unparalleled work product and level of innovation contributed to exploration

Specifically unmatched early exploration capabilities, enabling precision prospecting

Technologies are in use for over 30 years

### Key Projects History

Currently engaged in STeP analysis of two areas in Venezuela for PDVSA/Petrocum

STeP® analysis of Overton County in Tennessee resulted in a commercial oil discovery for ATR Energy

STeP® analysis of 50,000 km<sup>2</sup> or more for YPF, PCR, Oil M&S, Unitec Energy and Epsur

STeP® survey for HCs of two areas covering 7,000 km<sup>2</sup> in Nigeria for NNPC

STeP® survey of 200 km<sup>2</sup> in Kuwait for Kuwait Oil Company

STeP® analysis under \$2.5MM contract for Petrobras – offshore West Africa

STeP® survey of 14,500 km<sup>2</sup> for oil & gas in Kazakhstan, under \$2MM

Oil & Gas STeP® analysis of 4,000 km<sup>2</sup> for Pertamina, Indonesian state company

In 2010, discovery of rubies and gold in Cambodia using STeP®

# TERRA ENERGY & RESOURCE TECHNOLOGIES (TERT)

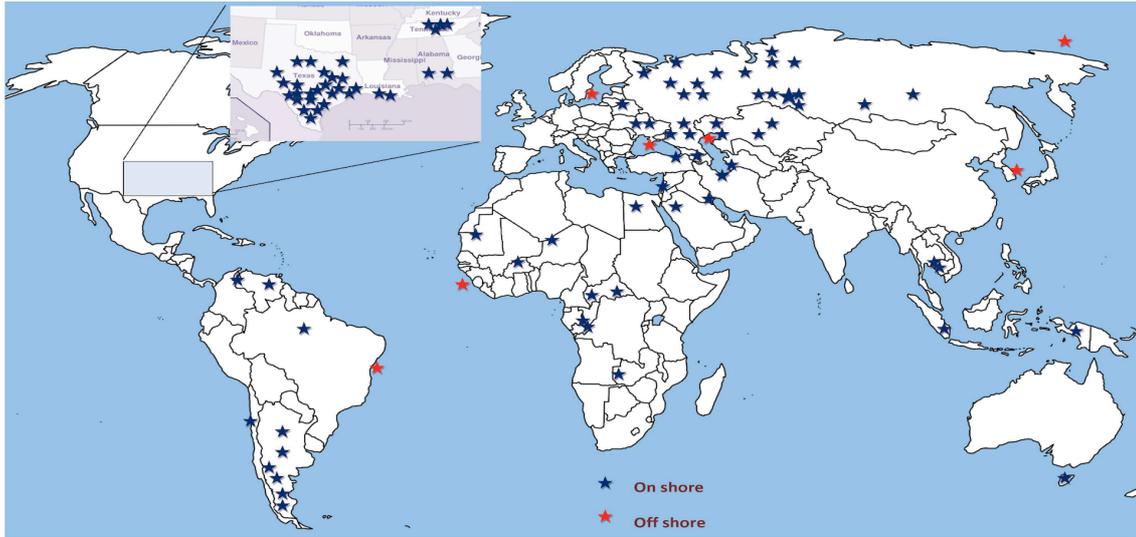


## Case Study 2

A project for a major oil company in Indonesia – a hydrocarbon zone at 1,900 meters depth was predicted with a drilling location, which should avoid complications in an otherwise structurally risky area, A Geological Resource Prediction was also made.

## Marketing Partners and Projects Around the World

U.S., South America, South Africa, Central Africa, Middle East, India, Sri Lanka, Kuwait, Indonesia, Australia, Malaysia, China, Timor Leste.



## Some of our clients



## TERT Technologies Results (All Methods)

Minerals	Total	Success		Pending		Failure		Success Rate	
		Predicted Mineral Presence	Predicted Mineral Absence or Marginal	Results Agree with Seismic. - Drilling Pending	Drilling Pending	Failed Predicting Presence	Failed Predicting Absence	Successful Prediction	Success & Project Goes into Production
Oil and Gas	151	71	25	25	27	2	1	98%	85%
Gold	6	4	0	0	2	0	0	100%	100%
Gems	17	13	0	2	0	2	0	87%	87%
Industrial Metals	4	0	0	0	4	0	0	N/A	N/A
Water/other	1	1	0	0	0	0	0	100%	100%
All Types	179	89	25	27	33	4	1	97%	93%

# TERRA ENERGY & RESOURCE TECHNOLOGIES (TERT)



## STeP® - Sub-Terrain Prospecting Overview

**STeP®** is a proprietary, satellite-based and analytical technology, which interprets and quantifies the effects of subsurface processes and geological features on the Earth's surface. It assesses and delineates natural resource anomalies and subsurface structures both onshore and offshore and is not limited by terrain, vegetation, or area-size.

**STeP®** consists of several unique independent and remotely administered methods such as Geodynamic analysis, Conventional remote sensing, Geoinformatics (artificial neural networks), Geomorphological studies, Morphometric analysis, Paleo-reconstruction, Structure-metric analysis and Proprietary spectrometry, which when they are superimposed, they yield a more accurate and powerful result than they would if rendered separately.

As far as we are aware, our capabilities are unmatched in the commercial marketplace as measured by the value of the work product: remote sensing analysis that produces a subsurface depiction with a reliable prospectivity conclusion.

The **STeP®** technology has evolved over the past 35 years from government research into an applied and practical suite of analytical tools, which quantify the potential of **all natural resources** in any given area, and delineates the anomalies/structures that are present within an area, assess resource potential, identify drilling locations/depth(s), and determine other geological characteristics. Such analysis produces results similar to traditional geological projections, however it significantly improves the understanding of the geology and structure within an area.

Success is not only if a resource is discovered within a given area which has been confirmed by drilling, it is also a success if it is concluded that further exploration is not required for various substantiated reasons.

In summary, **STeP®** is a powerful exploration solution that significantly improves the exploration success rate, reduces time from years to months, and reduces the expenditure for seismic and exploratory drilling, whilst at the same time reducing the exploration risk.

### TERT technologies address's such challenges as:

- Detection of presence of hydrocarbons and minerals;
- Large areas
- Lack of subsurface data
- Complex geology
- Absence of, or poor quality seismic data
- Oil-to-water contact

### In exploration, TERT Technologies are used for:

- Work in under explored areas; (greenfield)
- Remotely or noninvasively delineate natural resource anomalies and structures
- Assess prospectivity and high grade territories; (green/brown field areas, mature areas)
- Select prospective areas to maximize the effectiveness of seismic data acquisition
- Determine structure contours and oil-to-water contact
- Project the target depth and best drilling locations
- Second opinion before deciding to drill

# TERRA ENERGY & RESOURCE TECHNOLOGIES (TERT)

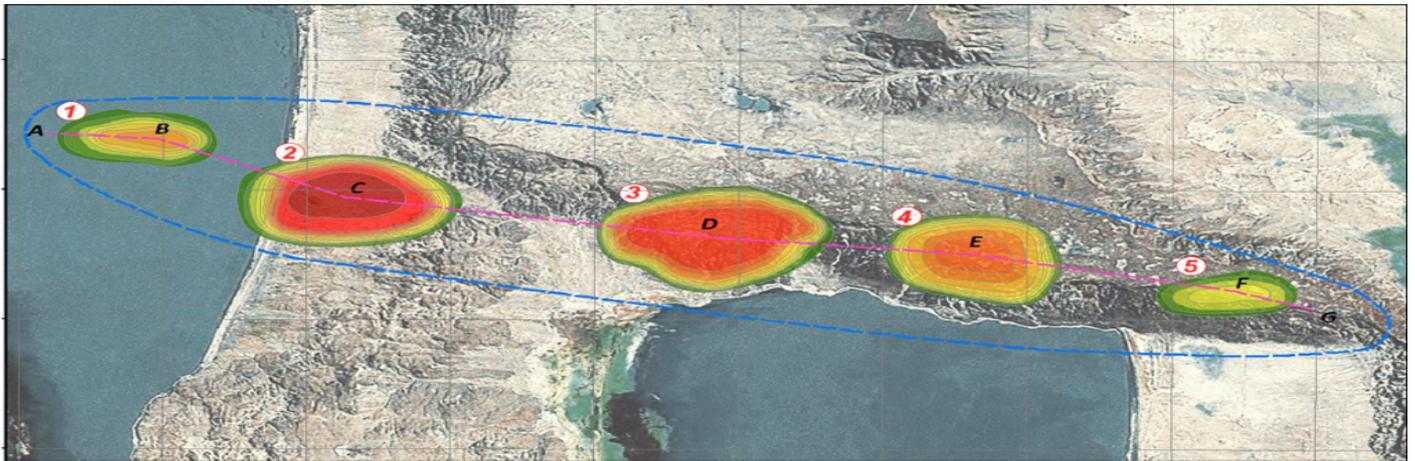


## STeP® Technology Description

The basis of **STeP®** is in the use of thematic processing of Remote Earth Sensing (RES) data combined with sophisticated mathematical and analytical techniques, and the processing of geological, geophysical and map data. Proprietary algorithms and specialized software are used to quantify resulting data and produce valuable information about the geology of the area, subsurface features, and subsurface mineral composition. The result of these methods is a report, which contains enough information about a prospective area to confidently proceed with or abort the exploration program.

**STeP®** technology's ability to predict the location, depth and, in many cases, the thickness of subsurface hydrocarbon/mineral accumulations via the interpretation of remote sensing data is unique. Standard industry approaches do not provide results that include information on depth and thickness. They rely on surface manifestations of hydrocarbons and minerals (macro-seepage, micro seepage, and related mineralogical, geobotanical, and geophysical surface alterations) to locate potential areas that might overlie, or at least be near to, subsurface accumulations.

Because these methods provide no information about depth and thickness, they must be used in conjunction with subsurface imaging techniques, which today is almost exclusively seismic. Perhaps for this reason, there is little emphasis on research in processing techniques for remote sensing data for hydrocarbon and mineral exploration. **STeP®** gathers satellite, topographic, cartographic, elevation, and publicly available geological/geophysical data and then uses sophisticated data mining techniques including Kohonen artificial neural nets (also known as self-organizing maps), pattern recognition techniques, and "fuzzy logic" to achieve results.



All components are interpreted and integrated to form a powerful, synergistic result. Standard geological, remote sensing, computational, mathematical, and artificial intelligence components are also integrated to deliver comprehensive, detailed, and actionable results on contours and deposit depth. In short, **STeP®** delivers a vastly superior early-exploration result or a confirmation result before making a final decision to drill based on traditional data sets.

While TERT closely guards the inner workings of its proprietary methods and algorithms, TERT will explain how the principals, methods, and process's of the respective **STeP®** components work, as well as justifying the results of a survey.

Unlike many other "Innovative Technology" exploration companies, TERT can provide many examples of successful applications resulting in the discovery of resources and/or confirmation of subsurface mapping evidenced by seismic, drilling, and/or sampling.

# TERRA ENERGY & RESOURCE TECHNOLOGIES (TERT)



## When Do Customers Engage TERT?

### For prior Knowledge of a Given Area or for that very Important Second Opinion

In the world of depletion, rising costs of exploration and market instability, Terra Energy Resource Technologies (TERT) address's some of the most difficult challenges of modern exploration, enabling the Company, its clients, and partners to identify and explore natural resource deposits accurately, cost effectively, and quickly, onshore or offshore, for any terrain, and for any geological condition.

Knowing the resources that are available prior to tendering for any area that is onshore or offshore is extremely beneficial; why tender for something that you only think or hope contains a resource?

A comprehensive knowledge of a country's natural resources is one of the greatest and most valuable resources that a country can possess.

Information about an area prior to the field exploration work is extremely important.

### For Early Exploration (underexplored areas)

- Frontier exploration
- Vetting license blocks prior to farmins or bidding
- Large blocks, prioritize targets, relinquish unneeded areas, supplement geology, geophysics geochemistry studies, budgetary considerations prior to drilling operations
- Decode challenging geology (folding, sub-salt, basalt covers...), stratigraphic features, tectonic trapping, etc.
- Canvas environmentally and socially sensitive areas
- Efficiently cover difficult terrain (access cost prohibitive)
- Government's resource knowledge – resource rights management
- Confirm prospect or a drillable location (2<sup>nd</sup> opinion)

### For Intermediate Exploration

- Need an additional data set
- When seismic (if used) is blind due to subsurface conditions
- Confirm prospect or a drillable location (2<sup>nd</sup> opinion)
- To confirm the fracturing system of a reservoir prior to drilling

### During the Production Phase and for Existing Oil & Gas and Geothermal Sites

- Reservoir Management
- Determine and monitor in real time the reservoir dynamics/water movement
- Evaluate existing and/or determine the best locations for production and/or injection wells

**The more exploration data that is available**

**The higher the chance of success**

**The more confidence there is before drilling**

# TERRA ENERGY & RESOURCE TECHNOLOGIES (TERT)



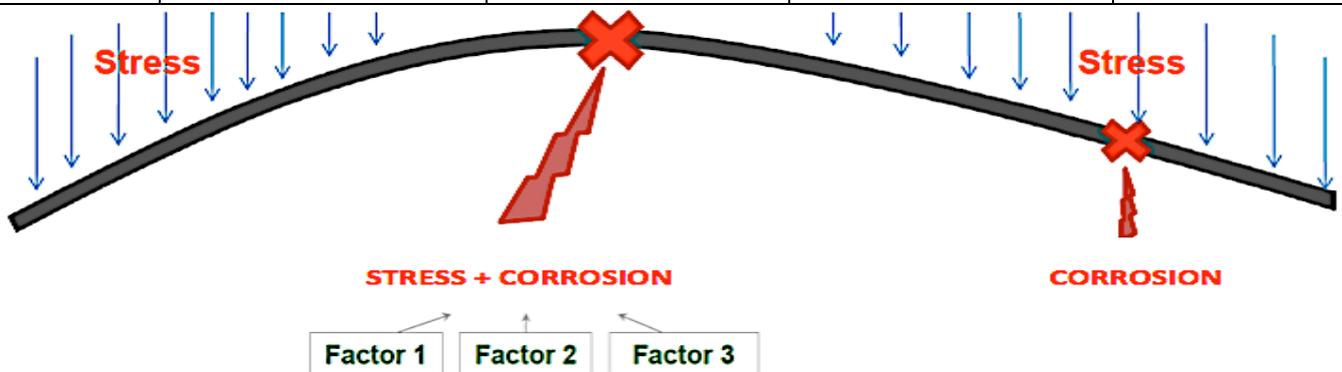
## Mature Fields

- Revisit the exploration "mature" areas by deepening the exploration targets and other overlooked prospects of both structural and stratigraphic traps. Overall it will open a new horizon for exploration targets and improve the exploration success ratio at minimum cost.
- Identify the best location of delineation wells for exploration and injection wells for the Enhanced Oil Recovery (EOR) program

## Pipeline Integrity Analysis (PIA)

- In many cases the real cause is not corrosion, but Stress or a combination of both.
- While it is fairly well understood how to detect corrosion (though with very high expenses), the challenge is to detect Stress.
- It is likely that a high percentage of corrosion-related pipeline breaks are due to unidentified Stress, that has accumulated over time

Nature of Service	Technology Applied	Value Proposition	Expected Results	Minimum Order
Satellite Data Acquisition and Analysis	Visual detection of anomalies, various <b>STeP®</b> methods used, de-cluttering analysis	Mapping of existing pipeline leaks and dangerous conditions	Map of existing pipeline anomalies. Maps of negative factors causing stress corrosion. Identification of pipeline spots with the highest risk of probable incidents.	100 sq. Km



## STeP® Drilling Location Validation Services (DLV)

When a second opinion is required before making the final decision to drill, which has been based on traditional data sets.

Nature of Service	Technology Applied	Value Proposition	Expected Results	Minimum Order
Satellite Data Acquisition and Analysis	Structuremetric analysis Proprietary Spectrometry	Valuable second opinion at low cost before the final drilling decision is made.	STeP DLV produces the results typically delivering structure contour maps with the scale of 1:10,000. Alternative-drilling location if warranted.	One location

# TERRA ENERGY & RESOURCE TECHNOLOGIES (TERT)



## Technological Capabilities & Competitive Advantage

- Reduce exploration costs by 50% to 90%
- Condense the exploration time-span into months instead of years
- Substantially increase success rates, eliminate exploratory guesswork
- Detect the actual presence of oil & gas structures, reduce the volume of seismic acquisition
- Explore any terrain of any size at accuracy levels that are significantly above-average
- Preserve the environment – significantly reduce the survey footprint/impact on land
- Complement/replace traditional gravimetric, magnetic, and other early exploration data

## TERT Technology Suite – 3S – Space, Surface, Subsurface

### Space

#### Sub-Terrain Prospecting (STeP®)

STeP® includes multiple independent components such as:

- ▶ Geodynamic analysis
- ▶ Structuremetric analysis
- ▶ Paleo-reconstruction
- ▶ Spectrometric analysis

that build on each other and gives added confidence for the potential of the natural resources that may be available for further confirmation.

STeP® is a remote sensing and analytical technology, which interprets satellite, cartographic, and geological data to ascertain the natural resource potential of respective areas and also to determine anomaly/structure contours, oil to water contact in hydrocarbon applications, and also target depth(s).

STeP® is particularly applicable to large license blocks and areas with difficult access, environmentally sensitivity, and geological challenging.

### Surface

#### Naturally Adsorbed Gas Survey (NAGS)

A unique geochemical technology which analyzes adsorbed hydrocarbon and nonorganic gases in subsoil rocks. Contrary to other gas geochemical technologies that deal with highly mobile subsoil atmosphere and hydrosphere gases, NAGS performs studies of gases firmly enclosed in rock material. Such gases are not affected by limited temperature and pressure changes. They accumulate in rocks during the course of migration of gas-saturated fluids at the maturation stage of regional geology. Hence, their characteristics are significantly more informative in contrast to the targeted free gases of other, well known geochemical studies. NAGS is based on a model of the “gas flux” of the Earth. The background gas distribution is affected by oil & gas fields or mineral deposits, manifesting themselves in geochemical anomalies on the surface. NAGS works for hydrocarbons, gold, uranium, diamonds, and other metals and minerals.

### Subsurface

#### Side View Seismic Locator (SVSL)

A micro-seismic technology which determines zones of abnormal or open fracturing. Its innovation is in the processing of scattered waves, as opposed to reflected seismic waves that are traditionally processed by the industry. SVSL has an excellent track record predicting drilling locations with highest production rates as well as assisting in well design and avoiding drilling complications. It can work as a seismic reprocessing / interpretation technique or as a field seismic acquisition method.

#### Seismic Location of Emission Centers (SLEC)

A passive seismic technology used to determine the fluid type / fluid saturation, oil to water contact, reservoir dynamics as well as timing and effectiveness of hydraulic fracturing.

Numerous applications of the technology proved its efficacy as an inexpensive monitoring tool that is extremely useful in producing oil fields.

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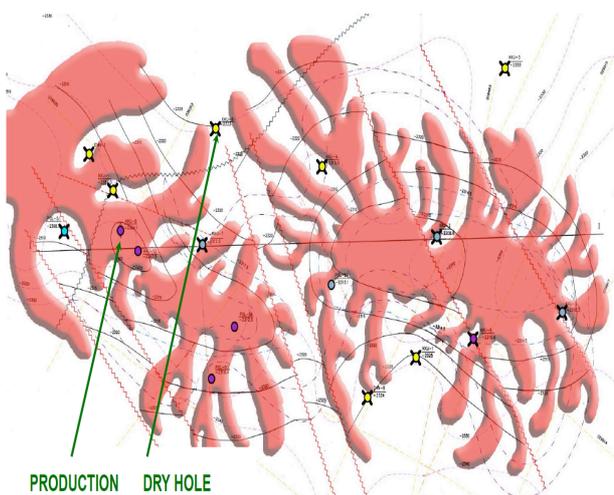


## TERT Technology Suite

### Technology Features & Applications

- ▶ **STeP®** - satellite-based and analytical technology that uses four integrated approaches to quickly, non-invasively, and environmentally safely assess resource hydrocarbon structures or m contours, depth of reservoir or deposit, both on or offshore
- ▶ **NAGS** - informative geochemical survey that uses a proven gas-flux model to delineate mineralization contours. Applicable in prospecting for oil & gas, gold, diamonds, copper, uranium, etc.; confirms STeP
- ▶ **SVSL** – micro-seismic method that defines zones of open fracturing, yielding significantly higher hydrocarbon production rates; processes 2D & 3D seismic data
- ▶ **SLEC** – passive seismic method that uses Earth's natural seismic emissions to identify oil and water saturated formations and determine reservoir dynamics

### Paleo Reconstruction

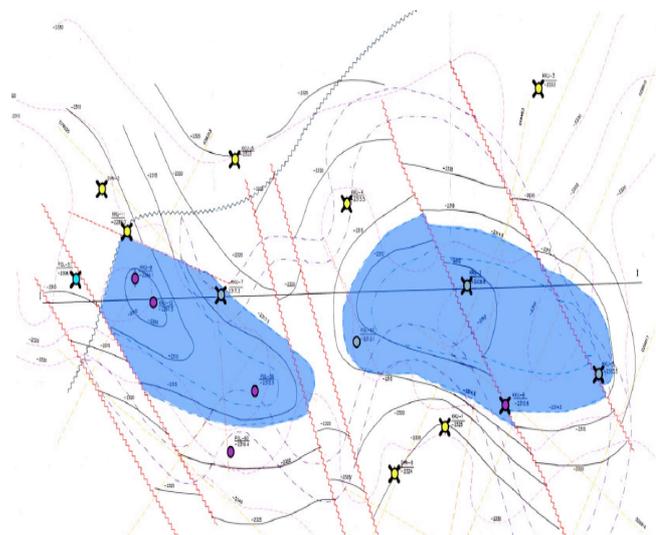


Oil & Gas  
Map  
created by TERT

Oil & Gas  
Geological Map  
created by the  
Customer

Paleo-reconstructed maps are more informative than conventional isopach/geological maps, which do not contain information about the deposit.

Paleochannel maps deliver a deeper understanding of regional and local geology, genetically connecting existing/known deposits to areas of interest, even if subsurface data is not available.



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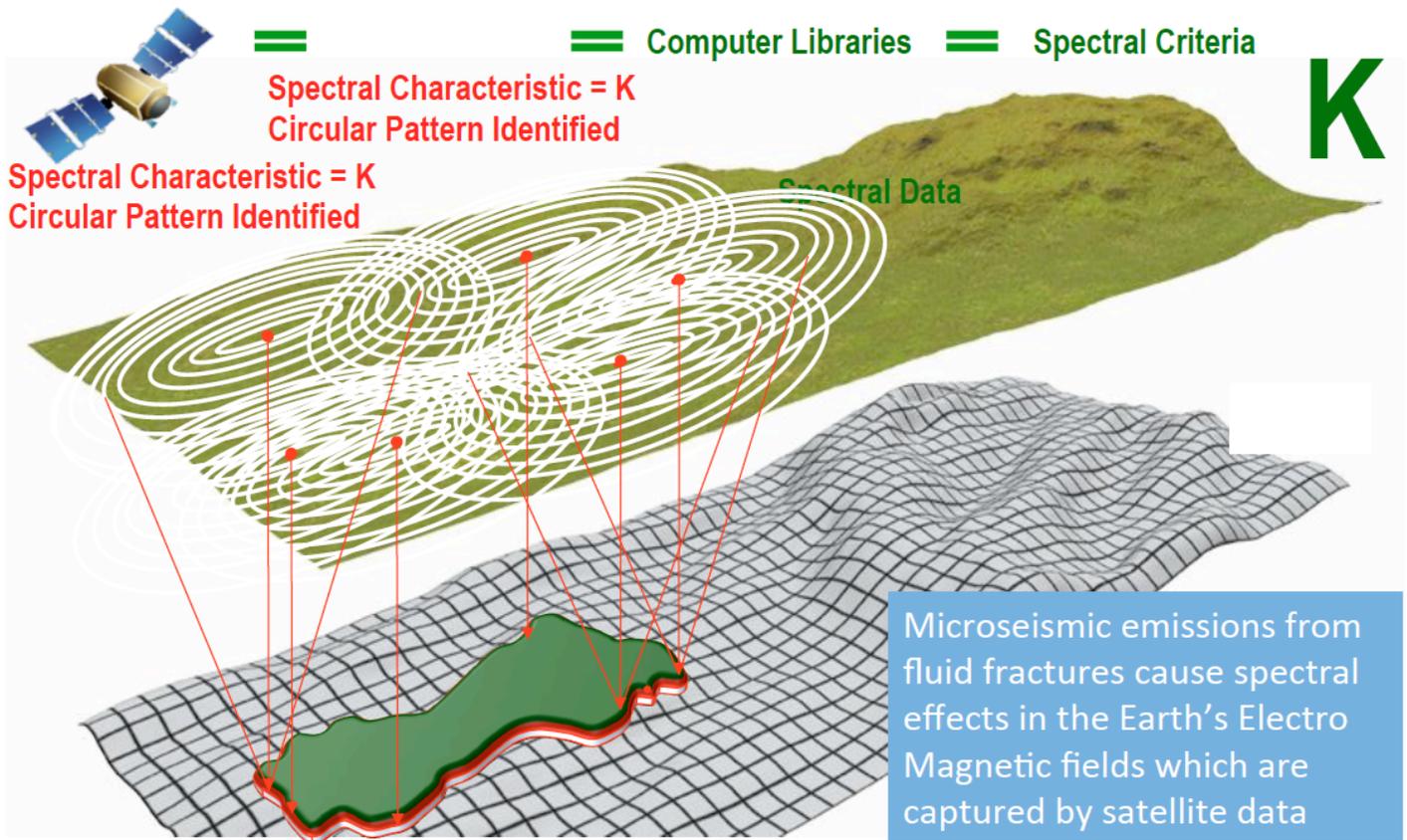
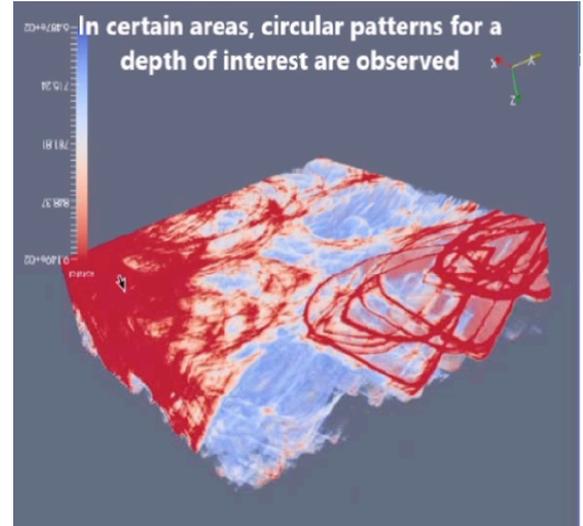


## Proprietary Spectrometric Analysis (PSA)

Dispersed natural acoustic waves, if projected on the day surface for a sufficiently long time, form a large number of surficial circular anomalies, which given sufficiently advanced and sensitive algorithms, that can be extracted from satellite imagery.

The same principle works on water surfaces. However, higher resolution imagery and further processing is required to register them.

Every particle in the subsurface vibrates (amplitude of several microns) under the influence of energy coming from the Earth's core (including microseismic radiation which is well known in general geology) and in turn emits secondary low-power energy, (apparently acoustic), propagating upward to the surface in the form of a 72° cone.



**The Earth's Passive/Natural Acoustic Emissions (seismic waves) is doing what our Manmade Seismic Equipment tries to do.**

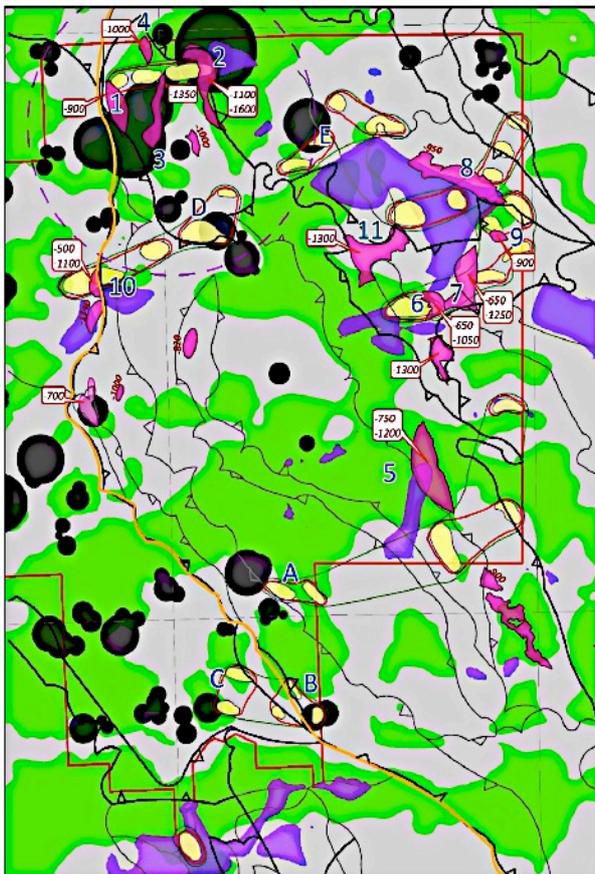
# TERRA ENERGY & RESOURCE TECHNOLOGIES (TERT)



## STeP® - A Suite of Independent Remote Exploration Methods

- Geodynamic analysis
- Geomorphological studies
- Conventional remote sensing
- Paleo-reconstruction
- Morphometry
- Structuremetric analysis
- Geoinformatics - artificial neural nets
- Proprietary spectrometric analysis
  
- Sophisticated data mining techniques and algorithms
  - Neural nets
  - Pattern recognition and fuzzy logic
  - Fourier analysis

### That produces Independent Results



- STeP Anomalies**
- Local Areas of Interest
- ➔ Areas of positive superposition of several methods
- SMA Structuremetric Analysis**
- ~ Stress fields and faults of various ranks
- ~ Probable rift zone border
- ~ Potential HC structures
- Hypocenter
- CLASS Geoinformatics, Artificial Neural Nets**
- ~ Areas of HC prospectivity
- MMA Morphometric Analysis**
- Anticlines of various levels
  - Anticlines corresponding to Base Level 2
  - Anticlines corresponding to Base Level 3
  - Anticlines corresponding to Base Level 4
  - Anticlines corresponding to Base Level 5
- ~ Positive/uplift of relief at Base Level 4 as compared to Base Level 5
- ~ Anticlines obtained via Residual and Etched relief maps that positively superimpose
- SPECTRO Proprietary Spectrometric Anomalies**
- ~ SPECTRO Anomalies
- ~ SPECTRO Anomalies

# TERRA ENERGY & RESOURCE TECHNOLOGIES (TERT)



## List of Services

Service	Space Prospecting	Surface Prospecting	Open Fracturing Analysis of 2D & 3D Seismic Data	Subsurface Fluid Saturation and Dynamics
<b>Nature of Service</b>	Satellite Data Acquisition and Analysis	Geochemical Analysis	2D & 3D Seismic re-interpolation	Passive Seismic data collection and processing
<b>Technology Applied</b>	<b>STeP®</b> Sub Terrain Prospecting	<b>NAGS</b> Naturally Absorbed Gas Survey	<b>SVSL</b> Side View Seismic Locator	<b>SLEC</b> Seismic Locator of Emission Centers
<b>Resources</b>	Hydrocarbons, Geothermal, Polymetals, Uranium, Kimberlites, Water etc.	Hydrocarbons, Polymetals, Uranium, Kimberlites, Water etc.	Hydrocarbons, Geothermal	Hydrocarbons, Water
<b>Value Proposition</b>	Predictive qualification of presence of resource	Assessment of Resource presence	Address issues of reservoir quality	Presence of Hydrocarbons and water formation
	Assessment of anomalies	Assessment of anomalies and structures	Avoid dry hole	Avoid dry hole
	Coverage of small/large areas with difficult geological conditions	Confirmation of STeP anomalies	Increase debit	Best well location selection for production and injection wells
	Remote	Non-evasive	Evaluate feasibility of hydro-fracturing	Hydrofracture planning and monitoring
	Non-evasive	Environmentally Friendly	Avoid drilling complications	Waterflooding monitoring
<b>Expected Results</b>	Map(s) depicting prospective contours of structures or anomalies (map scale 1:25,000 to 1:100,000). If applicable map with cross section(s) through the structure/anomaly depicting drilling location(s), target depth(s), depth(s) of pay zones, and/or changes of major formations. Map outlining the grid for NAGS sampling.	A series of Maps depicting graphs related to the various values of gasses and related parameters. A table outlining parameters of collected sample points. Report explaining study results. If applicable, recommendations of further NAGS work.	Graphical representation of SVSL reprocessing results, side-by-side or overlaying the original seismic datagram. Interpolation results outlining most promising zones of open fracturing in connection with the targeted structures and horizons.	4D cube produced with demonstration of hydrocarbon and water zones, migration and dynamics on a pre-drilling stage or during production, frac or water flooding.
<b>Mimimun Order</b>	100 sq. Km	100 sample points	100 linear km (2D seismic) or 30 sq. km (3D seismic)	100 sq. Km

## Onshore and Offshore Exploration

**When You Need to Know Detailed Information of  
What is Beneath the Sub-Soils of the Earth's Surface or you Need  
Additional Data Sets before making the Costly Decision to Drill use  
Innovative Exploration Tools from**

**TERT will Save YOU Time, Cost and Risk**