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POTENTIAL ENERGY LLC

Executive Summary

Potential Energy LLC is a California, USA, company formed to apply the use of high-resolution magnetometers in airborne and marine environments for the industry's first commercial service/database for ***'direct-detection'*** of hydrocarbons on land and in the ocean. Identify oil & gas directly, on land and shallow ocean from aircraft and in the deep ocean from ships or fleets of robotic buoys, by virtue of the subtle magnetic effects of the gas plumes which overlie most oil deposits. With the foreknowledge of the presence of hydrocarbons, planning seismic coverage reduces cost and drilling reduces risk. Perhaps, most important, using IP-based technology, identify oil reservoirs difficult or impossible using conventional seismic (e.g., certain stratigraphic, sub-salt and drill sites for shale oil/gas). Proposed projects include the Mexican Gulf and the entire U.S. Gulf of Mexico at low cost with negotiated revenue streams from spec data bases from these and, in the future, all other major oil basins and shelf areas, globally. Seeking $5 million Series A.

Methane gas plumes in the sedimentary section overlie most oil fields, as no rock seal is perfect. The gas, in turn, acts as feedstock for bacteria that contain an organelle, called a magnetosome, used by the bacteria (and many higher forms of life) for several billion years that act as a magnetic compass for 'magnetotaxis' navigation. These organelles have as operative components, biogenic magnetite, Fe_3O_4, naturally ferrimagnetic (or greigite, Fe_3S_4) typically cubes 30 nanometers across. Once produced, the magnetite stays forever accumulating over generations of bacteria producing small magnetic anomalies seen over oil fields for years and serving as indicators of the underlying oil/gas fields.

The basis for this means of direct detecting are gas plumes which are present throughout the sedimentary formations above most (expert estimates 80%) oil and gas deposits. These plumes exhibit detectable magnetic properties for reasons explained below. Deploying aircraft over land and over the shallow offshore shelf and using newly-developed automated robotic magnetometer-deployed buoys in the ocean will produce confirming evidence about the presence of oil & gas which enables more efficient seismic coverage, lowers risk and renders—at low cost—economic value for leasing or mineral rights.

One of the most critically important breakthroughs represented by this direct detection might well be its use to confirm or locate, especially in the ocean, those oil traps such as sub-salt or stratigraphic traps of all kinds or others not yet characterized that are difficult or impossible to discern with standard seismic surveys. Another intended use will be to map 'gas chimneys' (localized plumes) reported in shale gas prospects over the areas where there are more productive "sweet spots" wells which are then drilled, saving the cost of drilling and fracking at other, less productive locations.

Moreover, surveys using airborne or robotic marine platforms are (for different reasons) far less expensive, cover greater areas and much more rapidly than seismic surveys alone. In any event, such data representing the resource itself adds very complementary data for more accurate seismic interpretation. Eventually, we expect to see these tools applied over most of the prospective global offshore regions, including the Arctic.

We confidently believe that within a few years, Potential Energy direct-detection methods over land and sea will be one of the standard tools for all exploration programs from land frontier areas, the shelf and deepwater basins.

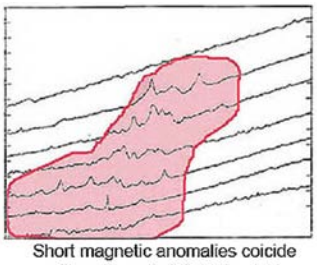
Background

In classic exploration and production programs for conventional hydrocarbons, virtually the only application of airborne or marine magnetics for petroleum for the past eighty years has been to map the underlying magnetic crystalline basement rocks. These rocks lie many thousands of feet below the surface just beneath the sedimentary rocks, that is, rocks capable of containing oil or gas. In this way, it is used as a reconnaissance tool to confirm the existence and thickness of a sedimentary basin and possible structures, conditions necessary for the presence of oil or gas.

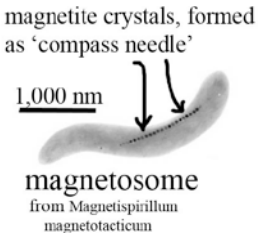
However, for more than six decades, it has been noted by geologists and by Dr. Sheldon Breiner, our co-founder, recognized as one of the world's experts in magnetics for geophysics and founder of Geometrics, that there appear to be subtle magnetic anomalies associated with oil/gas fields that originate in the shallow sedimentary section (which does not normally contain magnetic minerals) detectable to depths of about several thousand feet. (See links to magnetic anomalies over oil fields, or Google *'magnetic anomalies over oil fields*. 'Surveys for such basement mapping purposes typically would not exhibit these small anomalies: because the magnetometer was not high-resolution, flights were too high or the magnetic anomalies were too small with wave lengths too short to have originated in the basement rocks of interest. Thus, when such anomalies are, in fact, recorded, they are considered to be noise and removed.

The curiosity over the possible source of these small anomalies was partially satisfied when a correlation was noted between these magnetic anomalies and gas plumes associated with underlying oil fields. But, since hydrocarbons are not themselves magnetic, it was surmised that something else must be associated with these gas plumes, that something being bacteria.

But, the mystery remained as to what the bacteria have to do with magnetic anomalies and the abstruse connection remains generally unknown—except to very few. Dr. Breiner, investigating other applications of magnetics, leveraged what cellular biologists knew from studies on bacteria and applied this to gas plumes.


Short magnetic anomalies coicide with outline of oil field (in pink) Cement Oil field, Anadarko basin

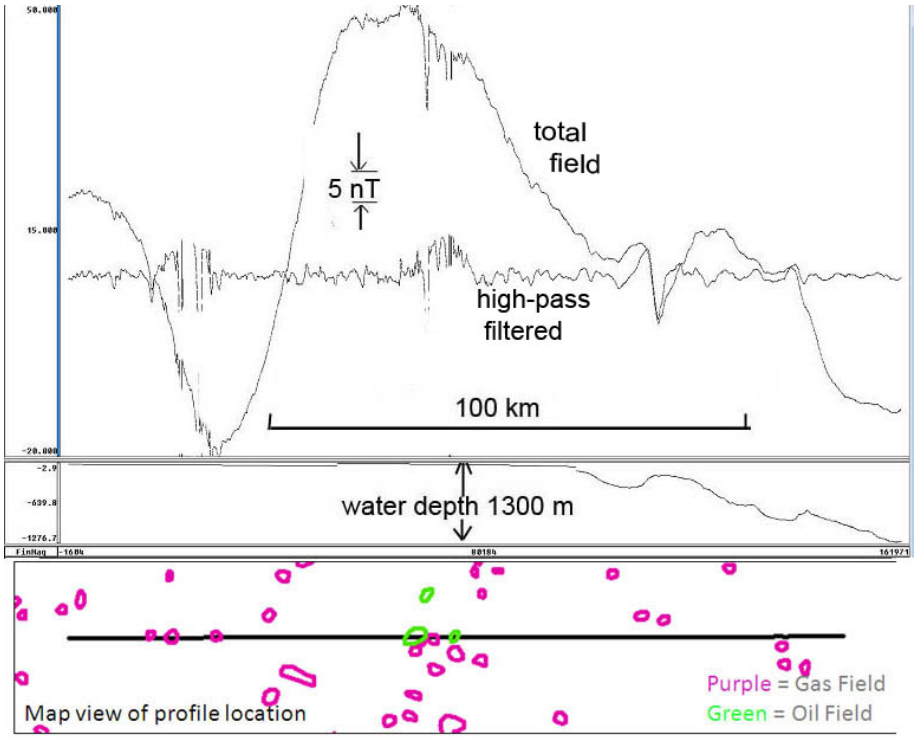
The plume, consisting mostly of methane, passes upwards from an oil & gas reservoir through microfractures in the shale caprock, as no seal is perfect, and is present all the way to the surface and often in a similar manner from tight-gas bearing shale—source of shale gas—via natural fractures. The gas, in turn, acts as feedstock for bacteria that contain an organelle, called a magnetosome (see below), used by the bacteria for several billion years that act as a magnetic compass for 'magnetotaxis' navigation. These organelles have as operative components, biogenic magnetite, Fe_3O_4, naturally ferrimagnetic (or greigite, Fe_3S_4) which are typically cubes 30 to 50 nanometers across, all not well understood until recent years. In fact, almost



no one who has ever noted these micromagnetic anomalies or anyone in the oil business today was (is) aware of ***all*** aspects of the aforementioned explanation of the source of these magnetic anomalies, many of which are necessary to successfully achieve our objectives.

The fact that we can detect such small 30-nanometer crystals (even if there are billions) is due to the constant regeneration of bacteria over millions of years, each generation leaving behind the extremely inert and durable magnetite crystals which, once formed, remain forever, thus accumulating almost indefinitely over time. Connecting the dots: oilfields → plumes over oilfields → bacteria → magnetosomes → magnetite → increase over time → detectable with magnetometers.

In the figure below are some airborne cesium magnetometer data, flown in a shallow marine area to map the magnetic crystalline basement for petroleum exploration. These data serve to express the nature of these micromagnetic anomalies. Note the two magnetic profiles, bathymetric profile over the 'shelf' extending out into the adjacent deep water, and at the bottom, a map-view of the flight line showing where the flights were with respect to developed gas and oil fields (color circles)and the resultant 'cultural' magnetic anomalies from wells and pipelines under the aircraft.



The data appears as a bimodal distribution of magnetic anomalies: long wavelength large anomalies from the basement rocks at 15 kilometers depth and small, short wavelength anomalies from the shallow sediments, the latter, derived using a high-pass filter to display only micromagnetic anomalies from the sea floor to about one or two kilometer depth. Note that the micromagnetic anomalies diminish as the water depth increases, thus confirming the origin of these micromagnetic sources as being in the sedimentary section –and, the limited distance at which they can be detected- at least by normal cesium magnetometers. Using a higher-resolution magnetometer—airborne or towed marine with noise removed—would increase somewhat their detectability resulting in a more complete set of such filtered examples and thus reveal more about their relationship to underlying oil/gas fields.

Service Strategy

Having the full knowledge of these micromagnetic anomalies over oil fields allows us to focus on how to exploit these facts for the benefit of finding oil and gas. Fortunately, however, several other recent developments—all critically necessary to achieve our objectives—have also come about in the past few years. **The timing is now perfect, therefore, to create a game-changing company in the energy space.**

Potential Energy LLC will utilize the following breakthrough technologies backed by patent pending techniques to map these magnetic anomalies for the purpose of Direct Detection of oil & gas:

1) A recently announced highest resolution ('picoTesla' cesium) magnetometer in the world and in 'chip-scale' form decreasing power by 10 for marine use, reducing cable drag
2) The most magnetically clean, carbon-fiber aircraft platform ever flown (at modest cost)
3) Satellite-connected, programmable robotic buoys for marine magnetic surveys deployed In small fleets for low-cost, effective coverage over an entire basin
4) Deployment of a magnetometer as a remote sensing *geochemical transducer*, mapping only the micromagnetic anomalies (such as show above), not the magnetic field, *per se*, exploiting two orders higher magnetic resolution than one would otherwise ever consider

We will conduct surveys as proposed supported by a geologically-supported distribution analysis and appropriate mathematical inversion-based analysis of the micromagnetic data which characterizes the geological sources of the anomalies. By doing so, we should be able to locate and assess various plume characteristics to facilitate exploration and possibly production criteria for gas/oil. We will also establish its permeable path, favorable geology, stratigraphy and certain microbial and seep factors for the oil in place, a process we term, '***Plume Analysis***.' These factors and possible seismic attributes are useful for conventional oil and gas and also for shale gas programs, the latter in desperate need of technical help (see following). Some additional characterization may be invoked to identify or confirm certain traps/reservoirs.

Shale Gas, Shale Oil (liquids)

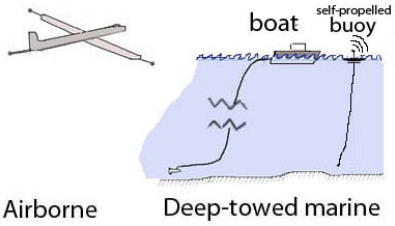
For shale gas, we will locate natural fracture zones in the shale as these zones are more optimal commercial locations for drilling and production. The search for shale gas is resulting in the fastest and most prolific growth, though still nascent, in natural gas supplies ever experienced world-wide—now in over 40 countries. It has been shown, however, that in some regions most shale gas wells are drilled at almost random locations since it is often cheaper to drill a test well than to try to confirm shale gas reserves using seismic or other exploration services. However, this results in many, or in some basins such as the Marcellus, most, wells to decline below commercial value in less than one year. There is some evidence from microbial mapping that the profitable, commercial wells are located in natural fracture zones in the shale–much more permeable than that attained via man-made fracking, alone. It is reported that such zones have a *gas chimney*–and that could be magnetically-detectable.

If that proves valid, direct-detection of such fractures with associated plumes would result in just the producing wells to be drilled enabling far better returns on investment. Also significantly less fracking will be needed–a dramatic win for the industry and for environmental detractors. And, a win for Potential Energy as it would mean mandatory coverage–everywhere–by Direct-Detection.

While it is yet to be proven, the mapping of 'gas chimneys' over both shale gas and shale oil (e.g., strongly-fractures, naturally) Monterey Shale in CA) could be a major service market world-wide, later as such shale markets develop.

Product and Services

1) airborne surveys for conventional oil and gas in frontier areas over land and shallow ('shelf') marine and for shale gas internationally, 2) marine surveys in deepwater for oil & gas, 3) Plume Analysis and interpretation and 4) spec databases from such surveys and interpretation



Airborne surveys for land-based and shallow marine areas for oil and gas will utilize low-flying, carbon-fiber aircraft with picoTesla magnetometer sensors on both wingtips configured transverse to the flight path as *independent* magnetometers for improved '3D' source mapping inversion. Such planes do not have any ferromagnetic or conducting metals in the wings that cause magnetic noise (while moving in the earth's magnetic field).

Deepwater marine surveys will be conducted in two modalities: using deep-towed magnetometers from a ship and/or fleets of remotely programmed buoys, in a proprietary fashion, to achieve the desired coverage. By utilizing these buoys in, say, 10-buoy fleets each programmed to cover a specific sub-area, we will be able to cover the entire oil-interested area of, say, the Gulf of Mexico in 24 months and do so economically at acceptable line spacing. For increased resolution, we would use one or two 'programmed' stationary WaveGlider^{tm} buoys with a reference magnetometer (in low magnetic gradient areas) and at a depth of a hundred meters to avoid the magnetic effects of sea swells). This will allow removal of the solar-induced micropulsation noise in magnetic field to yield very high net resolution of magnetic field, very useful to our objectives. From such platforms, we will obtain the highest resolution magnetic data ever achieved at sea. [By-products of such a systematic coverage over such vast areas, magnetic or other, could be archived, processed and sold to other clients, if such demand exists.] Follow-up by the client of the mapped data might be directly by seismic, or if the client chooses, by buoys at a greater line resolution or by our magnetometer-equipped ship.

Such deployment of low-cost 'robots' for magnetic surveying in the oceans would be an incredible breakthrough never before achieved in our industry— in this case, for remote mapping of indications of oil & gas deposits over vast areas of the globe.

In all cases for conventional oil & gas exploration, such data will have the maximum value when used in conjunction with the interpretation of seismic imaging results (not as critical for shale gas drill locations, as seismic does not always work for this purpose). Spec data becomes extremely valuable in the major offshore areas where drilling and production costs are very high and where direct detection 'hits' might hold the location of a 'strat' trap or sub-salt prospects. All the future giant and super giant oil fields will likely be found in such oil locales as the currently active Gulf of Mexico, offshore Brazil, offshore West and East coasts of Africa, South China Sea, West offshore Australia, North Sea and soon the Arctic.

For both airborne and marine, we shall conduct services on a multi-client basis as is the custom in this industry, or through independent financing. In either case, the resultant 'spec' database will be owned by us and sold on an on-going basis into the future. The value of the database, with its ability to reduce risk by increasing the probability of identifying oil/gas and possible indications of otherwise undetectable traps, could even be a driving strategic reason to be acquired.

Magnetics provides information which is perfectly complementary to seismic and seismic attributes in that it provides direct indications of the resource and uses the natural course by which the gaseous plume traverses the geology. While such surveys for these purposes and with this kind of knowledge and processing have not yet been performed over conventional or shale gas prospects nor analyzed as suggested for these purposes, there is ample evidence online and in references on magnetic anomalies over oil fields, gas and oil seeps over both land and offshore oil to give us confidence for these claims. Admittedly, as a new method, it will be a few years before analyses are fully developed for successful identifications of oil and gas.

[Note: Dr. Dietmar ("Deet") Schumacher and one of the industry's most experienced microbial expert for ground-based studies on micro seeps and related microbial methods for oil exploration, has confirmed several facts of critical importance to our strategies: *a) 80% of conventional oil and gas reservoirs have overlying associated gas plumes; b) productive shale gas wells are frequently associated with natural fracture zones in shale, many of which are not detectable by seismic; c) the value of some of what Dr. Schumacher does on the ground could be reproduced on a large scale through* Direct-Detection.

We expect that our methods will prove to be far more useful—even critical—for conventional oil/gas in frontier areas, deepwater offshore programs and for shale gas, a renaissance for magnetics and far different than the 'recon' objectives as has been the case for magnetics for eight decades. This technology could truly be a game-changer in our normally conservative industry. The long-term goal of Potential Energy LLC is to make Direct Detection as critical as seismic for all oil & gas and shale gas/oil exploration programs.

The Company has filed patents to cover much of the technologies.

Market Size and Competition

The upstream (exploration/production) market was about $350 billion/yr, though initiating new production has somewhat lower CAPEX budgets due to the depressed oil price. Nevertheless, driven as never before to replace reserves and develop new fields. Unfortunately, it is also more costly than ever to explore and produce new sources of oil. If only a few of the above-cited unique capabilities are demonstrated (e. g., lowering seismic costs, not drilling planned sites based upon absence of plumes, discovery of new modes of reservoirs, possible direct mapping of sub-salt deposits), Direct Detection should eventually become not only de rigueur for seismic interpretation for drilling programs but as a primary exploration tool, along with seismic.

Potential Energy will be working directly for contracting oil companies, via multi-client surveys or sales of data from our spec database of hydrocarbon evidence in all the major basins and perhaps in some frontier areas. We will also establish working relationships with the principal oil service companies such as Schlumberger, Halliburton, PGS, CGG, TGS, or others. Eventually, it might be that one or more of these companies enters this Direct-Detection market via the marine or, less

likely, airborne channels. One or more of the major aeromagnetic contractors will likewise eventually offer such airborne services. But, this market is global, regional where offered, diversified in how and what it offers and bifurcated between exploration for shale gas and for land/ocean oil, so that once we establish traction, competition will serve to legitimize more than cannibalize the nascent market. Moreover, Potential Energy will have an edge on experience, magnetics knowledge and the subtleties of how best to apply this knowledge (e.g., possibly, trade secret aspects of Plume Analysis). And, we shall patent coverage for most of the critical steps necessary to make it work.

The goal will be to capture part of the hundreds of billions of dollars spent annually on oil exploration. Our main selling points are to lower the cost of seismic coverage (2D or 3D), by "high-grading" the area under investigation to those areas with signs of hydrocarbons. And, by virtue of the same advance signs of hydrocarbons, reduce the risk in drilling. Our surveys and proprietary Plume Analysis results will also be sold as a complementary data source to seismic at a fractional addition to the cost of seismic. Our mission is to make our services and data using Direct Detection, a de facto oil and gas exploration method.

Strategy, Execution and Summary Financials

Our major goals will be met via the following milestones:

Milestone 1: Analysis of existing data, surveys over proven Oil/Gas using Plume Analysis
Milestone 2: Close & execute multi-client airborne & marine survey contracts for revenue
Milestone 3: Finalize marine survey strategy (i.e., ships, buoys)

The first milestone will be completed during the first year using existing government and commercial data and a few surveys over known oil and gas land reserves and over shallow offshore shelf. Conduct data analysis using proprietary Plume Analysis procedures applying multi-sensor inversion and several proprietary analytical tools. Flying will be via contracted aircraft and, later, buy low-cost carbon-fiber aircraft and, in either case, use high-res pico-Tesla magnetometer equipment. In 2nd year, apply the above in a airborne and ship-towed marine survey to map the Mexican Gulf of Mexico in one year as multi-client survey alone or joint venture with contractor. Also, in 2nd year, finalizing our marine survey plans and testing the first robotic buoy system.

mode of deployment	YR 1		YR 2		YR 3		YR 4		YR 5	
	cost	rev	cost	rev	cost	rev	cost	rev	cost	rev
Airborne	1.2	0	3	10	5	14	5	15	12	20
Airborne/Marine (shelf)	0	0	2	4	3	8	2	10	10	15
Ship-towed Marine	0.5	0	0.5	4	2	8	4	12	6	16
Buoy Marine	0	0	2	0	5	20	10	40	15	85
($ mil) total	1.7	0	7.5	19	15	70	21	77	43	136

With successful surveys and a reputation for these applications, Potential Energy will have the momentum to pursue our *second major goal* of expanding direct-detection around the globe, esp., in the major deepwater oil basins

SUMMARY

Potential Energy LLC was formed to exploit propriety knowledge in detection of gas plumes. To do so successfully requires critical know-how, full knowledge of the mechanisms involved in the geological and magnetic aspects of the plume, appropriate application of high-resolution instruments and robotic systems to detect and map them and algorithms for field and interpretation use. Most importantly, one needs to be able to re-think how to apply magnetics to this space.

What we hope to achieve, any one of which could make this a game-changer, can be summarized in the following bullets:

- Identify oil & gas directly, on land and in the ocean, by virtue of magnetic effects of the gas plumes which overlie most oil deposits. As correlative information with seismic, increase confidence of the presence of hydrocarbons
- Reducing cost of seismic by only doing seismic in hydrocarbon zones or 3D in such areas.
- Reducing risk & investment for drilling by high-grading drill-site locations.
- Using self-propelled, programmable buoys with deep-towed magnetometer to map petroleum deposits automatically (patents filed) in most of the world's major offshore oil basins: Gulf of Mexico, offshore Brazil, coasts of Africa & W. Australia, South China Sea, North Sea, Arctic Ocean.
- Low-cost, remote means of assessing commercial value of prospects for lease sales and offers to buy into other working areas where one oil company might know the potential better than the current owner.
- Probability of finding other types of oil-bearing structures, stratigraphic & other, on land or the ocean that does not depend upon acoustics, i.e., seismic, to define them, perhaps some that heretofore could not be identified, or possibly map, directly, sub-salt (pre-salt) deposits.
- Fly 'shelf' (i.e., <1,000' water depth) areas over all the continents for direct hydrocarbon mapping
- In the U.S. and 40 other countries with shale gas programs, identify 'sweet spots' drill locations where the good wells are located (naturally-fracked) and avoid those many locations drilled and fracked that commonly result in non-commercial wells. And, possibly, render economic, the largest single shale oil deposit in the U.S., the Monterey Shale in California

As a most exemplary step in the execution of our strategy, we intend, starting in year 3, for 12 months, to map the entire U.S. Gulf of Mexico, using a fleet of ten Direct Detection programmed, robotic buoys (or at lower cost and sooner, ship-based,deep-towed magnetometers. It will be financed (est. costs $7 mil) by investors, the resulting data to be licensed so as to earn on-going revenues for our investors.

Patents have been filed for various aspects of these methods and procedures.

The founder and starting CEO of Potential Energy, LLC, is Dr. Sheldon Breiner (link to bio). Breiner is recognized as one of the world's experts in magnetics and the founder and CEO for 14 years of Geometrics, then a major world-wide airborne geophysical contractor and still the world's leading developer and manufacturer of high-resolution magnetometers. Breiner is also the author of the widely-read *manual on magnetics*, and, a founder and CEO of a half-dozen companies, including ParaMagnetic Logging (PML), originator of 'through-casing resistivity logging' licensed to Schlumberger and Baker Hughes. We also have world-class experts and will recruit others on our Scientific Advisory Board in the specialty areas of what we're doing and experienced persons on management of survey operations ready to go upon closing of financing.

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