FREYTECH INC. EBD TECHNOLOGY FOR CRUDE OIL AND GAS WELLS

SUSTAINABLE SOLUTIONS TO INCREASE OIL PRODUCTION AND DECREASE EXPENSES

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Remediation: Air, Water and Soil

1) EBD TECHNOLOGY BENEFITS IN ONSHORE AND OFFSHORE OIL & GAS WELLS.

A) Reduction in paraffin wax and scale build up in oil tubes
B) Reduction in sulfur & hydrogen sulfide
C) Reduction in oil viscosity
D) Reduction in iron eating bacteria colonies
E) Reduction in corrosion
F) Reduction in Greenhouse Gas (GHG) Emissions and foul odors around wells.
G) Reduction in electric power consumption to run the motor pumps given less friction and lower viscosity.
H) Increases oil production.
I) Prolongs tube and oil rig equipment service life
J) Reduces emulsification caused by asphaltene in crude oil.
K) Effectively remediates oil produced water and oil wastewater.
L) Reduction in required maintenance and wastewater treatment expenditure.
M) Decreases capital investment and increases profits
N) Remediates organic and inorganic pollutants including chemicals, heavy metals & greatly benefits the environment.

2) EBD TECHNICAL SUMMARY FOR ONSHORE & OFFSHORE OIL WELLS (Short Version)

All matter on Earth contains positive and negative energy particles. Environments containing man-made chemicals and pollution such as in oil wells, contain excessive levels of negative energy particles (NEP-) and lack sufficient levels of PEP+. Excessive NEP- volumes increase oil viscosity, piping drag, iron eating bacteria colony concentrations, sludge & wax build up and are also detrimental to living organisms such as microbes. EBD units attract positive energy particles (PEP+) which are naturally present in the ecosystem. By creating an energy particle balance between NEP- and PEP+ levels, all atomic frequencies of all matter situated above, below and around the EBD perimeter surrounding the oil well facility, are naturally optimized causing all natural and indigenous microorganisms present within the EBD balanced perimeter to become much more active and much more prolific. By naturally optimizing: A) atomic excited states and frequencies in matter, B) microbial life in nature and C) physical properties of various natural elements in oil well facilities such as, but not limited to, “streaming electrification”, within the EBD perimeter, EBD systems provide the benefits enumerated above in Section 1, in an environmentally sustainable, green and affordable way without using any chemicals and without consuming any electric power.

3) OIL & GAS EXTRACTION METHODS

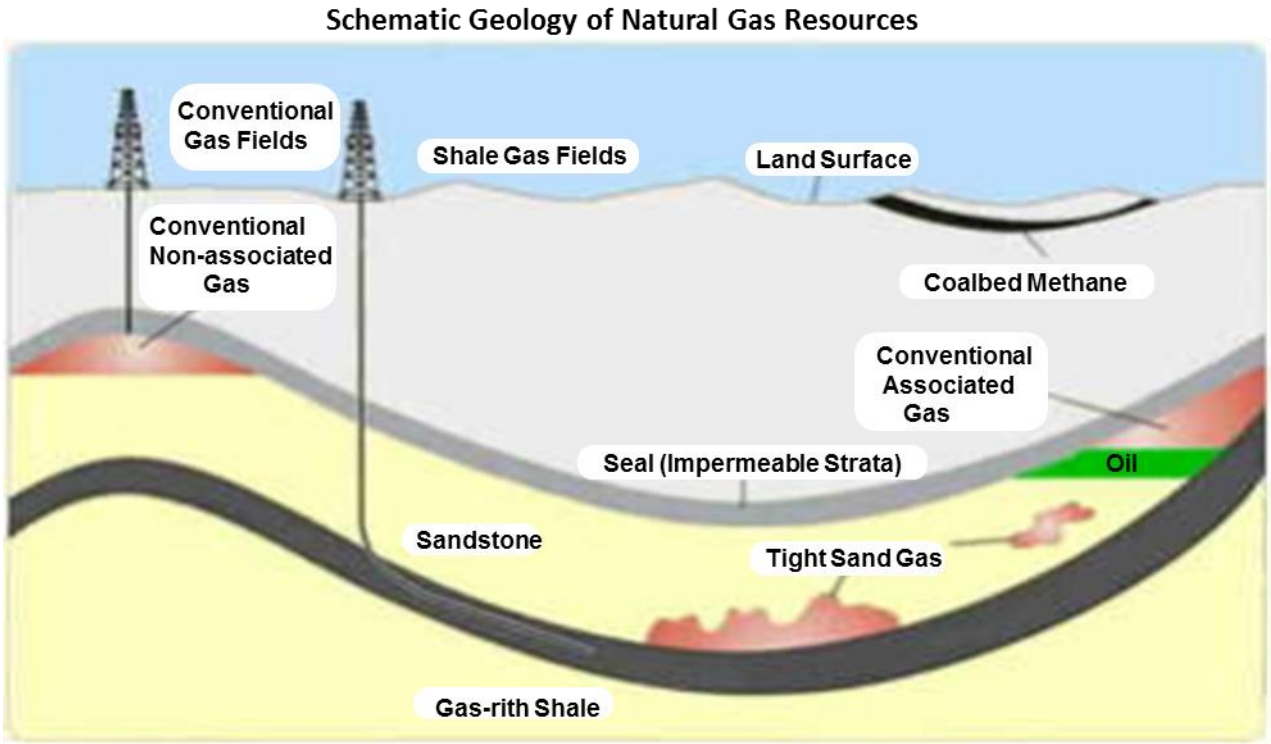
Crude oil can naturally rise to the surface as long as there is sufficient pressure in the oil reservoir. If the pressure depletes, an artificial lift method using pumps is employed. This method is known as “primary recovery”.

The energy required for the transportation and production of the reservoir fluids is provided by the expansion of gas (a gas cap) which accumulates in the upper portion of a reservoir. Approximately

40% of crude oil in the reservoir can be recovered during the primary recovery process. If no gas cap is present, the gas that dissolved in the oil, expands and provides the driving force. In that case, around 20 % of crude oil in the reservoir can be extracted through "primary recovery".

A "secondary recovery" method is employed, in order to extract the remaining crude oil from the reservoir by injecting an external fluid such as water or gas into the reservoir. The method for water injection is called "water flooding"' and the method for gas injection is called "gas injection". The general term for these methods is known as "Improved Oil Recovery". Water flooding which maintains the pressure of a reservoir, enables approximately 60% of crude oil recovery from the reservoir including the primary recovery process. Gas injection is not as effective as water flooding. Natural gas once injected into a reservoir is thereafter recovered from the reservoir as unwanted gas which is then burned off at the well site.

Oil recovery enhancement methods employ techniques which alter the original properties of the crude oil. Once ranked as a third stage of oil recovery which is carried out after the secondary recovery, the techniques employed during the enhanced oil recovery can actually be initiated at any time during the productive life of an oil reservoir. Its purpose is not only to restore the formation pressure, but also to improve oil displacement or fluid flow in the reservoir. The major types of enhanced oil recovery operations are steam flooding, carbon dioxide flooding, surfactant flooding, and miscible flooding.



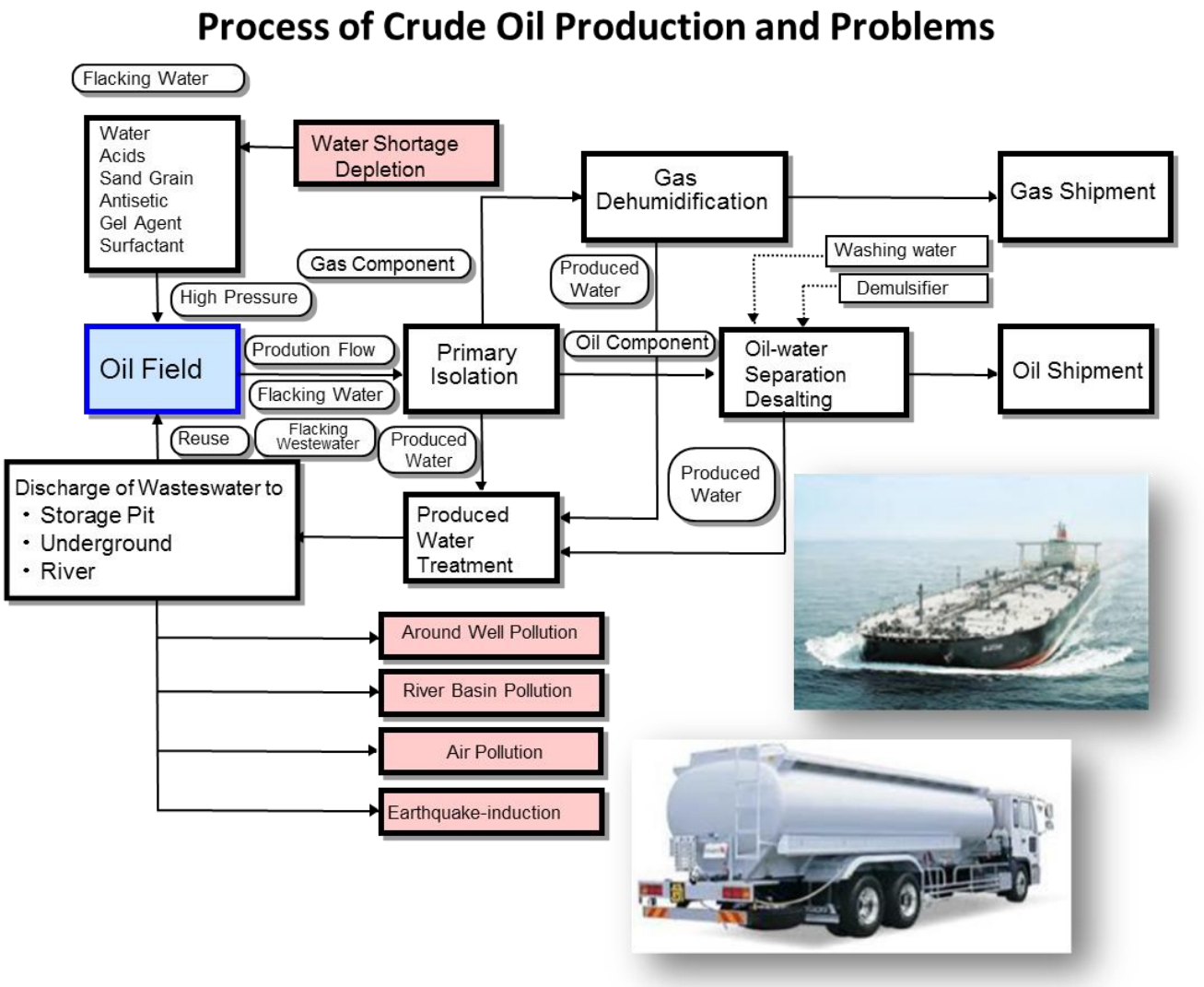
"Steam Flooding" is a method that injects steam into oil fields and heats the deposited oil to a higher temperature. The oil's viscosity decreases so that paraffin and asphaltenes that adhere to the rock's surface can be fluidized and collected together with water. There are two steam injection methods: one method that uses a steam injection well in addition to an oil production well. The other injection method uses the oil production well only and is called the 'Huff and Puff method'. Steam injection and oil recovery are carried out alternatively from one well.

Given that Carbon dioxide (CO2) dissolves easily in both water and oil, CO2 flooding is used whereby carbon dioxide dissolved in water is injected into an oil reservoir to increase oil output. When CO2 is injected in an oil reservoir, the volume of oil is expanded and thus oil recovery can be carried out smoothly. CO2 can be reused after oil recovery is accomplished and separated from the recovered oil.

Dissolved surfactant (detergent) water is injected in the reservoir to alter the surface tension between the water and the oil causing the oil mobilizing. This method is effective for shallow reservoirs but in deeper reservoirs, the higher temperatures decompose the surfactants (detergents).

Miscible flooding is commonly used in enhanced oil recovery. The method employs miscible gases such as butane and propane which are injected into the oil reservoir causing the oil to mobilize. It theoretically displaces and recovers 100% of the oil. Such miscible gases are expensive however. This method is used however, when the oil reservoir contains no more oil leakage or water to once again collect the injected gases after the recovery.

Fire flooding is a method which injects air and ignites a fire in the reservoir to heat the oil. It can enhance the mobilization of the oil by reducing oil viscosity. The amount of injected air can be controlled, so that it will not burn the entire reservoir.



4) PROBLEMS CAUSED BY CRUDE OIL WELL EXTRACTION PROCESSES

Problem 1: Ground water contamination can occur by using chemicals (lubricants, polymers, and radioactive substances) and/or methane gas (natural gas) during the excavation processes.

Through trial and error, the components of the chemicals used, have been gradually increasing over time to facilitate and increase oil and gas extraction. The types of chemicals used however, are often proprietary information and is not disclosed. Conducting effective environmental impact assessments is thus more complicated.

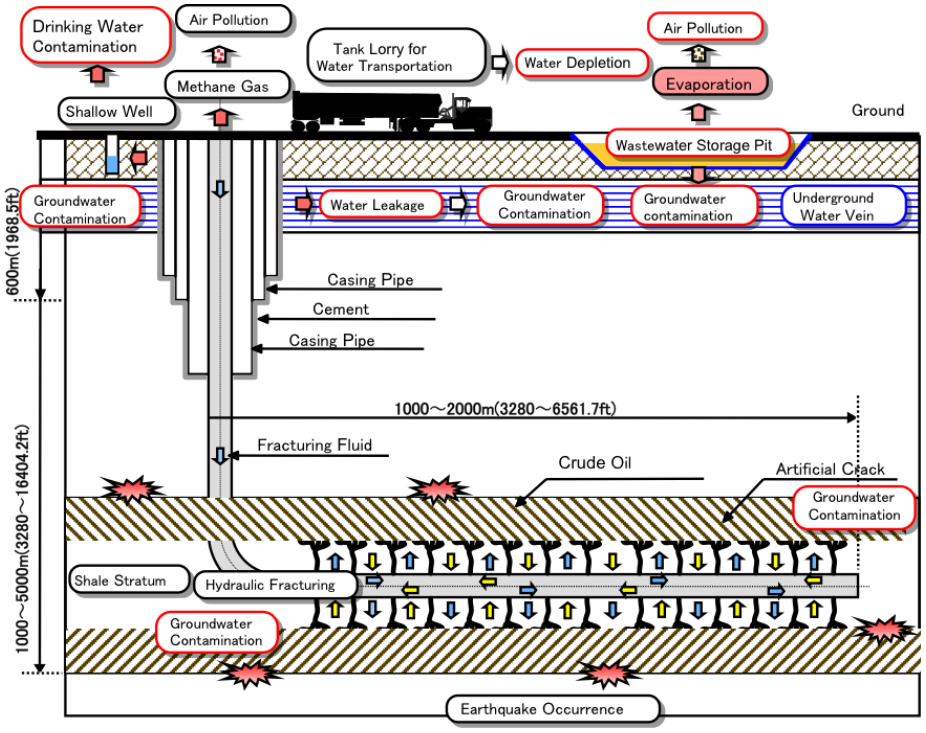
Problem 2: Methane Gas Emissions from Oil Wells into the Atmosphere Cause Public Health Concerns, Explosions and Global Warming.

Given that gas injected into the well as well the gas gas originating in the oil field itself, contain volatile components, they can and do sometimes ignite and explode thus impeding progress in the oil and gas extraction process.

Methane gas generated from the oil reservoir is incinerated. However, methane gas flare can be a source of energy and various uses have been considered. Hydrogen sulfide content in the gas however is a corrosive component which leads to increased maintenance fees for the transportation pipelines and gas liquefaction plants. In addition, global warming is a concern since it generates carbon dioxide during the liquefaction process.

Problem 3: Comprehensive Environmental Risks for Global Warming

The following factors have led to increased environmental risks: 1) Methane gas emissions, 2) Destruction of the natural ecosystem caused by crude oil and gas extraction processes, and 3) The increased use of inexpensive natural gas.



Problem 4: The Use of Massive Amounts of Water and Water Depletion Risk in the Areas of Crude Oil Excavations

Fracturing fluid which uses a large amount of water and chemicals is injected into crude oil wells. A portion of the fracturing fluid which is transported into the temporally drilled pits, is reused or discharged underground or into rivers after it is treated.

Problem 5: Risk of Earthquakes through the Fracturing Operation and/or Injection of Fracturing Fluid and Wastewater

Hydraulic fracturing sometimes causes induced seismicity or earthquakes. Earthquakes can be triggered when fluid is injected into the deep wells for gas excavation and/or when fracturing waste fluid (wastewater) is injected into the wellbores.

5. EBD Technology Summary for Onshore and Offshore Oil Wells (Full Version)

EBD Technology is based on the presence of certain concentrations of ultra-elementary particles in the air/atmosphere (+) and in the earth's crust (-). It is well known that the conducting and rotating metals present at the core of our planet earth emit negative energy particles upwards which create the force field around our planet and contains our atmosphere on Earth. For purposes of this summary, we term this (-) charged emission as "the forces pushing upwards". It is also well established, that positive energy particles from the stratosphere are emitted down towards the surface of the planet. For purposes of this summary, we term this (+) charged emission as "the forces pushing downwards".

We hypothetically name the ultra-elementary particles which are present in the atmosphere as "Concentration of Positive Particles (**CPPs+**)" and the ultra-elementary particles which are present in the earth's crust (core), as the "Concentration of Negative Particles (**CNPs+**)".

The CPPs (+) in the atmosphere are ***the forces pushing downwards*** and the CNPs (-) in the earth's crust are ***the forces pushing upwards*****.** They meet and mix above the ground and at sea level on the earth and affect the global environment. In a pristine and unpolluted ecosystem, the concentration balance between the two sets of elementary particles should be equal or close to it. This basic principal can also be applied to oil, sludge, and piping materials which are composed of elementary particles and which have ***forces pushing upward (-)*** from within their molecules.
The force pushing upward (-) from the Earth's crust differs depending on the areas and depths of the crude oil excavation, along with the oil's components and properties. ***The force pushing upward (-)*** increases when the CNPs (-) from the earth's crust increase and thus the crude oil and sludge accumulates on the inner walls of the piping and plumbing in accordance with the concentration level of the CNPs (-) present from the Earth's crust.

During the crude oil transportation process, kinematic viscosity is forced towards the crude oil and streaming electrification is caused by the friction created between the inner wall surface of the piping and the stream of the crude oil. This leads to a decrease in the velocity of the crude oil and an

increase in the accumulation of sludge. Heavy and large particles which flow within the piping walls cause streaming electrification.

According to conventional thinking, crude oil viscosity rates vary depending on the properties of the crude oil in question. We opine otherwise. All crude oil excavated from below ground is replete with CNPs (-) from the Earth's crust. Crude oil viscosity rates change when it is forced out above ground where CPPs (+) is present.

Regarding the excavated crude oil molecules in the oil pipelines, the force pushing upward (-) from within the molecules is higher than the force pushing downward (+) to the surface of the molecules. The concentration balance between the two sets of forces (+) (-), greatly affects the viscosity rate in the crude oil. In addition, when the crude oil molecules contact CPPs (+), it causes streaming electrification since the crude oil was previously buried with CNPs (-) present in the Earth's crust.

Sludge is composed of wax, water, asphaltene, earth, sand, iron and rust and these components have higher densities than those of crude oil. That is to say, they are composed of a higher concentration of negative particles (-) which have a greater force pushing upward (-) than that of the crude oil. This is a reason why they convert and form sludge.

Piping materials are made of minerals which are extracted from the Earth's crust. They are composed of a high concentration of negative particles (-) which have a force pushing upward (-). This facilitates contact with the Reactive Oxygen Species (ROS) surrounding the crude oil and piping materials and also increases piping and plumbing equipment deterioration (wear and tear).

By installing the appropriate type and number of EBD units in and around the oil well, high oil viscosity and sludge accumulation caused by streaming electrification and changes in the rate of viscosity will be reduced. The degree of friction present in the oil pipeline will also vary according to the molecular differences present in the individual properties of the crude oil. This is due to the fluctuating flow direction of the crude oil molecules not being in parallel with the same direction as the oil liquid flow being exerted by the oil pump.

By producing a balanced state using the EBD systems, the frequency of the crude oil molecules will be excited by the concentration balance between the force pushing downward (+) and the force pushing upward (-). Once both sets of positive and negative forces are balanced or close to becoming balanced, the molecular frequency will increase. This results in less friction being generated and oil viscosity being reduced.

By installing EBD systems and thus causing an increase in crude oil molecular frequency, the volume of sludge will be reduced. This is because the ROS which is present in and around the crude oil will not be able to easily bond with the sludge components. In addition, rust build-up caused by the combination of the metallic piping materials and ions will also be reduced. High oil viscosity and reduction in streaming electrification caused by friction will significantly decrease regardless of 1) oil well depth, 2) location of oil well, 3) hot or cold climates.

By increasing and optimizing the frequency of the crude oil and sludge molecules, crude oil will flow far less impeded and oil production will increase. In addition, sludge accumulation will be decreased, as will the incidence of rust thus significantly prolonging oil well equipment and piping service life. This is turn will also conserve electric power and CO2 emissions will be dramatically reduced during the crude oil production process.

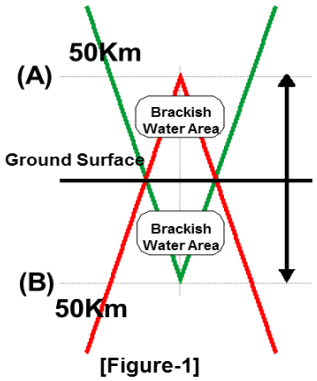
Ultra-Elementary Particles in Balanced Environments

EBD technology has been developed based on the existence of ultra-elementary particles present between the Earth's atmosphere and the Earth's crust and they do not cause any electromagnetic interaction.

To better illustrate the "Concentration of Positive Particles (CPPs+)", regard it for a moment if you will, as if it were "fresh water" flowing down stream and regard the "Concentration of Negative Particles (-) (CNPs+)" as if it were "sea water" flowing upstream with both types of water mixing/ permeating together (see Figure 1, Areas A & B) in the illustration to the right herein. Within the 100-km area between areas A & B, both CPPs (+) and CNPs (-) are mixing to form "brackish water" as it were.

When both the CPPs (+) and CNPs (-) are equally mixed, it is known as a "Balanced Environment". This situation resembles the osmotic pressure (the Van't Hoff's law) and under the balanced environment, entropy energy is very high. Our planet exists metaphorically in a "brackish water area". All life, matter, and phenomenon on Earth are affected by both the CPPs (+) and CNPs (-).

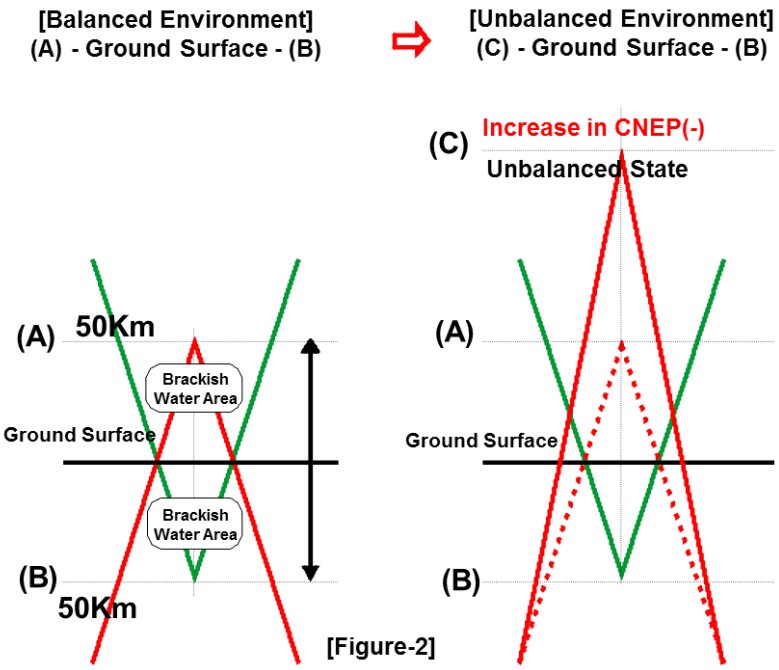
[Balanced Environment]
(A) - Ground Surface - (B)



[Figure-1]

6) CREATION OF IMBALANCED ENVIRONMENTS

To date, mankind has achieved remarkable progress but such advancement has also created a number of problems such as overpopulation, resource depletion, environmental contamination, use of vast quantities of chemicals which all together, have led to an alarming increase in CNPs (-) concentrations. See Figure 2 below. CNPs (-) concentrations emanating from the Earth's crust have increased and reached/exceeded over 50 km upwards into the airspace (Figure 2, Line C). When either concentration of particles (+ or -) increases, entropy energy decreases and under such an imbalanced environment, atoms enter an unstable state. This unstable situation where the concentration between positive (+) and negative (-) particles is not equal is called an "Imbalanced Environment". Under an imbalanced environment, all atoms which compose all substances are negatively impacted. Normally, paired electrons which rotate on the outermost orbit of an atom's nucleus are in stable form. In an imbalanced environment however, where the CNPs (-) increase, this results in an electron spinning off from the outermost orbit of the atom's nucleus due to ultraviolet rays, electromagnetic waves, chemicals, acid rain, and/or high temperature (global warming).



[Figure-2]

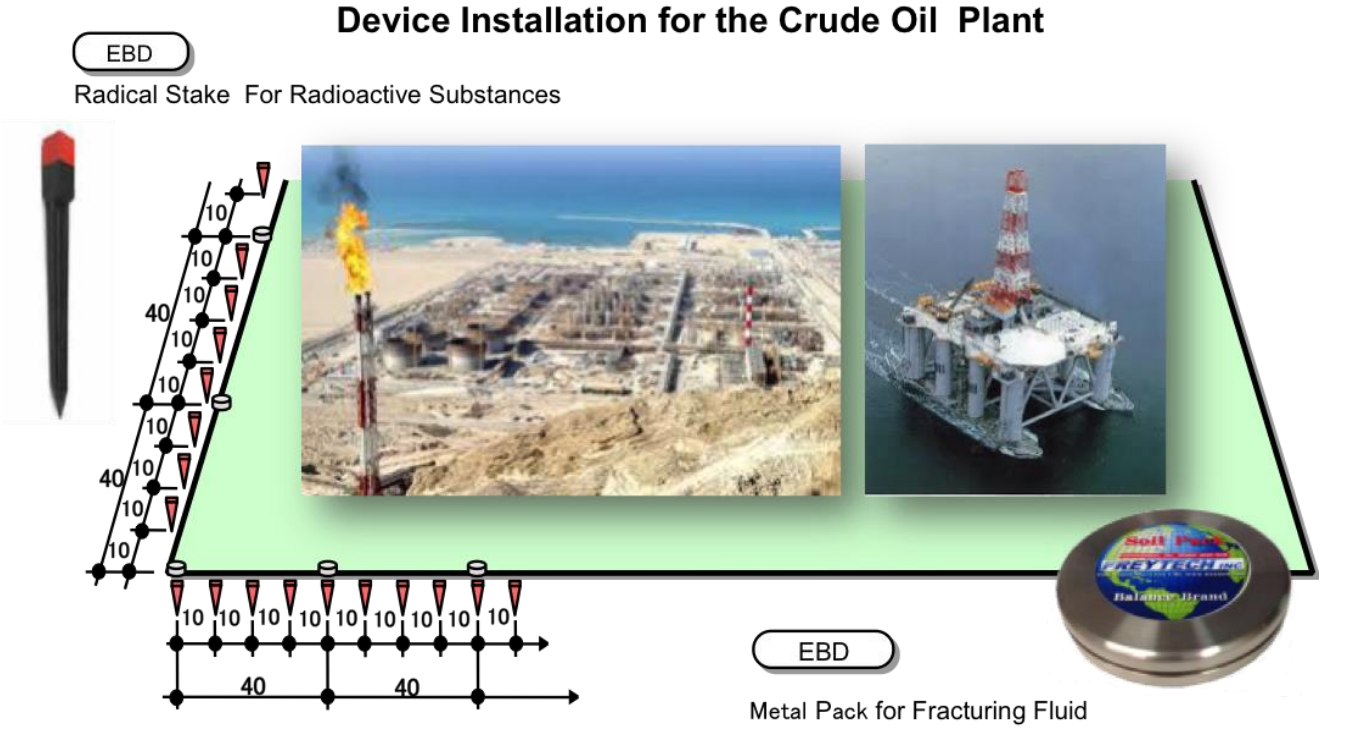
A single electron state on the outermost orbit is known as an 'unpaired electron' and is also called a 'free radical'. A free radical tries to stabilize itself by taking one electron away from other atoms. This is called a "radical chain reaction" through highly activated strong atoms. The presence of free radicals, including super oxidant and hydroxyl radicals in the Reactive Oxygen Species (ROS) results in significant decrease in nature's natural purification processes.

Areas of the crude oil rock layer where crude oil is located, contain high concentrations of negative elementary particles (-). With hydraulic fracturing technology, fracturing fluid, which contains acids, sand grains, antiseptic agents, gel agents, and surfactants, is injected under high pressure into the crude oil well which contains a high concentration of negative elementary particles (-). Chemical substances, which are added into the fracturing fluid, also contain high concentrations of negative elementary particles (CNPs-). Both the crude oil and the fracturing fluid are composed of CNPs (-) and they are attracted to each other forming strong bonds**.** This becomes a significant obstacle in separating gases and fluids and in addition, CNPs (-) causes sludge accumulation in the wellbore and pipeline. Hydraulic fracturing creates cracks in deep-rock formations through hydraulically pressurized fluid injection which is also a factor in the increase of the CNPs (-). Earthquakes occur when the concentration balance between the negative and positive ultra-elementary particles becomes extremely imbalanced. Hydraulic fracturing operations have led to an increase in artificially imbalanced states.

7) ESTABLISHING THE NECESSARY CPPS (+) & CNPS (-) BALANCE AT OIL & GAS FIELD FACILITES: EBD SYSTEMS FOR OIL WELL AREA

EBD Radical Stakes need to be buried underground, around the perimeter of each oil well, in order to restore the balance between the positive (+) and negative (-) particle concentrations present within said perimeter. Bury one EBD Radical Stakes at 45 cm in depth in each of the 4 corners of the oil well perimeter as well as one EBD Radical Stake at each 10-meter equidistant interval in between each of

the 4 corners of the perimeter. The concentration balance between the air space (+) and the earth (-), will be restored and maintained usually within one year. The EBD Radical Stake units restore the balance in all matter located within the perimeter up to100 km above ground and down to 100 km below ground. That is to say, the concentration balance of the areas where the crude oil is located 1000m ~ 5000m below ground, will be sufficiently recovered. EBD Radical Stakes also counter the effects of the radioactive substances contained in the fracturing fluid and in below ground layers.



When the two sets of ultra-elementary particles become equal or get close to becoming equal, the composition of minerals which make up the shale rock layer will change. That is to say, the direction of the crude oil molecules will become unified and will flow smoothly in the same parallel position as that of the pumped oil flow and this greatly facilitates fluid transportation.

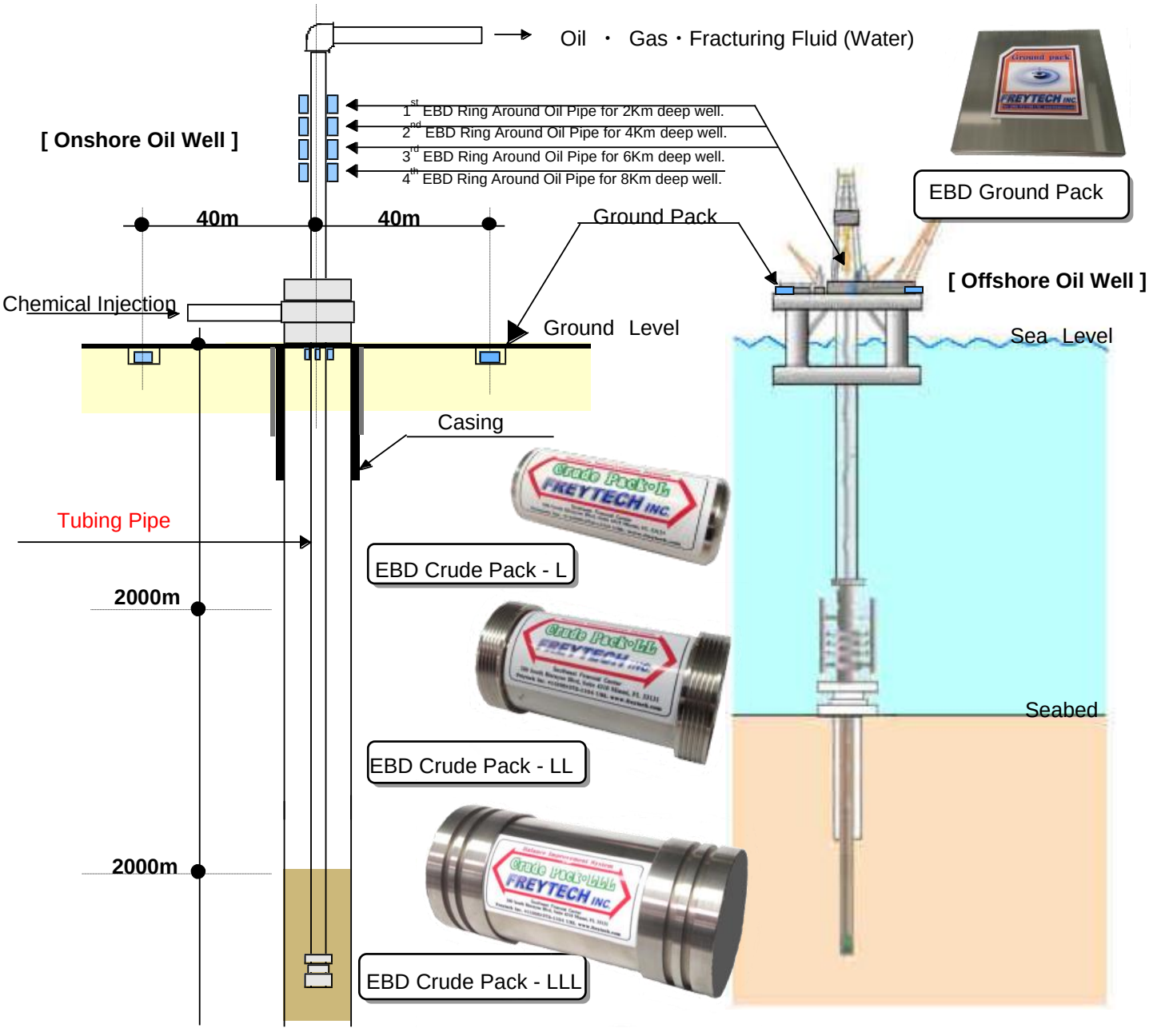
As already mentioned in the above segment, hydraulically pressurized liquid is composed of water, sand grains, and chemicals (fracturing fluid) and it is injected into the crude oil reservoir. Large amounts of these chemicals, remain in the underground layer however, and not only cause soil and ground water contamination, but also increase CNPs (-) concentrations which limits oil production at the well. Therefore, an additional type of EBD system needs to be buried around the perimeter of the oil filed and/or refinery. **EBD Metal Packs** are for soil remediation and will remediate chemical substances such as acids, antiseptic agents, gel agents, and surfactants, along with the heavy metals present in the soil. EBD Metal Packs are effective regardless of the size of the perimeter and regardless of the underground depth of the pollutants. Bury one EBD Metal Pack at 45 cm in depth in each of the 4 corners of the oil field and/or refinery perimeter as well as one EBD Metal Pack at each 40-meter equidistant interval in between each of the 4 corners. The concentration balance between the air space (+) and the earth (-), will be restored and maintained within one year or less.

The EBD Systems working in unison, produce an environment where indigenous microorganisms can decompose the chemical substances and the heavy metals. Even in the case of radioactive substances, extremophiles (a type of microbe) present in nature, can decompose them but only in those ecosystems balanced by EBD Systems.

8) EBD SYSTEMS FOR EACH INDIVIDUAL OIL WELL

A) Regarding the EBD Systems required for fluids (liquids, solids, and gases), **EBD Crude Packs** will also be required to achieve the required energy particle balance. They should be installed vertically (in series) in ring formation at equidistant spacing around the oil pipe. If the well is less than 2,000 m in depth, then only one set of EBD Crude Packs is required to be attached above ground to the outer surface of the vertical line of the oil well casing. The number and type of EBD Crude Packs required at each oil well, are calculated according to the diameter of the oil tube inside the casing. If the distance of the wellbore pipe is 4,000m, a double set of EBD Crude Packs need to be installed along the vertical line of the casing. If the distance is 6,000m, a triple set of EBD Crude Packs will be required and finally, if the distance is 8,000m, four sets of EBD Crude Pack systems will be required. Please see following diagram below.

EBD Installation Diagrams
Onshore & Offshore Platforms



B) EBD Crude Pack Selection According to Oil Pipe Diameter and Fluid Temperature

Oil Pipe Diameter in mm	Oil Pipe Diameter in Inches	Number and Type of EBD Crude Pack Units Required for Fluid Below 80℃	Number and Type of EBD Crude Pack Units Required for Fluid Above 80℃
40	1×3/4	2(L)	4(L)
50	2	2(L)	4(L)
65	2×1/2	2(L)	4(L)
80	3	3(L)	6(L)
90	3×1/2	3(L)	6(L)
100	4	4(L)	8(L)
125	5	4(L)	8(L)
150	6	5(L)	10(L)
175	7	5(L)	10(L)
200	8	6(L)	12(L)
225	9	6(L)	12(L)
250	10	7(L)	14(L)
300	12	7(L)	14(L)
350	14	8(LL)	16(LL)
400	16	9(LL)	18(LL)
450	18	10(LL)	20(LL)
500	20	12(LL)	24(LL)
600	24	14(LL)	28(LL)
700	28	18(LLL)	36(LLL)
750	30	20(LLL)	40(LLL)
800	32	22(LLL)	44(LLL)
850	34	24(LLL)	48(LLL)
900	36	26(LLL)	52(LLL)
1000	38	28(LLL)	56(LLL)
1100	40	30(LLL)	60(LLL)
1200	48	32(LLL)	64(LLL)
1350	54	34(LLL)	68(LLL)
1500	60	36(LLL)	72(LLL)
1600	64	38(LLL)	76(LLL)
1800	72	40(LLL)	80(LLL)
2000	80	42(LLL)	84(LLL)

EBD Crude Pack - L

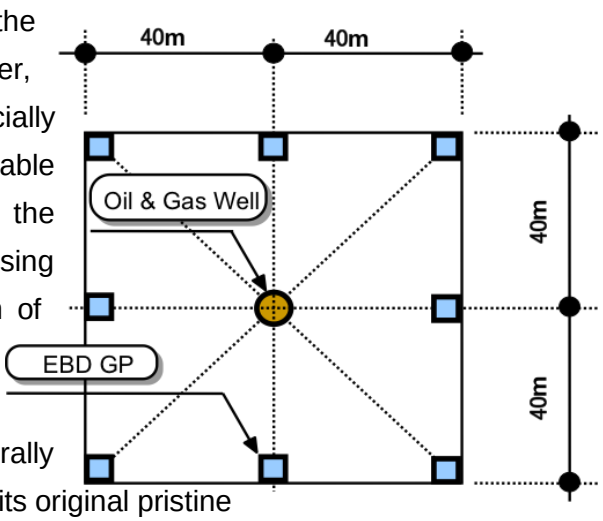
EBD Crude Pack – LL

EBD Crude Pack – LLL

C) In addition, eight (8) **EBD Ground Pack (GP)** units need to be buried at 45 cm in depth around each crude oil well. In offshore applications, place them around the perimeter of the platform. Each GP unit should be buried at a 40m distance from the oil well as shown the diagram below to the right . GP systems function to improve the balance state below ground in order to enhance smooth microbial activation.

Massive amounts of Reactive Oxygen Species (ROS) are now present in our global environment. ROS is caused by ultra-violet rays, electric magnetic waves and chemicals. As previously explained, these conditions cause electrons in oxygen atoms to spin off from their outermost orbits. ROS kills massive amounts of beneficial microorganisms present in water, soil and in nature. This dangerous

phenomenon contributes greatly to breaking the natural chain resulting in a marked decrease in the absolute amount of microorganisms present on Earth which remediate environmental contamination.



By burying the EBD Systems at 45 cm in depth around the perimeter of the oil well, all matter within said perimeter, including all the soil down to 100 km in depth will be beneficially influenced. Once a balanced state is reached, a suitable environment is created in which the unpaired electrons on the outermost orbits of oxygen atoms can recover their missing electrons. When ROS is converted back into a stable form of oxygen, indigenous microorganisms are then able to propagate exponentially. As indigenous microbial reproduction grows exponentially, contaminated soil is naturally remediated in the process and the soil condition is returned to its original pristine condition over time. Extremophiles existing in nature will be activated for this specific type of soil remediation. Extremophiles which exist in the oil produced water and in the soils below ground can only propagate under a balanced environment and they will, therefore, not propagate even if they are artificially cultivated to remediate contamination.

9) EBD SYSTEMS TO TREAT DISCHARGE WATER (OIL PRODUCED WATER & OIL WASTEWATER DERIVED FROM OIL PRODUCED WATER)

Water which is recovered together with crude oil after the hydraulic fracturing process, is separated into crude oil, methane gas, and oil produced water. This oil produced water, is commonly treated using oil-water separation, distillation, flocculation, reverse osmotic membrane filtration and porous coordination polymers. However, capital investment, consumables, and maintenance costs associated with the installation and operation of on-site wastewater facilities and infrastructure, has become a heavy burden to bear for oil companies.

In addition, there are numerous technical problems involved to effectively treat oil produced water, which contains untreatable substances such as oils, toxic substances, and heavy metals.

After primary treatment, the oil produced water is usually transported to temporary storage ponds/pits and/or tanks. After costly treatment processes, it is thereafter, injected into underground deep wells in order to permeate the contaminated wastewater around the layers of soils.

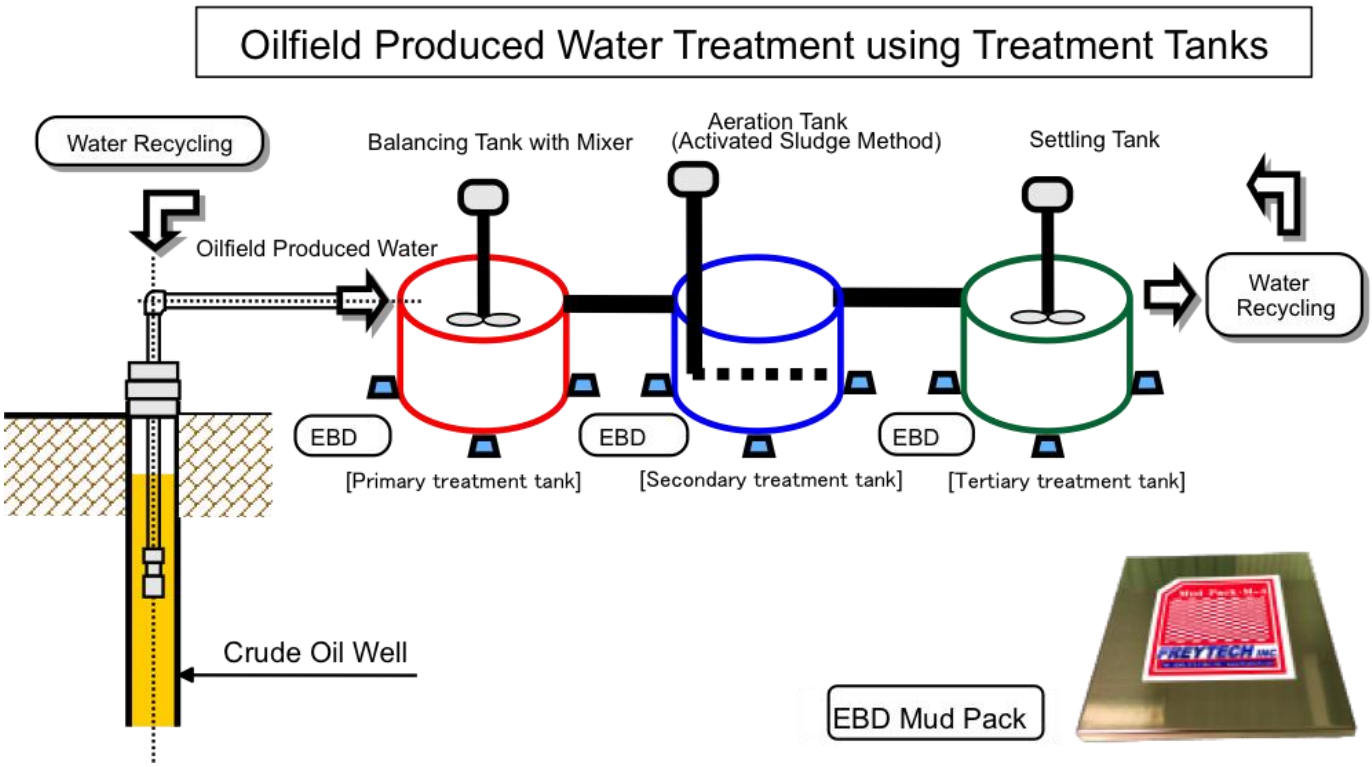
FREYTECH EBD Technology is effective in treating oil produced water and oil waste water derived from oil produced water in much more affordable and sustainable ways.

a) EBD SYSTEMS FOR WATER TREATMENT IN STORAGE TANKS

By burying **EBD Mud Pack** (Model MP3) units at 30 cm in depth, at 2 m equidistant intervals around the entire perimeter of each water treatment tank, detrimental and oxidizing Reactive Oxygen

Species (ROS) which exists in the waste water in each of the tanks, will be converted into a stable form of ROS. The amount of ROS will be significantly reduced and as a result, indigenous microorganisms will effectively replicate and decompose the contaminants after being enabled to consume a much heathier type of oxygen introduced naturally by the beneficial effects of EBD technology.

Each primary treatment tank should include a functioning mechanized mixer / stirring machine in order to accelerate EBD waste water treatment. If the waste water depth of the primary treatment tanks is below 3 m, mixers are not absolutely required but are still recommended. The EBD treatment target levels at this primary stage, are at 50% reduction in contaminants. By the time the EBD treated waste water from the primary treatment tanks flows into the secondary treatment tank, the BOD level will be between 500~1000mg/l.



The secondary treatment stage requires aerator units, which include an air intake and injection pipe in the tank together with the **EBD Mud Pack (Model MP4)** units buried underground or secured above ground, around the base of each secondary treatment tank. The number of EBD Mud Packs required, is determined according to the size of the tank(s). During the secondary process, the contaminant reduction rate will be decreased by 98%. The BOD target value will be 10~30mg/l. This part of the waste water process, normally employs activated sludge methods. However, one of the important advantages of EBD technology, is that sludge build up will be significantly reduced as compared to employing conventional waste water treatment methods. Consequently, the greatly reduced natural ecosystem and environmentally required amount of sludge will accumulate, thus making frequent and costly sludge suction processes, unnecessary.

An additional EBD System advantage is that the aerators do not need to be functioning 24 hours a day, seven days a week. EBD Mud Packs enable operators to only run their aerators only 8 hours a day,

thus providing for substantial electrical power savings. Furthermore, it is estimated that if the waste water in the secondary treatment tanks have less than 3 meters in depth, aerators are not even necessary.

For the third treatment stage, the EBD Mud Pack (Model MP4) units will also need to be installed around the tank(s). This will be the final treatment process in which the water quality will be remediated to a point in which it can be properly recycled. The EBD target value of the BOD will be 0.5 mg/l. This process also employs the activated sludge method. The contaminants, including inorganic substances, will be transmuted by enzymes which are secreted from the microorganisms already existing in the EBD treated tank area. The phenomenon of element transmutation can be confirmed using an **Electron Probe Micro Analyzer (EPMA)**. Thus, element compositions before and after the EBD system installation, can be confirmed in soil and water using at EPMA.

Producing an energy particle concentration balance between the negative (-) and positive (+) particles, is very important for the decomposition of inorganic substances in the contaminated water in the tanks. This balanced state will assist with the smooth transportation of electrons and the enhancement of the microbial energy metabolism processes. The microorganisms present in the newly balanced environment, will have the important function to decompose inorganic substances. As mentioned above, the microorganisms will secret the transmutation enzymes responsible for the decomposition of inorganic substances. This vital process, can only be activated however, in an environment where the two sets of energy particles (+ & -), are equal or close to becoming equal. Without using EBD Systems, we do not know of any other way of establishing such a balance between the energy particles.

Although the transmutation enzymes secreted by the microorganisms, contain only minute, small quantities of metal ions, they can however, absorb the CPPs (+). An increase in the CPPs (+), leads to an increase or decrease in the quantities of the protons and neutrons in atoms which form the very matter of inorganic substances.

An amplification of the CPPs (+), will occur not only in the enzymes, but also in the surrounding environment. This will also lead to an increase in the NPPs (-) from the Earth’s crust in order to produce a balanced state. As a result, entropy energy will increase in the brackish water area where the positive (+) and negative (-) particles are mixed. Entropy is very strong energy and is even stronger than the ionizing energies of "Nuclear force" (strong interaction) and "Coulomb Force", which combine with protons and neutrons in the nucleus.

Decreases in the numbers of protons and neutrons, translates into decreases in the number of their frequencies. In contrast, increases in the numbers of protons and neutrons, translates into increases in the number of their frequencies. Elements of inorganic substances, will be transmuted into different kinds of elements depending on the increase or decrease in the number of frequencies. Contrary to some schools of thought, this element transmutation function, is performed regularly in nature and has been ongoing, since life began on Earth

b) EBD SYSTEMS FOR WATER TREATMENT IN WASTEWATER PITS AND EFFLUENT WELLS

If the oil well site does not have a full-scale waste water treatment plant, oil produced water once partially treated on site is temporarily stored in pits. When the treated water storage pit is filled, the partially treated water is injected below ground into an area approximately 4000 m deep. Such injection causes excess pressure on the ground layers. As a result, the risk of earthquakes is heightened through the occurrence of crustal movements.

The treated water in the temporary storage pits evaporates through exposure to sunlight and contaminated substances are continually diffused into the atmosphere. This has a negative impact on public health for those residing nearby. This practice also contributes to global warming as the evaporated substances reach the ozone layers. EBD technology solves these problems.

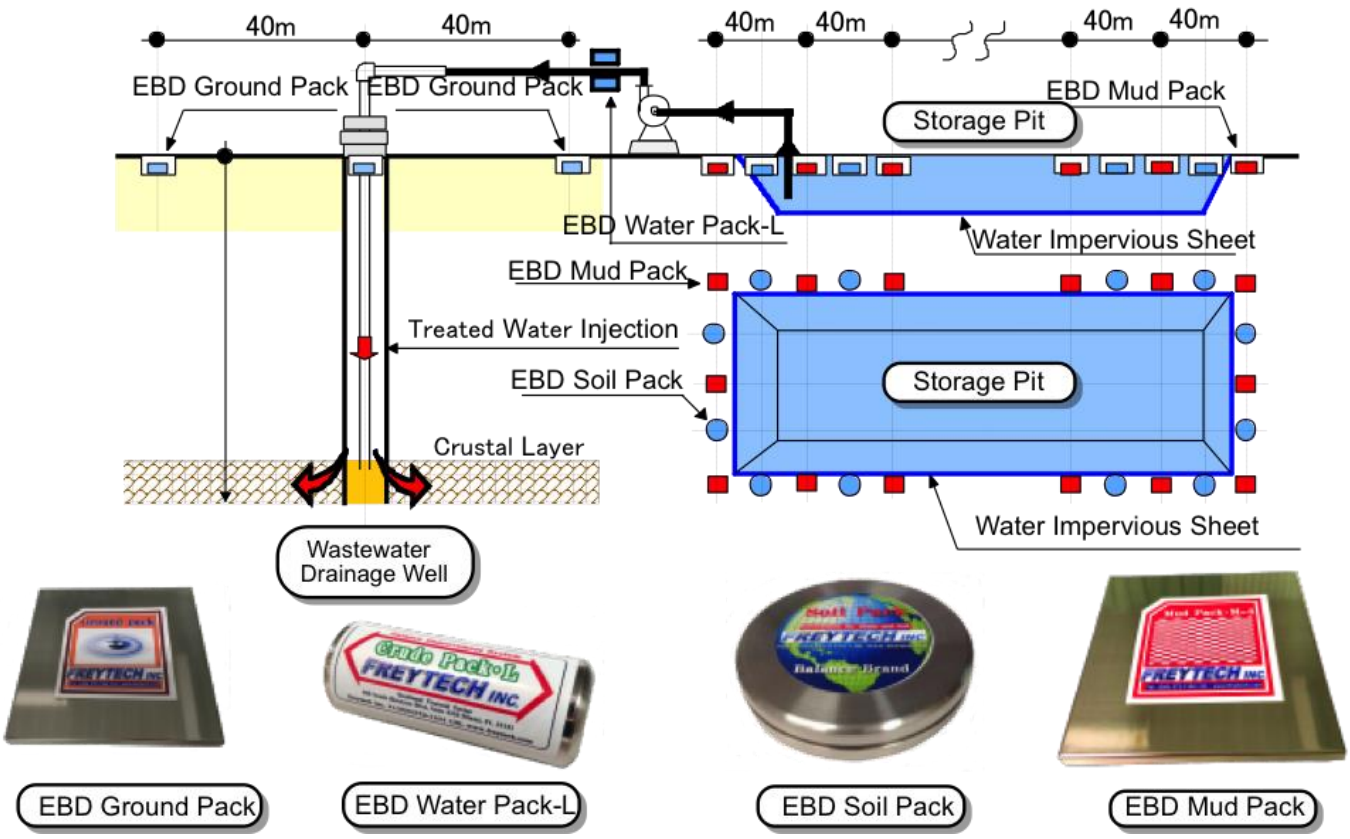
If the temporary storage pits are rectangular, **EBD Mud Packs** need to be buried at 30 cm in depth at each of the four corners of the tank and at 40 m equidistant intervals in between each corner. In addition, the **EBD Soil Packs** need to also be buried at 30 cm in depth at 20 meter equidistant intervals in between the location of each EBD Mud Pack.

Over time, the EBD systems will produce and maintain a balanced state in the pit and this will cause a marked reduction of ROS produced by the contaminated wastewater. When ROS are converted into stable forms, extremophiles which exist in nature will be significantly activated. The contaminated water in the pit will be remediated through exponential indigenous microbial propagation.

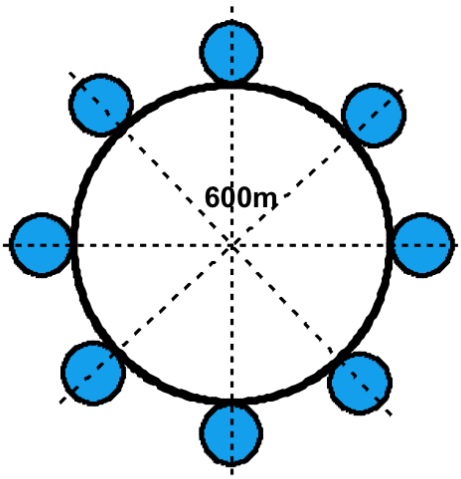
Since waste water is continually produced and flows into the treatment tanks on an ongoing basis, it will also be necessary to install **EBD Water Pack** units on the outer surface of the waste water pump discharge pipe. EBD Water Packs will produce and maintain a balanced state running from the treated water storage pit to the water injection well. The number of EBD Water Pack units required will be determined according to the diameter of waste water pump's discharge pipe diameter. In addition, **EBD Ground Pack** (GP) units will be required to be buried around the treated water injection pump. Eight (8) EBD Ground Pack units are required for each treated water injection pump. Each EBD Ground Pack, should be buried at 30 cm in depth, each at 40 m in distance to the 8 cardinal points where the pump is located. GP units will contribute towards the creation of a balanced state below ground, and this will enhance smooth microbial activation.

Producing a balanced state in the soil, is very important for maintaining the stable oxygen form for microbial activation. The stabilization of the soil quality, decreases the accumulation of contaminated substances on the inner wall of the well and it also decreases the CNPs (-) around the well. The accumulation of contaminated substances has occurred due to highly contaminated water being injected deep into the ground under very high pressure. This has also led to the lithospheric phenomenon (crustal movements). Producing a concentration balance between the negative (-) and positive (+) particles will enable the prevention of the lithospheric phenomenon.

Remediation for the Water Storage Pits and Wastewater Injection Wells



Water Pump Discharge Pipe Diameter in mm	Water Pump Discharge Pipe Diameter in inches	Number and Type of EBD Water Pack Units Required for Treated Waste Water Below 80℃	Number and Type of EBD Water Pack Units Required for Treated Waste Water Above 80℃
15 to 40	1×3/4	1	2
50	2	1	2
65	2×1/2	1	2
80	3	1	2
90	3×1/2	1	2
100	4	2	4
125	5	2	4
150	6	3	6
175	7	3	6
200	8	4	8
225	9	4	8
250	10	4	8
300	12	5	10
350	14	5	10
400	16	6	12
450	18	6	12
500	20	7	14
600	24	8	16



Note: Piping may be made out of any type of material

10) ADDITIONAL EBD SYSTEM CONSIDERATIONS

- A balanced state between the airspace and earth's crust will be produced within 6 – 12 months after EBD systems are installed.
- Indigenous microbial activation will become significant once a balanced environment in the entire area surrounding the crude oil wells, storage pits and wastewater discharge wells is produced.
- Soil analysis is recommended every two months after EBD system installation.
- The required period of EBD treatment can be calculated based on the age of the oil well facility. For example, if 10 years represents one unit of ongoing operation, three months will be required for the improvement of soil and water quality by achieving the maximum microbial propagation. Therefore, if the oil well facility is 30 years old, it will take 3 months x 3 = 9 months for the required balance to be achieved. Once the Balance is reached, microbes will begin to replicate exponentially. Allow for additional time in low precipitation areas.
- The following environmental factors greatly affect indigenous microbial activity: temperature, oxygen density, ROS density, nutritive salt concentrations, moisture levels, and pH levels.
- Active oxygen which is present in the environment of the well will begin bonding with free electrons which are also present in the surrounding atmosphere. We assume that the value of the parameters will fluctuate depending on the amount of precipitation until the soil and water quality can be improved. Long-term observation will be required.
- EBD systems are effective even with highly concentrated substances as well as multiple kinds of contaminates.
- EBD systems effectively use the existing indigenous microorganisms without adding non-indigenous bacteria. Balance Improvement technology employs an element transmutation system instead of converting hazardous substances into non-hazardous substances. The inorganic substance elements will be transmuted and vaporized.
- EBD systems are effective for onshore as well as offshore Oil & Gas applications.
- Please see additional EBD brochures for other applications such as soil remediation, oil transportation, etc.
- All materials contained in EBD units comply with OSHA 29 CFR XVII-1910.1200 Section (i). EBD systems do NOT contain hazardous components under current OSHA definitions, or EPA listing. The EBD materials do NOT contain any ingredients that are on the NPT list or registered with IARC for carcinogens and the material mixture tested as a whole has been found to be: • Nontoxic • Non-corrosive • Not an irritant • Not a sensitizer in oral, dermal and ocular tests (see US Federal Hazardous Substance Act 16 CFR 1500) Section 3. Physical & Chemical Characteristics. EBD systems do not contain any flammable materials, are explosion proof and do not cause any electromagnetic interaction.