NEW BIOSPHERE AGRICULTURE

OPEN ALL

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OPEN ALL
(Deuterium Sulfate)

... agricultural and environmental solutions
http://www.deutrel.com/openall.htm

OPEN ALL OMRI Listed

The **OPEN ALL** family of products (Listed by the Organic Materials Review Institute "OMRI" for use in production of organic food and fiber) are used for soil conditioning accomplish many things. First of all, it is an agricultural mineral concentrate specifically developed to change the condition of soil. The easiest way to understand **OPEN ALL** is to remember that **OPEN ALL** is not a fertilizer and does not contain plant food (except for needed trace minerals). But, it will take ***any*** kind of soil structure and change it; some more dramatically than others. Once the soil structure change has occurred, many other benefits are derived. **OPEN ALL** begins to open up the soil to water, air, fertilizer, and easier cultivation. It PENETRATES, PERMEATES and FLOCCULATES by molecular attraction. It begins a sequence of events that continue for years. **OPEN ALL** boosts chemical changes, physical changes, and biological changes. Most benefits are derived from a direct action, but many benefits are attributable to indirect actions. In every case, the "back to health" cycle is accelerated dramatically and the infinitely strong, natural corrective forces are accentuated.

The **OPEN ALL** treatment is absolutely essential in areas with a high pH measurement. These soils generally have a host of problems including alkali, hardpan, clay, top crust, and a build-up of chemical salts. Today, the **OPEN ALL** treatment is the only known method used to eliminate these problems, without damaging the soil or crops. Other effects include excellent percolation, improved water retention, water savings, reduction in fertilizer requirements, and the removal of salts and other contamination from the root zone.

The electro-chemical action of **OPEN ALL** is capable of dissolving hardpans, clay, and even caliche to form a granular productive soil with excellent percolation and water retention. Plant root penetration will be improved even in the hardest or most difficult soil conditions to improve nutrient utilization.

For more than 30 years **OPEN ALL** has provided soil conditioning solutions in 42 American states, as well as 15 countries and is considered ecologically and environmentally safe.

SOIL CONDITIONING

INTRODUCTION

OPEN ALL soil structure conditioner will regenerate the soil and provide a proper growing medium for all crops and ground cover. If you are able to improve soil, you are able to improve yield. Soils are complex physical, chemical, and biological entities. **OPEN ALL** works within the soil to change and enhance molecular structure. Soils that are rich in humus, minerals, and bacteria help plants to gain optimum genetic growth and development. **OPEN ALL** helps increase the development of plant proteins while improving plant vitamin synthesis. This process improves plant cell structure as well as the increasing mineral storage within the cells; fruit textures are better, flavor is enhanced, and nutritional content values are increased. **OPEN ALL** helps plant build resiliency against pests, insects and disease.

OMRI Listed

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SOIL STRUCTURE

OPEN ALL affects soil structure or groups of soil particles. Soil structure has an important influence on plant growth as it affects moisture relationships, aeration, heat transfer, and mechanical impedance of root growth. Quality seedbed preparation is related to moisture and heat transfer; two important factors in seed germination. A good porous structure is needed for infiltration of water and air exchanges between the soil and the atmosphere. This creates the ideal physical medium for plant growth while **OPEN ALL** makes the necessary structural change in soil particles as needed. The soil condition is the most important factor in growing ***any*** plant - vegetables, shrubs, lawns, flowers, and even house plants. Soil condition is more important than seed type and fertilizer! It is the basis for all plant growth. Plants grow in response to their food intake. Certain foods are obtained from air and water. Other types like nitrogen, phosphorus, potash, sulfur, calcium, iron, and magnesium are obtained from the soil. As plants grow, they deplete the soil of these life-giving foods.

WATER

The main water nutrient medium for plant roots is from capillary water. Capillary water is water stored in the capillary space forming a continuous film around soil particles. **OPEN ALL** provides soil with the proper pore size for optimum moisture holding capacity. Water performs several functions while passing through the plant; it carries and distributes mineral nutrients from the soil, and from organic materials produced in the plant, to areas needed for physical functions, growth, and storage. A plant ***transpires*** (water evaporation from its leaves) to prevent overheating from sunlight. ***Transpiration*** creates the suction causing the water and nutrients to move from the soil, into the roots, and through

the plant to replace water lost by transpiration. A very small part of the water passing through a plant remains to provide water for the living cells. This water is pressurized to give each part of the plant its shape and firmness. As water is extracted from the soil by roots, the suction required to take water from the soil increases. When the suction developed by the plant is not high enough to provide all of the water needed to pressurize the cells, the plant wilts. **OPEN ALL** ensures proper water flow and nutrient availability by increasing water retention capabilities.

SOIL TEMPERATURE

Soil temperature influences plant growth and microbial activity. **OPEN ALL** helps to ensure organic matter decomposition and various nitrogen transformations which affect soil temperature.

WATER PENETRATION

One of the most important factors affecting production is water penetration. Slow water penetration means the amount of water absorbed by the soil during an average irrigation cycle is less than required by the plant. Plants become stressed and growth is inhibited. Water tens to pond or puddle on the surface causing a lack of soil aeration. Salts accumulate on the surface as the water evaporates. This may be caused by the crusting at the soil surface, impermeable layers beneath the surface, unstable soil structure, lack of organic matter, or plate-shaped soil minerals. You can add gypsum, deep rip the soil, change irrigation practices, eliminate traffic and compaction, increase soil matter, use chemical amendments ***or*** simply apply **OPEN ALL** to correct all of these problems.

SOIL MICROORGANISMS

Soil microorganisms make an important contribution to plant growth affecting fertility. (a gram of soil may contain as many as 4 billion bacteria, 1 million fungi, 22 million actinomycetes, and 30 thousand algae) These microorganisms help to break up soils and provide aeration, assist the plant root structure to flourish, help plants to attain optimum utilization of nutrients, and improve water retention. Bacteria and enzymatic activity is essential. Organic matter also contributes to an improved physical soil condition by increasing water infiltration and storage, while aiding the aeration process. **OPEN ALL** aids in the development of the proper formation of soil environments, enabling the production of the necessary microorganisms to encourage biotic growth. Organic fertilizers are another excellent source of these microorganisms.

NITROGEN

OPEN ALL provides nitrogen fixation (nitrogen combined with hydrogen or oxygen forming ammonia or nitrate). Nitrogen compounds comprise 40-50% of the dry matter of protoplasm (the living substance of plant cells). Nitrogen does ***not*** exist in soil in a ***natural*** mineral form like other plant nutrients. Nitrogen must come from the air. **OPEN ALL** not only releases nutrients bound in the soil, but also provides aeration within the soil structure. An abundant supply of nitrogen results in dark green foliage and active vegetative growth. If soils contains the proper nitrogen content, plants become more resistant to disease, infection, and injury. If a rich, heavy carpet of grass or strong vigorous plants are desired, a generous amount of nitrogen is required. Nitrogen, in organic form, continues maintains effectiveness over a long period of time. **OPEN ALL** helps to convert nitrogen into NITRATES, phosphorous into PHOSPHATE, and sulfur into SULFATE FORMS.

SOIL pH

OPEN ALL is the key to soil pH normalization and pH is the key to enabling plants to consume fertilizers and nutrients. pH is a numerical measurement of the acidity (sour) or alkalinity (sweet) level of the soil. A pH of 7.0 is considered neutral, or a balanced condition. When the pH is at the proper level, available nourishment in the soil is unlocked, giving the plant the necessary vitality to grow, produce, multiply and resist disease. If the pH is too high or too low, the potential nourishment is locked-out and fertilizer applications are wasted. Most plants thrive when the pH soil condition ranges between 5.8 and 6.6; a shade below neutral on the acid side. **OPEN ALL** is absolutely essential in soils with high pH. These soils normally have a host of problems including alkali, hardpan, clay, top crust, and a build-up of herbicides. The most cost effective method to eliminate these problems is **OPEN ALL**. **OPEN ALL** will neutralize pH; whether it is on the alkaline or acid side. To ensure the proper pH level is maintained, the **OPEN ALL** treatment should be completed prior to adding fertilizers and nutrients.

PHOSPHORUS & POTASH

Phosphorus promotes good germination of seed, healthy seedlings, and general plant vigor. Phosphorus also accelerates the maturity of plants. **OPEN ALL** will decrease the amount of additional phosphorus needed by the soil. Potash is important for the formation and transportation of starch, sugar, and other carbohydrates within plants. **OPEN ALL** frees the locked-in nutrient within the soil structure, reducing or eliminating the need for additional potash.

MINERALS

Trace minerals (micro) are not usually found in chemical fertilizers and need to be extracted from the soil. **OPEN ALL** not only is a source of trace minerals, but also frees the trace minerals trapped within the soil structure. Roots will grow deeper and have more surface area to extract minerals from. Another excellent source of trace minerals is found in our organic fertilizers. These organic fertilizers contain over 100 elements instead of the normal 3 (N-P-K) found in most chemical fertilizers. At least 25 minerals are known to be required. These minerals must be replaced as they are used.

SOIL ORGANIC MATTER

Organic matter (humus), living plants, dead plants, and animal residues are a very active and an important part of soil. Minerals from organic matter also improve soil structure, boost fertilizer action, and provide many of the elements needed to support plant life. For maximum benefit, organic matter must be readily decomposable. Adequate oxygen is essential to this process. **OPEN ALL** creates a unique combination of pore space in the soil; small enough to hold large amounts of water. Under these conditions, oxygen, available oxygen, available water, and nutrients are more readily available to plants. Our organic fertilizers will also help to dramatically increase the organic content of soil.

SALINE & SODIC SOIL RECLAMATION

About 30,000,000 irrigated acres in the United States, and countless more internationally, have some kind of salt problem. Salted soils are rendered unproductive unless harmful salts are lessened or eliminated. Soluble soil salts are mostly sodium, calcium, magnesium, chloride, sulfate, and bicarbonate ions. Many of these salts are introduced to the soil by chemical fertilizers which attach nutrients to salt crystals as carriers! The plant removes the nutrients and leaves behind the salt, further destroying the soil. **OPEN ALL** is extremely effective in removing the salts from the root zone.

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SOIL REGENERATION

FERTILIZER AND SOIL CONDITIONERS FOR IMPROVED CROP YIELD AND WATER CONSERVATION

The soil regeneration system is a complex combination of electro-chemical, biological, nutrient, physical structure, and fluid retention treatments developed and patented by Deutrel Industries. This multi-functional system is designed to restore soil life, eliminate alkali build-up, and normalize soil pH, while providing the essential microorganisms, plant nutrients, and trace minerals as an organic, non-damaging, long term soil preservation solution.

This system utilizes a combination of products especially design to perform the correct function for improved productivity while regenerating the soil condition for improved out-put with normal care and maintenance each year. One of the most important benefits of **OPEN ALL** conditioned soil is the dramatic reduction in water usage; as much as 50% in certain soil types! The end result is an increased volume of high quality produce, in a shorter growing cycle, at a reduced cost. This creates the **OPEN ALL** competitive advantage.

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ORGANIC FERTILIZERS AND SOIL CONDITIONERS

LIQUID LEAF FERTILIZER

Liquid Leaf Fertilizer is an ***organic fertilizer*** manufactured by liquefying whole fish and fish dressing waste. Fish meal is in short supply and is very expensive, however, fish meal as a single ingredient makes the best fertilizer contribution of any single ingredient in use today. The resulting liquid hydrolysate that Deutrel industries produces has a combination of enzymes, proteins, macro and micro materials, and lipoproteins. The product provides all of the minerals present in whole fish. The heavy liquid slurry is diluted and sprayed directly onto plants, or applied through an irrigation system, or with gravity flow systems. This application may be used for accelerated green-up, fast growth, and with all plant types from the very young to the mature.

LIQUID LEAF FERTILIZER is available in 5 or 55 gallon containers and in the following compositions:
N-P-K 4-1-1
N-P-K 5-1-1
N-P-K 5-3-1

PELLET FERTILIZER

This product is prepared by blending a number of high nitrogen ***organic materials*** containing dressing waste from the animal and plant food processing industry. The preparation may be in either a powder or pellet form using only ***organic materials*** for nutrients and binders. The pellets break up quickly and easy by applying water. Cultivation or watering is recommended immediately following applications as birds and other animals consider these products as excellent food sources. The pellet fertilizer, designed for soil applications, provides an excellent supply of nutrients for plant growth, fruit, and seed production. The pellets will provide for both a short term green-up, and a long term nutrient supply due to the bacteria in the soil gradually releasing nutrients for plant utilization. Pellet nutrients not used during the year of application will be utilized during the following crop season. The micro minerals will rebuild the mineral base in soils depleted of trace mineral content from the long term use of chemical fertilizers. These pellets may be applied in the same manner, using the same equipment previously used to apply chemical fertilizers.

PELLET, GRANULE, and FLOUR FERTILIZERS are available in the following compositions:
N-P-K 5-3-1
N-P-K 7-3-1
N-P-K 10-3-1

OPEN ALL

OPEN ALL is a soil conditioner providing many unique growth benefits to vegetables, fruits, nuts, cereal grasses, and cereal grains. This product has the ability to change the electronic bonding in soil chemicals and water. **OPEN ALL** will increase the oxygen status of the soil and, as a result, will break up clay and hardpan formed from mineral or alkali contamination while eliminating any alkaline crust formed from the use of chemical fertilizers. The soil will take on a regenerated structural change accommodating deeper water penetration. Plant root penetration and water utilization increase while evaporation and run-off dramatically decrease. The electro-chemical forces in the soil changes radically after one **OPEN ALL** application. You may experience a reduction of up to 50% in water requirements. These changes result in a granular soil texture ideal for moisture penetration, moisture retention, and extended root growth. **OPEN ALL** helps plants to develop larger stalks and larger leaves, improving photosynthesis, and stimulating rapid growth. Normal results include an earlier harvest with improved volume of higher quality.

SOIL REGENERATION SYSTEM

The regeneration system includes a planned procedure using **OPEN ALL** to develop proper soil conditions, followed by the correct ***organic fertilizing solution.*** Most producers know the basic soil condition and have knowledge of the soil pH and fertility. If the pH is high, **OPEN ALL** will gradually reduce and correct the level. Since **OPEN ALL** is an acid product, some immediate effect is possible as well. However, the buffering capacity of some soils may decrease the rate of pH normalization. By design, this system combines the use of ***organic fertilizers*** (providing organic acids) and **OPEN ALL** to force the soil pH toward the neutral point.

The alkaline soil fraction will continue to be eliminated because ***organic fertilizers*** do **NOT** utilize any salts as carriers. The large number of trace minerals (over 70) present in **OPEN ALL**®, combined with the larger number of trace minerals (over 100) in our ***organic fertilizers***, will gradually rebuild the soil mineral base. These ***organic fertilizers*** provide an additional source of organic material which

leaves some residue each season. Bacteria carried in the pellet fertilizer will assist in regenerating the microbiological system of the soil, helping with the vitalization process.

- Ecologically and Environmentally safe
- Restores "Dead" and Unproductive Soils
- Eliminates "Detergent Soil" Problems
- Improves Root Growth Penetration
- Stabilizes Problem Soils
- Reduces Soil Erosion
- Improves Percolation
- Corrects pH
- Last For Years
- Eliminates Root Rot
- Aerates Compacted Soil
- Improves Moisture Retention
- Normalizes Salty and Alkaline Soil Conditions
- Improves Microbiological Activity
- Increases Organic Capacity of Most Soils
- Removes Most Toxic Soil Contamination
- Completely Changers Soil Structure
- Helps Stop Water Pollution

ORGANIC VS. CHEMICAL

A good rule-of-thumb which seems to work out accurately for most producers is: "Use one-fourth to one-half the total nitrogen per acre when using **ORGANIC FERTILIZERS** compared to the recommended equivalent of chemical fertilizers."

The gradual release by microorganisms in the soil for plant use provides a much more efficient transfer of nutrients from the fertilizer to the plant. Also, the evaporation of nutrients is eliminated and leaching is almost non-existent.

The alkaline fraction of the soil will continue to be eliminated because **ORGANIC FERTILIZERS** do ***not*** utilize salt as a carrier. The larger number of trace minerals (over 100) will gradually rebuild the soil mineral base, while chemical fertilizers utilize only 3 basic elements (N-P-K) and use salt as a carrier that is eventually left behind to further damage the soil. Additionally, ORGANIC FERTILIZERS provide a source of organic material which will leave behind an organic soil repairing residue each season.

While there are many benefits not described here, some of the key benefits of **ORGANIC FERTILIZER** use are:

- Ecologically and environmentally safe - no toxins, no pollution.
- Provides a continuous supply of organic nutrients and trace elements. (Our organic fertilizers contain over 100 elements rather than the basic 3 N-P-K. Most chemical fertilizers do not include specific trace elements to the soil that has become depleted from continuous cropping using chemical fertilizers. This method forces plants to continuously withdraw trace elements

needed for plant tissue growth without any effort to restore these nutrients into the soil. Most experts agree that plants require a host of trace elements for optimum growth.
- Provides a constant flow of amino acids and fatty acids where necessary.
- Restores the depleted vitamin and mineral content to the soil.
- Safe and easy to apply - no need for expensive protective clothing for applications.
- Eliminates environmental contamination - especially the surface water and in many areas, the underlying water table.
- Provides the necessary soil microorganisms - these organisms assist with the manufacturing of organic matter and nitrogen fixation products that are very important to plant production and health.
- Restores "dead" and unproductive soils.

Many times, the continued use of chemical fertilizers makes the soil dead and unproductive, and soil bacteria is killed. Without the presence of soil bacteria, several conditions may begin: insect infestation, and nematode. **ORGANIC FERTILIZERS** continue to improve the soil condition while increasing crop/plant productivity. Most farmers will admit when asked if their soils seem to require more and more chemical fertilizers each year to achieve the same productivity. This common occurrence for farmers using chemical products is not the case for organic farmers; due to the improved soil condition each season, less fertilizer is used to achieve the same (or better) results.

Another benefit to our **ORGANIC FERTILIZERS** is that each gallon contains a small amount of **OPEN ALL**. Although it is a necessary ingredient used during the production of our **ORGANIC FERTILIZERS**, the end result is a fertilizing product without equal.

NATURE'S BEST LIQUID ORGANIC FERTILIZER 5-1-1

DEFINITION: Liquid Organic (5-1-1) Leaf Foliar is a fish protein hydrolysate. solubilized by a special enzymatic hydrolysis process.

PHYSICAL APPEARANCE: Dark liquid

RAW MATERIAL: Fish or fish frames from filleting plant processed in fresh condition, 100% fresh protein.

PROCESSING:
Principle: Insoluble fish protein is processed into polypeptides and amino acids having a molecular weight low enough to be soluble and to react with minerals to enhance chelation.

Process: Controlled solubilization of protein conducted under well defined conditions of temperature and time, while pH maintains full utilization of all essential and non-essential amino acids. The select enzymatic hydrolysis action allows maximum availability and digestibility of the protein. After removing insoluble minerals, the remaining liquid is pasteurized and bottled.

Uses: Solubility, palatability, digestibility, and molecular weight of this product make it highly suitable for a number of uses in starter formulas, pet foods, mink feed, aquaculture, mineral supplements, industrial fermentations, and organic fertilizers to name a few.

Storage: In its original unopened container and under normal storage conditions, the product retains all of its properties for several months. As there are no sugars in this product, reactions like Maillard's

are impossible and available lysine determined by Carpenter's test remain high (95%). Proper caution should be maintained to keep product container sealed and out of direct sunlight or freezing conditions.

PACKING: 1 and 5 gallon containers

TRACE ELEMENTS:

Potassium	**133.00 ppm**
Calcium	**0.18%**
Copper	**7.00 ppm**
Iron	**125.00 ppm**
Magnesium	**270.00 ppm**
Manganese	**8.00 ppm**
Selenium	**0.18 ppm**
Sodium	**0.12%**
Sulfur	**0.01%**
Strontium	**50.00 ppm**
Zinc	**19.00 ppm**

GUARANTEED ANALYSIS:

Total Nitrogen	**5%**
Available Phosphoric Acid (P205)	**1%**
Soluble Potash (K20)	**1%**

AMINO ACIDS: Alanine, Arginine, Aspartic Acid, Cystine, Glycine, Glutamic Acid, Histidine, Isoleucine, Lysine, Methionine, Phenylalanine, Proline, Serine, Threonine, Tryptophan, Tyrosine, Valine

APS SYSTEM™ OMRI listed
AEROBIC PROTEIN STABILIZING SYSTEM

Deutrel Industries is on the leading edge of technology with the development of the **APS SYSTEM™**. The **APS SYSTEM™** is ecologically and environmentally safe, diverse and able to solve most waste management problems including animal waste (such as pig manures), municipal and industrial waste water treatment facilities that suffer from an accumulation of sludge or solids (free of heavy metals), and food processing facilities that are not capable of meeting government requirements for waste management. The **APS SYSTEM™** is able to convert waste from any of these undesirable and problematic conditions, into a usable and saleable liquid organic fertilizer or feed! The **APS SYSTEM™** is a unique process that utilizes a recently developed biotechnology to biologically convert waste material into a liquid. The resulting liquid may be formulated with other specific nutrients to form a balanced or specialized organic fertilizer or reconstituted by drying.

The **APS SYSTEM™** utilizes enzymes produced by the specialized bacterial culture as well as other biochemical, physical, and thermodynamic fundamental principals to convert waste (even with bones) into a liquid for use in a liquid organic fertilizer concentrate or feed protein hydrolysate concentrate. Heat is generated by the thermophilic bacteria to raise the temperature beyond pasteurization temperatures, therefore, all disease producing organisms are destroyed. The heat generating process is cost effective as most of the heat is provided by the biochemical activity in the reactors. Finally, the hydrolysate is sterilized to provide a completely stable product.

The final protein concentrate generated by the **APS SYSTEM™** is used as a high protein source in the liquid organic fertilizer. These products feature a number of additional benefits in addition to the excellent plant food nutrient value. Soil essentials, including enzymes, vitamins, lipoproteins, free amino acids, free fatty acids and minerals are replaced in soils that have been depleted from the use of chemical fertilizers. Another reported benefit is the reduction or elimination of most pests from both insect and animal origin.

THE FIRST APS SYSTEM IN MEXICO

Our Global Business Partners in Mexico, Millennium Terra Aqua, have recently begun full operation of the first APS System in Mexico. This APS conversion plant is ideally situated in the fish cannery section of one of the largest fishing ports, Ensenada Mexico.

PROCESS WASTE INTO VALUABLE LIQUID ORGANIC FERTILIZER

When processing waste into usable fertilizer utilizing the **APS SYSTEM™**, four very important items are addressed:

1. **PROCESSING SPEED** - The **APS SYSTEM™** will convert waste into valuable liquid organic fertilizer in one to three days
2. **ODOR REMOVAL** - The **APS SYSTEM™** will eliminate almost all odors associated with processing
3. **PATHOGENIC ORGANISM REMOVAL** - The **APS SYSTEM™** will remove ***all*** pathogenic organisms
4. **COST EFFECTIVE** - The **APS SYSTEM™** is the most cost effective waste management system today!

PROCESSING SPEED

APS SYSTEM™ configuration example: With one 6,000 gallon receiving vat as the first station, two 4,000 gallon vats as the second and third stations, a 7hp. motor, 4 mixing paddles, 3 baffles, an aeration device and a special pump; an **APS SYSTEM™** will convert approximately 3,000 gallons of waste per day into valuable liquid organic fertilizer.

ODOR REMOVAL

The **APS SYSTEM™** process is so effective with waste odor removal that the end product will be almost odor free! There will be some odor at the onset on the first stage of the process, but will gradually diminish and be virtually eliminated by the final stage of the process.

PATHOGENIC ORGANISM REMOVAL

The **APS SYSTEM™** process works several ways to remove the pathogenic organisms, while retaining the beneficial organisms for the eventual conversion to a liquid organic fertilizer. The **APS SYSTEM™** process is similar to homogenizing and pasteurization. By accelerating the bacteria growth, adding air into the system, and maintaining proper temperatures, the **APS SYSTEM™** from Deutrel Industries is the most effective waste management system available today.

COST EFFECTIVE

The **APS SYSTEM™** process requires adding a small amounts of very cost effective products from the **OPEN ALL** family, to the raw waste materials to produce valuable organic fertilizers. After the initial start up investment, the only cost incurred will be normal maintenance of the **APS SYSTEM™**, nominal wages for personnel, and modest utility costs! The **APS SYSTEM™** waste management process is the most cost effective tool found in the marketplace today.

GOLF COURSE

Managers and greens keepers alike enjoy the benefits of an **OPEN ALL** maintained golf course experiencing a water use reduction of up to 50% as well as a drastic reduction in the total fertilizer requirement while at the same time improving the appearance and quality of greens and fairways! Regenerate the soil with **OPEN ALL** soil structure and conditioner in preparation for our organic fertilizer application and experience lush greens and fairways without using damaging chemical fertilizers.

OMRI Listed

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SOIL STRUCTURE

OPEN ALL treatment improves soil structure by eliminating alkali top crust, reducing compacted heavy use areas, and reviving dead or malnourished greens. Treatment affects soil structure or groups of soil particles. Soil structure has an important influence on plant growth as it affect moisture relationships, aeration, heat transfer, and mechanical impedance of root growth. Good seedbed preparation is related to moisture and heat transfer which are important in seed germination. A good porous structure is needed for water infiltration and air exchanges between atmosphere and the soil, and microorganism activity for nutrient generation. **OPEN ALL** treatments provide solutions to all of these conditions without mechanical rupturing of the soil, even in hard compact areas. An **OPEN ALL** treatment after seedbed preparation by mechanical means will ensure continued green and fairway aeration for longer periods.

WATER

Water is a specialized universal solvent that performs multiple functions with results that cannot be provided by any other solvent media. Water carries nutrients to the plant roots by capillary action. It is necessary to maintain conditions for proper aeration for microbial and other plant and animal life in soil. Water has a pronounced effect on all environmental soil conditions. However, proper space in soil is necessary for water penetration and to maintain an active capillary state. **OPEN ALL** provides the proper conditions for water penetration and regenerates the correct spacing for increased water retention. This is the basis for both water and nutrient conservation in highly active soils where rapid growth is required for outer appearance.

NITROGEN

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INSECTICIDE ODOR REMOVAL

OPEN ALL is an excellent treatment for odors caused by insecticides and disinfectants. It will not react with or interfere with the actual insecticide ingredient and, therefore, will not change the efficacy of the insecticide. **OPEN ALL** does not mask the odor, it dissolves and neutralizes volatile odors. Use **OPEN ALL** to improve the golf course environment and improve your golfing experience. NOTE: when applying **OPEN ALL** prior to pesticides or insecticides, use the insecticides sparingly as **OPEN ALL** will have made many corrections in the soil profile already and the need for pesticides will have been greatly reduced.

TRAFFIC COMPACTION

Traffic patterns cause soil compaction to occur where golfers have repeatedly walked over the same area and where golf carts leave the cart paths. This causes the soil to harden and kills the grass in these areas. Because of the unique ability that **OPEN ALL** has to maintain moisture and proper aeration spacing, the soil is able to continue receiving nourishment and stay green and healthy.

HIT BALL REACTION

Another concern for golfers is how the ball will react when coming into contact with the ground. This is especially important on and around the green areas. **OPEN ALL** treated greens are able to maintain firmness and trueness without having to "kill" the soil in an attempt to keep the greens hard and fast.

GREEN REPLACEMENT

As greens keepers around the world know, green replacement every few years is inevitable... or is it? **OPEN ALL** treated greens ***can*** be saved from replacement! Many greens need replacing after several years due to extensive use by golfers and the need to maintain the grass short, green, and lush. In many

instances, harsh chemical fertilizers are used which can cause dense formations of sand and soil particles and clog the percolation pathways. **OPEN ALL** treated greens have not experienced this problem due to the ability to create the correct aeration pathways, as well as increasing water retention and nutrient utilization. Water is able to deeply penetrate supplying needed oxygen, hydrogen, and carbon dioxide from the air, greatly improving plant growth stimulation. **OPEN ALL®** is the most cost effective way to avoid green replacement.

FERTILIZER UTILIZATION

While the use of harmful chemical fertilizers is diminishing, those that continue the use may be needlessly adding salt to the soil and further damaging the soil by creating an alkali state. This negative effect may even be accelerated if the irrigation water is high in mineral content. The use of organic fertilizers has become more common, increasing plant stimulation without damaging the soil. Additionally, if the soil has been treated previously with **OPEN ALL**, the fertilizer requirements are dramatically reduced due to the normalized soil pH.

CONSTRUCTION

OPEN ALL is the answer to many problems facing today's building and development problems. It is a great tool for the engineers, architects, builders and developers that must meet all of the regulations, state requirements, and building design specifications.

EXCAVATION AND SITE PREPARATION

Prior to bringing in the heavy equipment, an **OPEN ALL** treatment should be applied to areas that have rock or hard digging characteristics. **OPEN ALL** will break down the elements of the soil so that excavation will be easier; easier excavation translates to significant cost savings. In most cases, excavation costs can be reduced by up to 50%.

SLAB PREPARATION

OPEN ALL will aid in obtaining the required percolation tests faster and easier. The 78 elements in **OPEN ALL**, in the form of complex ions, allow the natural reaction of "***ionization***" to occur. This elemental breaking down of each soil particle allows the water to move freely within the soil. **OPEN ALL** has been proven to greatly reduce the expansion of heavy clay soils while maintaining optimum moisture, compaction, and stability. Even sandy soils can be corrected with **OPEN ALL**. **OPEN ALL** has been proven to ***physically*** and ***permanently change*** the soil classification of heavy clays to clay loam and that of silt or sand to a sand or sandy loam. **OPEN ALL** will allow the soil to drain or percolate and not expand or contract too much from the water movement through it. **OPEN ALL** will also prevent

cracked slabs and subsidence in later years and help prevent claims against the builder or contractor. **OPEN ALL** will turn sterile sand into soil that appears to be composed of at least 50% clay. Have you ever been rained on at your construction site and it has taken you a week to go back to work? These types of events cause scheduling problems, delays, and angered workers. **OPEN ALL** treated construction sites, in most cases, are back to work the very next day.

DUST CONTROL

The normal procedure for dust control consists of watering down the soil to keep the dust from blowing. This uses approximately 60,000 gallons of water to cover an average 20 acre site. In a 25 mph wind, that 60,000 gallons will evaporate in just over 60 minutes. That's just one project and one day's use of water. Over a four month period, that 20 acre development site will use 6.72 million gallons of water - enough to sustain the water needs of an average family for 15 years. It also requires a lot of manpower, fuel use, wear and tear on equipment, cost of water, waste of a valuable resource, and generally costs a lot of money! With **OPEN ALL**, you can reduce all of these costs and also conserve our water resources at the same time.

OPEN ALL works in four ways to control dust suppression; Chemically, Physically, Biologically, and Electrically. An explanation of just how **OPEN ALL** works electronically is that the soil particles that have been treated are placed within the magnetic field of the earth and the gravitational pull of the earth itself holds the soil particles close to the earth surface. Thus the blowing of soil particles are reduced to a noticeable minimum, even in winds of tremendous force. Ground covers, such as grass, will be able to take root and grow much easier thereafter.

When working with dust control, **OPEN ALL** does not normally produce a permanent solution. In most cases, recontamination occurs because additional contamination is brought into the area with spillage from trucks, mud and dirt falling off tires, and dust blowing onto the area. When this occurs, a lower reapplication rate will be needed for dust suppression

DESERT RECLAMATION

The most difficult challenge that our world faces can be solved with ELECTROCULTURE*.

*ELECTROCULTURE actually stretches water. Although the people overseas are rarely blessed with sufficient water, **OPEN ALL** holds and conserves water often to the point where the net moisture equivalent goes up 300% or more. (Beyond Belief page 53, by Everett Storey, 1982)

The need for water, food, and reclamation rises every year. So far, the Sahara Desert's ever driving sand continues to wipe out camel routes, oasis, villages, and even cities. No one has successfully challenged the relentless force of sand and wind.

It is important to understand sand, its properties , and how it can be tamed. Sand is actually loose particles of disintegrated or worn rock. Despite the small size of these sand particles, sand is fundamentally SOLD ROCK. The process of ***normalizing*** sand particles requires the following:

1. Moisture must penetrate the solid rock
2. This moisture must be retained within the solid rock
3. The rock and the retained moisture must be alive with microorganisms capable of digesting carbon
4. The microorganisms should be enzymes capable of either catalytic or electrolytic action
5. Approximately 2 volts of electricity must flow through the treated sand-rock medium
6. The essential soil elements must be present
7. At least 78 metals and agricultural minerals must be within the sand particles and in full solution
8. All of these factors must be combined and treated within the magnetic field of the earth
9. The gravitational pull of the earth itself holds the sand particles close to the desert surface. Air born sand is reduced to a minimum, even in winds of tremendous force
10. With natural (although infrequent) rainfall, the treated sand survives particularly with the addition of various types of humus, eventual cultivation, planting, and reasonable irrigation

11. Fresh water is not essential if dust control and sand stabilization are the only goals. Airports and industrial complexes in desert areas should not be attempted without previously applying **OPEN ALL**.

FRESH WATER COLLECTION AND STORAGE

Desert regions present a special challenge for water collection and storage. **OPEN ALL** treated areas will serve as COLLECTORS of fresh water run-off. These run-off paths should be engineered by design to empty into underground black metal tanks approximately 6 feet below ground level. As these storage tanks fill up, they will not be subject to undue evaporation. Light weight aluminum pipes, used in conjunction with portable pumps will get this project into full productivity quickly and cost effectively.

BENEFIT SUMMARY

1. Simply stated, **OPEN ALL** is a soil conditioner with many unique features not found in any other product.

2. **OPEN ALL** has the ability to change or alter the electronic bonding in both soil chemicals and water. Because of this capability, the oxygen status of the soil is increased resulting in the break-up of clay and hardpan, in addition to eliminating mineral and alkali contamination. Alkaline crusts formed from using chemical fertilizers will also be eliminated.

3. After the **OPEN ALL** treatment, soils take on a regenerated structural change, accommodating deeper water penetration. This allows for deeper plant root penetration and increased utilization of stored water for long periods of time. Attributed to the improved water penetration, **OPEN ALL** decreases evaporation and run-off resulting in substantial water savings (by up to 50%).

4. **OPEN ALL** is an electrolyte able to remove the "NEGATIVE ION FOG" surrounding each clay or soil particle. This process allows soil particles to chain bond, producing larger soil aggregate and optimal pore size. Proper pore size promotes increased aeration and optimum moisture retention capacity, encouraging fast biotic growth.

5. The electro-chemical forces in the soil change radically after just one application of **OPEN ALL**. These changes result in a granular soil texture ideal for moisture penetration, retention, and extended root growth.

6. **OPEN ALL** will also stimulate bacterial growth in the soil while adding specific amino acid chains that are dormant in **OPEN ALL**, but activated in the presence of fresh water. Nitrogen fixation simultaneously occurs.

7. **OPEN ALL** eliminated the salts left behind from years of chemical fertilizer use. If not eliminated, these salts can burn the roots of plants, and cause stress. Salt removal, in addition to alkali and boron reduction, are some of the most significant benefits derived from a proper **OPEN ALL** treatment.

8. **OPEN ALL** helps to correct soil pH. Most soils experience immediate effects, however, the buffering capacity of some soils may decrease the pH adjustment speed.

9. **OPEN ALL** increases the organic capacity of worn out soil while unlocking natural fertility.

10. **OPEN ALL** revitalizes dormant fertilizer. Often, soils contain readily available nutrients, but the plants are unable to obtain them. **OPEN ALL** provides for proper nutrient absorption and utilization.

11. **OPEN ALL** has the ability to release nascent oxygen and hydrogen gases simultaneously (mainly from the water molecule).

OPEN ALL®

SELAMA RESEARCH CENTER
THE RESEARCH INSTITUTE FOR GRASS
WALLACE LABORATORIES (1)

WALLACE LABORATORIES (2)
WALLACE LABORATORIES (3)
UNIVERSITY OF CALIFORNIA SOUTH COAST R.E.C.
INIFAP MEXICO
SAGARPA MEXICO
PRODUCT SAFETY LABS LD50 REPORT



AQUATRONICS®

POULTRY BROILER REPORT FROM SOUTH AFRICA

PRODUCT SAFETY LABS LD 50 REPORT

SEPTI-SOL®

NORTH IOWA COLLEGE
BELMOND LABS ammonia/nitrate STUDY
BELMOND LABS amino acid STUDY
IOWA STATE UNIVERSITY

FORMULA 703®

TEXTILE WASTE (graph A)
TEXTILE WASTE (graph B)
TANNING WASTE (table C)
CAPISTRANO SANITATION DISTRICT
CAPISTRANO (pH vs. Time)
CAPISTRANO (Temp. vs. Time)
CAPISTRANO (Solids vs. Time)
FORMULA 703 Bench Testing I
FORMULA 703 Bench Testing II

OPEN ALL
(Deuterium Sulfate)

... agricultural and environmental solutions
http://www.cellfood.com/aquatronics.htm

AQUATRONICS

Pond Applications

AQUA CULTURE Applications

CHICKEN FARM Applications

IDEAL FOR GOLF COURSE PONDS & LAKES
ORNAMENTAL & FISH PONDS

The major problems encountered with golf course ponds and the industry as a whole are the extensive accumulation of contamination that changes the natural conditions of pond water. By design, these ponds are normally at a lower elevation and receive drainage from several acres of land. Consequently, the run off from this area can contain fertilizers and other dangerous chemicals. High rates of phosphorus and other nutrient build up results in an algae bloom and upsets the ecological cycle of the pond. **AQUATRONICS™** pond treatment will change the conditions in any pond and provide the environmental conditions necessary to enhance and accelerate the natural processes and aid the laws of nature.

The beneficial effects from every **AQUATRONICS™** treatment begin immediately with bacterial activity increasing tremendously. Although many other benefits are derived from its use, the primary and most important function is the action of altering or weakening the dipolar bonds of oxygen and hydrogen. This alteration results in an improved re-oxygenation rate.

- Non-toxic
- Fast and potent
- Eliminates noxious odors
- Enhances biological activity
- Ends unsightly pond problems
- Cost effective & economical
- Reduces algae in ponds
- Makes water clearer
- Easy to use
- Safe For Fish, Birds, and other wildlife

RESULTS NORMALLY OBTAINED AFTER AQUATRONICS POND TREATMENT

1. An immediate increase in available oxygen (many times small air bubbles can be observed rising to the top of the pond).
2. Reduction in odor and algae growth.

3. Nitrates and phosphates present in the pond will be converted into single cell protein, enzymes, free amino acids, and polypeptides.
4. Pond water will become cleaner and clearer.

Results are normally observed within a few hours as odor reduction and the break-up of solids and surface scum are normally observed within a week.

Many golf course superintendents/groundskeepers experience the most difficulty with keeping their ponds clean during the hot summer months. Since water loses its ability to hold water in suspension during these periods, **AQUATRONICS™** is specially formulated to be effective with this problem. **AQUATRONICS™** has the ability to increase dissolved oxygen (DO) in ponds by as much as 5 fold!

AQUA-CULTURE (Shrimp/fish farming)

Today's shrimp farming industry faces many challenges; Rising FCR (feed conversion ratio), slower growth rate, rising mortality rate, disease, deterioration of feed quality, severe climate changes, aging pond bottom, and the use of drugs among others. At Deutrel Industries, we believe that shrimp farming production is determined by two factors; the capacity of the organisms and the capacity of the environment. The capacity of the organisms is the maximum of the organisms to grow and develop in the optimum environmental conditions. In shrimp pond culture, shrimp fry quality and quantity can act as the capacity of the organisms. The capacity of environment is determined by the quality of water and soil. Water quality is the major component of environment (effective environment) which directly influences the life of the organisms in the water, whereas soil is the secondary component of environment (generative environment) which affects water quality.

AQUATRONICS helps to safely restore a natural bio-environment by providing aerobic conditions and reducing or eliminating pathogenic organisms, without the use of dangerous chemicals or drugs.

AQUATRONICS helps to reduce the high stocking densities and build-up of dissolved organic matter from metabolites and decomposition of uneaten feeds ins the ponds. In addition, AQUATRONICS normalizes pH providing the optimum environment for shrimp cultivation. The usage benefits of AQUATRONICS include:

- Lower mortality rate
- Increase yield (size and quantity)
- Lower FCR
- Reduce need for pond replacement
- Increase DO
- Eliminate ammonia and nitrates

Recently, in what used to be one of the largest shrimp and prawn producing regions but has since been ravaged by disease, a group from Taiwan completed an in-depth study using **AQUATRONICS**. In more than one pond, the group was able to increase the yield by more than 100%.

POULTRY and EGG FARM applications

Like most industries, the broiler chick and egg industries face continuous challenges. Chickens and turkeys are the most common kinds of poultry sold today, often as value-added products. Poultry parts and an increasing number of skinless and/or boneless products are meeting consumer demand for convenient, lower fat, portion-controlled items. This shift away from whole carcass birds creates

special challenges for buyers and sellers, whether they are poultry producers or processors, wholesalers, food manufacturers, food service operators, food retailers, or consumers. Large commercial hatcheries currently experience unique health and growth problems associated with increasing ammonia (nitrate) levels, bacterial, viral, and fungal infections, and an increasing FCR (feed conversion ratio). These and many other issues are eliminated with the use of **AQUATRONICS**. **AQUATRONICS**, when added to the broiler drinking water, has the ability to strengthen the immune system while increasing the absorption and assimilation of nutrient content helping the broilers to achieve an increase in overall weight. **AQUATRONICS** has been shown to lower mortality rates, lower FCR's, and increase the performance efficiency factor, while increasing income from saleable mass. **AQUATRONICS** is a drug free, chemical free, cost effective solution for today's broiler industry challenges.

OPEN ALL
(Deuterium Sulfate) **... agricultural and environmental**

http://www.cellfood.com/septisol.htm

SEPTI-SOL

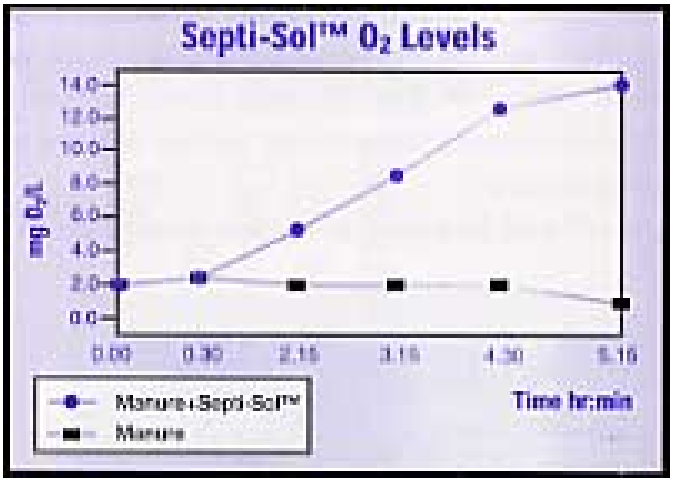
PIT & LAGOON TREATMENT
SEPTIC TANKS and CESSPOOLS

FAST RESULTS

SEPTI-SOL begins to work immediately! Odors are diminished within minutes after the initial use. There is an immediate release of oxygen in solution from water and organic materials containing oxygen at a sufficient rate to cause a population explosion in microorganisms.

INCREASE IN AVAILABLE OXYGEN

DO (dissolved oxygen) levels of 4-6 fold are often reported. With more oxygen available for natural biological activity, odors are quickly reduced or eliminated. Ammonia and other gases are reduced or eliminated as well. **SEPTI-SOL** quickly converts anaerobic (without air) conditions into aerobic (with air) conditions. Anaerobic microorganisms are the gas producers. Once these types of microorganisms are eliminated, gases are eliminated. Instead of fermenting (rotting), manure is degraded biologically. Excess ammonia gas can reduce your daily gain. Health of animals is improved which results in higher profits for growers.



Iowa State University Test Results

WASTE TO VALUE

SEPTI-SOL converts waste (manure) into a valuable agricultural nutrient. Nitrogen present in manure will be turned into single cell protein, enzymes, natural antibiotics, free amino acids and polypeptides that become a natural organic nitrogen fertilizer in a micro solid form. This end product serves as an excellent soil conditioner adding natural benefits like improved soil texture, depth of water percolation, and better water retention.

LAGOON TREATMENT

The major problems associated with animal lagoons and the animal industry are the extensive noxious odors and the accumulation of solid manure due to the anaerobic status of lagoons and litter areas. **SEPTI-SOL** and a aerobic microorganism culture will eliminate the odor problem and enhance the degradation of solids.

Noxious odors disappear rapidly following the **SEPTI-SOL** treatment with a significant improvement observed within the first few minutes. In many instances, this odor is simply intolerable to the surrounding communities and may pose an eventual health risk forcing closure or relocation. The amount of product required for a successful treatment varies, but is cost effective. In many cases, it will actually reduce the overall cost of operation. By improving the environmental quality and accelerating the rate of solid degradation, the high cost of frequent lagoon clean-out processes is eliminated. Many non-treated odors and their resulting gases (ammonia), cause disease and sickness with animals and birds.

Odors may be attributed to many parts of a working organization and waste flow. Prior to the **SEPTI-SOL** treatment, there is usually odor in the pens and barns, odor in the drainage area to the lagoons, odor from the ditches, odor from the washed-down and recycled water, and odor from the lagoon. **SEPTI-SOL** is capable of solving each of these odor problems... and more.

Some operations have installed filtration systems for recycling water and have discovered the incredible recycled water quality provided by **SEPTI-SOL**, as well as the reduced required maintenance of the filtration system. This not only translates to significant water savings, it also diminishes the total water volume in surrounding lagoons and eliminates the substantial discharge into waste streams improving environmental quality.

Most **SEPTI-SOL** treatment users have recognized the hidden benefits of their newly treated water. **SEPTI-SOL** treated water can be used for irrigation purposes. In fact, **SEPTI-SOL** treated water applied to any soil, actually ***improves*** the soil condition; helping to normalize pH, improve water percolation, improve water retention, and improve crop yields.

NORMAL SEPTI-SOL RESULTS

1. Reduction of large air bubbles (methane) from the bottom of the lagoon which are replaced by small (sometimes very small) carbon dioxide bubbles with a low moisture mist over the lagoon on non-windy mornings and evenings.
2. Reduction in lagoon odor and at point of waste water irrigation. Once the aerobic system is completely established and the sludge has been degraded, the odor will rapidly dissipate.
3. Reduction of solids on the surface and sludge under the surface. The liquefying of solids will continue to the depth at which the mixing is effective. If the aerator is capable of mixing to the entire depth, then solids will completely disappear except for the newest raw waste.
4. Nitrogen present in manure will be turned into single cell protein, enzymes, natural antibiotics, free amino acids, and polypeptides; becoming a natural organic nitrogen fertilizer in a micro-solid form.
5. The **SEPTI-SOL** treated water, when applied to soil, becomes a potent microorganism and soil conditioner capable of improving soil conditions, improving water percolation, water retention, and crop yields.

OUTLINE OF TREATMENT

Apply a diluted solution of water and **SEPTI-SOL** at the rate of 50:1 over the slats, water surface, or the the surface of the manure storage facility. Using the chart below, apply the required amount of **SEPTI-SOL** every three to four months or as often as needed.

Level of Solids	Gal. of SEPTI-SOL™	Gal. of Manure
Heavy	1	20,000
Moderate	1	40,000
Light	1	60,000

GENERAL SUMMARY OF TEST RESULTS

Through extensive testing, we have been able to determine that **SEPTI-SOL** is an extremely cost effective solution to many of the problems associated with manure wastes generated from various industries. After treating manure pits and lagoons with **SEPTI-SOL**, there is an increased release of oxygen in solution from water and organic materials containing oxygen at a sufficient rate to cause a population explosion in microorganisms.

In the **IOWA STATE UNIVERSITY of SCIENCE and TECHNOLOGY** testing report: DO (dissolved oxygen) levels of 2.3 were dramatically increased to 13.7 in a short period of time. (This is an increase of almost 6 fold using a ratio of 1:20,000 (**SEPTI-SOL** and Manure).

In the **NORTH IOWA COLLEGE** testing report: A 70 day trial period using **SEPTI-SOL** resulted in a 5 inch reduction in solids. Pit solids on Feb. 24 measures 20 inches; pit solids on May 6 measured 15 inches. Amazingly, during the test period, additional new waste was continuously introduced into the testing environment.

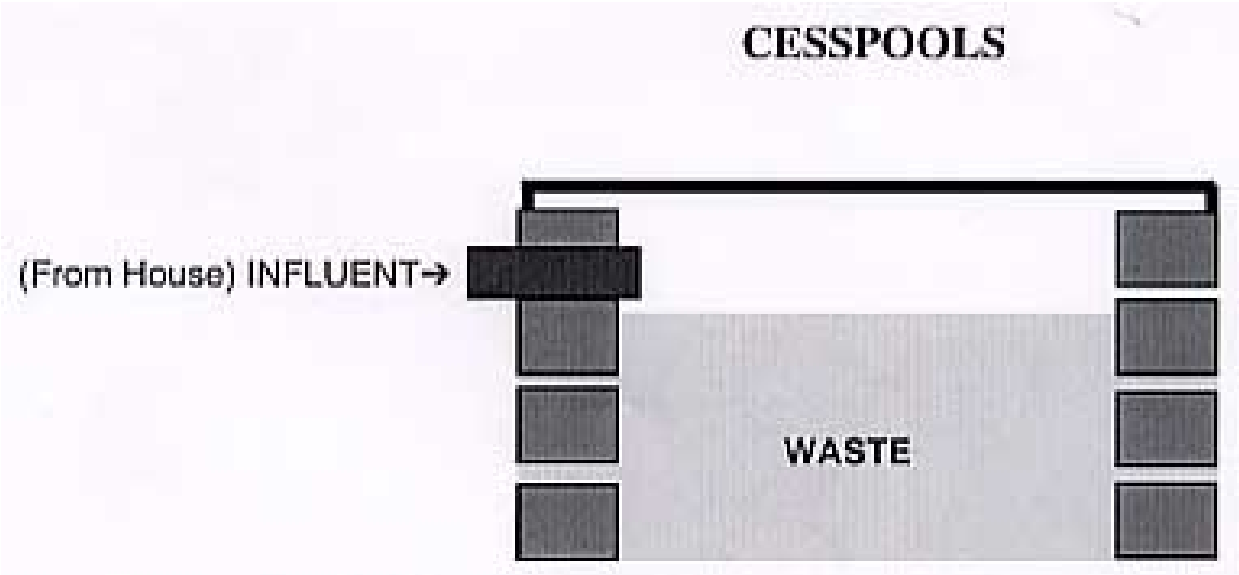
In the **BELMOND LABS** testing report: Nitrates in the manure were reduced by 37%. Nitrates in the control measured 239 and nitrates in the **SEPTI-SOL** treated sample measured 150.

In the second **BELMOND LABS** testing report: Of the 19 Amino Acids tested during the profile, 18 amino acids were increased when **SEPTI-SOL** was used.

SEPTIC SYSTEM TREATMENT

SEPTI-SOL accelerates the decomposition of animal and human waste while reducing or eliminating odors. Drain pipes carry waste from you home to a septic tank or cesspool under your yard. A septic tank is normally made from metal or concrete and is completely enclosed. bacteria breakdown waste in the tank to prevent solids from entering the drainfield. Most other products contain harsh chemicals that destroy the necessary bacteria in your septic tank. Septi-Sol is a natural biological solution that will enhance the natural bacteria activity.

Septic systems usually fail when lateral lines become blocked from solids building up, causing an overflow and back-up into the house. **SEPTI-SOL** applied via the commode begins clearing the system immediately by breaking down solids usually within 24 hours.



Cesspools are built with open walls of stone or concrete. Aerobic bacteria, which need a supply of fresh air to survive, break down waste that enters the pool. Liquid seeps into the ground surrounding the cesspool through the open walls. **SEPTI-SOL** will ensure that aerobic bacteria survive and aid in the digestion of the waste solids helping to eliminate clogging and odor.

OPEN ALL
(Deuterium Sulfate)

... agricultural and environmental solutions
http://www.cellfood.com/703.htm

FORMULA 703

WHAT IS FORMULA 703

FORMULA 703 was prepared with the specific objective to enhance the natural environmental process of waste degradation and elimination. **FORMULA 703** dramatically accelerates the microbiological activity associated with natural bacterial digestion by providing the necessary minerals and enzymes while increasing the rate of re-oxygenation.

Industrial Waste Treatment

Textile Waste Treatment

Sewage Treatment

Dispersal of waste into receiving waters is no longer the right of any individual, industry, or municipality. Water has become our most precious resource. Property management and control will no longer tolerate the old philosophy that pollution of streams, rivers, and lakes is inevitable and necessary to our way of life. **FORMULA 703** is designed to assist in the elimination of industrial waste, while protecting the environment. This process is achieved by releasing the oxygen that is tightly bound in the well known formula of water H_2O. **FORMULA 703** releases the tight polar bond between the oxygen and hydrogen molecules in water, stimulating the digestion of waste solids, while initiating the safe treatment of water wastes. **FORMULA 703** helps to reduce operational costs by eliminating pathogenic organisms.

FORMULA 703 is a liquid chemical complex that has been specifically formulated to assist in the digestion of organic solids. Although many other benefits are derived, the primary function is to alter or weaken the Dipolar bonds of hydrogen and oxygen. This alteration results in a dramatic increase in available oxygen.

DO (dissolved oxygen) levels of 4-6 fold are often reported. With more oxygen available for natural biological activity, odors are quickly reduced or eliminated. Ammonia and other gases are reduced or eliminated as well. **FORMULA 703** quickly converts anaerobic (without air) conditions into aerobic (with air) conditions. Anaerobic microorganisms are the gas producers. Once these types of microorganisms are eliminated, gases are eliminated. Instead of fermenting (rotting), manure is degraded biologically. Excess ammonia gas can reduce your daily gain.

FORMULA 703 is formulated by a secret process and contains over 70 elements. It also contains sulfur in many combined forms: hydrogen, oxygen, nitrogen, carbon, sodium, and magnesium. **FORMULA 703** is completely soluble in water, providing the basis for activity in aqueous solutions. Many chemists have made the error of believing that this complex chemical matrix is indeed sulfuric acid due to a similar specific gravity. Tests demonstrate that **FORMULA 703** alters the nature of water triggering several important events in organic waste. Every particle of organic matter being

treated is electro-chemically activated and truly wetted, something the cannot be done with ordinary untreated water. Galvanic couples are formed, much like those causing corrosion in most metals, with the resulting oxidation being similar to that which occurs with metals. The same inevitable result occurs; the ultimate complete decomposition of organic mass. This process would naturally (after a very long time) occur even without the help of bacteria, but is dramatically accelerated in the presence of these organisms. Since the process of organic oxidation involves a transfer of electrons from oxygen in solution into the organic substrate, both oxygen and hydrogen are needed to complete the process. **FORMULA 703** is able to make both elements readily available dramatically accelerating the organic-reduction process, especially in the presence of enzymes produced by the accompanying bacteria. All forms of bacteria, aerobic or anaerobic, use the dual process of oxidation and reduction in their metabolic cycle. When properly used, **FORMULA 703** will increase the capacity of all present waste disposal systems, and can vastly increase the capacity of systems currently being built or engineered.

INDUSTRIAL WASTE TREATMENT

While most companies continue to search for a mechanical solution for biological waste problems, our goal at Deutrel Industries is to provide a biological solution to a biological problem. **FORMULA 703** has been formulated as a free standing solution, or used in combination to enhance an engineered mechanical solution. Product testing in Asia and in America conclusively demonstrates that almost ALL chemicals were eliminated, including polymers.

The typical reactions with **FORMULA 703** are a rapid and dramatic reduction of BOD (biological oxygen demand) followed by a sudden increase of BOD caused by a bacterial population explosion. This new population and degradation activity will increase the BOD until a corresponding increase in dissolved oxygen (provided by **FORMULA 703**) begins to rapidly digest the organic waste and a stabilized environment is achieved. **(Click here for a BOD chart)**

When properly used, **FORMULA 703** will increase the capacity of all present waste disposal systems. Although **FORMULA 703** chemically attacks and destroys organic matter, it does not retard or destroy bacterial growth, rather, it enhances and stimulates the growth of beneficial bacteria. Aerobic organisms will obtain the greatest benefit, however, the chemical action of organic mass will also aid the action of anaerobic microorganisms.

TEXTILE WASTE TREATMENT

Deutrel Industries has once again positioned itself as the leader in environmental science and technology providing waste solutions for the textile industry. Typical stages of textile production are: fiber production, fiber processing and spinning, yarn preparation, fabric production, bleaching, dyeing and printing, and finishing. Each stage generates wastes that require proper management.

Textile production involves a number of wet processes that may use solvents. Emissions of volatile organic compounds (VOCs) mainly arise from textiles finishing, drying processes, and solvent use. VOC concentrations vary from 10 milligrams of carbon per cubic meter (mg/m^3) for the thermosol process to 350 mg carbon/m^3 for drying and condensation process. Processes wastewater is a major source of pollutants. It is typically alkaline and has high BOD_5 (700 to 2,000 milligrams per liter (mg/L)) and chemical oxygen demand (COD) (approximately 2 to 5 times the biochemical oxygen demand (BOD) level), solids, oil and possibly toxic organics, including phenols (from dyeing and finishing) and halogenated organics (from processes such as bleaching). Dye wastewaters are frequently highly colored and may contain heavy metals such as copper and chromium. Wool

processing may release bacteria and other pathogens. Pesticides are sometimes used for the preservation of natural fibers and these are transferred to wastewaters during washing and scouring operations. Pesticides are also used for moth proofing, brominated flame retardants for synthetic fabrics, and isocyanates for lamination (*Note*: The use of pesticides and other chemicals which are banned in OECD countries is discouraged and in general, not acceptable). Wastewaters should be checked for pesticides (such as DDT and PCP), and metals (such as mercury, arsenic, and copper).

Implementation of cleaner production processes and pollution solution measures can provide both economic and environmental benefits. A common approach to treatment of wastewaters is screening, flow equalization, and then settling to remove suspended solids, followed by a chemical treatment. The following summary contains extracts from **FORMULA 703** textile waste testing results.

Graph A - Test were conducted over 140 hours, beginning June 10, 1994 with 20 mL of **FORMULA 703**. 10 grams of bacteria mix 731, and the solution had suspended solids of 1,332 mg/l. Temperature was 30° C. A second test was run over 140 hours beginning June 15, 1994 with 20 mL of **FORMULA 703**, 20 grams of bacteria mix 731, and the solution had suspended solids of 2,680 mg/l/ Temperature was 30° C. The upper line in input COD, and the lower line is the output COD. Statistics from the two tests have been combined.

Graph B - Tests were conducted over 140 hours, beginning June 17, 1994 with 20 mL of **FORMULA 703**, 20 grams of bacteria mix 731, and the solution had suspended solids of 2,755 mg/l. Temperature was 30° C. There was no air stir in the raw waste water tank. The upper line is input COD, and the lower line is the output COD. Statistics from the two tests have been combined. These tests were conducted by the Environmental Institute of Taiwan.

Table C - The table was compiled from the waste stream from a tanning plant. The three sections of the test compare the average drop in output COD, compared to the input COD.

Section 1 - Samples recorded during July, 1993, are from the unaided mechanical treatment system. Average rate of decrease in DO = 31%

Section 2 - Samples are from November 30, through December 14, 1993 ate after the addition of enzymes. Average rate of decrease in DO = 45.3%

Section 3 - Samples are from June 14 through June 25, 1994 are after the addition of FORMULA 703. Average rate of decrease in DO = 59.3%

SEWAGE TREATMENT

FORMULA 703 was introduced into the Capistrano Beach Sanitary District, Capistrano Beach, California on 12/1993. The plant was originally designed and engineered to handle a maximum capacity of 850,000 gallons per day. Current flow was from 800,000 to 1,200,000 gallons per day and operation in excess of the designed capacity. While they were confronted with issues commonly associated with municipal waste treatment, their main problem was the reduction of solids and achieving a more cost-effective treatment solution. From the inlet statistics to Clarifier #1, solids represented between 15 and 18% of the influent. Current sludge processing time is 40+ days. The sludge removal, transportation, and processing represented a significant portion of operational expenses. The treatment plan called called for the complete elimination of chemicals and additives, substituting FORMULA 703. Their normal mechanical operating system would be utilized "as is".

TREATMENT PLAN

The immediate elimination all chemicals and additives, while substituting **FORMULA 703** into the system at the earliest point possible to provide benefits through the entire system. Stabilize existing system by adding 30 gallons of **FORMULA 703** immediately, plus 50 pounds of CULTURE SUPPLEMENT #2 (**FORMULA 703** ratio 1;100,000)

RESULTS

Without 703		With FORMULA 703	
Avg. prior to 12/93		Avg. post 12/93	
DO	1.0-2.0	DO	6.4-9.0
SS	20,000-28,000 ppm	SS	7 mg/L (EPA 160.4)
pH	4.0-6.0	pH	6.57-7.09
		BOD	10 mg/L (SM 507)

Capistrano Beach District Data

Capistrano Sanitation District (pH vs. time)

Capistrano Sanitation District (temp. vs. time)

Capistrano Sanitation District (solids vs. time)

Additional FORMULA 703 Bench Testing

Additional FORMULA 703 Bench Testing