



Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

September 6, 2012

Via Electronic Mail
Gonzalo@MicroMix-USA.com

Gonzalo A. Pozo
Green Star Environmental Technologies
7301 NW Gainesville Road
Ocala, Florida 34475

Re: Ergofit MicroMix

Dear Mr. Pozo:

The Bureau of Petroleum Storage Systems (Bureau) hereby accepts Ergofit MicroMix, a mixture of non-pathogenic microbes, amino acids, and nutrients for the biodegradation of petroleum contaminants in groundwater and soil, in situ and ex situ pursuant to Chapter 62-770, Florida Administrative Code (F.A.C.). As Ergofit USA, LLC has clarified earlier, the product is called Ergofit MicroMix Aqua when it is used to treat water, and Ergofit MicroMix Sludge when it is used to treat soil, but there is only a single, as-shipped product formulation per the Material Safety Data Sheet for the material named MicroMix Aqua / MicroMix Sludge. A difference could develop later, at the point of use during soil cleanups, should the user elect to amend the product with sugar and nitrogen. Enclosure 1 is a voucher for the confidential disclosure of the proprietary proportions of Ergofit MicroMix ingredients. Enclosure 2 contains regulatory information; and Enclosure 3 contains supplemental information.

The Bureau does not provide endorsement of specific or brand name remediation products or processes. It does, however, recognize the need to determine their acceptability in the context of environmental regulations, safety and the protection of public health. For that reason, the Bureau issues an "acceptance" letter, not an approval. In no way shall an acceptance be construed as a certification of performance. Additionally, vendors, upon receipt of an acceptance, must market their product or process on its own merits regarding performance, cost, and safety in comparison to competing alternatives in the marketplace.

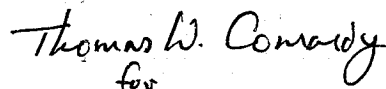
Remedial Action Plans that propose the use of an accepted product or process should include a copy of the acceptance letter in the plan's appendix, and reference it in the text of the document. It is not a requirement that a particular remediation product or process have an official acceptance letter in order for it to be proposed in a site-specific Remedial Action Plan. The plan, however, must contain sufficient information about the product or process to show that it meets all applicable rules and regulations.

The Bureau reserves the right to revoke its acceptance of a product or process if it has been falsely represented. Additionally, Bureau acceptance of any product or process does not imply it has been deemed applicable for all cleanup situations, or that it is preferred over other treatment or cleanup techniques in any particular case. A site-specific evaluation of applicability and cost-effectiveness must be considered for any product or process, whether conventional or innovative, and adequate site-specific design details must be provided in a Remedial Action Plan submitted for Bureau review and approval. If you have any questions, please contact Rick Ruscito at (850) 877-1133, extension 3720.

Sincerely,



Rick Ruscito, P.E.
Ecology and Environment, Inc.
Bureau of Petroleum Storage Systems
Petroleum Cleanup Section 6 - MS 4590



for
Rebecca S. Lockenbach
FDEP Section Leader
Bureau of Petroleum Storage Systems
Petroleum Cleanup Section 6

Enclosures: (1) Voucher for Disclosure of Proprietary Ingredients Proportions
in Ergofit MicroMix
(2) Regulatory Information
(3) Supplemental Information

c: Tom Conrardy - FDEP/Tallahassee

ENCLOSURE 1



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Gonzalo A. Pozo
Green Star Environmental Technologies
7301 NW Gainesville Road
Ocala, Florida 34475

Re: Voucher for Disclosure of Proprietary Ingredients Proportions
in Ergofit MicroMix Aqua / MicroMix Sludge

Dear Mr. Pozo:

In regard to Ergofit MicroMix Aqua / MicroMix Sludge, a product for which Green Star Technologies is now a distributor, there is already on file with the Florida Department of Environmental Protection a confidential disclosure of the proprietary proportions of the ingredients. The Bureau of Petroleum Storage Systems (Bureau) hereby references the September 14, 2011 confidential disclosure by Ergofit USA, LLC, in the form of a modified Material Safety Data Sheet, regarding the proprietary proportions of non-pathogenic microbes, amino acids, and nutrients in MicroMix, for the biodegradation of petroleum contaminants in groundwater and soil. Having reviewed the disclosure, the Bureau hereby vouches for the proprietary proportions of the ingredients in the table below. The product is a liquid with a specific gravity of 1.0 and a pH of 6.2.

Ergofit MicroMix Aqua / MicroMix Sludge
(from Material Safety Data Sheet issued 5/23/11)

<u>Ingredient</u>	<u>CAS No.</u>	<u>Concentration</u>
Enzymes and Microbial Blend	Not applicable	Proprietary
Ethoxylated Sorbitan Monolaurate	9005-64-5	Proprietary
Water	7732-18-5	Proprietary
A source of Carbon	-	Proprietary
Potassium Oxide	12136-45-7	Proprietary
A source of Nitrogen	-	Proprietary
Phosphorus Pentoxide	1314-56-3	Proprietary

Gonzalo A. Pozo
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Ergofit MicroMix
Enclosure 1
Voucher

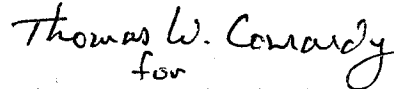
Without this voucher for the proportions of the proprietary ingredients, and advice from the Bureau in Enclosure 2 based on its review of those proportions, users of Ergofit MicroMix would not know how to comply with Rule 62-520.310(8)(c), Florida Administrative Code (F.A.C.).

For underground injection control purposes, aquifer remediation plans proposing the use of Ergofit MicroMix must indicate the volume and composition of the fluid to be injected. Since the proportion of each ingredient is proprietary, it will suffice to indicate just the overall volume and concentration of Ergofit MicroMix to be injected, and provide a footnote indicating that a one-time confidential disclosure dated September 14, 2011, identifying the proprietary proportions of the ingredients, is already on file with the Bureau. Please direct questions regarding this voucher to Rick Ruscito at (850) 877-1133, extension 3720.

Sincerely,



Rick Ruscito, P.E.
Ecology and Environment, Inc.
Bureau of Petroleum Storage Systems
Petroleum Cleanup Section 6 - MS 4590



for
Rebecca S. Lockenbach
FDEP Section Leader
Bureau of Petroleum Storage Systems
Petroleum Cleanup Section 6

REGULATORY INFORMATION

- a. Regulations: Chapters of the Florida Administrative Code (F.A.C.) that may be applicable, either in part or in their entirety, include but are not necessarily limited to Chapter 62-550, F.A.C., for primary and secondary water quality standards; Chapter 62-520, F.A.C. for groundwater classes and standards, and groundwater permitting and monitoring requirements; Chapter 62-528, F.A.C., for Underground Injection Control (UIC), particularly Part V, for Class V, Group 4 aquifer remediation projects; Chapters 62-770, 62-780, 62-782, and 62-785 F.A.C., for cleanup criteria; and Chapter 62-777, F.A.C., for cleanup target levels.

Users of Ergofit MicroMix shall comply with all applicable regulations. This includes meeting applicable groundwater cleanup target levels for the contaminants of concern, the residual concentrations of ingredients, and any byproducts of concern produced by chemical and biological reactions induced by those ingredients during the timeframe of the cleanup project. For the ingredients of concern that are present in excess of their groundwater standards, the timeframe is that which is permitted for a temporary injection zone of discharge (ZOD) as described below.

- b. Pilot study: Per rule 62-770.700(2), Florida Administrative Code (F.A.C.), a pilot study proposal shall be submitted for review, and a pilot test shall be performed prior to designing a treatment system. If conditions or the situation at a site do not warrant a pilot study, then a proposal explaining the rationale for the decision not to perform a pilot study shall be submitted for review.
- c. UIC and ZOD permission: Per Rule 62-528.630(2)(c), F.A.C., Class V injection-type aquifer remediation wells are exempt from the permitting requirements of Rule 62-528.635, F.A.C., when authorized by a Department-approved Remedial Action Plan or other enforceable mechanism, provided the requirements of the rules governing the remediation project, as well as the construction, operation, and monitoring requirements of Chapter 62-528, F.A.C., are met. Per Rule 62-528.630(2)(c), F.A.C., the issuance of an enforceable, site-specific Remedial Action Plan Approval Order by the Department for injection-type aquifer remediation constitutes the granting of a Class V injection well construction/clearance permit. And per Rule 62-520.310(8)(c), F.A.C., if a temporary ZOD is necessary, and permissible by way of that rule, then the issuance of the site-specific Remedial Action Plan Approval Order also constitutes the granting of permission for the temporary ZOD.
- d. UIC notification: Remedial Action Plans proposing injection-type aquifer remediation shall include information pursuant to Rules 62-528.630(2)(c)1 through 6, F.A.C., for the inventory purposes of the UIC program. Reviewers of those plans, upon issuance of an enforceable Remedial Action Plan Approval Order by the Department, must submit a completed copy of the UIC inventory notification form to the UIC program in Tallahassee.

- e. General information about temporary ZODs: For in-situ aquifer remediation, the composition of an injected material must meet the primary and secondary drinking water standards set forth in Chapter 62-550, F.A.C., and the minimum groundwater criteria of Chapter 62-520, F.A.C., pursuant to UIC Rule 62-528.600(2)(d), F.A.C. Aquifer remediation products that do not meet these requirements must seek relief from water quality criteria by one of two mechanisms. The first mechanism is permission for a temporary ZOD by way of Rule 62-520.310(8)(c), F.A.C. If a ZOD cannot be obtained by way of this rule, then it will be necessary to use the second mechanism to seek a variance from Department rules in accordance with Section 120.542, Florida Statutes.

Rule 62-520.310(8)(c), F.A.C., allows for a temporary ZOD for closed-loop re-injection systems, for the prime constituents of the reagents used to remediate site contaminants, and for groundwater secondary standards. In order to obtain permission for a temporary ZOD by rule, a site-specific Remedial Action Plan must indicate: (a) the chemical ingredients of concern in the fluid to be injected that will be present in excess of groundwater standards; (b) the size of the ZOD that is needed; (c) the amount of time that the ZOD will be needed; and (d) a plan for monitoring the injected chemical ingredients of concern. The size of the temporary ZOD will usually be the injection well radius of influence when the treatment system is a single injection point. For a multiple point system, the ZOD can usually be expressed and illustrated as the total area of the cluster formed by all the injection points, located side-by-side with overlapping radii of influence.

- f. Specific ZOD information for Ergofit MicroMix: The Bureau of Petroleum Storage Systems has determined that in almost all cases, regardless of whether Ergofit MicroMix is injected into an aquifer at the as-shipped concentration, or diluted with water prior to injection, a zone of discharge shall be established and permitted by way of Rule 62-520.310(8)(c), F.A.C., as described in paragraph e above for ammoniacal nitrogen, nonionic surfactant, total dissolved solids, and pH.

It is anticipated that the volumetric dilution ratio of water to as-shipped Ergofit MicroMix, prior to injection, depending on site conditions, will be in the range of 20:1 to 40:1. The Bureau cites this range as information only, and it shall not be construed that injections of Ergofit MicroMix are confined only to that range.

Using the information provided by Ergofit USA, the Bureau conservatively calculates that total dissolved solids can be omitted as a ZOD parameter of concern at pre-injection volumetric dilutions of water to Ergofit MicroMix of 699:1 or greater. As for the other parameters of concern, it appears unlikely that the Ergofit MicroMix will ever be so highly diluted prior to injection that it would eliminate the need for ZOD permission for ammoniacal nitrogen and surfactant. Nevertheless, for ammoniacal nitrogen, the Bureau conservatively estimates the volumetric dilution

threshold to be 10,332:1, and for the nonionic surfactant of proprietary concentration the threshold is even greater.

None of the above takes into account that users might amend Ergofit MicroMix with sugar as an additional carbon source or urea as an additional nitrogen source, both of which are options mentioned by the manufacturer. If sugar is injected as an amendment during aquifer remediation, then the associated ZOD parameter of concern is total dissolved solids, which is already covered because the product itself, without any amendment, already triggers a ZOD for total dissolved solids. If urea is injected as an amendment during aquifer remediation, then the associated ZOD parameter of concern is ammoniacal nitrogen, which is already covered because the product itself, without any amendment, already triggers a ZOD for ammoniacal nitrogen. Amendments other than sugar and urea will have to be evaluated on a case-by-case basis. For all others, a site-specific Remedial Action Plan must provide the complete chemical composition of the additive and comply with the requirements of Rule 62-520.310(8)(c), F.A.C., for any parameters that require permission for a zone of discharge.

Rice husks, straw, and saw dust are also amendments discussed by the manufacturer. There are no parameters that require a ZOD when these materials are used in situ, but the Bureau assumes that the means of introducing them to the subsurface are unlikely to ever include injection, and that they will be used only during soil remediation and introduced by way of tilling, disking, or other mechanical means.

Bulky, coarse amendments other than rice husks, straw, and saw dust for in situ soil remediation will have to be considered on a case-by-case basis, and their chemical composition compared to the soil criteria established in Chapter 62-777, F.A.C. Additionally, for in situ soil remediation, if the depth to groundwater is shallow or conditions are such that chemical species of concern might leach or percolate into the underlying groundwater, then monitoring of the underlying groundwater for those chemical species must be included in the proposed site-specific Remedial Action Plan. This applies not only to the amendments but to the ingredients of the Ergofit MicroMix itself and the contaminants of concern at the remediation site, all of which might have the potential to leach or percolate into the underlying groundwater. Groundwater standards are set forth in Chapters 62-520, 62-550, and 62-777, F.A.C.

- g. ZOD monitoring advice for Ergofit MicroMix: In most cases, quarterly monitoring of groundwater should suffice for the ZOD parameters associated with Ergofit MicroMix. The number of monitoring wells to be sampled should be representative of the Ergofit MicroMix treatment area, and should include at least one monitoring well just beyond the downgradient edge of the treatment area. The current groundwater standards for the parameters associated with Ergofit MicroMix

are as follows: ammoniacal nitrogen, 2.8 milligrams per liter (mg/L); nonionic surfactant, 0.5 mg/L; total dissolved solids, 500 mg/L; and pH, range 6.5-8.5. Upon expiration of the time period granted for the ZOD, each must meet its respective groundwater standard, or its natural-occurring background value at the specific cleanup site, whichever is less stringent.

- h. Analytical method for surfactants: Per Chapter 62-550, F.A.C., Standard Method 5540 (SM 5540) can be used to determine the concentration of surfactants in water samples. Method SM 5540 D is for the measurement of nonionic surfactant concentration.
- i. Utilization of wells: If a remediation site happens to have an abundance of monitoring wells, then the Bureau has no objection to the use of some wells for the application of Ergofit MicroMix. However, no "designated" monitoring well, dedicated to the tracking of remediation progress (by sampling) shall be used to apply Ergofit MicroMix. This will avoid premature conclusion that the entire site meets cleanup goals. By making sure that designated tracking wells are not also used for treatment, there will be more assurance that the treatment process has permeated the entire site and that it did not remain localized to the area immediately surrounding each injection well.
- j. Avoidance of migration: For injection-type, in-situ aquifer remediation projects, pursuant to Rule 62-528.630(3), F.A.C., injection of Ergofit MicroMix shall be performed in such a way, and at such a rate and volume, that no undesirable migration of either the ingredients of concern, site contaminants, or remediation byproducts results.
- k. Abandonment of wells: Upon issuance of a Site Rehabilitation Completion Order, injection wells shall be abandoned pursuant to Section 62-528.645, F.A.C., and the Underground Injection Control Section of the Department shall be notified so that the treatment wells can be removed from the injection well inventory-tracking list.
- l. Open-pit application: The direct application of Ergofit MicroMix to an open pit in which the groundwater is exposed is not an injection, and notification of the UIC Section is not required, but the user must still be mindful of groundwater quality. Therefore, for open-pit applications, the groundwater in the application area should be monitored for the same parameters that would have required ZOD monitoring, had the application actually been an injection.
- m. Phosphorus: This element is present in Ergofit MicroMix. It is essential for life, and occurs naturally in Florida's groundwater. It is not regulated as a groundwater contaminant, but it is regulated as a surface water contaminant. At a Panama City, Florida site, total phosphorus in the groundwater was measured at 800 to 1,100 micrograms per liter (ug/L). At a Volusia County site in Florida, it was measured at

1,200 ug/L, as PO_4 . For comparison purposes, the European Community Guide level for phosphorus in drinking water is 400 ug/L, as P_2O_5 . While phosphorus may not be a matter of great toxicological concern for in situ injection-type groundwater remediation projects, the Bureau of Petroleum Storage Systems would like to remind users of Ergofit MicroMix that it could become an environmental concern if a surface water body is very close to the treatment area of a remediation site. In such a case, if there is potential for interaction between the groundwater being treated and the nearby surface water body, then the state's surface water regulations should be reviewed first for requirements regarding phosphorus.

SUPPLEMENTAL INFORMATION

- a. Dosage and application rates: Prospective users of Ergofit MicroMix should consult the manufacturer to determine the dosage and application rate of Ergofit MicroMix on a site-specific basis.
- b. Dissolved oxygen: For in situ aquifer remediation, if dissolved oxygen is not present in sufficient concentration for bioremediation by Ergofit MicroMix, then the site-specific Remedial Action Plan should propose a means by which to supply the necessary oxygen.
- c. Manufacturer: Ergofit Manufacturers and Distribution (Pty) Ltd,
Unit 3, Observatory Park, Howe Street, Observatory 7925,
Cape Town, South Africa.
- d. USA Importer: Ergofit USA, LLC, 40 East Main Street #379,
Newark Delaware 19711.