

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Colleen M. Castille
Secretary

October 16, 2006

Mr. Fernando De Torres
c/o Cohn & Cohn, P.A.
P.O. Box 3424
Tampa, Florida 33601-3424

Re: **ECOSAFE®**

Dear Mr. De Torres:

The Bureau of Petroleum Storage Systems hereby reaffirms its acceptance of ECOSAFE® for the remediation of petroleum and other suitable organic contaminants in groundwater and soil, in situ and ex situ. This letter supersedes the original April 23, 2005 acceptance. No changes have been made to the text. Only minor updates and changes have been made as follows: (a) replacement of an older version of the Underground Injection Control notification with the most recent June 2005 issue in Enclosure 4; (b) a reduction in the number of recipients receiving copies of this letter; and (c) an update of the Bureau telephone extension that can be called if there are any questions.

ECOSAFE® is a specially prepared nutrient-surfactant. The surfactant used in its preparation is of the nonionic type. When added to water, the nutrient-surfactant forms colloidal micelles and emulsifies the contaminants, thereby making them more readily available for chemical and biodegradation. The Bureau notes that ECOSAFE®, upon introduction to the environment, is capable of approximately 90% biodegradation in 24 hours, and 99% in 7 days at 25° C. Enclosure 1 is a voucher for the confidential disclosure of ECOSAFE's proprietary ingredients to the Florida Department of Environmental Protection.

As you have indicated, a distinguishing aspect of ECOSAFE® is its colloid-active ability to produce, as the first step in the contaminant destruction process, a REDOX reaction that breaks some of the chemical bonds in the contaminant molecules, in order to make them more readily digestible to indigenous microorganisms that perform biodegradation as the second step. The initial bond cleavage that occurs is, for example, the breaking of aromatic ring structures, or the breaking of large aliphatics into smaller chains. The ultimate end products, after both the chemical and biological degradation processes have occurred are carbon dioxide, water, oxygen and nitrates.

"More Protection, Less Process"

Visit Our Internet Site At: www.dep.state.fl.us/waste/categories/pcp/default.htm

Printed on recycled paper.

This acceptance applies only to the regulatory jurisdiction and the remediation needs of the Bureau of Petroleum Storage Systems, which is primarily the cleanup of subsurface petroleum contamination pursuant to Chapter 62-770, Florida Administrative Code (F.A.C.). Other government agencies and local governments may choose to recognize this acceptance if their needs and regulations are similar. This Bureau, however, is not responsible for applications beyond its jurisdiction.

For vadose remediation, where the underlying groundwater will not be affected by the leaching of ECOSAFE[®], there are no special concerns beyond those that would normally be addressed in preparing a Remedial Action Plan and conducting a cleanup in accordance with Chapters 62-770 and 62-777, F.A.C. However, for in situ groundwater remediation via direct injection of ECOSAFE[®] into an aquifer, there are underground injection control (UIC) regulations that must be observed. Since injection-type, in situ aquifer remediation is likely to be a common application of this product, the bulk of the regulatory requirements discussed herein will be directed to that topic.

The Bureau recognizes ECOSAFE[®] as a viable product for the remediation of petroleum contaminated sites in Florida. There are no objections to its use provided: (a) the considerations of this letter are taken into account; (b) Rule 62-522.300(2)(c), F.A.C., is observed with respect to pH; and (c) a site-specific Remedial Action Plan is submitted pursuant to Chapter 62-770, F.A.C., and approved by the Department for each site where the use of ECOSAFE[®] is proposed. Some major regulatory considerations that apply to ECOSAFE[®] are discussed in Enclosure 2.

While the Department of Environmental Protection does not provide endorsement of specific or brand name remediation products or processes, it does recognize the need to determine their acceptability from an environmental standpoint with respect to applicable rules and regulations, and the interests of public health, safety and welfare. Vendors must then market the products and processes on their own merits regarding performance, cost, and safety in comparison to competing alternatives in the marketplace. In no way, however, shall this regulatory acceptance letter be construed as Department certification of product or process performance. Additionally, the Department emphasizes a distinction between its regulatory "acceptance" letters and an approval. Products and processes are accepted but they are not approved.

Also, 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 and appropriate rules and regulations, especially those of the Florida Administrative Code pertaining to underground injection control.

Those who prepare Remedial Action Plans are advised to include a copy of this letter in the appendix of plans they submit, and call attention to it in the text of their document. In this way, technical reviewers throughout the state will be informed that you have contacted the Department of Environmental Protection to inquire about the acceptability of ECOSAFE[®]. To aid those

Mr. Fernando De Torres
October 16, 2006
Page 3

reviewers, the Bureau of Petroleum Storage Systems provides supplemental information as Enclosure 3.

The Department reserves the right to revoke its acceptance of a product or process if it has been falsely represented. Additionally, Department 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. Please contact Rick Ruscito at (850) 877-1133, extension 3722 if there are any questions.

Sincerely,



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



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

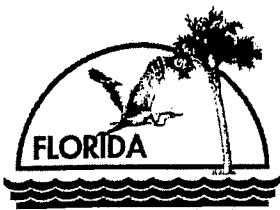
enc: (1) Proprietary Ingredients Voucher
(2) Regulatory Information
(3) Supplemental Information
(4) Underground Injection Control Memorandum

c: T. Conrardy - FDEP/Tallahassee

History:

PPL #266
IT 26910
INN_129.doc
4/23/05

INN_129a.doc
10/16/06



ENCLOSURE 1

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Colleen M. Castillo
Secretary

October 16, 2006

Mr. Fernando De Torres
c/o Cohn & Cohn, P.A.
P.O. Box 3424
Tampa, Florida 33601-3424

Re: **Proprietary Ingredients Voucher for ECOSAFE®**

Dear Mr. De Torres:

The Bureau of Petroleum Storage Systems hereby acknowledges the confidential disclosure dated March 29, 2005, submitted by Cohn & Cohn Associates, on behalf of AFA Holding Company LLC, regarding the proprietary ingredients of a remediation product known as ECOSAFE®, for the cleanup of petroleum contaminants in groundwater and soil pursuant to Chapter 62-770, F.A.C.

Having reviewed the confidential disclosure, the Bureau hereby vouches for the ingredients. Without divulging any proprietary aspects of the product, we provide the minimum amount of information necessary to potential users of ECOSAFE®, in order for them to comply with the Florida Administrative Code (F.A.C.). In order to comply, the groundwater, during an ECOSAFE® cleanup project must be monitored for pH, pursuant to Rule 62-522.300(2)(c), F.A.C.

Additionally, without divulging any proprietary aspects of the product, we hereby indicate that -- at our request -- a sample of ECOSAFE® at the concentration to be injected (a 1000 to 1 aqueous dilution) was analyzed for ammonia nitrogen, surfactants (foaming agents), nitrate and pH. The analytical results, along with the applicable groundwater standards are shown below.

<u>Parameter</u>	<u>Analytical Result</u>	<u>Groundwater Standard</u>	
Ammonia Nitrogen	0.52 mg/L	2.8 mg/L	(mg/L denotes milligrams per liter)
Surfactants (foaming agents)	0.074 mg/L	0.5 mg/L	
Nitrate	BDL (<0.5 mg/L)	10 mg/L	(BDL denotes Below Detection Limit)
pH*	10.33	Range 6.5 to 8.5	* Does not meet standard; requires monitoring.

"More Protection, Less Process"

Visit Our Internet Site At: www.dep.state.fl.us/waste/categories/pcp/default.htm

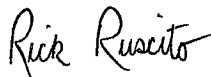
Printed on recycled paper.

Per Rule 62-522.300(2)(c), F.A.C., in order to obtain a temporary zone of discharge for pH, a secondary groundwater parameter, those who prepare site-specific Remedial Action Plans must indicate in their plans that the pH of the fluid to be injected will not meet the applicable standard, which is range 6.5 to 8.5. The plans must also indicate the size of a temporary zone of discharge that will be needed (i.e. radius of influence around each injection point), the length of time that the temporary zone of discharge is needed, and propose adequate groundwater monitoring for pH.

Lastly, in order to comply with the Underground Injection Control regulations of Chapter 62-528, F.A.C., remediation plans proposing ECOSAFE[®] must indicate the volume and composition of the fluid to be injected into an aquifer. Since the composition is proprietary, it will suffice to indicate just the overall volume of ECOSAFE[®] solution to be injected, and provide a footnote indicating that a one-time confidential disclosure regarding the proprietary composition has been submitted to the Department. It is suggested that a copy of the acceptance letter for ECOSAFE[®], including this voucher, be included in the appendix of each site-specific Remedial Action Plan proposing its use.

Remediation plan reviewers for petroleum-contaminated site applications involving ECOSAFE[®] may contact Rick Ruscito at (850) 877-1133, extension 3722, if there are any questions.

Sincerely,



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



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

ENCLOSURE 2

REGULATORY CONSIDERATIONS

- a. Groundwater regulations and cleanup standards: The onus shall be on users of ECOSAFE® to ensure that all applicable groundwater contaminant standards will be met at the time of project completion, for petroleum, other contaminants that may be present, any residuals associated with the ingredients of ECOSAFE®, and any byproducts produced as a result of chemical or biochemical reactions involving those ingredients. The following chapters of the Florida Administrative Code are cited: 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 minimum criteria; Chapter 62-522, F.A.C., for groundwater permitting and monitoring requirements; Chapter 62-528, F.A.C., for underground injection control, particularly Part V, for Class V, Group 4 aquifer remediation projects; Chapter 62-770, F.A.C., for petroleum cleanup criteria; and Chapter 62-777, F.A.C., also for minimum groundwater criteria.

A noteworthy aspect of the minimum criteria set forth in Chapter 62-520, F.A.C., is that it requires groundwater to be free from substances that are harmful to plants, animals, and organisms, and free from substances that are carcinogenic, mutagenic, teratogenic or toxic to human beings. In effect, these "free from" requirements form a catchall. They close what would otherwise be a loophole in the regulations by preventing injection of a potentially harmful product in the event that any of its ingredients is not regulated as a specific primary or secondary drinking water contaminant.

- b. Injection well permit: The issuance of a site-specific Remedial Action Plan Approval Order by either the Bureau of Petroleum Storage Systems or the Bureau of Waste Cleanup, for remediation via injection of ECOSAFE® into an aquifer, constitutes the granting of a Class V injection well permit.
- c. Groundwater injection standards: For in situ aquifer remediation, the composition of an injected fluid must meet the drinking water standards set forth in Chapter 62-550, F.A.C., pursuant to underground injection control Rule 62-528.600(2)(d), F.A.C.
- d. Utilization of wells: If a remediation site happens to have an abundance of monitoring wells, then the Department has no objection to the use of some wells for the application of ECOSAFE®. However, no "designated" monitoring well, dedicated to the tracking of remediation progress (by sampling) shall be used to apply ECOSAFE®. This will avoid premature conclusions 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.

e. Groundwater monitoring:

1. Active remediation petroleum monitoring: During the period of active remediation, groundwater shall be monitored in accordance with the requirements set forth in Section 62-770.700, F.A.C.
2. Post remediation petroleum monitoring: At least one (1) year of quarterly post remediation groundwater monitoring shall be conducted at a minimum of two (2) wells, one located in the area of maximum petroleum contamination, the other downgradient of the area of maximum petroleum contamination, pursuant to Section 62-770.750, F.A.C.
3. Underground injection control monitoring: For pH, pursuant to Rule 62-522.300(2)(c), F.A.C., the monitoring shall be conducted as proposed in a Department-approved Remedial Action Plan.

f. Underground injection control inventory: Remedial Action Plans proposing injection-type, in situ aquifer remediation shall include information pursuant to Rule 62-528.630(2)(c)1 through 6, F.A.C., for the inventory purposes of underground injection control. Per Rule 62-528.630(2)(c), F.A.C., aquifer remediation projects involving injection wells may be authorized under the provisions of a Remedial Action Plan, provided the construction, operation, and monitoring requirements of Chapter 62-528, F.A.C., are met. A memorandum outlining the inventory information about injection-type aquifer remediation plans to be transmitted by Department reviewers to the Underground Injection Control Section is provided as Enclosure 4. Only reviewers within the Department, including its district offices, may approve injection-type, in situ remediation plans for which the approval constitutes a Class V injection permit; local programs are not authorized to grant such approvals. See Enclosure 3.

g. Operation:

1. Avoidance of migration: For injection-type, in situ aquifer remediation projects, injection of ECOSAFE® shall be performed in such a way, and at such a rate and volume, that no undesirable migration of either the product's ingredients or the petroleum contaminants in the aquifer results, pursuant to Rule 62-528.630(3), F.A.C.
2. Underground injection control operating permit: Although an operating permit is not required for aquifer remediation wells pursuant to Rule 62-528.640(1)(b), and 62-528.640(1)(c), F.A.C., since no movement of the petroleum contamination plume is expected to accompany the ECOSAFE® treatment process, the Department requests that the information items listed in Rule 62-528.640(1)(b), F.A.C., be considered and included in Remedial Action Plan proposals as a matter of good and thorough design practice. Briefly summarized, they are: quality of water in the aquifer; quality of the injected fluid; existing and potential uses of the affected aquifer; and well construction

details. Additionally, each Remedial Action Plan should clearly indicate the total volume of ECOSAFE® that will be injected.

3. Operating parameter measurements: Rule 62-770.700(9)(h), F.A.C., sets forth frequency requirements for the measurement of bioremediation operating parameters such as dissolved oxygen levels, rates of nutrient addition, temperature, etc. It also includes an option for reduction in the frequency or discontinuation of some measurements in situations when appropriate. Since ECOSAFE® promotes biodegradation, those who submit Remedial Action Plans proposing its use should indicate which parameters, if any, should be measured in order to track and control the cleanup.
- h. Abandonment of wells: Upon issuance of a petroleum Site Rehabilitation Completion Order, or a declaration of "No Further Action", injection wells shall be abandoned pursuant to Section 62-528.645, F.A.C. The Underground Injection Control Section of the Department shall be notified so that the injection wells can be removed from the inventory-tracking list.

ENCLOSURE 3

SUPPLEMENTAL INFORMATION

- a. Department of Environmental Protection reviewers of injection-type, in situ aquifer remediation plans, regardless of whether in Tallahassee or district offices, must fill in the blanks on the Enclosure 4 memorandum, whose subject is "Proposed Injection Well(s) for In situ Aquifer Remediation at a Petroleum Remedial Action Site". The completed form must be submitted to the Underground Injection Control Section at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

Only reviewers within the Department and its district offices may approve injection-type, in situ remediation plans in which the approval constitutes the issuance of a Class V injection permit; local programs are not authorized to grant such approvals. Reason: Although an arrangement between the Environmental Protection Agency and the Department delegates underground injection control authority to the Department, it does not allow the Department to delegate that authority any further. This includes delegation to the Department's contracted remediation review agencies such as those operated by the counties and other local governments.

- b. Pilot study: For bioremediation, per rule 62-770.700(2), 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. Bench test: The Bureau of Petroleum Storage Systems generally recommends that bench tests not be conducted, but the developer of ECOSAFE® indicates that this is integral to the ECOSAFE® treatment method. Therefore, technical reviewers of remediation plans, and cleanup site project managers throughout the state should take this into consideration.
- d. Dosage and application rate: Information provided to the Bureau of Petroleum Storage Systems by the developer of ECOSAFE® did not include dosage and application rate. The Bureau therefore suggests that users of ECOSAFE® consult the developer on these matters. The developer did indicate, though, that the product is not used in concentrated form, but rather at dilution ratios ranging from 1:1,000 to 1:10,000.
- e. Oxygen: The developer indicates that oxygen is used when treating a cleanup site with ECOSAFE® but that the only source of oxygen is compressed air, not a chemical source or some other means of introducing oxygen. The compressed air used during an ECOSAFE® treatment serves as more than just a source of oxygen for indigenous aerobic microorganisms that degrade contaminants. It also serves to promote the mixing and

distribution of nutrients, and intensifies the REDOX degradation that is performed by the active colloid.

- f. Degradation products: Carbon dioxide, water, oxygen and nitrate are the ultimate end products when hydrocarbon contaminants are destroyed by ECOSAFE®.
- g. Methods of application: It is indicated that ECOSAFE® can be applied in a number of ways. They include topical methods, such as sprinkling or irrigation, in order for the ECOSAFE® to percolate downward; direct injection; open pit applications; and recirculating/re-injection-type methods.
- h. Clarification by the developer: ECOSAFE® is not a degreaser, although it can be used for that purpose.

**Florida Department of
Environmental Protection**

Memorandum

TO: Richard Deuerling, Mail Station 3530
Division of Water Resource Management
Underground Injection Control Section
Florida Department of Environmental Protection
2600 Blair Stone Road, Tallahassee, FL 32399-2400

FROM: _____ [see Note 1.]

DATE: _____

SUBJ: **Proposed Injection Well(s) for In Situ Aquifer**

Remediation at a Remedial Action Site

Pursuant to paragraph 62-528.630(2)(c), F.A.C., inventory information is hereby provided regarding the proposed construction of temporary injection well(s) for the purpose of in situ aquifer remediation at a contaminated site.

Site name: _____

Site address: _____

City/County: _____

Latitude/Longitude: _____

FDEP Facility Number: _____

Site owner's name: _____

Site owner's address: _____

Well contractor's name: _____ [see Note 2.]

Well contractor's address: _____

Brief description of the in situ injection-type aquifer remediation project:

Richard Deuerling
Page Two
Date: _____

Site name: _____
FDEP facility no.: _____

Summary of major design considerations and features of the project:

Areal extent of contamination (square feet): _____

Number of injection wells: _____

Composition of injected fluid [see Note 3.]

(ingredient, wt. %): _____

Injection volume per well (gallons): _____

Single or multiple injection events: _____

Injection volume total (all wells, all
events): _____

A site map showing the areal extent of the groundwater contamination plume, and the location and spacing of injection wells and associated monitoring wells is attached.

The following is a summary description of the affected aquifer:

Name of aquifer: _____

Depth to groundwater (feet): _____

Aquifer thickness (feet): _____

The injection well(s) features are summarized below, and/or a schematic of the injection well(s) is attached.

Direct-push or HSA/Mud rotary (*circle the appropriate well type*)

Diameter of well(s) (i.e., riser pipe & screen) (inches): _____

Total depth of well(s) (feet): _____

Screened interval: _____ to _____ feet below land surface

Grouted interval: _____ to _____ feet below land surface

Casing diameter, if applicable (inches): _____

Cased depth, if applicable: _____ to _____ feet below land surface

Casing material, if applicable: _____

The in situ injection-type aquifer remediation plan for this contaminated site is intended to meet the groundwater cleanup criteria set forth in Chapter 62-777, F.A.C., for the contaminants of concern. Additionally, all other groundwater standards will be met at the time of project completion for any residuals associated with the ingredients of the injected remediation products, and any by-products or intermediates produced as a result of the chemical or biochemical transformation of those ingredients or the contaminants of concern during their use. Applicable primary and secondary drinking water standards are set forth in Chapter

Richard Deuerling

Page Two

Date: _____

Site name: _____

FDEP facility no.: _____

62-550, F.A.C., and additional groundwater quality criteria are set forth in Chapters 62-520 and 62-777, F.A.C.

The remediation plan estimates that site remediation will take _____ months. We will notify you if there are any modifications to the remediation strategy which will affect the injection well design or the chemical composition and volume of the injected remediation product(s).

The proposed remediation plan was approved on _____ by an enforceable approval order. A copy is attached. The remediation system installation is expected to commence within 60 days. Please call me at _____ if you require additional information.

Note 1. This form is primarily for use by Florida Department of Environmental Protection technical reviewers or Department-designated reviewers. Remediation contractors may fill in all blanks except those labeled "FROM" and "DATE" on page 1, and the approval date and telephone number blanks in the last paragraph. Those blanks should be completed only by a Department reviewer or a Department-designated reviewer.

Note 2. If an injection well installation contractor has not yet been selected, then indicate the name and address of the project's general remediation contractor/consultant.

Note 3. Complete chemical analysis of injected fluid is required by Chapter 62-528, F.A.C. Proprietary formulations shall make confidential disclosure. Injected fluids must meet drinking water standards of Chapter 62-550, F.A.C., unless permission for a temporary zone of discharge has been granted by way of Rule 62-522.300(2), F.A.C., or a variance.