

**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

February 20, 2013

Via Electronic Mail
JHimelfarb@Pureous.com

John Himelfarb
Pureous Products, LLC
5930 Royal Lane, Suite E
Dallas, Texas 75230

Re: Pureous Hydrocarbon Fix

Dear Mr. Himelfarb:

The Bureau of Petroleum Storage Systems (Bureau) hereby accepts Pureous Hydrocarbon Fix, a proprietary formulation for in situ remediation of petroleum contaminants in groundwater and soil pursuant to Chapter 62-770, Florida Administrative Code (F.A.C.).

Pureous Hydrocarbon Fix catalytically alters the chemical structure of hydrocarbon contaminant molecules and then precipitates them as a stable, nonhazardous by-product. The Bureau notes an indication by the manufacturer that Pureous Hydrocarbon Fix is recognized by the EPA's Design for the Environment program.

Enclosure 1 is a voucher for the confidential disclosure of the proprietary ingredients and their proportions in Pureous Hydrocarbon Fix. 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.

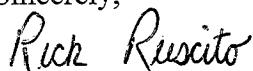
Remedial Action Plans that propose the use of an accepted product or process should include a copy of the acceptance letter in the plan's appendix, and reference it in the text of the document. It is not a requirement that a particular remediation product or process have an official acceptance letter 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.

February 20, 2013

This acceptance is issued for the purposes of the Florida Department of Environmental Protection's Bureau of Petroleum Storage Systems. Other state agencies and local governments may choose to recognize it if their needs are similar, but the Bureau shall not be responsible for applications beyond its jurisdiction.

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 3722, or by e-mail at RRuscito@ene.com.

Sincerely,

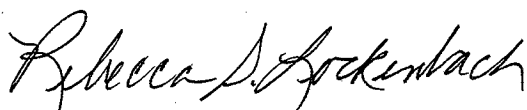


Rick Ruscito, P.E.

Ecology and Environment, Inc.

Bureau of Petroleum Storage Systems

Petroleum Cleanup Section 6 – MS 4590



Rebecca S. Lockenbach

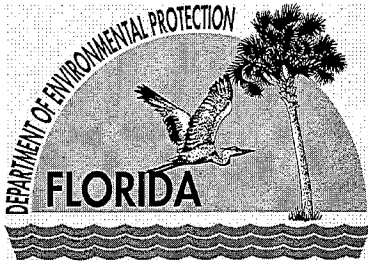
FDEP Section Leader

Bureau of Petroleum Storage Systems

Petroleum Cleanup Section 6

- Enclosures:
- (1) Voucher for Disclosure of Proprietary Ingredients and their Proportions in Pureous Hydrocarbon Fix
 - (2) Regulatory Information
 - (3) Supplemental Information

c: Tom Conrardy - FDEP/Tallahassee



**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

February 20, 2013

John Himelfarb
Pureous Products, LLC
5930 Royal Lane, Suite E
Dallas, Texas 75230

Re: Voucher for Disclosure of Proprietary Ingredients and
their Proportions in Pureous Hydrocarbon Fix

Dear Mr. Himelfarb:

The Bureau of Petroleum Storage Systems (Bureau) hereby acknowledges your letter dated February 14, 2013, indicating that Pureous Products LLC (Pureous) has begun to market a product for in situ remediation of petroleum contaminants in groundwater and soil under the new label name Pureous Hydrocarbon Fix. Your letter also indicates that Pureous Hydrocarbon Fix has the same ingredients as the product for which you earlier sought and received acceptance by the Bureau on December 19, 2011, under a different label name. Since the formulation is the same, the original August 22, 2011 confidential disclosure of proprietary ingredients and their proportions on file with the Bureau is still valid.

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

For underground injection control notification purposes, aquifer remediation plans proposing the use of Pureous Hydrocarbon Fix must indicate the volume and composition of the fluid to be injected. Since the formulation is proprietary, it will suffice to indicate just the overall volume and concentration of Pureous Hydrocarbon Fix to be injected, and provide a footnote indicating that a one-time confidential disclosure dated August 22, 2011, identifying the proprietary ingredients and their proportions, is already on file with the Bureau.

John Himelfarb
Page 2
February 20, 2013

Pureous Hydrocarbon Fix
Enclosure 1
Voucher

If there are any questions about this voucher, please direct them to Rick Ruscito at (850) 877-1133, extension 3722, or by e-mail at RRuscito@ene.com.

Sincerely,



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



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 Pureous Hydrocarbon Fix 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 in-situ, 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 Pureous Hydrocarbon Fix: The parameters for which 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, when Pureous Hydrocarbon Fix is injected into an aquifer shall be sodium, nonionic surfactant, and pH. ZOD permission shall be sought, and monitoring shall be conducted for all three parameters, regardless of whether Pureous Hydrocarbon Fix is injected at the as-shipped concentration or diluted with water prior to injection. The manufacturer has indicated to the Bureau of Petroleum Storage Systems that it prefers to conservatively seek ZOD permission and to conduct monitoring for all three parameters whenever Pureous Hydrocarbon Fix is injected, regardless of injection concentration.
- g. ZOD monitoring advice for Pureous Hydrocarbon Fix: In most cases, quarterly monitoring of groundwater should suffice for the ZOD parameters associated with Pureous Hydrocarbon Fix. The number of monitoring wells to be sampled should be representative of the Pureous Hydrocarbon Fix 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 Pureous Hydrocarbon Fix are as follows: sodium, 160 milligrams per liter (mg/L); nonionic surfactant, 0.5 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, for two (2) consecutive quarters.
- 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 Pureous Hydrocarbon Fix. However, no "designated" monitoring well, dedicated to the tracking of remediation progress (by sampling) shall be used to apply Pureous Hydrocarbon Fix. 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 Pureous Hydrocarbon Fix 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 Pureous Hydrocarbon Fix 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. In situ soil remediation: 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 to the parameters of concern for the ingredients of the Pureous Hydrocarbon Fix itself and the petroleum contaminants of concern at the remediation site, all of which might have the potential to leach or percolate into the underlying groundwater.

SUPPLEMENTAL INFORMATION

- a. Dosage and application rates: Prospective users of Pureous Hydrocarbon Fix should consult the manufacturer to tailor the dosage and application rate on a site-specific basis.
- b. Ingredient residuals: The Bureau of Petroleum Storage Systems advises users of chemical-type, in situ remediation products to apply only as much of the product as necessary. This may help to avoid a situation in which a site's petroleum contaminants of concern have been successfully remediated, but the issuance of a Site Rehabilitation Completion Order is delayed by the presence of high concentration, ingredient-related zone of discharge parameters that have not yet decreased to their groundwater standards or natural-occurring background levels at the cleanup site, whichever is less stringent.
- c. End product: The manufacturer has indicated, in discussions with the Bureau of Petroleum Storage Systems, that the precipitated byproduct is a stable, chemically altered, non-hazardous end product. Additionally, the Bureau, in literature searches of patents, articles, and other product literature, has found that the state-of-the-art at this time is such that the complex reaction mechanisms that alter the hydrocarbons are not entirely understood. But what is known, and frequently cited as an example by this manufacturer and others in the literature, is that catalytic conversions take place, and that reverse catalysis non-hazardous products are formed.