



Florida Department of Environmental Protection

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

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

April 28, 2009

Mr. Gary M. Birk, P.E.
EOS Remediation, LLC
1101 Nowell Road
Raleigh, North Carolina 27607

Re: **AquaBupH™**

Dear Mr. Birk:

The Bureau of Waste Cleanup (Bureau) hereby accepts AquaBupH™, a proprietary blend of substances, for the remediation of chlorinated solvents and other suitable contaminants in groundwater. EOS Remediation, LLC, has an acceptance letter for its remediation product Edible Oil Substrate (EOS). AquaBupH™ is essentially EOS with an added ingredient that serves as a buffer. A proprietary information voucher is provided as Enclosure 1 and regulatory information as Enclosure 2. Additional information regarding the use of AquaBupH™ can be obtained from the EOS acceptance letter.

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 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, with all original attachments, 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 Department review and approval.

Sincerely,

A handwritten signature in blue ink, appearing to read "Gary M. Millington".

Gary Millington, P.E.
Bureau of Waste Cleanup
Program and Technical Support Section

Enclosures: (1) Proprietary Information Voucher for AquaBupH™
(2) Regulatory Information

c: Tom Conrardy - FDEP/Tallahassee
Rob Cowdery - FDEP/Tallahassee

ENCLOSURE 1

PROPRIETARY INFORMATION VOUCHER



Florida Department of
Environmental Protection

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Mr. Gary M. Birk, P.E.
EOS Remediation, LLC
1101 Nowell Road
Raleigh, North Carolina 27607

Re: **Proprietary Information Voucher for AquaBupH™**

Dear Mr. Birk:

The Bureau of Waste Cleanup (Bureau) hereby acknowledges receipt of a confidential disclosure dated March 20, 2009, from EOS Remediation, LLC, which included the proprietary analysis of AquaBupH™. Having reviewed the confidential disclosure, the Bureau hereby vouches that this product meets the requirements of Chapters 62-522 and 62-528, F.A.C., if used in the quantities stated in the disclosure.

Each site-specific Remedial Action Plan that proposes the use of AquaBupH™ must include information that is required by Chapters 62-522 and 62-528, F.A.C. Remedial Action Plan Approval Orders, when issued by the Department, will meet the requirements of the underground injection control (UIC) program.

For UIC purposes, Remedial Action Plans proposing the use of AquaBupH™ must disclose the dilution rate of the AquaBupH™ concentrate and include a footnote indicating that a one-time confidential disclosure regarding the proprietary analysis has been submitted to the Department and accepted. Reference should be made to the original March 20, 2009, disclosure, and a copy of this voucher should be included as an appendix in the plan.

Reviewers of cleanup site remedial plans involving the use of AquaBupH™ may contact Gary Millington at 850.245.7502.

Sincerely,

A handwritten signature in blue ink that reads "Gary Millington".

Gary Millington, P.E.
Bureau of Waste Cleanup
Program and Technical Support Section

GM/gm

ENCLOSURE 2
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; 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; 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 AquaBupH™ shall comply with all applicable regulations. This includes meeting applicable groundwater cleanup target levels for the contaminants of concern, the residual concentrations of AquaBupH™ ingredients, and any byproducts of concern produced by chemical and biological reactions induced by the ingredients during the timeframe of the cleanup project. For the “ingredients of concern” in AquaBupH™ that are present in excess of their groundwater standards, the timeframe is that which is permitted for a temporary injection zone of discharge.

- b. Underground Injection Control (UIC) permit: 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 permit.
- c. 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 memorandum to the UIC program.**
- d. General information about temporary injection zones of discharge: For in-situ aquifer remediation, the composition of an injected fluid 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 fluids that do not meet these requirements must seek permission for a temporary injection zone of discharge. Depending on the chemical composition and the physical properties of the fluid, it will be necessary to obtain an injection zone of discharge by either one or both of the following methods: by Rule 62-522.300(2)(c), F.A.C., or by variance from Rule 62-522.300(3), F.A.C.

Rule 62-522.300(2)(c), F.A.C., allows a temporary injection zone of discharge for closed-loop re-injection systems, the prime constituents of the reagents used to remediate site contaminants, and the secondary standards for groundwater, provided a Department-approved remedial action plan addresses the duration and size of the zone of discharge, and groundwater monitoring of the injected chemical species of concern.

In order to obtain permission for a temporary zone of discharge by way of Rule 62-522.300(2)(c), F.A.C., a site-specific Remedial Action Plan must indicate: (a) the chemical species of concern in the fluid to be injected that will be present in excess of their allowable concentrations; (b) the size of the zone that is needed; (c) the amount of time that the zone will be needed; and (d) a groundwater monitoring plan for the injected chemical species of concern. In most cases, monitoring on a quarterly basis should be sufficient. The size of the temporary injection zone of discharge in item (b) above will usually be the radius of influence when the treatment system is a single injection point. For a multiple point system, the zone of discharge 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.

- e. Specific zone of discharge information for AquaBupH™: In order for AquaBupH™ to be used for in-situ, injection-type aquifer remediation, **a temporary injection zone of discharge is needed for total recoverable petroleum hydrocarbons (TRPH), surfactant, total dissolved solids; and chloride** (a contaminant degradation byproduct). The issuance of a site-specific Remedial Action Plan Approval Order constitutes the granting of permission for the temporary injection zone of discharge. **The product formulation includes approximately 15%, by weight, buffering agent. The normally expected minimum dilution rate for the AquaBupH™ is 1 part AquaBupH™ concentrate to 4.2 parts water. A zone of discharge, possibly needing a variance, may be required for additional contaminants if a higher quantity of buffering agent is needed or lower dilution rate is proposed in a Remedial Action Plan.**
- f. Additional nutrients: If, in the future, either the manufacturer or a user decides to augment AquaBupH™ with other products, including nutrients, microorganisms, or other chemicals, those products must also meet the rule requirements as outlined above.
- g. 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 injection. However, no “designated” monitoring well, dedicated to the tracking of remediation progress (by sampling) shall be used for injection. This will avoid premature conclusions that the entire site meets cleanup goals. By making sure that designated tracking wells are not also used for injection, 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.

- h. Avoidance of migration: For injection-type, in-situ aquifer remediation projects, pursuant to Rule 62-528.630(3), F.A.C., injection of AquaBupH™ shall be performed in such a way, and at such a rate and volume, that no undesirable migration of either the AquaBupH™ or the contaminants of concern in the aquifer results.
- i. 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 UIC Section of the Department shall be notified so that the treatment wells can be removed from the injection well inventory tracking list.
- j. Open-pit applications: While open-pit application of AquaBupH™ is not an injection-type application, and notification of the UIC Section therefore not required, the user must still be mindful of groundwater quality. For open-pit applications, the Bureau suggests that groundwater in the application area be sampled for the same parameters that would have been monitored had the application been an injection.