



Department of Environmental Protection

Jeb Bush
Governor

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

Colleen M. Castille
Secretary

December 13, 2004

Mr. Steve Perry
ConSeal International Incorporated
90 Kerry Place, Suite 2
Norwood, Massachusetts 02062

Re: **ProBio-CSX**

Dear Mr. Perry:

The Florida Department of Environmental Protection hereby accepts ProBio-CSX for in situ remediation of chlorinated solvents and other suitable contaminants in groundwater and soil. ProBio-CSX is a proprietary sodium lactate-based product that enhances the anaerobic degradation of chlorinated solvents. It serves as an electron donor in reductive chemical reactions during which hydrogen atoms replace chlorine atoms in chlorinated solvent molecules.

The Department recognizes ProBio-CSX as a viable product for the remediation of contaminated sites in Florida. There are no objections to its use provided: (a) the considerations of this letter are taken into account; (b) a Remedial Action Plan is approved by the Department; and (c) applicable and appropriate underground injection control regulations are observed. For ProBio-CSX, the major environmental and regulatory considerations are set forth in enclosure 1.

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 interest 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 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.

It is suggested that those who prepare and submit Remedial Action Plans include a copy of this letter in the appendix, and call attention to it in the text of the document. In this way, technical reviewers throughout the state will be informed that ConSeal International has contacted the Department of Environmental Protection to inquire about the environmental acceptability of

"More Protection, Less Process"

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ProBio-CSX. To aid those reviewers, supplemental information is provided in enclosure 2.

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 Remedial Action Plans proposing the product or process. You may contact Rick Ruscito by telephone at (850) 877-1133, extension 29, or at the letterhead address, Mail Station 4590, 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

c: T. Conrardy - FDEP, Tallahassee/MS 4530

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ENCLOSURE 1

ENVIRONMENTAL AND REGULATORY INFORMATION

For ProBio-CSX, the major environmental and regulatory concerns are listed below.

- a. Groundwater cleanup standards: The onus shall be on users of ProBio-CSX to ensure that all applicable groundwater contaminant standards will be met at the time of project completion, for the contaminants of concern, any residuals associated with the ingredients of ProBio-CSX, 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; 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; and Chapter 62-777, F.A.C., for cleanup target levels.

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. Zone of Discharge: Those who prepare in situ, injection-type aquifer Remedial Action Plans proposing the use of ProBio-CSX must comply with underground injection control regulations. The Department, having reviewed a confidential disclosure of the proprietary ingredients and their proportions in ProBio-CSX, advises users of the product that rule 62-522.300(2)(c), F.A.C., applies, and that they can comply with this rule by preparing and submitting to the Department, for review and approval, a site-specific Remedial Action Plan that includes the items listed below.

- An indication that ProBio-CSX could potentially cause a temporary exceedance of the groundwater standards for sodium, total dissolved solids, pH, and chloride. (Chlorine is not an ingredient of ProBio-CSX, but if the concentration of chlorinated solvent contaminants at a site is great enough, then the amount of chlorine liberated could be sufficient to exceed the groundwater standard for chloride.)
- The size and duration of a temporary zone of discharge, within which there is the potential for ProBio-CSX to temporarily cause an exceedance of the groundwater standards for sodium, total dissolved solids, pH, and chloride. The term "zone of discharge" appears in Florida Administrative Code rules that pertain to underground injection control, but a corresponding term commonly used by those in the remediation industry when referring to the size of an injection zone is the "radius of influence" of a single injection point. The duration period is the length of time, after injection, during which there could be an exceedance of a groundwater standard within the zone of discharge.
- A groundwater monitoring plan for sodium, total dissolved solids, pH, and chloride. (If a site clearly does not have a high enough

concentration of chlorinated solvents to cause an exceedance of chloride, then the Department does not object to the omission of chloride sampling from the groundwater monitoring plan.) The results of the groundwater monitoring must show -- by the end of the time period during which a temporary zone of discharge is permitted -- that sodium, total dissolved solids, pH, and chloride meet their respective groundwater standards, or their natural-occurring background levels at the cleanup site, whichever is less stringent. The standards are as follows: sodium, 160 milligrams per liter (mg/L), maximum; total dissolved solids, 500 mg/L, maximum; pH, range 6.5 to 8.5; and chloride, 250 mg/L, maximum.

Historical note: Prior to August 27, 2001, it was necessary to first be granted a variance that would permit a temporary zone of discharge for in situ, injection-type aquifer remediation using sodium lactate. However, with the advent of rule 62-522.300(2)(c), F.A.C., effective August 27, 2001, the need for a variance was eliminated in most but not all cases of substances used for in situ, injection-type aquifer remediation. In the case of sodium lactate, a variance is no longer necessary, and the temporary zone of discharge is now permitted more expediently by the new rule, although any variances that were issued prior to August 27, 2001 for sodium lactate are still valid.

- c. Injection well permit: The issuance of a site-specific Remedial Action Plan Approval Order by the Department for injection-type aquifer remediation via ProBio-CSX constitutes the granting of a Class V injection well permit. [Ref. Chapter 62-528, 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 as injection points for the ProBio-CSX. However, no "designated" monitoring well, dedicated to the tracking of remediation progress (by sampling) shall be used as ProBio-CSX injection points. 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. Underground injection control inventory: Remedial Action Plans proposing in situ injection-type 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 projects to be transmitted by Department reviewers to the Underground Injection Control Section is provided as enclosure 3.
- f. Avoidance of migration: For in situ injection-type aquifer remediation projects, injection of the ProBio-CSX shall be performed in such a way that no undesirable migration of either its ingredients or the contaminants of concern in the aquifer results, pursuant to Rule 62-528.630(3), F.A.C.
- g. Abandonment of wells: Upon issuance of a 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 ProBio-CSX injection wells can be removed from the inventory-tracking list.

ENCLOSURE 2

SUPPLEMENTAL INFORMATION

- a. Department of Environmental Protection reviewers of in situ injection-type aquifer remediation plans, regardless of whether in Tallahassee or district offices, must fill in the blanks on the enclosure 3 memorandum, whose subject is "Proposed Injection Well(s) for In Situ Aquifer Remediation at a Remedial Action Site". The completed form must be submitted to the Underground Injection Control Section at 2600 Blair Stone Road, Tallahassee, Florida, 32399-2400.
- b. Dosage: ConSeal International indicates that ProBio-CSX can be applied at strengths up to 5 percent in water, and that a 5-percent dose can be prepared by mixing 1 part ProBio-CSX with 95 parts water. A more preferable method of determining the dose, as suggested by ConSeal International, is to "match the use-level on a 1:1 basis with the chlorinated compound in the soil at the same PPM level".

**Florida Department of
Environmental Protection**

Memorandum

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

FROM: _____

DATE: _____

SUBJ: **Proposed Injection Well(s) for In Situ Aquifer
Remediation at a Remedial Action Site**

Pursuant to Rule 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: _____ (Note 1.)
Well contractor's address: _____

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

Summary of major design considerations and features of the project:

Areal extent of contamination (square feet): _____
Number of injection wells: _____
Composition of injected fluid (Note 2)
(ingredient, wt. %): _____

Injection volume per well (gallons): _____
Single or multiple injection events: _____
Injection volume total (all wells, all
events): _____

Richard Deuerling
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Date: _____

Site name: _____
FDEP facility no.: _____

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 Conventional (*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 surface
Grouted interval: _____ to _____ feet below surface
Casing diameter, if applicable (inches): _____
Cased depth, if applic.: _____ to _____ feet below surface
Casing material, if applic.: _____

The in situ injection-type aquifer remediation plan for this contaminated site is intended to meet the applicable 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 62-550, F.A.C., and additional groundwater quality criteria are set forth in Chapter 62-520, 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 that 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. 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 2. Complete chemical analysis of injected fluid is required by Chapter 62-528, Florida Administrative Code. Proprietary formulations shall make confidential disclosure. Injected fluids must meet drinking water standards of Chapter 62-550, F.A.C., unless an exemption or variance has been granted.