

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

July 18, 2011

Craig Sandefur
Regenesis
1011 Calle Sombra
San Clemente, California 92673

Re: RegenOx® PetroCleanze™

Dear Mr. Sandefur:

The Bureau of Petroleum Storage Systems (Bureau) hereby accepts RegenOx® PetroCleanze™ for rapid in situ desorption of petroleum contaminants from soils, both above and below the water table. Below the water table, the desorption serves to expedite the remediation of the groundwater as well, by making the contaminants more readily available for in situ destruction by other means or mechanical recovery.

PetroCleanze™ is a two-part system. Part A Oxidizer is a white granular material that contains sodium percarbonate, and the Activator is a liquid catalyst that contains ferrous sulfate. The two parts can be combined prior to use, or the activator alone can be introduced to the subsurface first as a pre-conditioning step. Enclosure 1 is a voucher for the confidential disclosure of the proprietary proportions of PetroCleanze™ ingredients. Enclosure 2 contains regulatory information; Enclosure 3 contains supplemental information; and Enclosure 4 is an Underground Injection Control Notification.

As Regenesis has indicated, PetroCleanze™ differs from Regenesis' standard RegenOx® in that it serves primarily to desorb hydrocarbons from soil particles, by partial oxidation. The partial oxidation produces chemical species that are more soluble and which act similarly to surfactants. It is anticipated that PetroCleanze™ will generally serve as part of an overall remediation strategy, not a stand-alone remedy, but the Bureau has no objection to its use as a stand-alone remedy if deemed appropriate for the conditions of a cleanup site.

There are different ways in which PetroCleanze™ can be part of an overall remediation strategy. In one way it can be used to desorb contaminant mass from the most highly

impacted surface or subsurface areas, followed by the application of standard chemical oxidation and/or bioremediation amendments, such as standard RegenOx® or Oxygen Release Compound (ORC®), or followed by the use of a mechanical system to recover desorbed contamination, such as dual-phase vacuum extraction, extraction via vacuum trucks, or the pumping of wells. It can also be used to revitalize the efficiency of pump-and-treat systems that may have reached asymptotic levels by hastening desorption of residual contaminants to make them more readily available for capture.

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.

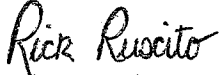
This acceptance is issued for the purposes of the Florida Department of Environmental Protection's Bureau of Petroleum Storage Systems. Other state agencies and local governments may choose to recognize it if their needs are similar, but the Bureau shall not be responsible in any way for applications 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 3720

Craig Sandefur
Page 3
July 18, 2011

RegenOx® PetroCleanze™

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 Proportions
in RegenOx® PetroCleanze™
(2) Regulatory Information
(3) Supplemental Information
(4) Underground Injection Control Notification Memorandum

c: Tom Conrardy - FDEP/Tallahassee

Drew Baird, P.G., Regenesys, 123 Ridgecrest Drive, Greenville, South Carolina 29609

History

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7/18/11



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July 18, 2011

Craig Sandefur
Regenesis
1011 Calle Sombra
San Clemente, California 92673

Re: Voucher for Disclosure of Proprietary Ingredients Proportions
in RegenOx® PetroCleanze™

Dear Mr. Sandefur:

The Bureau of Petroleum Storage Systems (Bureau) hereby acknowledges a confidential disclosure by Regenesis dated June 22, 2011, regarding the proprietary proportions of ingredients in RegenOx® PetroCleanze™, a chemical oxidation-type remediation product for rapid desorption of petroleum contamination from soils, both above and below the water table. PetroCleanze™ is a two-part system: an oxidizer and an activator. Having reviewed the disclosure, the Bureau hereby vouches for the proportions of the ingredients in the tables below.

RegenOx® PetroCleanze™ Part A (Oxidizer Complex) (granular)

<u>Ingredient</u>	<u>CAS No.</u>	<u>Concentration</u>
Sodium Percarbonate	15630-89-4	Proprietary
Sodium Carbonate Monohydrate	5968-11-6	Proprietary
Silicic Acid, Sodium Salt, Sodium Silicate	1344-09-8	Proprietary
Silica Gel	63231-67-4	Proprietary

RegenOx® PetroCleanze™ (Activator Complex) (liquid)

<u>Ingredient</u>	<u>CAS No.</u>	<u>Concentration</u>
Silicic Acid, Sodium Salt, Sodium Silicate	1344-09-8	Proprietary
Ferrous Sulfate	7720-78-7	Proprietary
Sodium Hydroxide	1310-73-2	Proprietary
Sodium Tripolyphosphate	7758-29-4	Proprietary
Water	7732-18-5	Proprietary

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 RegenOx® PetroCleanze™ 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 RegenOx® PetroCleanze™ 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 RegenOx® PetroCleanze™ to be injected, and provide a footnote indicating that a one-time confidential disclosure, dated June 22, 2011, identifying the proprietary proportions of the individual 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



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 PetroCleanze™ 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 permits: 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 Enclosure 4 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. Permission for a temporary ZOD may be obtained by way of Rule 62-520.310(8)(c), F.A.C. If a ZOD cannot be obtained by rule, it will be necessary 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 PetroCleanze™: Regenesis indicates that the two parts of PetroCleanze™ can be combined prior to use, or the activator alone can be introduced to the subsurface first as a pre-conditioning step. For that reason, the Bureau of Petroleum Storage Systems provides ZOD advice below for 3 situations: (1) injection of PetroCleanze™ oxidizer alone; (2) injection of PetroCleanze™ activator alone; and (3) injection of PetroCleanze™ oxidizer and activator combined.

Tables are included as part of the Bureau's advice. Each is presented in such a way that it provides enough information about the ionic species of regulatory interest for users of the product to comply with ZOD permission and monitoring requirements, but not so much as to divulge the proprietary proportions of the product's molecular ingredients.

1. ZOD for PetroCleanze™ oxidizer alone: Regenesis anticipates that the concentration of PetroCleanze™ oxidizer alone in the fluid to be injected will usually be in the range of 3-5% by weight. For that concentration range, obtain ZOD permission by way of Rule 62-520.310(8)(c), F.A.C., as described in paragraph e above and monitor the groundwater for sodium, total dissolved solids, and pH. It is only at concentrations of less than 0.051% by weight of oxidizer alone in the fluid to be injected that ZOD and groundwater monitoring requirements decrease to just pH, as shown in Table 1.

2. ZOD for PetroCleanze™ activator alone: Regenesis anticipates that the concentration of PetroCleanze™ activator alone in the fluid to be injected will usually be in the range of 3-8% by weight. For that concentration range, obtain ZOD permission by way of Rule 62-520.310(8)(c), F.A.C., as described in paragraph e above and monitor the groundwater for iron, sodium, total dissolved solids, sulfate, and pH. It is only at concentrations of less than 1.205% by weight of catalyst alone in the fluid to be injected that ZOD and groundwater monitoring requirements begin to decrease, as shown in Table 2.
3. ZOD for injection of PetroCleanze™ oxidizer and activator combined: If PetroCleanze™ oxidizer and activator will be combined at a 1:1 weight ratio prior to injection, as recommended by Regenesis, and the overall combined concentration is greater than or equal to 1.21% percent by weight, as shown and explained in Table 3, then obtain ZOD permission by way of Rule 62-520.310(8)(c), F.A.C., as described in paragraph e above and monitor the groundwater for iron, sodium, total dissolved solids, sulfate, and pH. At concentrations less than 1.21% by weight of combined oxidizer and activator in the fluid to be injected, the ZOD and groundwater monitoring requirements begin to decrease, as shown in Table 3.
- g. Injection "event" for the two-part system: If PetroCleanze™ activator alone will be injected first as a pre-conditioning step, and followed by the injection of oxidizer alone a relatively short time later, then consider it to be a single injection event for the Underground Injection Notification purposes of Enclosure 4. The Bureau of Petroleum Storage Systems assumes that the amount of time between the application of activator and oxidizer is site-specific, and therefore not possible for Regenesis to specifically address in its instructions for the use of PetroCleanze™. In that case, the Bureau suggests that a "short time", for UIC injection notification purposes, be 3-7 days typically, but not more than 30 days for unusual circumstances. If the oxidizer will be injected more than 30 days after the injection of activator, then consider it to be a separate injection event for UIC notification purposes.
- h. ZOD monitoring advice for PetroCleanze™: In most cases, quarterly monitoring of groundwater should suffice for the ZOD parameters associated with PetroCleanze™. The number of monitoring wells to be sampled should be representative of the PetroCleanze™ 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 PetroCleanze™ are as follows: iron, 0.3 milligrams per liter (mg/L); sodium, 160 mg/L; total dissolved solids, 500 mg/L; sulfate, 250 mg/L; and pH, range 6.5-8.5. Upon expiration of the time period granted for the ZOD, the concentration of each must

meet its respective groundwater standard, or its natural-occurring background value at the specific cleanup site, whichever is less stringent.

- 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 PetroCleanze™. However, no "designated" monitoring well, dedicated to the tracking of remediation progress (by sampling) shall be used to apply PetroCleanze™. 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 PetroCleanze™ 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 PetroCleanze™ 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.

PetroCleanze ZOD Tables	If injecting an aqueous solution of weight percent (wt%) that is...		Obtain Permission for Zone of Discharge by way of Rule 62-520.310(8)(c), F.A.C., and Monitor for...				Notes
	greater than or equal to...	but less than...	Iron	Sodium	Total Dissolved Solids	Sulfate	
Table 1 Regen Ox - Part A (Oxidizer Complex) ALONE							A typical concentration of 3-5% by weight of <u>oxidizer alone</u> in the fluid to be injected will require ZOD permission for sodium, TDS, and pH. Regenesis, in a confidential disclosure, provided the proportions of oxidizer ingredients, which the Bureau of Petroleum Storage Systems used to calculate the 0.051% ZOD trigger point for reduced monitoring, should it be necessary in the future to inject a very low concentration of oxidizer alone. The oxidizer (as shipped by Regenesis) is a <u>powder</u> .
	0.051%	The solubility limit		X	X		
	0%	0.051%					
Table 2 Regen Ox - PetroCleanze (Activator Complex) ALONE	1.205%	100%	X	X	X	X	A typical concentration of 3-8% by weight of <u>activator alone</u> in the fluid to be injected will require ZOD permission for iron, sodium, TDS, sulfate, and pH. Activator, as-shipped, is a <u>liquid</u> of specific gravity in the range of 1.1 to 1.3. Regenesis, in a confidential disclosure, provided the proportions of activator ingredients, which the Bureau of Petroleum Storage Systems used to calculate the ZOD trigger points for reduced monitoring, should it be necessary in the future to inject activator alone at a concentration less than 1.205%.
	0.050%	1.205%	X	X	X		
	0.045%	0.050%	X	X			
	0.003%	0.045%	X				
	0%	0.003%					
Table 3 Part A Oxidizer and PetroCleanze Activator COMBINED and present in the mixture at a 1 to 1 weight ratio	1.21%	The solubility limit	X	X	X	X	When the oxidizer and activator are combined <u>prior</u> to injection, Regenesis indicates that they should be applied at a 1 to 1 weight ratio. For example, 1,000 lbs of such a 1:1 mixture would contain 25 lbs of oxidizer (powder), 25 lbs of activator (liquid), and 950 lbs of water. The overall weight percent of combined oxidizer and activator in the mix would be 5%, calculated as follows: the 50 lbs of combined weight is first divided by 1,000, and then multiplied by 100. Since the 5% overall concentration is greater than the 1.21% threshold value shown at the left, ZOD permission and monitoring will be necessary for iron, sodium, TDS, sulfate, and pH.
	0.056%	1.21%	X	X	X		
	0.022%	0.056%	X	X			
	0.0025%	0.022%	X				
	0%	0.0025%					

SUPPLEMENTAL INFORMATION

- a. Dosage and application rates: Prospective users of RegenOx® PetroCleanze™ should contact Regenesis to determine the dosage and application rate of PetroCleanze™ on a site-specific basis.
- b. Safety reminders: Even though the activator and oxidizer components of PetroCleanze™ can be combined prior to application without producing a vigorous reaction, it is still worthwhile to be mindful about safety when using chemical oxidizers. Safety considerations to keep in mind include but are not necessarily limited to the items below.
 - Use of proper protective clothing.
 - Proper handling and storage of PetroCleanze™ activator and oxidizer, and consideration for their compatibility with other chemicals that may be placed alongside them in storage facilities.
 - Use of containers, tanks and piping constructed from materials that are compatible with the activator and oxidizer.
 - Proper disposal of unused or unwanted PetroCleanze™.
- c. Additional safety items to consider for chemical oxidation remediation processes at petroleum cleanup sites are listed in the Bureau of Petroleum Storage Systems' Remedial Action Plan checklist.

July 18, 2011

**Florida Department of
Environmental Protection**

Memorandum

{This version of UIC Notice memo is for use by staff of the BPSS, BWC, and District offices}

TO: Cathy McCarty, P.G.
Florida Department of Environmental Protection
Bureau of Water Facilities Regulation
Underground Injection Control Section – MS 3530
2600 Blair Stone Road, Tallahassee, Florida 32399-2400

FROM: _____
(An employee of Div. of Waste Management or DEP District Office)

DATE: _____

SUBJECT: **Remediation Product Injection Well(s) for In Situ Aquifer
Remediation at a Contaminated Site**

Reminder: This memorandum must be completed by an FDEP employee of the Bureau of Petroleum Storage Systems, the Bureau of Waste Cleanup, or an FDEP District Office. A person working for a consultant company preparing a RAP may complete some portions of this memo to expedite the FDEP's review but if so, the "From" and "Date" blanks and the date of RAP approval and phone number should be left blank for the FDEP technical reviewer to complete after verifying other information in the memo is accurate and conforms to applicable rules and procedures.

oOo

Please remove this message box prior to submittal of this memorandum to the Underground Injection Control Section.

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

Facility name: _____

Facility address: _____

City/County: _____

Latitude/Longitude: _____

FDEP Facility Number: _____

Facility owner's name: _____

Facility owner's address: _____

Well contractor's name: _____

Well contractor's address: _____

Cathy McCarty, P.G.
Page 2 of 4
Date: _____

Facility name: _____
FDEP facility no.: _____

AFFECTED AQUIFER

Name of aquifer: _____
Depth to groundwater (feet): _____
Aquifer thickness (feet): _____
Areal extent of contamination (square feet): _____

INJECTION WELLS

A site map showing the location and spacing of injection wells, the areal extent of the groundwater contamination plume, and associated monitoring wells is attached. 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, if applicable: _____ to _____ feet below land surface
Casing diameter, if applicable (inches): _____
Cased depth, if applicable: _____ to _____ feet below land surface
Casing material, if applicable: _____
If a remediation product will be injected as a DP rod is inserted, indicate injection interval: _____ to _____ feet below land surface.

PROJECT DESCRIPTION

The in situ, injection-type aquifer remediation product/process remediates contaminants by:
(check those that apply)

- ☐ use of a bioremediation product,
- ☐ use of a chemical oxidation product,
- ☐ recirculation of partially treated contaminated groundwater, or
- ☐ other (describe) _____

Brief description of the project: _____

Summary of major design considerations and features of the project:

Number of injection wells: _____
Injection volume per well (gallons): _____
Single or multiple injection events: _____
Injection volume total (all wells, all events): _____
For continuous recirculation of partially treated water, indicate total daily design flow rate: _____ gallons per day

FLUID TO BE INJECTED

Brand name of remediation product(s): _____

Has an innovative technology acceptance letter been issued for this product by the BPSS:
__ yes __ no (Note: it is not required that an innovative technology acceptance letter be issued for the technology or product to be proposed in a RAP)

If product formula is proprietary then non-disclosure of the formula to the PE reviewing the RAP for the Department is only acceptable if there is an innovative technology acceptance letter issued by the Department with an attached proprietary voucher of confidential disclosure and it is verified that the proposed application rates (dosage) is limited to the rates specified in the innovative technology acceptance letter.

Is product formulation proprietary? __ yes __ no.

If product formulation is proprietary are proposed application rates limited to that indicated in innovative technology acceptance correspondence? __ yes __ no __ N/A

Composition of injected fluid (e.g. ingredient, wt. %): _____

TEMPORARY INJECTION ZONE OF DISCHARGE (ZOD)

(check those that apply)

- ☐ No ZOD needed. The fluid to be injected meets the primary and secondary groundwater standards of Chapter 62-550, F.A.C., and the minimum groundwater criteria of Chapters 62-520 and 62-777, F.A.C. _____
- ☐ ZOD permission by rule 62-520.310(8)(c) †, F.A.C., for reagent chemical species and/or parameter(s) in the fluid to be injected (or re-injected) that exceed secondary groundwater standards. ZOD permission by this rule also applies to chemical species in the fluid to be injected that exceed primary groundwater standards or minimum groundwater criteria, provided those species are prime constituents of the reagents used to remediate site contaminants. The chemical species and parameters for which the approved Remedial Action Plan identifies zone size and duration, and addresses groundwater monitoring are summarized below.

Chemical species & parameters: _____

Zone size (sq. ft.) _____ Duration (mos.) _____ Yes, monitoring addressed. ☐

- ☐ ZOD permission by rule 62-520.310(8)(c) †, F.A.C., for the following contaminants of concern that exceed their groundwater standards in the fluid to be re-injected as part of a closed-loop re-injection system for which the approved Remedial Action Plan identifies zone size and duration, and groundwater monitoring:

Contaminants of concern: _____

Zone size (sq. ft.) _____ Duration (mos.) _____ Yes, monitoring addressed. ☐

- ☐ ZOD permission by variance because the fluid to be injected contains the following impurities that are not prime constituents of the reagents used to remediate the site's contaminants, and the concentrations of those impurities in the fluid to be injected are in excess of their primary groundwater standards:

Impurities regulated as primary groundwater contaminants: _____

Zone size (sq. ft.) _____ Duration (mos.) _____ Yes, monitoring addressed. ☐

- ☐ A variance needs to be granted before the remediation can be conducted.

- ☐ A variance has already been granted for the impurities listed above:

Date variance granted: _____

Zone size (sq.ft.): _____

Duration (mos.): _____

- ☐ If ZOD permission by rule 62-520.310(8)(c) †, F.A.C., or by variance is checked above, then a figure that delineates the ZOD is attached. (Use the lines below to more fully describe the ZOD if a figure alone will not suffice).

CLEANUP CRITERIA AND ENFORCEABLE APPROVAL ORDER

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. 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 reactions induced by those ingredients or the contaminants of concern during their use. Applicable primary and secondary groundwater standards are set forth in Chapter 62-550, F.A.C., and minimum groundwater 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 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.

† Effective July 12, 2009, rule 62-522.300(2)(c), Florida Administrative Code (F.A.C.), was relocated to Chapter 62-520, F.A.C., and renumbered as rule 62-520.310(8)(c), F.A.C.