Department of
Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

June 12, 2000

Mr. Felix Perriello
Global BioSciences, Inc.
608 Normandy Drive
Norwood, Massachusetts 02062

Re: **Butane Biostimulation Technologies**

Dear Mr. Perriello:

The Bureau of Petroleum Storage Systems hereby accepts as an innovative technology the Global BioSciences Incorporated (GBI) butane biostimulation process for the remediation of sites in Florida that are contaminated by petroleum, methyl tertiary butyl ether (MTBE), chlorinated hydrocarbons, or other non-petroleum contaminants suitable for the process. As indicated by GBI, the process is well-suited for the in situ remediation of both soil and groundwater.

Briefly, butane biostimulation can be described as a process that uses the injection of butane and air to increase the populations of indigenous microorganisms, which in turn, aerobically and cometabolically, oxidize both the butane and the contaminants of concern to carbon dioxide and water. If chlorinated hydrocarbons are a contaminant of concern at a site remediated by this process, then chloride ions will also be present as a degradation product. The butane serves as the primary substrate for the indigenous microorganisms, while oxygen in the injected air serves as an electron acceptor for oxidation. As the microorganisms consume their butane food source, they produce coenzymes and enzymes (i.e. monooxygenases) that gratuitously degrade the contaminants of concern.

There are no objections to the use of the butane process provided: (a) the considerations of this letter are taken into account; (b) a Remedial Action Plan is approved by the Department; and (c) the terms of a June 9, 2000 variance granted by the Department to GBI are observed. The terms of the variance -- which temporarily allows a zone of discharge where the concentration of dissolved butane in the groundwater may be elevated -- are summarized in enclosure 1. The enclosure also includes a list of environmental and regulatory considerations.

The following chapters of the Florida Administrative Code are cited as pertinent, as portions of them are applicable to the butane biostimulation process: 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; and Chapter 62-528, F.A.C., for underground injection control, particularly Part V, for Class V, Group 4 aquifer remediation wells. Please note that 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 also constitutes the granting of a Class V injection well permit.

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.

Preparers of 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 the Department of Environmental Protection has determined the environmental acceptability of this process. 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 the nature or composition of either or any of its principal and proprietary ingredients, or its performance 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 prescribing the product or process.

Questions regarding petroleum applications of the butane biostimulation process may be directed to Rick Ruscito in the Bureau of Petroleum Storage Systems at (850) 487-3299. Questions about non-petroleum applications may be directed to the Bureau of Waste Cleanup at (850) 488-3935.

Sincerely,

Rick Ruscito, P.E.
Bureau of Petroleum Storage Systems

enclosures (3)

c: D. Larri Greth
S&G Environmental Group
P.O. Box 14003 N.E. Plaza
Sarasota, Florida 34278

Allan Woodman
Advanced Environmental Laboratory, Inc.
15 North Street
Spencer, Massachusetts 01562

George Heuler - UIC, FDEP/Tallahassee
Cynthia Christen - OGC, FDEP/Tallahassee
Tom Conrardy - BPSS, FDEP/Tallahassee

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ENCLOSURE 1

BUTANE BIOSTIMULATION: ENVIRONMENTAL AND REGULATORY INFORMATION

For butane biostimulation, the major environmental and regulatory concerns are listed below.

a. Groundwater cleanup standards: The onus shall be on users of the butane process to ensure that all applicable groundwater contaminant standards will be met at the time of project completion. This includes the contaminants of concern, any residuals associated with the injected butane, and any by-products produced as a result of chemical reactions. 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.

b. Groundwater injection standards: For in situ aquifer remediation, the composition of the 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. Additionally, any non-regulated substances injected must meet the minimum criteria for groundwater as defined in Rule 62-520.400(1), F.A.C.

c. Variance summary: The June 9, 2000 variance granted to GBI is for an exemption from Rule 62-522.300(2)(a), F.A.C., in order to create a 100 foot zone of discharge in the aquifer around each injection point. Within this zone of discharge, a temporary departure from the minimum groundwater quality requirements set forth in Chapter 62-520, F.A.C., will be tolerated for a period of time not to exceed two (2) years. And although this or any other chapter of the Florida Administrative Code does not set a maximum allowable concentration for dissolved butane in groundwater, the Florida Department of Environmental Protection (FDEP) has determined that a groundwater cleanup target level of 9 milligrams per liter (mg/L) is appropriate, based on health effects. Therefore, by the end of the 2-year period, the groundwater must meet this value, or the natural-occurring background concentration value of dissolved butane at a given remediation site, whichever is less stringent.

   The variance granted by the Department is a general variance, which may be applied to each site-specific butane biostimulation Remedial Action Plan submitted by hereafter. GBI does not have to petition for a new variance each time butane biostimulation is proposed for the remediation of a site, provided you do not deviate from the terms of the variance.

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 injection of butane. 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 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 designated tracking well.

e. Groundwater monitoring: As in any remediation effort, the actual petroleum and/or non-petroleum contaminants of concern are to be

monitored in accordance with applicable rules and regulations. Several aspects of monitoring are discussed below.

1. Active remediation monitoring: During the period of active remediation, groundwater shall be monitored for contaminants of concern in accordance with the requirements set forth in Section 62-770.700, F.A.C., for petroleum contaminated sites, or in accordance with the provisions of an approved Remedial Action Plan for non-petroleum sites, whichever applies. The selection of designated monitoring wells shall be of sufficient quantity to demonstrate remediation of the aquifer.

2. Post active remediation monitoring: At least one (1) year of quarterly post active remediation groundwater monitoring for contaminants of concern shall be conducted at a minimum of two (2) wells, one located in the area of maximum contamination, the other downgradient of the area of maximum contamination. (For specific information about post active remediation monitoring at petroleum contaminated sites, please refer to Section 62-770.750, F.A.C.)

3. Underground injection control monitoring: The Department, for environmental protection purposes, has determined that a limited amount of groundwater sampling, before and after injection, shall be conducted when butane is injected into an aquifer. It is required that the concentration of dissolved butane in the groundwater be measured before and after injection, for comparison to the FDEP's 9 mg/L groundwater cleanup target level or the site's natural-occurring background concentration, whichever is less stringent.

   The Department, pursuant to Rule 62-528.615(2), F.A.C., has also determined that the monitoring schedule for in situ injection-type aquifer remediation projects involving butane shall include at least one pre-injection background sampling event to measure the dissolved concentration of butane. At least one (1) monitoring well located upgradient of the contamination plume, or at least one (1) non-upgradient monitoring well, located beyond the edge of the plume, shall be sampled and analyzed. If more than one well is sampled, then the average value of the dissolved butane concentration can be used as the background value for the site.

   Post injection sampling shall be conducted for at least two (2) wells, one located in the central region of the injection points, where concentrations are likely to be highest, the other downgradient, to determine if unwanted migration has occurred. For a given remediation site, costs may be kept to a minimum by installing only two monitoring wells for this purpose, whose locations are such that they serve as both the underground injection control wells required for compliance with Rule 62-528.615(2), F.A.C., and the post remediation monitoring wells for compliance with above paragraph e.2. When post injection sample results indicate that the dissolved butane concentration does not exceed the FDEP's groundwater cleanup target level of 9 mg/L, or the natural-occurring background level for the site, then measurement of its concentration may be reduced in frequency or discontinued.

f. Underground injection control inventory: Remedial Action Plans prescribing in situ aquifer injection-type 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 3.

g. Operation:

1. Avoidance of migration: Injection of butane shall be performed in such a way, and at such a rate and volume, that no undesirable migration of either the butane or the contaminants already in the aquifer occurs, 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 contamination plume is expected to accompany the butane biostimulation 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 amount of butane that will be injected.

h. 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 the injection wells can be removed from the inventory tracking list.

ENCLOSURE 2

BUTANE BIOSTIMULATION: SUPPLEMENTAL INFORMATION

The information below, compiled from various sources, may be helpful to reviewers of Remedial Action Plans prescribing butane biostimulation. It is provided as information only and should not be construed as absolute, nor should it be used as a substitute for technical judgments that should be made on a site specific basis.

a. UIC Notification: 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 Contaminated Site". The completed form must be submitted to the Underground Injection Control Section at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

   Local governments contracted by the Department to conduct technical reviews of petroleum Remedial Action Plans and Remedial Action Plan Modification proposals are instructed to follow the March 16, 2000 instructions for approval of such documents, and for submittal of the above memorandum. The March 16, 2000 instructions are included in the Bureau of Petroleum Storage Systems guidance package BPSS-10, titled "In Situ Chemical Additives for Petroleum Remediation", at web page address /www.dep.state.fl.us/dwm/programs/pcp/geninfo/active.htm.

b. Patent: United States patent number 5,888,396, titled "Bioremediation of Pollutants with Butane-Utilizing Bacteria" was issued on March 30, 1999. The inventor is identified as Felix Perriello of West Roxbury, Massachusetts. The patent is for the treatment of pollutants with butane-utilizing bacteria in the presence of oxygen in order to degrade them by cometabolism or direct metabolism.

c. Butane isomers: GBI has indicated that normal butane (*n*-butane) will be used for its biostimulation process. Branched butane isomers can also be used but only a relatively limited number of microbial strains use the branched isomers as a food source.

d. Butane purity: Product bulletins from a producer of butane, Matheson Tri-Gas Incorporated, indicate that several grades of *n*-butane, of purity ranging from 99% to 99.91%, is available in cylinder sizes containing 0.375 to 120 pounds.

e. Natural occurrence of butane: While natural-occurring methane is usually the prevalent dissolved hydrocarbon gas in groundwater, it is possible that natural-occurring ethane, propane, and butane could also be present. The natural-occurring concentrations of these other dissolved hydrocarbon gases, however, are usually not high in comparison to methane.

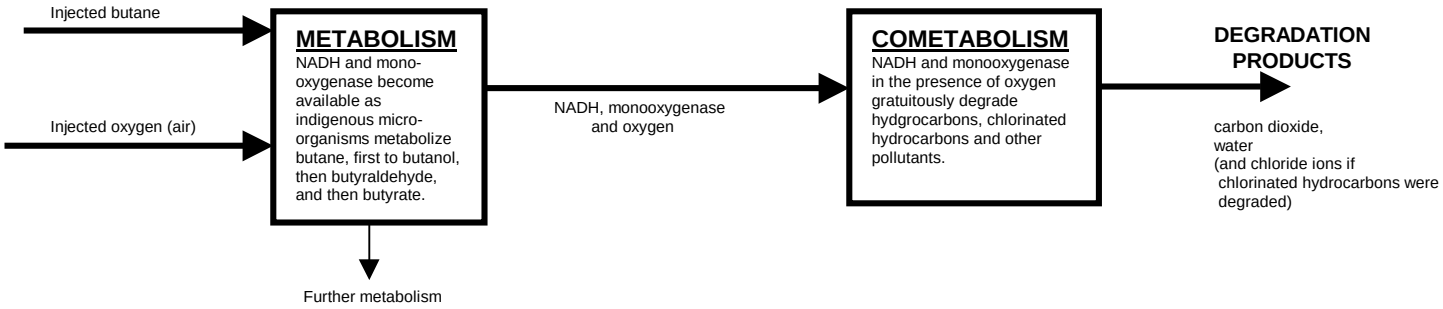
f. Solubility: The literature indicates that the solubility of butane in water is 61 milligrams per liter (mg/L) at 20 degrees C. The solubility varies with temperature.

g. Toxicity of butane: The Bureau of Petroleum Storage Systems notes that the Food and Drug Administration lists butane as a general-purpose food additive, and categorizes it as "generally regarded as safe". It is more noted for its narcotic effect of producing drowsiness, rather than toxicity, but it can act as an asphyxiant. It is also used as an aerosol propellant for health care products that contact the skin.

h. Gratuitous degradation: As microorganisms consume a food source, such as butane, they produce and make use of coenzymes (e.g. NADH) and enzymes (e.g. monooxygenases). If pollutants such as hydrocarbons and chlorinated hydrocarbons happen to be in the presence of these enzymes, and oxygen is also present, then the pollutants will be degraded, coincidentally, by the enzymes. This coincidental degradation is commonly referred to as either gratuitous or fortuitous degradation.

i. Reaction products and by-products: When petroleum hydrocarbons are degraded by butane biostimulation, aerobically and cometabolically, the ultimate degradation products are carbon dioxide (CO_2) and water (H_2O). When chlorinated hydrocarbons are degraded, the products are CO_2, H_2O, and chloride ions.

j. A simplified diagram of the aerobic cometabolic butane biostimulation process is shown below. Some key biochemistry terms, as defined in the literature, are also provided below.



1. Nicotinamide-adenine dinucleotide (NAD): A coenzyme that serves as an electron carrier by being alternately oxidized and reduced. NADH is used to denote the reduced form of NAD, and NAD^+ is used to denote the oxidized form.

2. Oxygenase: An oxidoreductase that catalyzes the transfer of free oxygen to its substrate.

3. Oxidoreductase: An enzyme that catalyzes an oxidation-reduction reaction.

4. Cofactor: A substance, such as a coenzyme, that activates an enzyme.

5. Coenzyme: An organic molecule that must be present for an enzyme to function.

6. Enzyme: Proteins, produced by living organisms, which serve as biocatalysts in living organisms.

k. Applications: It is anticipated that butane biostimulation will be used for in situ remediation of groundwater or soil, but ex situ applications are feasible.

l. Air monitoring: It is anticipated that no air emissions monitoring will be necessary for the butane biostimulation process since the ultimate degradation products are carbon dioxide and water, and chloride ions when chlorinated hydrocarbons are degraded. Additionally, the rate at which butane is injected is anticipated to be low enough so as for the butane

to be entirely consumed in the subsurface before it can become a fugitive emission in the atmosphere.

Air that is injected along with the butane is for biosparging purposes, not volatilization, and is therefore not expected to cause unwanted air emissions. If emissions do occur at a remediation site, however, then appropriate action should be taken to rectify the problem.

m. Fire safety: Butane is a flammable gas with a lower explosive level in the range of 1.6% to 1.9%. Since it will be injected along with air, the GBI strategy for the avoidance of a fire hazard from such a fuel/air mixture is to periodically pulse inject only small doses of butane into the subsurface. In this way, the indigenous subsurface microorganisms will have a chance to consume the butane before it can escape to a location where an ignition could occur.

Even if the rate at which the microorganisms consume the butane were to decrease substantially, thereby allowing the groundwater to become saturated with unused butane, the excess would first rise out of the groundwater as bubbles, and then begin to fill the pore space of the overlying vadose. And since the molecular weight of butane is heavier than air, it would not immediately rise to the surface to present itself as a fire hazard.

Lastly, in regard to fire safety, GBI and its equipment collaborator, Matheson Tri-Gas, indicate that the aboveground equipment associated with the butane biostimulation process complies with federal, state and local regulations pertaining to compressed gas storage and use. Additionally, to prevent trespassing and tampering with remediation equipment in such a way that a fire hazard could result, the Bureau of Petroleum Storage Systems provides a reminder in its Remedial Action Plan Checklist to provide a fenced and locked equipment compound.

n. Pilot tests: Pursuant to Rule 62-770.700(2), F.A.C., a pilot study shall be performed when a bioremediation or innovative technology is proposed for the cleanup of a petroleum-contaminated site, 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, pursuant to a provision of that same rule.

GBI indicates that a biofeasibility test can be conducted in the laboratory over a period of 2 to 4 weeks on a soil or groundwater sample from the remediation site. The test determines the number of butane-oxidizing bacteria that already exist at the site, and the cell densities that can be expected as a result of butane biostimulation. Contaminant degradation rates can also be determined. This information can then be used to design a full-scale remediation system based on site specific test data.

o. Key design considerations:

1. Injection point spacing: Radii of influence up to 100 feet from the point of injection have been observed in glacial till. Since soil lithology affects the radius, site specific information regarding an effective radius of influence should be used for design purposes. GBI attributes this relatively large radius of influence to the relatively high solubility of butane in water. Its solubility is approximately four times that of methane and twice that of propane.

2. Injection point depths: 5 to 500 feet, although greater depths for deeper contaminant remediation can be achieved with an appropriately sized compressor.

3. Inject of butane and air into the subsurface using the same injection point, using a 3-way valve at each injection point to occasionally allow a pulsed injection of butane into a continuous-flowing air stream.

p. Key operating parameters:

1. Concentration of butane: It is desirable to maintain a dissolved concentration of 50 to 100 mg/L of butane in the groundwater treatment area of a remediation site, and it may have to be adjusted, depending on the concentration and vertical and horizontal distribution of the contaminants of concern. The solubility of butane in water at 20 degrees C. is 61 mg/L but it will vary with temperature.

2. Injection rates: Butane injection rates may range from 2 to 16 cubic feet per day per injectin point. Air injection rates may range from 5 to 20 cubic feet per minute. Butane is typically pulsed into each injection point for 0.2 seconds per hour at 50 pounds per square inch. Injection of air is usually continuous but it can be cycled if desired, depending on types, distributions, and concentrations of contaminants of concern.

q. Avoidance of migration: It is intended that the butane biostimulation process will avoid unwanted migration of the contaminants of concern and the butane itself by maintaining sufficiently low injection rates of butane and air. The rate of air injection needs only to be sufficient for the supply of oxygen for biostimulation, not volatilization of the contaminants of concern. Typically, the rate of air injection for the purpose of biosparging is lower than that of a sparging system designed for in situ volatilization of contaminants.

r. Elimination of residual butane, if any: After the contaminants of concern have been degraded by the butane process at a remediation site, the injection of butane is stopped, but the injection of air is allowed to continue for a matter of days in order to ensure that any residual butane that may be lingering in the soil or groundwater is degraded by the same microbes that remediated the site. The groundwater cleanup target level established by FDEP for butane is 9 mg/L, and it is the maximum concentration of butane that will be allowed to linger in the groundwater upon completion of the project, unless the natural-occurring background concentration of butane at the site is higher.

s. Butane analysis: GBI has indicated that a gas chromatograph can be used for analysis of groundwater samples taken for butane at remediation sites.

t. Butane usage: Each butane biostimulation Remedial Action Plan submitted should include the estimated mass of the contaminants of concern which are present at the site, and the amount of butane and air that will be needed to remediate that given mass over the estimated life of the project. Although usage is site specific, depending on the size of the treatment area and the horizontal and vertical distribution of the contaminants, GBI has indicated as a rule of thumb that approximately 120 to 240 pounds of butane may be used over a 1-month period, for a 0.5 to 1.0-acre site.

u. Cleanup time: For rule of thumb estimating purposes, the period of operation for a butane biostimulation system could range from 2 to 24 months, depending on the vertical and horizontal extent of contamination, the concentration of the contaminants, and subsurface lithology.

v. Advantages: Provides remediation of the saturated zone, capillary fringe, and vadose. Low operation and maintenance costs. Can be used as a barrier technology. High cell densities as a result of the high solubility of butane provide a more effective cleanup than possible with alkane substrates of lower molecular weight.

w. Limitations: Chlorinated solvent concentrations greater than 1,000 milligrams per liter could inhibit performance. Pure product, present as either dense non-aqueous phase liquid (DNAPL) or light non-aqueous phase liquid (LNAPL) must be removed prior to or concurrently with the butane process.

x. Additional information: GBI’s web site can be found at www.biobutane.com.

Florida Department of

Memorandum **Environmental Protection**

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: _____ (Note 1.)
_____
_____

DATE: _____

SUBJ: **Proposed Injection Well(s) for In Situ Aquifer Remediation at a Petroleum 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 petroleum-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 2.)
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 3)
(ingredient, wt. %): _____
_____
_____
_____

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

Richard Deuerling
Page Two
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 petroleum contaminated site is intended to meet the groundwater petroleum cleanup criteria set forth in Chapter 62-770, 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 transformation of those ingredients or the contaminating petroleum during their use. Applicable primary and secondary drinking water standards are set forth in Chapter 62-550, F.A.C., and additional groudwater 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 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. Local programs are not authorized to approve underground injections into aquifers. Reason: Per agreement with EPA, the FDEP cannot delegate this authority. Local programs, after reviewing a Remedial Action Plan or an injection proposal document, should follow the instructions in a March 16, 2000 memorandum to arrange for Department headquarters' execution of an approval order, and then complete this form. This form is primarily for use by state and local program technical reviewers, but petroleum remediation contractors may fill in all blanks except those labeled "FROM", "DATE", and "approval date", and "telephone number" blanks in the last paragraph. Those blanks should be completed only by a state or local program 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, 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.