

Petroleum Cleanup Program

REMEDIAL ACTION PLAN GUIDELINES

BUREAU OF PETROLEUM STORAGE SYSTEMS

History: New, 9/10/93; revised 5/1/98; 6/8/2000

Identification No.: BPSS-8

Topic of Guideline: Effluent Disposal via Injection Well

Signature and Date
SECTION ADMINISTRATOR

Signature and Date
BUREAU CHIEF

This guidance applies to underground injection when it is used as a method for the disposal of effluent from a groundwater treatment system during the remediation of a petroleum contaminated site. For guidance on the injection of substances other than treated effluent (e.g., chemicals, nutrients, or microorganisms for in situ aquifer remediation) please see program guidance policy BPSS-10.

1. Definition: Chapter 62-528, Florida Administrative Code (F.A.C.), defines an injection well as an underground disposal device whose depth is greater than the dimension of width or length. Under this definition, infiltration galleries are not considered to be injection wells and are not subject to these requirements. However, there is no requirement that a disposal well must operate under pressure to be considered an injection well. Gravity flow disposal wells are considered to be injection wells.
2. History: On August 9, 1989 the Department of Environmental Protection's Division of Water Facilities issued Program Guidance Policy Memorandum No. UIC-89-01, which set forth requirements for the underground injection of treated groundwater via Class V injection wells at remediation sites. The essence of this policy document has not changed since 1989. It is still in effect but its references to Chapter 17 of the Florida Administrative Code are now obsolete, since that chapter has been redesignated as Chapter 62. Also, the administrative instruments that it cites for relief from state and federal injection regulations have become somewhat outmoded. A *water quality criteria exemption* was cited as a requirement for the exceedance of a state water quality standard, and an *aquifer exemption* for the exceedance of a federal primary drinking water standard. These instruments were seldom used -- if

ever -- and have been largely abandoned in favor of variances. The Bureau of Petroleum Storage Systems will provide a copy of injection policy UIC-89-01 on request to anyone who is interested in the origins of this guidance.

3. Disclaimer: Nothing in this guideline or the original August 9, 1989 policy provides an exemption from the need to contact the appropriate Water Management District Office and satisfy appropriate design and permit requirements in regard to disposal of effluent from a petroleum groundwater treatment system via injection.
4. Permits: An enforceable Remedial Action Plan (RAP) Approval Order, or other enforceable mechanism, serves as the Department permit for an injection well at a petroleum cleanup site, provided the conditions below are satisfied in the RAP design and monitoring proposal. No separate UIC permit from the Department is necessary unless these conditions are not addressed, or otherwise directed by the Department (or contracted local program). The requirement that an enforceable mechanism be used to approve Class V injection wells associated with aquifer remediation is set forth in Rule 62-528.630(2)(c) of the July 15, 1999 issue of Chapter 62-528, F.A.C., titled "Underground Injection Control".
5. Treatment criteria: The injected effluent must meet the primary and secondary drinking water standards set forth in Chapter 62-550, Florida Administrative Code (F.A.C.), and the minimum criteria for groundwater set forth in Chapter 62-520, F.A.C., or be of equivalent quality to the natural unaffected background in the injection zone or any zone into which injected fluids will migrate. The treatment criteria of Chapters 62-550 and 62-520, F.A.C., are generally reflected in the groundwater cleanup requirements of Table I of Chapter 62-777, F.A.C., for contaminants of concern at a remediation site. These criteria are generally appropriate as effluent specifications for the design of a groundwater treatment system, with the added safeguards specified in paragraph no. 6 below.
6. Discharge standards: The requirements for recovered groundwater treatment design are the same as for an NPDES discharge, as described in program guidance policy BPSS-3. This generally necessitates activated carbon polishing, or an equivalent method of ensuring discharge standards will be continuously met, following a conventional treatment process designed to achieve effluent standards (e.g., air stripping). The alternate design techniques identified in BPSS-3 for demonstrating discharge standards will be continuously met are also acceptable for remedial designs with injection wells for effluent disposal.

7. Receiving aquifer: The injection well discharge must be to the same aquifer from which contaminated groundwater will be withdrawn. Discharge to a deeper zone of the same aquifer is acceptable if a representative deep well exists or will be installed to monitor the background water quality of the receiving zone and the discharge effects. If the interpretation of the lithology is in question or this condition cannot be satisfied, the appropriate Department district office must be contacted to determine whether an injection well permit is necessary in addition to the RAP Approval Order (or RAP Modification Approval Order). The monitoring plan in the RAP (or RAP Modification) must include a proposal for the deeper monitoring well(s) to be used for injection well monitoring.
8. Avoidance of migration: The injected fluids must not cause migration of the contaminant plume into areas not previously contaminated. A hydraulic analysis must be included in the RAP to demonstrate this condition will be met.
9. Approval Orders: Pursuant to Rule 62-528.630(2)(c), F.A.C., in order for the approval of any aquifer remediation plan involving injection to also constitute the granting of a state injection permit, the approval must be enforceable. Examples of enforceable orders are state-issued RAP Approval Orders and state-issued Alternate Procedure Approval Orders.

Technical reviewers of remediation plans, regardless of whether their workplace is the Department's headquarters in Tallahassee, a department district office, or a contracted local program must use a state-issued enforceable order when approving an aquifer remediation proposal prescribing effluent injection.

The "standard" RAP Approval Order, without alteration of its language, is sufficient and enforceable for the approval of a RAP prescribing effluent disposal via injection. For the approval of Alternate Procedures prescribing effluent disposal via injection, the "standard" Alternate Procedure Approval Order, without alteration of its language, is enforceable. And for RAP Modifications, pilot tests, or any other type of proposal involving effluent disposal via injection, the UIC Approval Order shown in guidance document BPSS-10, with the language of its first paragraph tailored as necessary, is enforceable.

10. Underground Injection Control (UIC) notification: RAPs and RAP Modification proposals must contain the necessary information for a Department or contracted local program technical reviewer to complete the attached Exhibit A fill-in-the-blanks memorandum titled "Effluent Injection Well(s) at a Petroleum Remedial Action Site", which must be submitted to the Division of Water Facilities' Underground

Injection Control (UIC) Section, along with a copy of a fully executed Approval Order. It is the responsibility of the Department's technical reviewer (or local program reviewer) to fill out the UIC notification memorandum.

TC/tc,rjr

Attachment:

Exhibit A - Memorandum titled "Effluent Injection Well(s) at a Petroleum Remedial Action Site".

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rev. 6/8/2000

EXHIBIT A

UIC Notification Memorandum

Effluent Injection Well(s) at
a Petroleum Remedial Action Site

Memorandum

**Florida Department of
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: _____

DATE: _____

SUBJ: **Effluent Injection Well(s) at a Petroleum Remedial Action Site**

Pursuant to Rule 62-528.630(2)(c), F.A.C, inventory information is provided below to notify you of proposed Class V, Group 4, injection well(s) to be constructed for the disposal of treated groundwater at a petroleum remediation site. The treatment system has been designed to produce and effluent that meets the injection requirements of Chapter 62-528, F.A.C.

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: _____

The design of the treatment system consists of the following:

Design flow rate: _____ gpm
Number of recovery wells: _____
Design influent groundwater concentration levels (ppb):
Benzene _____ EDB _____
Toluene _____ MTBE _____
Ethylbenzene _____ PAHs & others: (as listed below)
Xylenes _____
Naphthalene _____
Lead _____

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.

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 Date: _____

Site name: _____
 FDEP facility no.: _____

The treatment system will be designed to produce an effluent quality which meets the primary and secondary drinking water standards set forth in Chapter 62-550, F.A.C., pursuant to the underground injection control requirements of Chapter 62-528, F.A.C., or the groundwater criteria set forth in Table I of Chapter 62-777, F.A.C., as referenced by Chapter 62-770, F.A.C., whichever is more stringent, for each contaminant as follows:

<u>Contaminant</u>	<u>Table I</u>	<u>Other (if applicable)(See note 2)</u>
Benzene	1 ppb	_____
Toluene	40 ppb	_____
Ethylbenzene	30 ppb	_____
Xylenes (total)	20 ppb	_____
Naphthalene	20 ppb	_____
1-Methylnaphthalene	20 ppb	_____
2-Methylnaphthalene	20 ppb	_____
Lead	15 ppb	_____
EDB	.02 ppb	_____
MTBE	50 ppb	_____

Individual PAHs & others: (as listed below)

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Note 2. Table I of Chapter 62-777, F.A.C., will usually apply. If other tables or criteria are applicable then the criteria are noted here, superseding those listed in the column for Table I. In no case has an effluent concentration been selected that is in excess of a primary or secondary drinking water standard for a regulated contaminant.

A schematic of the proposed treatment system is attached. Treatment system description:

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FDEP Facility No. _____

The treated groundwater will be returned to the aquifer through the proposed injection well(s). Excerpts from the Remedial Action Plan (RAP) which describe the site lithology are attached. The following is a summary description of the affected aquifer:

Depth to groundwater: _____
Aquifer thickness: _____
Name of aquifer: _____

A schematic of the injection well(s) is attached. The injection well(s) will be designed as follows:

Number of wells: _____
Bore hole diameter: _____
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 Remedial Action Plan estimates that site rehabilitation will take _____ years. We will notify you if there are any modifications to the remediation strategy which will affect the injection well design or the flow rate of recovered groundwater.

The proposed remediation system was approved on _____ by a RAP Approval Order or other enforceable document (copy attached). Please contact me at _____ if you require additional information.