

ENVIRONMENTAL PROTECTION REGULATIONS
CHAPTER 11
UNDERGROUND INJECTION CONTROL RULE

(Formerly cited as subchapter 13.UIC)

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PREAMBLE

A UIC program is necessary in any state listed by the U.S. EPA under Section 1422 of the Safe Drinking Water Act (SDWA). Because all states have been listed, all states must submit a UIC program. If a state fails to submit an approvable program, EPA will establish a program for that state. Once a program is established, the SDWA provides that all underground injections in listed states are unlawful and subject to penalties unless authorized by a permit or a rule. This Subchapter sets forth the requirements governing authorizations by individual permit or general permit and prohibits authorization of certain types of injection. Additional provisions, criteria, definitions, and standards are shown at Appendix II.

The permit program of this Subchapter regulates underground injections by five classes of injection wells (see definition of "well injection," § 13.UIC.3). The five classes of wells are set forth in § 13.UIC.4. All owners or operators of these injection wells must be authorized either by permit or rule by the Secretary. In carrying out the mandate of the SDWA, this Subchapter provides that no Class I, II, or III well shall be authorized by permit or rule if it results in movement of contaminating fluid into underground sources of drinking water (USDWs) (§ 13.UIC.24). The technical requirements in Appendix II are designed to insure that such movement will not occur. No Class V well will be authorized by permit or rule if a discharge into that well results in the presence of any contaminant in a USDW which would violate any drinking water standard or adversely affect the health of persons (§ 13.UIC.24). Any existing Class IV wells which inject hazardous waste directly into, or above an underground source of drinking water are to be eliminated over a period of six months and new Class IV wells are prohibited (§ 13.UIC.23). Class V wells will be inventoried and assessed. During UIC program development, the Secretary has been identifying aquifers and portions of aquifers which are actual or potential sources of drinking water. This will assist the Secretary to protect all USDWs. An aquifer is a USDW if it fits the definition, even if it has not been "identified". This rule is intended to provide comprehensive regulation over all types of subsurface injections except those specifically excluded.

The following are not covered by these regulations:

- (1) Individual or single family residential waste disposal systems such as domestic cesspools or septic systems which are less than seven feet in depth and used only for the discharge and disposal of domestic waste.

(2) Surface impoundments, land treatment facilities leachfields, sanitary landfills or other subsurface discharges provided that:

(A) the discharge is permitted by the Secretary under authorities other than this subchapter; and

(B) the permitted discharge does not cause or allow a violation of any drinking water standard in a underground source of drinking water or otherwise endanger the health of persons.

(3) Any dug hole which is not used for the discharge of waste underground.

§ 13.UIC.1 SCOPE OF RULE - LEGAL AUTHORITIES

(a) Scope

Discharges into injection wells as defined in this subchapter are subject to the provisions of this subchapter and are prohibited, permitted or authorized by rule in order to prevent the endangerment of underground sources of drinking water. Discharges into injection wells are not eligible for emergency or temporary pollution permits under 10 V.S.A. § 1265 and 1268.

(b) Legal Authorities

(1) This Subchapter (13.UIC) is adopted under the authority of the Secretary pursuant to the following statutes:

(i) State Administration

- (A) 1 VSA § § 311-320
- (B) 3 VSA § § 315-318
- (C) 3 VSA § § 801-847 (Chapter 25)
- (D) 3 VSA § § 2801, 2802, 2822 (c) (1) and 2878

(ii) Water Resources

- (A) 10 VSA § § 901, 903, 905-907, 911, and 960
- (B) 10 VSA § § 1201-1384 (Chapter 47)
- (C) 10 VSA § § 6004, 6086 (a) (1) (B)
- (D) 10 VSA § § 6501-6506 (Chapter 157)
- (E) 10 VSA § § 6601-6613 (Chapter 159)

(iii) Health

- (A) 18 VSA § § 609 and 610
- (B) 18 VSA § § 1201-1221 (Chapter 23)

(iv) Natural Gas and Oil Resources

- (A) 29 VSA § § 501-566 (Chapter 14)

(2) This Subchapter supplements the Water Pollution Control Regulations, Chapter 13 and may be used by the Secretary in conjunction with other appropriate rules and regulations to administer the Vermont UIC program.

(3) This Subchapter is not intended to affect other existing health regulations or to usurp the authorities of the Commissioner of Health or the Natural Gas and Oil Resources Board in matters not related to underground sources of drinking water.

§ 13.UIC.2 PURPOSE OF RULE

The purpose of this Subchapter is to protect the quality of the ground water resources in the State of Vermont by controlling discharges of waste into injection wells. These rules are intended to:

(a) Prevent the degradation of underground sources of drinking water below drinking water standards;

(b) Prevent the movement of fluids into underground sources of drinking water if that movement would cause or allow any violation of drinking water standards or endanger the health of persons;

(c) Protect the health of persons; and

(d) Prevent the unnecessary degradation of ground water resources.

§ 13.UIC.3 DEFINITIONS

The following definitions will apply to this subchapter.

"Act" means Title 10, Chapter 47 of the Vermont Statutes Annotated, as amended.

"Administrator" means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

"Application" means the standard forms for applying for a permit to discharge waste into an injection well, including any additions, revisions or modifications as developed by the Secretary with the approval of the Administrator.

"Aquifer" means a geologic formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to a well or spring.

"Area of review" means the area surrounding an "injection well" described according to the criteria set forth in Appendix II § 146.06.

"Contaminant" means any physical, chemical, biological, or radiological substance or matter in water.

"Discharge" means the placing, depositing or emission of any waste into an injection well.

"Disposal well" means an injection well.

"Domestic waste" means solely wastewater discharging from the sanitary conveniences of single family residences. "Domestic waste" does not include stormwater, discharges from industrial facilities, industrial process wastewater, or any waste not ordinarily found in household discharges.

"Draft permit" means a document prepared indicating the Secretary's tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a "permit". A notice of intent to terminate a permit, and a notice of intent to deny a permit are types of "draft permits". A denial of a request for modification, revocation and reissuance or termination is not a "draft permit".

"Drilling mud" means a heavy suspension used in drilling an "injection well", introduced down the drill pipe and through the drill bit.

"Drinking water standards" means those standards set forth in Vermont Health Regulations, Chapter 5, Subchapter 12, Public Water Supply Regulations, and any revisions thereof.

"Environmental Protection Agency ("EPA")" means the United States Environmental Protection Agency.

"Existing injection well" means an "injection well" other than a "new injection well".

"Facility" or activity" means any "injection well", or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under this subchapter.

"Federal regulation" means the technical standards in 40 CFR Part 146.

"Fluid" means any material or substance which flows or moves whether in a semi-solid, liquid, sludge, gas, or any other form or state.

"Form" means the standard forms adopted by the Secretary with the approval of the Administrator to administer the provisions of this subchapter.

"Formation" means a body of rock characterized by a degree of lithologic homogeneity which is prevailingly, but not necessarily, tabular and is mappable on the earth's surface or traceable in the subsurface.

"Formation fluid" means "fluid" present in a "formation" under natural conditions as opposed to introduced fluids, such as "drilling mud".

"General permit" means an authorization by rule pursuant to § 13.UIC.25.

"Ground water" means water below the land surface in a zone of saturation.

"Hazardous waste" means a hazardous waste as defined in 10 V.S.A. § 6602, and current and future regulations implementing that section.

"Hazardous waste management facility" means all contiguous land and structures, other appurtenances, and improvements on the land used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (for example, one or more landfills, surface impoundments, or combination of them).

"Injection well" means any opening in the ground used as a means of discharging waste except for a dry hole not exceeding seven feet in depth which is constructed as, and used solely for the disposal of domestic wastes. "Injection Well" does not mean a surface impoundment, land treatment facility, leachfield, sanitary landfill or other subsurface facility which has a horizontal dimension greater than its vertical dimension provided that:

- 1) the discharge is permitted by the Secretary under authorities other than this subchapter; and
- 2) the permitted discharge does not cause or allow a violation of any drinking water standard in an underground source of drinking water or otherwise endanger the health of persons.

"Major facility" means any "facility or activity" classified as such by the Regional Administrator in conjunction with the Secretary.

"New injection well" means an "injection well" which began injection after a UIC program for Vermont is approved.

"Owner or operator" means the owner or operator of any "facility or activity" subject to regulation under this subchapter.

"Permit" means an authorization, license or equivalent control document.

"Person" means an individual, association, partnership, corporation, municipality, state or federal agency, or an agent or employee thereof.

"Plugging" means the act of stopping the flow of any fluid into or out of a "formation" through a borehole or well penetrating that formation.

"Radioactive waste" means any waste which contains radioactive material in concentrations which exceed those listed in 10 CFR Part 20, Appendix B, Table II, Column 2.

"Regional Administrator" means the Regional Administrator of the appropriate Regional Office of the Environmental Protection Agency or the authorized representative of the Regional Administrator.

"Schedule of compliance" means a schedule of remedial measures included in a "permit", including an enforceable sequence of interim requirements leading to compliance with the Act and this subchapter.

"Secretary" means the Secretary of the Vermont Agency of Environmental Conservation.

"Site" means the land or water area where any "facility or activity" is physically located or conducted, including adjacent land used in connection with the facility or activity.

"State Director" means the "Secretary" of the Vermont Agency of Environmental Conservation.

"Stratum" (plural strata) means a single sedimentary bed or layer, regardless of thickness, that consists of generally the same kind of rock material.

"Total dissolved solids" means the total dissolved (filterable) solids as determined by use of the method specified in 40 CFR Part 136.

"UIC" means the Underground Injection Control program under Part C of the Safe Drinking Water Act, including a state program approved by the U.S. Environmental Protection Agency.

"Unaltered ground water" means ground water of the same quality as found in the aquifer prior to its withdrawal except for the extraction or addition of heat.

"Underground injection" means a "well injection".

"Underground source of drinking water" ("USDW") means an aquifer or its portion:

(a) Which supplies drinking water for human consumption; or

(b) In which the ground water contains naturally occurring constituents totalling fewer than 10,000 mg/l "total dissolved solids".

"USDW" means "underground source of drinking water".

"Waste" means effluent, sewage or any substance or material, liquid, gaseous, solid or radioactive, including heated liquids, whether or not harmful or deleterious to ground water. "Waste" includes "fluids" and "contaminants".

"Well injection" means the subsurface emplacement of "waste" or "fluids" through an injection well.

Note: Additional definitions are included in Appendix II

§ 13.UIC.4 CLASSIFICATION OF INJECTION WELLS

Injection wells are classified as follows:

(a) Class I.

(1) Wells used by generators of hazardous or radioactive wastes or owners or operators of hazardous or radioactive waste management facilities, to inject hazardous or radioactive waste, other than Class IV wells.

(2) Other disposal wells which inject fluids other than hazardous or radioactive waste beneath the lowermost formation containing, within one quarter mile of the well bore, an underground source of drinking water.

(b) Class II. Wells which inject fluids:

(1) Which are brought to the surface in connection with conventional oil or natural gas production and may be commingled with waste waters from gas plants which are an integral part of production operations, unless those waters are classified as a hazardous waste at the time of injection;

(2) For enhanced recovery of oil or natural gas; and

(3) For storage of hydrocarbons which are liquid at standard temperature and pressure.

(c) Class III. Wells which inject for extraction of minerals or energy including:

- (1) Mining of sulfur by the Frasch process;
- (2) In situ production of uranium or other metals;
- (3) Solution mining of salts or potash;
- (4) In situ combustion of fossil fuel; and
- (5) Recovery of geothermal energy.

(d) Class IV. Wells used by generators of hazardous wastes or of radioactive wastes, by owners or operators of hazardous waste management facilities, or by owners or operators of radioactive waste management facilities to dispose of hazardous wastes or radioactive wastes into or above a formation which within one quarter mile of the well contains an underground source of drinking water.

(e) Class V. Injection wells not included in Classes I, II, III, or IV. See Appendix II for examples of Class V wells.

§ 13.UIC.5 APPLICATION FOR A PERMIT: AUTHORIZATION BY PERMIT

(a) Permit application. Except as provided in § 13.UIC.25 (authorization by rule), all underground injections into Class I, II, III, or V wells are prohibited unless authorized by permit. Any person who is required to have a permit (including new applicants, owners or operators if different from the owner, and permittees with expiring permits) shall complete, sign, and submit an application to the Secretary on forms provided by the Secretary which are incorporated into these regulations and attached at Appendix I.

(b) Completeness. The Secretary shall not issue a permit before receiving a complete application for a permit. An application for a permit is complete when the Secretary receives an application form and any supplemental information which are completed to his or her satisfaction. The completeness of any application for a permit shall be judged independently of the status of any other permit application or permit for the same facility or activity.

(c) Information requirements. All applicants shall provide the information required by the Secretary, using the application form provided by the Secretary.

(d) Recordkeeping. Applicants shall keep records of all data used to complete permit applications and any supplemental information submitted with the application for a period of at least 3 years from the date the application is signed.

(e) Time to apply. Any person who performs or proposes an underground injection for which a permit is or will be required shall submit an application to the Secretary in accordance with the UIC program as follows:

(1) For existing injection wells, as expeditiously as practicable, but no later than 1 year from the approval by EPA of the UIC program; and

(2) For new injection wells at least 180 days before construction is expected to begin.

(f) Forms. All applications shall be on forms provided by the Secretary which are incorporated into this regulation and shown at Appendix I. Each permit application must include a properly completed copy of Form WR-UIC-I and other forms as appropriate for the Class of Injection Well for which an application is submitted.

Any permit to discharge will be valid only if it is issued on Form WR-UIC-II and application is made on Form WR-UIC-I and other appropriate forms as are incorporated into this regulation at Appendix I.

§ 13.UIC.6 SIGNATORIES TO PERMIT APPLICATIONS AND REPORTS

(a) Applications. All permit applications except those submitted for Class II wells (see paragraph (b) of this section) shall be signed as follows:

(1) For a corporation: by a principal executive officer of at least the level of vice-president;

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official.

(b) Reports. All reports required by permits, other information requested by the Secretary, and all permit applications submitted for Class II wells shall be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in paragraph (a) of this section;

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

(3) The written authorization is submitted to the Secretary.

(c) Changes to authorization. If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.

(d) Certification. Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all

attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

§13.UIC.7 DRAFT PERMITS

(a) Once an application is complete, the Secretary will tentatively decide whether to prepare a draft permit or to deny the application.

(b) If the Secretary decides to deny the application, the applicant will be notified by letter in which the Secretary will give the reasons for denial.

(c) If the Secretary decides to prepare a draft permit it will follow the format prescribed by the approved permit forms which are incorporated as part of these regulations. The draft permit will contain all the conditions necessary to meet the applicable provisions of federal and Vermont law, these regulations, and the standards set forth in the federal regulations at 40 CFR Part 146 which are incorporated, by reference, into these regulations at Appendix II.

(d) The Secretary will prepare a fact sheet, as described in Section 13.UIC.8, for any draft permit for a major UIC facility.

13.UIC.8 FACT SHEET

(a) The Secretary will prepare a fact sheet for any draft permit for a major UIC facility. The fact sheet shall briefly set forth the principal facts and significant questions considered in preparing the draft permit. The Secretary shall send a copy of the fact sheet to the applicant and, on request, to any other person.

(b) The fact sheet shall include, when applicable:

(1) a brief description of the type of facility which is the subject of the draft permit;

(2) type and quantity of wastes which are proposed to be or are being discharged;

(3) reasons why any requested variances or alternatives to required standards do or do not appear justified;

(4) a description of the procedures for reaching a final decision on the draft permit including:

(i) the beginning and ending dates of the comment period and the address where comments will be received;

(ii) procedures for requesting a hearing and the nature of that hearing; and

(iii) any other procedures by which the public may participate in the final decision; and

(5) name and telephone number of a person to contact for additional information.

§13.UIC.9 PUBLIC NOTICE OF PERMIT ACTIONS AND PUBLIC COMMENT PERIOD

(a) Scope

(1) The Secretary shall give public notice that the following actions have occurred:

(i) a draft permit has been prepared under Section 13.UIC.7; or

(ii) a hearing has been scheduled under Section 13.UIC 11.

(b) Timing

(1) Public notice of the preparation of a draft permit required under paragraph (a) of this section shall allow at least 30 days for public comment.

(2) Public notice of a public hearing shall be given at least 30 days before the hearing. (Public notice of the hearing may be given at the same time as public notice of the draft permit and the two notices

may be combined.)

(c) Methods. Public notice of activities described in paragraph (a) (1) of this section shall be given by the following methods:

(1) By mailing a copy of a notice to the following persons (any person otherwise entitled to receive notice under this paragraph may waive his or her rights to receive notice for any classes and categories of permits:

(i) the applicant;

(ii) any other state or federal agency which the Secretary knows has issued or is required to issue a RCRA, UIC, PSD, NPDES or 404 permit for the same facility or activity;

(iii) Federal and state agencies with jurisdiction over fish and wildlife resources, the Advisory Council on Historic Preservation, State Historic Preservation Officers, and other appropriate government authorities, including any affected states; and

(iv) persons on a mailing list developed by:

(A) including those who request in writing to be on the list;

(B) soliciting persons for "area lists" from participants in past permit proceedings in that area; and

(C) notifying the public of the opportunity to be put on the mailing list through periodic publication in the public press and in such publications as Regional and State funded newsletters, environmental bulletins, or state law journals. (The Secretary may

update the mailing list from time to time by requesting written indication of continued interest from those listed. The Secretary may delete from the list the name of any person who fails to respond to such a request.)

(2) Publication of a notice in a daily or weekly newspaper within the area affected by the facility or activity;

(3) In a manner constituting legal notice to the public under state law; and

(4) Any other method reasonably calculated to give actual notice of the action in question to the persons potentially affected by it, including press releases or any other forum or medium to elicit public participation.

(d) Contents

(1) All public notices. All public notices issued under this Part shall contain the following minimum information:

(i) name and address of the office processing the permit action for which notice is being given;

(ii) name and address of the permittee or permit applicant and, if different, of the facility or activity regulated by the permit;

(iii) a brief description of the business conducted at the facility or activity described in the permit application;

(iv) name, address and telephone number of a person from whom interested persons may obtain further information, including copies of the draft permit, fact sheet, and the application;

(v) a brief description of the comment procedures required by § 13.UIC.10 and 13.UIC.11 and the time and place of any hearing that will be held, including a statement of procedures to request a hearing (unless a hearing has already been scheduled) and other procedures by which the public may participate in the final permit decision; and

(vi) any additional information considered necessary or proper.

(2) Public notices for hearings. In addition to the general public notice described in paragraph (d) (1) of this section, the public notice of a hearing under § 13.UIC.11 shall contain the following information:

(i) reference to the date of previous public notices relating to the permit;

(ii) date, time, and place of the hearing; and

(iii) a brief description of the nature and purpose of the hearing, including the applicable rules and procedures.

(e) In addition to the general public notice described in paragraph (d) (1) of this section, all persons identified in paragraphs (c) (1) (i), (ii), and (iii) of this section shall be mailed a copy of the fact sheet, the permit application, and the draft permit.

§ 13.UIC.10 PUBLIC COMMENTS AND REQUESTS FOR PUBLIC HEARINGS

During the public comment period provided under § 13.UIC.9, any interested person may submit written comments on the draft permit and may request a public hearing, if no hearing has already been scheduled. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. All comments shall be considered in making the final decision and shall be answered as provided in § 13.UIC.12.

§ 13.UIC.11 PUBLIC HEARINGS

(a) The Secretary will hold a public hearing whenever he or she finds, on the basis of requests, a significant degree of public

interest in a draft permit(s). The Secretary also may hold a public hearing at his or her discretion, whenever, for instance, such a hearing might clarify one or more issues involved in the permit decision. Public notice of the hearing shall be given as specified in 13.UIC.9.

§ 13.UIC.12 RESPONSE TO COMMENTS

(a) At the time that a final permit is issued, the Secretary shall issue a response to comments. This response shall:

(1) Specify which provisions, if any, of the draft permit have been changed in the final permit decision, and the reasons for the change; and

(2) Briefly describe and respond to all significant comments on the draft permit raised during the public comment period, or during any hearing.

(b) The response to comments shall be available to the public.

§ 13.UIC.13 CONDITIONS APPLICABLE TO INDIVIDUAL PERMITS

(a) The following conditions apply to all individual permits issued under this subchapter. Discharges to Class V wells which are covered by general permits issued pursuant to § 13.UIC.25 are exempt.

(1) All conditions applicable to individual permits issued under this subchapter will be incorporated into the permits expressly by specific inclusions on the approved permit forms, which are incorporated into this subchapter.

(2) The applicant must satisfy the Secretary that any discharge into any injection well will not endanger any underground source of drinking water.

(3) All individual permits issued under this subchapter must satisfy the applicable technical criteria and standards at Appendix II.

(4) For all individual permits issued under this rule the applicant must authorize the Secretary or an authorized representative to enter, inspect, sample, monitor, and have access to and copy records at

reasonable times at any permitted facility.

(5) All individual permits to be valid, will be issued on forms approved by the Secretary. These forms are incorporated into this regulation at Appendix I.

(6) Any individual permit issued will include all applicable requirements which take effect prior to final disposition of the permit.

§ 13.UIC.14 DURATION OF PERMITS

(a) Permits for injection wells shall be effective for a fixed term not to exceed 5 years.

(b) The Secretary may issue any permit for a duration that is less than the full allowable term under this section.

§ 13.UIC.15 SCHEDULES OF COMPLIANCE

(a) General. This permit may, when appropriate, specify a schedule of compliance leading to compliance with the Act, the SDWA, the Vermont Water Pollution Control Regulations, Chapter 13, and this Subchapter.

(1) Time for compliance. Any schedules of compliance under this section shall require compliance as soon as possible, but in no case later than 2 years after the effective date of the permit.

(2) Interim dates. If a permit establishes a schedule of compliance which exceeds 1 year from the date of permit issuance, the schedule shall set forth interim requirements and the dates for their achievement.

(i) The time between interim dates shall not exceed 1 year.

(ii) If the time necessary for completion of any interim requirement is more than 1 year and is not readily divisible into stages for completion, the

permit shall specify interim dates for the submission of reports of progress toward completion of the interim requirements and indicate a projected completion date.

(3) Reporting. The permit shall be written to require that no later than 14 days following each interim date and the final date of compliance, the permittee shall notify the Secretary in writing of its compliance or noncompliance with the interim or final requirements.

(b) Alternative schedules of compliance. A UIC permit applicant or permittee may cease conducting regulated activities rather than continue to operate and meet permit requirements as follows:

(1) If the permittee decides to cease conducting regulated activities at a given time within the term of a permit which has already been issued:

(i) The permit may be modified to contain a new or additional schedule leading to timely cessation of activities; or

(ii) The permittee shall cease conducting permitted activities before noncompliance with any interim or final compliance schedule requirement already specified in the permit.

(2) If the decision to cease conducting regulated activities is made before issuance of a permit whose term will include the termination date, the permit shall contain a schedule leading to termination which will ensure timely compliance with applicable requirements.

(3) If the permittee is undecided whether to cease conducting regulated activities, the Secretary may issue or modify a permit to contain two schedules as follows:

(i) Both schedules shall contain an identical interim deadline requiring a final

decision on whether to cease conducting regulated activities no later than a date which ensures sufficient time to comply with applicable requirements in a timely manner if the decision is to continue conducting regulated activities;

(ii) One schedule shall lead to timely compliance with applicable requirements;

(iii) The second schedule shall lead to cessation of regulated activities by a date which will ensure timely compliance with applicable requirements.

(iv) Each permit containing two schedules shall include a requirement that after the permittee has made a final decision under paragraph (b) (3) (i) of this section it shall follow the schedule leading to compliance if the decision is to continue conducting regulated activities, or follow the schedule leading to termination if the decision is to cease conducting regulated activities.

(4) The applicant's or permittee's decision to cease conducting regulated activities shall be evidenced by a firm public commitment satisfactory to the Secretary, such as a resolution of the board of directors of a corporation.

§ 13.UIC.16 REQUIREMENTS FOR RECORDING AND REPORTING OF MONITORING RESULTS

All permits shall specify:

(a) Requirements concerning the proper use, maintenance, and installation, when appropriate, of monitoring equipment or methods;

(b) Required monitoring including type, intervals, and frequency sufficient to yield data which are representative of the monitored activity including, when appropriate, continuous monitoring;

(c) Applicable reporting requirements based upon the impact of the regulated activity and as specified in Appendix II § 146.13, 146.23, and 146.33. Reporting shall be no less frequent than specified in this rule at Appendix II.

§ 13.UIC.17 TRANSFER OF PERMITS

(a) Transfers by modification. A permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued (under 13.UIC.18) to identify the new permittee and incorporate such other requirements as may be necessary under the Act, the SDWA and this subchapter and when:

(1) The current permittee notifies the Secretary at least 30 days in advance of the proposed transfer date in paragraph (2) of this section; and

(2) The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them and, the notice demonstrates that the financial responsibility requirements of the existing permit will be met by the new permittee.

§ 13.UIC. 18 MODIFICATION OR REVOCATION AND REISSUANCE OF PERMITS

When the Secretary receives any information, he or she may determine whether or not one or more of the causes listed in paragraphs (a) and (b) of this section for modification or revocation and reissuance or both exist. If cause exists, the Secretary may modify or revoke and reissue the permit accordingly and may request an updated application if necessary. In the case of revoked and reissued permits, the Secretary will require the submission of a new application. When a permit is modified, only the conditions subject to modification are reopened. If a permit is revoked and reissued, the entire permit is reopened and subject to revision and the permit is reissued for a new term. If cause does not exist under this section, the Secretary shall not modify or revoke and reissue the permit. If a permit modification satisfies the criteria in § 13.UIC.20 for "minor modifications" the permit may be modified without a draft permit or public review. Otherwise, a draft permit must be prepared and the procedures of this subchapter and the approved state program followed.

During any revocation and reissuance proceedings, the permittee will comply with all conditions of the existing permit until a new final permit is issued.

(a) Causes for modification. The following are causes for modification but not revocation and reissuance of permits. However, for Class II or III wells, the following may be causes for revocation and reissuance as well as modification; and the following may be causes for revocation and reissuance as well as modification for Class I and V wells when the permittee requests or agrees.

(1) Information. The Secretary has received information. Permits other than for Class II or III wells may be modified during their terms for this cause only if the information was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and would have justified the application of different permit conditions at the time of issuance. This cause shall include any information indicating that cumulative effects on the environment are unacceptable.

(2) New regulations. The standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Permits other than for Class II or III wells may be modified during their terms for this cause only as follows:

(i) For promulgation of amended standards or regulations, when:

(A) The new standards or regulations are at least as stringent as EPA requirements;

(B) The permit condition requested to be modified was based on a promulgated state regulation or effluent limitation; and

(C) A permittee requests modification.

(ii) For judicial decisions, when:

(A) A court of competent jurisdiction has remanded and stayed state promulgated regulations or effluent limitations;

(B) The remand and stay concern that portion of the regulation on which the permit condition was based; and

(C) A request is filed by the permittee.

(3) Compliance schedules. The Secretary determines good cause exists for modification of a compliance schedule, such as an act of God, strike, flood, materials, shortage or other events over which the permittee has little or no control and for which there is no reasonably available remedy.

(b) Causes for modification or revocation and reissuance. The following are causes to modify or, alternatively, revoke and reissue a permit:

(1) Cause exists for termination under § 13.UIC.19 and the Secretary determines that modification or revocation and reissuance is appropriate;

(2) The Secretary has received notification of a proposed transfer of the permit;
or

(3) The Secretary has received information that material and substantial alterations or additions are planned for the permitted facility.

(c) Facility siting. Suitability of the facility location will not be considered at the time of permit modification or revocation and reissuance unless new information or standards indicate that a threat to human health or the environment exists which are unknown at the time of permit issuance.

§ 13.UIC.19 TERMINATION OF PERMITS

(a) The following are causes for terminating a permit during its term, or for denying a permit renewal application:

(1) Noncompliance by the permittee with any condition of the permit;

(2) The permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts, or the permittee's misrepresentation of any relevant facts at any time;

(3) A determination by the Secretary that material and substantial alterations or additions to the permitted facility, which have been made or are planned following the issuance of a permit when the permit conditions did not specify such alterations; or

(4) A determination that the permitted activity endangers underground sources of drinking water, human health or the environment and can only be regulated to acceptable levels by permit modification or termination.

(b) The Secretary will follow the applicable procedures at Section 13.UIC. 21 in terminating any permit under this section.

§ 13.UIC.20 MINOR MODIFICATIONS OF PERMITS

Upon the consent of the permittee, the Secretary may modify a permit to make the corrections or allowances for changes in the permitted activity listed in this section. Any permit modification not processed as a minor modification under this section must be made for cause with a draft permit and public notice as required in §§ 13.UIC.7, 13.UIC.8, and 13.UIC.9. Minor modifications may only:

(a) Correct typographical errors;

(b) Require more frequent monitoring or reporting by the permittee;

(c) Change an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with the attainment of the final compliance date requirement;

(d) Allow for a change in ownership or operational control of a facility where the Secretary determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittees has been submitted to the Secretary.

§ 13.UIC.21 PROCEDURES TO MODIFY, REVOKE AND REISSUE OR
TERMINATE PERMITS

The following are the procedures that the Secretary will follow in modifying, revoking and reissuing or terminating any permit issued under this Subchapter.

(a) Permits may be modified, revoked and reissued or terminated either at the request of any interested person (including the permittee) or upon the Secretary's initiative. However, permits may only be modified, revoked and reissued, or terminated for the reasons specified in Section 13.UIC.18 and 13.UIC.19 of this Subchapter. All requests will be in writing and will contain facts or reasons supporting the request.

(b) Procedures to Deny. If the Secretary decides the request is not justified, he or she shall send the requestor a brief written response giving a reason for the decision. Denial of requests for modification revocation and reissuance, or termination are not subject to public notice, comment, or hearings.

(c) Procedures to Modify or Revoke and Reissue.

(1) If the Secretary tentatively decides to modify or revoke and reissue a permit, he or she will prepare a draft permit incorporating the proposed changes. The Secretary may request additional information and, in the case of a modified permit, may require the submission of an updated permit application. In the case of revoked and reissued

permits, the Secretary will require the submission of a new application.

(2) In a permit modification under this section, only those conditions to be modified shall be reopened when a new draft permit is prepared. All other aspects of the existing permit shall remain in effect for the duration of the unmodified permit. When a permit is revoked and reissued under this section, the entire permit is reopened, just as if the permit had expired and was being reissued. During any revocation and reissuance proceeding the permittee shall comply with all conditions of the existing permit until a new final permit is reissued.

(3) "Minor modifications" as defined in § 13.UIC.20 are not subject to the requirements of this section.

§ 13.UIC.22 CONFIDENTIALITY OF INFORMATION

(a) Any information submitted to the Agency pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions, or in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, the Agency may make the information available to the public without further notice. The Secretary shall protect any information (other than that listed in part (b) of this section) contained in such form, or other records, reports, or plans as confidential upon showing by any person that such information if made public would divulge methods or processes entitled to protection as trade secrets of such person. If, however, the information being considered for confidential treatment is contained in a form, the Secretary shall forward such information to the Regional Administrator for his concurrence in any determination of confidentiality pursuant to the agreement between EPA and the Agency described in the UIC Memorandum of Agreement.

Any information accorded confidential status, whether or not contained in a form, shall be disclosed, upon request, to the Regional Administrator, or his authorized representative.

(b) Claims of confidentiality for the following information will be denied:

(1) The name and address of any permit applicant or permittee;

(2) Information which deals with the existence, absence, or level of contaminants in ground water.

(3) Data covering the nature, quality and quantity of the waste discharged or to be discharged to any injection well.

§ 13.UIC.23 PROHIBITIONS

(a) No person shall discharge any waste, substance or material into an injection well without first obtaining a permit for that discharge from the Secretary, except as provided for under § 13.UIC.25 (authorization by general permits) of this rule.

(b) No person shall discharge any waste, substance or material into a Class IV injection well.

(c) No person shall discharge any hazardous or radioactive waste into any class of injection well.

(d) No person shall discharge any waste, substance or material into any injection well if that discharge could cause or allow the endangerment of any U.S.D.W., the violation of a drinking water standard, or adversely affect the health of persons.

(e) No person shall construct an injection well until a permit containing conditions including construction requirements has been issued.

(f) No person shall construct a Class IV injection well.

§ 13.UIC.24 PROHIBITION OF MOVEMENT OF FLUID INTO UNDERGROUND SOURCES OF DRINKING WATER

(a) No owner or operator of an injection well shall construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of

any drinking water standard or may otherwise adversely affect the health of persons. The applicant for a permit shall have the burden of showing that the requirements of this paragraph are met.

(b) For Class I, II, and III wells, if any water quality monitoring of an underground source of drinking water or other information indicates the movement of any contaminant into the underground source of drinking water the Secretary shall prescribe such additional requirements for construction, corrective action, operation, monitoring, reporting, or other action (including closure of the injection well) as are necessary to prevent such movement, the violation of any drinking water standard, and any adverse effect on the health of persons. In addition, the Secretary may terminate any permit and take any appropriate enforcement action if any terms or conditions of the permit have been violated.

(c) For Class V wells, if at any time the Secretary learns that a Class V well may cause a violation of any drinking water standards, he or she shall:

(1) Require the injector to obtain an individual permit;

(2) Order the injector to take such actions (including where required closure of the injection well) as may be necessary to prevent the violation; or

(3) Take enforcement action.

(d) Whenever the Secretary learns that a Class V well may be otherwise adversely affecting the health of persons, he or she may prescribe such actions as may be necessary to prevent the adverse affect, including any action authorized under paragraph (c) of this section.

(e) Notwithstanding any other provision of this section, the Secretary may take emergency action upon receipt of information that a contaminant which is present in or is likely to enter a public water system may present an imminent and substantial endangerment to the health of persons.

§ 13 UIC.25 AUTHORIZATION OF UNDERGROUND INJECTION BY RULE
GENERAL PERMITS

(a) Limitations. The provisions of this section apply only to Class V injection wells as follows:

(1) Discharges of unaltered ground water into injection wells serving as ground water heat pump return wells may be issued a general permit provided that the discharge is in compliance with the following:

(i) The water has not been exposed to the atmosphere or any substance other than the interior of an approved undamaged heat exchange apparatus and the necessary piping appurtenances;

(ii) The quantity of flow is less than 25,000 gallons per day;

(iii) The water is returned to the same aquifer from which it is withdrawn, or another hydraulically connected aquifer;

(iv) The returned water does not cascade down the well, but is injected below the water level in the return well;

(v) The returned water does not cause a violation of any drinking water standards or adversely affect the health of persons; and

(vi) Any person proposing to discharge or discharging unaltered ground water under this Subsection has reported to the Secretary as required at Subsection 13.UIC.25(B).

(2) Injections of waste into Class V wells other than ground water heat pump return wells as described in part (a) (1) of this section are hereby issued a general permit under this Subchapter provided that:

(i) the Class V injection well is currently authorized under 10 V.S.A. Chapter 159 (Solid Waste Management) and the regulations promulgated thereunder, or the Environmental Protection Rules adopted by the Agency effective September 10, 1982, under the provisions of 18 V.S.A. § 1301-1306; and

(ii) the permits and certificates issued under the authorities described in paragraph (a) (2) (i) of this section contain the necessary conditions and provisions to prevent the violation of drinking water standards in underground sources of drinking water and adverse effects on the health of persons.

(b) Inventory and Reporting Requirements. All owners or operators of Class V injection wells will submit inventory information to the Secretary unless the discharge is already authorized by the Secretary under other authorities.

(1) Contents. As part of the inventory, the Secretary requires and the owner/operator must supply at least the following information:

- (i) facility name and location;
- (ii) name and address of legal contact;
- (iii) ownership of facility;
- (iv) nature and type of injection wells;
and
- (v) operating status of injection wells.

(Note: This information is to be reported on a form supplied by the Secretary. (See Form WR-UIC-III at Appendix I of these regulations.)

(2) Notice. Upon approval of the UIC program in the state, the Secretary will notify owners or operators of injection wells of their duty to submit inventory information. The method of notification selected by the Secretary must assure that the owners or operators will be made aware of the inventory and reporting requirements.

(3) Deadlines. Owners or operators of existing but unauthorized Class V injection wells must submit inventory information no later than 45 days after the notice by the Secretary. The Secretary need not require inventory information from any facility with interim status under RCRA.

(c) Requiring Individual Permits. The Secretary may require individual permits under these regulations for Class V wells when:

(1) There is reason to believe that a discharge into a Class V injection well may cause a violation of any drinking water standard in an underground source of drinking water, or adversely affect the health of persons;

(2) The Class V injection well is not in compliance with one or more requirements of the general permit;

(3) The Class V injection well is no longer within the category of wells and types of well operations authorized by general permit under this section; and

(4) The protection of USDW's requires that the injection operation be regulated by requirements, such as for corrective action, monitoring and reporting, or operation, which are not contained in a general permit.

(d) All Class V wells not described under Subsection 13.UIC.25(a) require individual permits from the Secretary under these regulations.

(e) Application for General Permits. Owners or operators of Class V heat pump return injection wells will apply by letter to the Secretary requesting a general permit for each heat pump return well. A completed copy of Form WR-UIC-III must be submitted with the letter

of application. Such an application meets the inventory and reporting requirements of § 13.UIC.25(b).

(f) Time of Application. Application for a general permit will be submitted as follows:

(1) For a proposed heat pump return well, at least 45 days prior to the proposed date of construction; and

(2) For an existing heat pump return well, no later than 45 days after the date of notice by the Secretary under § 13.UIC.25(b)(2).

(g) Response to Application. No later than 30 days after receipt of a properly completed application, the Secretary will:

(1) Issue a general permit by letter of notification to the successful applicant, in which the date of expiration is set forth; or

(2) Notify the applicant that he or she must apply for an individual permit pursuant to § 13.UIC.25(e). The letter will set forth the reasons for the decision not to issue a general permit.

(h) Duration of General Permits. All general permits issued under this section expire no later than 5 years from the date of the letter confirming the issuance of the general permit pursuant to § 13.UIC.25 (g)(1).

(i) Reissuance of General Permits. Owners or operators of heat pump return wells authorized by general permits must reapply to the Secretary not later than 90 days prior to the expiration date. Upon receipt of a request for reissuance the Secretary will:

(1) Reissue a general permit for a term not to exceed 5 years; or

(2) Notify the owner or operator that the heat pump return well requires an individual permit.

(j) Public Notice and Comments. The Secretary will provide public notice and opportunity for written comments or a public hearing or both relative to general permits.

(1) Notice will be published in selected daily and weekly newspapers covering each of at least 5 geographic areas. Geographic areas will correspond to the Environmental Districts covered by the regional offices of the Agency.

(2) Notice and opportunity for written comments and/or hearings will be repeated periodically at least once every 5 years commencing in 1985.

(3) Notice will be sent to a mailing list of interested persons and government agencies.

(k) Right of Entry and Inspection. The holder of any general permit must authorize the Secretary to enter, inspect, sample, monitor and have access to and copy records at reasonable times at any facility authorized under this section.

§ 13, UIC, 26 CORRECTIVE ACTION

(a) Coverage. Applicants for Class I, II, or III injection well permits shall identify the location of all known wells within the injection well's area of review which penetrate the injection zone, or in the case of Class II wells operating over the fracture pressure of the injection formation, all known wells within the area of review penetrating formations affected by the increase in pressure. For such wells which are improperly sealed, completed, or abandoned, the applicant shall also submit a plan consisting of such steps or modifications as are necessary to prevent movement of fluid into underground sources of drinking water. This is a corrective action plan. Where the plan is adequate, the Secretary shall incorporate it into the permit as a condition. Where the Secretary's review of an application indicates that the permittee's plan is inadequate (based on the factors in 40 CFR § 146.07 which is incorporated into these regulations by adoption and attached at Appendix II) the Secretary shall:

(1) require the applicant to revise the plan which if then is adequate shall be prescribed as a condition of the permit under paragraph (b) of this section; or

(2) deny the application.

(b) Requirements.

(1) No permit for a Class I, II or III injection well may be issued without conditions prescribing the required corrective action and a schedule of compliance.

(2) No injection of fluids will be authorized until all the required corrective action has been taken.

§ 13.UIC.27 EMERGENCY ACTIONS

Notwithstanding any other provisions of this subchapter, upon receipt of evidence that a discharge of waste into an injection well is presenting an endangerment to underground sources of drinking water or the health of persons or to the welfare of persons by endangering their livelihood, the Secretary shall take whatever actions are necessary to prevent or correct the endangerment including, but not limited to, ordering cessation of the discharge, closure of the well and restoration of the affected underground source of drinking water.

UNDERGROUND INJECTION CONTROL RULE

CHAPTER 11

PERMITS

APPENDIX I: PERMIT FORMS

(Formerly Water Pollution Control Regulations Chapter 13: Permits)

APPENDIX I. PERMIT FORMS

INTRODUCTION

This appendix to the Vermont Water Pollution Control Regulations, Subchapter 13.UIC has been duly adopted by the Secretary as part of the Subchapter and therefore has the force of law.

This permit application package contains the necessary forms and schedules for any person seeking a permit to discharge any waste, fluid, substance or material beneath the land surface of Vermont through an injection well. The forms should be filled out only with careful attention to the applicable State law (10 V.S.A. Chapter 47), the Vermont Water Pollution Control Permit Regulations, (Chapter 13 and Subchapter 13.UIC).

Assistance in completing an application is available from:

Vermont Department of Water Resources
and Environmental Engineering
Permits and Compliance Section
Montpelier, Vermont 05602

(802) 828-3341

or

Air Pollution Control and
Solid Waste Management

(802) 828-3395

The Secretary will not issue a permit before receiving a completed application. Incomplete applications will be returned to the applicant.

Who Must Apply.

Any person seeking to discharge or who is already discharging any waste, fluid, substance or material into an injection well beneath the surface of Vermont, except as described in Section 13.UIC.25 will need a permit and must apply for a permit on these forms.

General Instructions.

Each applicant must complete and sign Form WR-UIC-I for any class of injection needing a permit. In addition, permits for each class of injection wells require completion of the appropriate schedule. Periodic and mid-course evaluation reports also require the completion of the appropriate schedules.

The Department recommends that all applicants contact the appropriate office to arrange a pre-application conference to discuss the proposed application and the facility needing a permit. Such conferences have proven to be very beneficial in saving time and money for the applicants.

Persons whose injection activities are authorized, by general permit, under Section 13.UIC.25 are not required to obtain an individual permit but must report to the Department on Form WR-UIC-III.

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES
AND ENVIRONMENTAL ENGINEERING

WATER POLLUTION CONTROL PERMIT REGULATIONS, CHAPTER 13
UNDERGROUND INJECTION CONTROL, SUBCHAPTER UIC

FORM WR-UIC-I

APPLICATION FOR A PERMIT TO DISCHARGE WASTES
INTO AN INJECTION WELL

All information to be typed or neatly printed and legible.
See Instructions on following pages.

1. Applicant/Owner _____ Legal Entity _____
2. Mailing Address _____
3. Operator _____ Telephone _____
4. Name of Activity or Facility for which Application is submitted.

5. Description of Activity or Facility _____
SIC Codes _____, _____, _____, _____
6. Nature of Wastes: Sanitary, Industrial, Oil or Gas Related Fluids,
 Commercial, Drainage, Heat Pump Return Flow,
 Other (Describe) _____
7. Classification of Injection Well I II III V
8. Description of Location of Injection Well (Attach map per instructions)

9. Status of Discharge Proposed Existing (Permit No. _____)

10. The applicant hereby applies for a discharge permit to discharge wastes into an injection well from the above named activity or facility as described in this application, its attached schedule(s), and specifications.

11. Application is for Original Permit Permit Renewal If this is for a permit renewal, is original application still valid in all respects ?
 Yes No If not, attach new schedule(s), plans and specifications.

Page 1 of 4

12. List below by permit number or other identification all State or Federal permits or construction approvals received or applied for under any of the following programs for this facility:

(i) Hazardous Waste Management program under RCRA. _____

(ii) UIC program under SDWA. _____

(iii) NPDES program under CWA. _____

(iv) Prevention of Significant Deterioration (PSD) program under the Clean Air Act. _____

(v) Nonattainment program under the Clean Air Act. _____

(vi) National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act. _____

(vii) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act. _____

(viii) Dredge or fill permits under section 404 of CWA. _____

(ix) Other relevant environmental permits, including State permits. _____

13. Application Fee Enclosed \$ _____. Date of Application _____

14. Signature of Authorized Representative (See INSTRUCTIONS).

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

I certify that to the best of my knowledge nothing in this application will cause or allow the endangerment of any underground source of drinking water.

I further certify that the Secretary or an authorized representative is hereby authorized to enter, inspect, sample, monitor and have access to and copy records at reasonable times at the facility identified above.

TYPE OR PRINT NAME

TITLE

SIGNATURE

INSTRUCTIONS FOR COMPLETING FORM WR-UIC-1

1. Applicant/Owner - Give complete name of applicant. The applicant will usually be the owner of the facility to be permitted.

Legal Entity - Describe the applicant if other than a natural person. For example: a corporation; partnership; firm; state agency; federal agency; or municipality.
2. Mailing Address - Give complete mailing address of the facility for which application is being made.
3. Operator - Give complete name of operator of the facility, mailing address, and telephone number; ownership status, and status as Federal, State, private, public, or other entity.
4. Name of Activity or Facility - Give the complete name of the facility for which the application is being made. For example: The Gusher Company, Oil Well No. 3, the John Doe residence, the XYZ Corporation Waste Disposal Plant, or the Dry Gulch State Park.
5. Description of Activity or Facility - Describe the nature of the facility including up to four (4) S.I.C. codes which best reflect the principal products or services provided by the facility. For example: The XYZ Corporations' Waste Disposal Plant treats and reclaims waste streams and filters from the metal plating industry. The following SIC codes are appropriate, 3471 and 3341.
6. Nature of Wastes - Check the appropriate box which accurately describes the waste or fluid to be discharged into the injection well. If none of the printed descriptions is exactly right, check "other" and describe fully the waste or fluid to be discharged. Note: Applicants should be aware that any claims of confidentiality or trade secrets do not extend to the nature of wastes to be injected.
7. Classification of Injection Well - Turn to section 13.UIC.4 of the regulations to determine which class of injection well best describes the facility for which an application is being made. Circle the appropriate number. Note that Class IV wells and any injection of hazardous or radioactive waste is prohibited.
8. Description of Location of Injection Well: Include town, latitude-longitude, U.S.G.S. map number, distances from prominent features or other information to locate the well. Attach a copy of a USGS Topographic Map or a Vermont Ortho-photo Map showing the location of the injection well, and each of of the pertinent structures of the facility. The map must show all the area within one (1) mile of the facility boundaries including injection well(s), all water wells, springs, and surface water bodies.
9. Status of Discharge - Check the appropriate box to show if the discharge to the injection well is proposed or already existing. If the discharge is currently or has been formerly permitted by the Department, please fill in the permit number.
- 10-11. Complete as appropriate.

12. List all appropriate State or Federal permits, received or applied for which are applicable to this activity or facility.
13. Submit appropriate application fee.

APPLICATION FEE SCHEDULE

<u>Nature of Discharge</u>	<u>Discharge Permit</u>
Class I Wells	\$100
Class II Wells	\$100
Class III Wells	\$100
Class V Wells	\$ 50

14. Signature Application must be signed by the applicant or an officer in applicant's business, a municipal official, etc. Application should not be signed by applicant's attorney, engineer, contractor, etc. See § 13.UIC.6 for further information.

ATTACH APPROPRIATE SCHEDULE(S), APPLICATION FEE, PLANS, SPECIFICATIONS AND OTHER MATERIAL AS APPROPRIATE.

For further information call or write:

Dept. of Water Resources and Environmental Engineering
Permits and Compliance
Montpelier, Vermont 05602 (802) 828-3341

or

Air & Solid Waste Division
Montpelier, Vermont 05602 (802) 828-3395

Note: The Air & Solid Waste Division handles all applications pertaining to industrial or commercial sludge and septage activities. The Permits and Compliance Section handles domestic sanitary wastes (sewage), agricultural practices, natural organic wastes, and stormwater discharges.

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES
AND ENVIRONMENTAL ENGINEERING

WATER POLLUTION CONTROL PERMIT REGULATIONS, CHAPTER 13
UNDERGROUND INJECTION CONTROL, SUBCHAPTER UIC

FORM WR-UIC - SCHEDULE A (CLASS I)

APPLICATION FOR A PERMIT TO DISCHARGE WASTES
INTO A CLASS I INJECTION WELL

This schedule must be completed by any person seeking to discharge (inject) any waste, fluid, substance or material into a Class I injection well. Prior to constructing, operating or plugging and abandoning any Class I well the applicant must complete this schedule. See criteria and standards at Part 146, Subpart B (Appendix II).

- I. Attach to this schedule a completed and signed copy of Form WR-UIC-I.
- II. Information required by the Secretary relative to construction. Attach to this form the following information:
 - (1) Depth to the injection zone;
 - (2) Injection pressure, external pressure and internal pressure;
 - (3) Hole size;
 - (4) Size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification and construction material);
 - (5) Corrosiveness of injected fluid, formation fluids, and temperatures;
 - (6) Lithology of injection and confining intervals;
 - (7) Type or grade of cement;
 - (8) Size, specifications, and other information relative to tubing, packer, and fluid seal including:
 - (i) Depth of setting;
 - (ii) Characteristics of injection fluid (chemical content, corrosiveness, and density);
 - (iii) Injection pressure;
 - (iv) Annular pressure;
 - (v) Rate, temperature and volume of injected fluid; and
 - (vi) Size of casing.

- (9) A descriptive report interpreting the results of all logs and tests conducted during the drilling and construction of new Class I wells;
- (10) A detailed record of deviation checks performed during the drilling of the well bore;
- (11) Copies of all logs and tests performed during the progress of the well construction including but not limited to the following:
 - (i) For surface casing intended to protect underground sources of drinking water:
 - (A) Resistivity, spontaneous potential and caliper logs before the casing is installed; and
 - (B) A cement bond, temperature, or density log after the casing is set and cemented.
 - (ii) For intermediate and long strings of casing intended to facilitate injection:
 - (A) Resistivity, spontaneous potential, porosity, and gamma ray logs before the casing is installed;
 - (B) Fracture finder logs; and
 - (C) A cement bond, temperature, or density log after the casing is set and cemented.
- (12) At a minimum, the following information concerning the injection formation shall be determined or calculated for new Class I wells:
 - (i) Fluid pressure;
 - (ii) Temperature;
 - (iii) Fracture pressure;
 - (iv) Other physical and chemical characteristics of the injection matrix; and
 - (v) Physical and chemical characteristics of the formation fluids.
- (13) A map showing the injection well for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected.

- (14) A tabulation of data on all wells within the area of review which penetrate into the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Secretary may require;
- (15) Maps and cross sections indicating the vertical and lateral limits of all underground sources of drinking water within the area of review, their position relative to the injection formation and the direction of water movement, in each underground source of drinking water which may be affected by the proposed injection;
- (16) Maps and cross sections detailing the geologic structure of the local area;
- (17) Generalized maps and cross sections illustrating the regional geologic setting;
- (18) Proposed operating data:
 - (i) Average and maximum daily rate and volume of the fluid to be injected;
 - (ii) Average and maximum injection pressure; and
 - (iii) Source and an analysis of the chemical, physical, radiological and biological characteristics of injection fluids.
- (19) Proposed formation testing program to obtain an analysis of the chemical, physical, and radiological characteristics of and other information on the receiving formation;
- (20) Proposed stimulation program;
- (21) Proposed injection procedure;
- (22) Schematic or other appropriate drawings of the surface and subsurface construction details of the well;
- (23) Contingency plans to cope with all shut-ins or well failures so as to prevent migration of fluids into any underground source of drinking water;
- (24) Plans (including maps) for meeting the monitoring requirements in 40 CFR § 146.13(b) (See Appendix II);
- (25) For wells within the area of review which penetrate the injection zone but are not properly completed or plugged, the corrective action proposed to be taken under § 13.UIC.26 of these regulations;
- (26) Construction procedures including a cementing and casing program, logging procedures, deviation checks, and a drilling, testing, and coring program; and

- (27) A certificate, acceptable to the Secretary, that the applicant has assured, through appropriate means, the resources necessary to close, plug or abandon the well.

III. Information required by the Secretary prior to operation.

Attach to this form the following information:

- (1) All available logging and testing program data on the well;
- (2) A demonstration of mechanical integrity pursuant to Appendix II, § 146.08;
- (3) The anticipated maximum pressure and flow rate at which the permittee will operate;
- (4) The results of the formation testing program;
- (5) The actual injection procedure;
- (6) The compatibility of injected waste with fluids in the injection zone and the confining zone; and
- (7) The status of corrective action on defective wells in the area of review.

IV. Information required by the Secretary prior to granting approval for plugging and abandonment. (Note: The plugging and abandoning of Class I wells will conform to the requirements specified at § 146.10, shown at Appendix II.)

Attach to this form the following information:

- (1) The type and number of plugs to be used;
- (2) The placement of each plug including the elevation of the top and bottom;
- (3) The type and grade and quantity of cement to be used;
- (4) The method for placement of the plugs; and
- (5) The procedure to be used to meet the requirements of Appendix II § 146.10(c).

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FORM WR-UIC - SCHEDULE RA (CLASS I)

REPORTING SCHEDULE FOR CLASS I INJECTION WELLS

This form is to be completed by the permittee to comply with the reporting requirements of Subpart B (§ 146.11 - 146.15) for Class I injection wells. See criteria and standards at Appendix II, Part 146.

I. Attach a completed and signed copy of Form WR-UIC-I.

II. Quarterly Reports to the Secretary.

Attach a report of Operation and Monitoring which shall at a minimum include:

- (1) The physical, chemical and other relevant characteristics of injection fluids;
- (2) Monthly average, maximum and minimum values for injection pressure, flow rate and volume, and annular pressure; and
- (3) The results of monitoring including:
 - (i) The type, number and location of monitoring wells within the area of review;
 - (ii) Any migration of fluids into and pressure in the underground sources of drinking water;
 - (iii) The parameters measured; and
 - (iv) The frequency of monitoring.
- (4) Reporting the results, with the first quarterly report after the completion, of:
 - (i) Periodic tests of mechanical integrity;
 - (ii) Any other test of the injection well conducted by the permittee if required by the Secretary; and
 - (iii) Any well work over.

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FORM WR-UIC - SCHEDULE RAME (CLASS I)

MID-COURSE EVALUATION FOR CLASS I INJECTION WELLS

This form must be completed and submitted for each Class I permit at six (6) month intervals during the first two years of operation of the UIC program.

- I. Attach a completed and signed copy of Form WR-UIC-I.
- II. Attach a completed copy of the tabulation of data on wells from Schedule A § II.(14) of the current permit application including under "location", distance and direction from the injection well.
- III. Attach the following additional information:
 - (1) The depth to the top and bottom of any USDW;
 - (2) The distance to the nearest downgradient water supply well;
 - (3) A description of the geology and hydrology of the area;
 - (4) The construction characteristics of the well;
 - (5) The corrective action proposed as well as that performed;
 - (6) The type and results of all mechanical integrity tests reported to the Secretary;
 - (7) Any reporting to the Secretary of monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW; and
 - (8) A report of any noncompliance with a permit condition or malfunction of the injection system which may cause a fluid migration into or between USDWs.

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FORM WR-UIC - SCHEDULE B (CLASS II)

APPLICATION FOR A PERMIT TO DISCHARGE WASTE
INTO A CLASS II INJECTION WELL

This schedule must be completed by any person seeking to discharge (inject) any waste, fluid, substance or material into a Class II injection well. Prior to the constructing, operating, or plugging and abandoning of any Class II well the applicant must complete this form. See criteria and standards at Appendix II, Part 146, Subpart C.

- I. Attach a completed and signed copy of Form WR-UIC-I.
- II. Information required by the Secretary relative to construction.

Attach the following information:

- (1) Depth to the injection zone;
- (2) Depth to the bottom of all USDWs;
- (3) Estimated maximum and average injection pressures;
- (4) Nature of formation fluids;
- (5) Lithology of injection and confining zones;
- (6) External pressure, internal pressure;
- (7) Hole size;
- (8) Size and grade of all casing strings;
- (9) Class of cement;
- (10) A descriptive report interpreting the results of that portion of those logs and tests which specifically relate to (1) an USDW and the confining zone adjacent to it, and (2) the injection and adjacent formations. The report shall be prepared by a knowledgeable log analyst and submitted to the Secretary. At a minimum, these logs and tests shall include:
 - (i) Deviation checks on all holes constructed by first drilling a pilot hole and then enlarging the pilot hole, by reaming or another method. Such checks shall be at sufficiently frequent intervals to assure that vertical avenues for fluid movements in the form of diverging holes are not created during drilling;

- (ii) Such other logs and tests as may be needed after taking into account the availability of similar data in the area of the drilling site, the construction plan, and the need for additional information that may arise from time to time as the construction of the well progresses.

(11) Logging Reports

- (i) For surface casing intended to protect underground sources of drinking water in areas where the lithology has not been determined:
 - (A) Electric and caliper logs before casing is installed; and
 - (B) A cement bond, temperature, or density log after the casing is set and cemented.
- (ii) For intermediate and long strings of casing intended to facilitate injection:
 - (A) Electric, porosity and gamma ray logs before the casing is installed;
 - (B) Fracture finder logs; and
 - (C) A cement bond, temperature, or density log after the casing is set and cemented.

(12) Fluid pressure;

(13) Estimated fracture pressure;

(14) Physical and chemical characteristics of the injection zone;

(15) A map showing the injection well for which a permit is sought and the applicable area of review, the map must show the number or name and location of all existing producing wells, injection wells, abandoned wells, dry holes, and water wells, bodies of surface waters, mines (surface and subsurface), quarries and other pertinent surface features including residences and roads and faults if known or suspected;

(16) A tabulation of data on all wells within the area of review which penetrate the proposed injection zone or, in the case of Class II wells operating over the fracture pressure of the injection formation, all known wells within the area of review which penetrate formations affected by the increase in pressure. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and completion, and any additional information the Secretary may require;

(17) Proposed operating data:

- (i) Average and maximum daily rate and volume of fluids to be injected;
- (ii) Average and maximum injection pressure; and

- (iii) Source and an appropriate analysis of the chemical and physical characteristics of the injection fluid.
- (18) Appropriate geological data on the injection zone and confining zone including lithologic description, geological name, thickness and depth;
- (19) Geologic name and depth to bottom of all underground sources of drinking water which may be affected by the injection;
- (20) Schematic or other appropriate drawings of the surface and subsurface construction details of the well;
- (21) The corrective action proposed to be taken by the applicant under § 13.UIC.26 of these regulations;
- (22) A certificate, acceptable to the Secretary, that the applicant has assured through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well;
- (23) The proposed formation testing program to obtain the information required by Appendix II, § 146.22(e);
- (24) The proposed stimulation program;
- (25) The proposed injection procedure;
- (26) The proposed contingency plans to cope with well failures so as to prevent migration of contaminating fluids into an underground source of drinking water; and
- (27) Plans for meeting the monitoring requirements of 40 CFR § 146.23(b).

III. Information required by the Secretary prior to operation.

Attach the following:

- (1) All available logging and testing program data on the well;
- (2) A demonstration of mechanical integrity pursuant to 40 CFR § 146.08;
- (3) The anticipated maximum pressure and flow rate at which the permittee will operate;
- (4) The results of the formation testing program;
- (5) The actual injection procedure; and
- (6) The status of corrective action on defective wells in the area of review.

IV. Information required by the Secretary prior to plugging and abandonment.

Note: The plugging and abandoning of Class II wells will conform to the requirements specified at Appendix II, § 146.10.

Attach the following:

- (1) The type and number of plugs to be used;
- (2) The placement of each plug including the elevation of top and bottom;
- (3) The type, grade, and quantity of cement to be used;
- (4) The method of placement of the plugs; and
- (5) The procedure to be used to meet the requirements of Appendix II, § 146.10(c).

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FORM WR-UIC - SCHEDULE RB (CLASS II)

REPORTING SCHEDULE FOR CLASS II INJECTION WELLS

This schedule must be completed by the permittee to comply with the reporting requirements for Class II injection wells. See criteria and standards at Appendix II, Part 146, Subpart C (§ 146.21 - 146.25).

- I. Attach a completed and signed copy of FORM WR-UIC-I.
- II. Attach an annual report to the Secretary summarizing the results of the monitoring required which shall, at a minimum, include monthly records of injected fluids, any major changes in characteristics or sources of injected fluid, and information on the following:
 - (1) Monitoring of the nature of injected fluids at time intervals sufficiently frequent to yield data representative of their characteristics;
 - (2) Observation of injection pressure, flow rate, and cumulative volume at least with the following frequencies:
 - (i) Weekly for produced fluid disposal operations;
 - (ii) Monthly for enhanced recovery operations;
 - (iii) Daily during the injection of liquid hydrocarbons and injection for withdrawal of stored hydrocarbons;
 - (iv) Daily during the injection phase of cyclic steam operations; and
 - (v) Recording of one observation of injection pressure, flow rate and cumulative volume at reasonable intervals no greater than 30 days.
 - (3) A demonstration of mechanical integrity pursuant to Appendix II, § 146.08 at least once every five years during the life of the injection well.

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FORM WR-UIC - SCHEDULE RBME (CLASS II)

MID-COURSE EVALUATION FOR CLASS II INJECTION WELLS

This schedule must be completed by the permittee and submitted to the Secretary on each new Class II permit at six (6) month intervals during the first two years of the Vermont UIC program.

- I. Attach to this form a completed and signed copy of Form WR-UIC-I.
- II. Attach to this form a completed copy of the tabulation of well data from Schedule B § II.(16) of the current permit application including under "location", the distance and direction from the injection well.
- III. Attach to this form the following information:
 - (1) The depth to the top and bottom of any USDW;
 - (2) The distance to the nearest downgradient water supply well;
 - (3) A description of the geology and hydrology of the area;
 - (4) The construction characteristics of the well;
 - (5) The corrective action proposed as well as that performed;
 - (6) Any reporting to the Secretary of monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW;
 - (7) A report of any noncompliance with a permit condition or malfunction of the injection system which may cause a fluid migration into or between USDWs;
 - (8) A report on the type and results of all mechanical integrity tests performed on the well; and
 - (9) A report on the results of a temperature log or noise log performed on the well as required by the Secretary.

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FORM WR-UIC - SCHEDULE C (CLASS III)

APPLICATION FOR A PERMIT TO DISCHARGE WASTES
INTO A CLASS III INJECTION WELL

This schedule must be completed by any person seeking a permit to discharge (inject) any waste, fluid, substance or material into a Class III injection well. Prior to the constructing, operating, or plugging and abandoning of any Class III well the applicant must complete this form. See criteria and standards for CLASS III wells at Appendix II, Part 146, Subpart D.

- I. Attach to this form a completed and signed copy of Form WR-UIC-I.
- II. Information required by the Secretary relative to construction.

Attach to this form the following information:

- (1) Depth to the injection zone;
- (2) Injection pressure, external pressure, internal pressure, etc.;
- (3) Hole size;
- (4) Size and grade of all casing strings (wall thickness, diameter, nominal weight, joint specification and construction material);
- (5) Corrosiveness of injected fluids and formation fluids;
- (6) Lithology of injection and confining zones;
- (7) Type and grade of cement;
- (8) A descriptive report interpreting the results of all logs and tests performed during construction of the well prepared by a knowledgeable log analyst;
- (9) A report of any deviation checks performed during the drilling of the well;
- (10) A report concerning the nature of the injection zone including at least the following:
 - (i) Fluid pressure;
 - (ii) Fracture pressure; and
 - (iii) Physical and chemical characteristics of the formation fluids.

- (11) A copy of the proposed monitoring program designed to detect any possible migration of fluids into USDWs;
- (12) A map showing the injection well for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name and location of all existing producing wells, injection wells, abandoned wells, dry holes, public water systems and water wells. The map will also show surface bodies of water, mines (surface and subsurface) quarries and other pertinent surface features including residences and roads, and faults if known or suspected;
- (13) A tabulation of data on wells within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and completion, and any additional information the Secretary may require;
- (14) Maps and cross sections indicating the vertical limits of all underground sources of drinking water within the area of review, their position relative to the injection formation, and the direction of water movement, where known, in every underground source of drinking water which may be affected by the proposed injection;
- (15) Maps and cross sections detailing the geologic structure of the local area;
- (16) Generalized map and cross sections illustrating the regional geologic setting;
- (17) Proposed operating data:
 - (i) Average and maximum daily rate and volume of fluid to be injected;
 - (ii) Average and maximum injection pressure; and
 - (iii) Qualitative analysis and ranges in concentrations of all constituents of injected fluids. The applicant may request Federal confidentiality as specified in 40 CFR Part 2. If the information is proprietary an applicant may, in lieu of the ranges in concentrations, choose to submit maximum concentrations which shall not be exceeded. In such a case the applicant shall retain records of the undisclosed concentrations and provide them upon request to the Secretary as part of any enforcement investigation.
- (18) Proposed formation testing program to obtain the information required by Appendix II, § 146.32(c);
- (19) Proposed stimulation program;
- (20) Proposed injection procedure;
- (21) Schematic or other appropriate drawings of the surface and subsurface construction details of the well;

- (22) Plans (including maps) for meeting the monitoring requirements of Appendix II, § 146.33(b);
- (23) Expected changes in pressure, native fluid displacement, direction of movement of injection fluid;
- (24) Contingency plans to cope with all shut-ins or well failures so as to prevent the migration of contaminating fluids into underground sources of drinking water;
- (25) A certificate that the applicant has assured, through a performance bond, or other appropriate means, the resources necessary to close, plug, or abandon the well; and
- (26) A copy of the corrective action plan and proposed schedule to remove the potential hazard of fluid migration out of the injection formation through improperly plugged wells.

III. Information required by the Secretary prior to granting approval for the operation of a Class III injection well.

Attach to this form the following information:

- (1) All available logging and testing data on the well;
- (2) A satisfactory demonstration of mechanical integrity;
- (3) The anticipated maximum pressure and flow rate at which the permittee will operate;
- (4) The results of the formation testing program;
- (5) The actual injection procedures; and
- (6) The status of corrective action on defective wells in the area of review.

IV. Information required by the Secretary prior to granting approval for the plugging and abandoning of a Class III injection well.

Note: The plugging and abandoning of Class III wells will conform to the requirements specified at Appendix II, § 146.10.

Attach to this form the following information:

- (1) The type and number of plugs to be used;
- (2) The placement of each plug including the elevation of the top and bottom;
- (3) The type, grade and quantity of cement to be used;
- (4) The method of placement of the plugs; and
- (5) The procedure to be used to meet the requirements of Appendix II, § 146.10(c).

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FORM WR-UIC - SCHEDULE RC (CLASS III)

REPORTING SCHEDULE FOR CLASS III INJECTION WELLS

This form is to be completed by the permittee to comply with the reporting requirements for Class III injection wells. See criteria and standards at Appendix II, Part 146, Subpart D (§ 146.31 - 146.35).

- I. Attach to this form a completed and signed copy of Form WR-UIC-I.
- II. Quarterly reports to the Secretary.

Attach to this form a report of operation and monitoring which shall at a minimum include:

- (1) The results of all monitoring required by Appendix II, Part 146 Subpart D;
- (2) Results of mechanical integrity and any other periodic test required by the Secretary. Results are to be reported in the first quarterly report after the completion of the test.

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FORM WR-UIC - SCHEDULE RCME (CLASS III)

MID-COURSE EVALUATION FOR CLASS III INJECTION WELLS

This schedule must be completed and submitted for each Class III well permit at six (6) month intervals during the first two years of operation of the Vermont UIC program.

- I. Attach a completed and signed copy of FORM WR-UIC-I.
- II. Attach a completed copy of the tabulation of data on wells from Schedule C § II.(13) from the current permit application including under "location", the distance and direction from the injection well.
- III. Attach the following additional information:
 - (1) The depth to the top and bottom of any USDW;
 - (2) The distance to the nearest downgradient water supply well;
 - (3) A description of the geology and hydrology of the area;
 - (4) The construction characteristics of the well;
 - (5) The type and results of all mechanical integrity tests reported to the Secretary during the first two years of the program;
 - (6) Any reporting to the Secretary of monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW; and
 - (7) A report of any noncompliance with a permit condition or malfunction of the injection system which may cause a fluid migration into or between USDWs.

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FORM WR-UIC - SCHEDULE D (CLASS V)

APPLICATION FOR A PERMIT TO DISCHARGE WASTES
INTO A CLASS V INJECTION WELL

This schedule must be completed by any person seeking to discharge (inject) any waste, fluid, substance or material into a Class V injection well. Prior to constructing, operating or plugging and abandoning any Class V well the applicant must complete this schedule in a manner approvable by the Secretary.

- I. Attach to this schedule a completed and signed copy of Form WR-UIC-I.
- II. Attach to this schedule the following information required by the Secretary:
 - (1) A map showing the injection well and the surrounding area within one quarter ($\frac{1}{4}$) mile of the injection well. Within this area the map must show the number or name and location of all wells including oil wells, gas wells, water wells, dry holes, abandoned wells, and other injection wells. In addition the map must show dug wells, springs, bodies of surface water, mines, quarries, houses, other buildings, roads and other significant features of the landscape;
 - (2) A tabulation of data for all wells within $\frac{1}{4}$ mile of the injection well as shown on the map under item II(1) above. Such data shall include depth, diameter, nature and length of casing, yield (if a water well), method of construction and other information which the Secretary may reasonably require;
 - (3) A detailed report of the hydrogeology of the area within $\frac{1}{4}$ mile of the injection well. This report should describe with maps, cross sections and other schematics as necessary, the vertical and lateral limits of all underground sources of drinking water within $\frac{1}{4}$ mile radius and their relationship to the injection well. Additional information must include direction and rate of flow within each USDW, the ambient water quality as it relates to Vermont drinking water standards and the waste proposed for discharge, and other information which the Secretary may require to assess the potential impact of the proposed injection;
 - (4) A detailed description of the physical, chemical, biological and other relevant characteristics of the injection waste (fluid) including concentrations of all constituents listed in the Vermont Drinking Water Standards and those which may endanger human health;
 - (5) A detailed plan for monitoring the potential impact of the injection;

- (6) The proposed operating plan including at least the following:
 - (i) Average and maximum daily rate and volume of the fluid to be injected;
 - (ii) Average and maximum injection pressure; and
 - (iii) Contingency plans to cope with well failure.
- (7) Schematic or other appropriate drawings of the surface and subsurface construction details of the injection wells including:
 - (i) Depth;
 - (ii) Openings to the injection zone;
 - (iii) Casing details; and
 - (iv) Grouting details
- (8) A certificate acceptable to the Secretary that the applicant has assured, through a performance bond or other appropriate means, the resources necessary to close, plug and abandon the well and take other steps necessary to prevent the contamination of underground sources of drinking water;
- (9) A plan for plugging and abandoning the injection well including:
 - (i) The type and number of plugs to be used;
 - (ii) The placement of each plug including the elevation of the top and bottom;
 - (iii) The type and grade and quantity of cement to be used; and
 - (iv) The method of placement of the plugs.
- (10) Copies of all logs and tests performed during the construction of the injection well.

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FORM WR-UIC - SCHEDULE RD (CLASS V)

REPORTING SCHEDULE FOR CLASS V INJECTION WELLS

This schedule must be completed by the permittee to comply with the reporting requirements for Class V injection wells.

I. Attach to this schedule a completed and signed copy of Form WR-UIC-I.

II. Annual Report

Attach to this form an annual report of the operation and monitoring of the Class V injection well which shall at a minimum include:

- (i) A recent (within 90 days) analysis of the physical, chemical, biological and other relevant characteristics of the injection fluid;
- (ii) Monthly average, maximum and minimum values for injection pressure, flow rate and volume; and
- (iii) The results of monitoring including:
 - (A) The type, number and locations of monitoring wells;
 - (B) The frequency and description of the sampling program;
 - (C) The values reported for the constituents tested on the samples from the monitoring wells; and
 - (D) Monthly static water levels or pressure readings for the monitoring wells.

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FORM WR-UIC-II

UIC PERMIT TO DISCHARGE WASTES INTO AN INJECTION WELL

In Compliance with the Provisions of
10 V.S.A. § 1263, 1267, 1274, 1278-1280

Permittee:

In accordance with all the "Terms and Conditions" hereinafter specified the above named permittee is hereby granted permission to discharge waste into an injection well within the State of Vermont.

I. EFFLUENT LIMITATIONS:

II. EXPIRATION DATE:

(1) Revocation: 10 V.S.A. § 1267 provides as follows:

"The Secretary may revoke any permit issued pursuant to this subchapter if he or she finds that the permit holder submitted false or inaccurate information in his application or has violated any requirement, restriction or condition of the permit issued. Revocation shall be effective upon actual notice thereof to the permit holder."

(2) Transfer of Permit: This permit is not transferable without prior written approval of the Secretary. The permittee shall notify the Secretary immediately, in writing, of any sale, lease or other transfer of ownership of the property from which the discharge originates. The permittee shall also inform the new owner or tenant of his responsibility to make application for a permit which shall be issued in his name. Any failure to so notify shall be considered a violation of this permit.

(3) Conditions applicable to all permits:

- (i) Duty to comply - The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and the SDWA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modifications; or for denial of a permit renewal application;
- (ii) Duty to reapply - If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for, no later than 180 days prior to expiration, and obtain a new permit;
- (iii) Duty to halt or reduce activity - It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit;
- (iv) Duty to mitigate - The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit;
- (v) Proper operation and maintenance - The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit;
- (vi) Permit actions - This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition;
- (vii) Property rights - This permit does not convey any property rights of any sort, or any exclusive privilege;

- (viii) Duty to provide information - The permittee shall furnish to the Secretary, within a reasonable time, any information which the Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Secretary, upon request, copies of records required to be kept by this permit;
- (ix) Inspection and entry - The permittee shall allow the Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
 - (A) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
 - (B) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 - (C) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
 - (D) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the appropriate Act, any substances or parameters at any location.
- (x) Monitoring and records
 - (A) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity;
 - (B) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Secretary at any time;
 - (C) Records of monitoring information shall include:
 - (1) The date, exact place, and time of sampling or measurements;
 - (2) The individual(s) who performed the sampling or measurements;
 - (3) The date(s) analyses were performed;
 - (4) The individual(s) who performed the analyses;
 - (5) The analytical techniques or methods used; and
 - (6) The results of such analyses.

The permittee shall retain all records concerning the nature and composition of injected fluids until five years after completion of any plugging and abandonment procedures specified in the permit. The Secretary may require the owner or operator to deliver the records to the Secretary at the conclusion of the retention period;

- (xi) Signatory requirement - All applications, reports, or information submitted to the Secretary shall be signed and certified (See § 13.UIC.6 of the Regulations);
- (xii) Reporting requirements
 - (A) Planned changes - The permittee shall give notice to the Secretary as soon as possible of any planned physical alterations or additions to the permitted facility;
 - (B) Anticipated noncompliance - The permittee shall give advance notice to the Secretary of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements;
 - (C) Transfers - This permit is not transferable to any person except after notice to the Secretary. The Secretary will require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary (See 13.UIC.10);
 - (D) Monitoring reports - Monitoring results shall be reported at the intervals specified elsewhere in this permit;
 - (E) Compliance schedules - Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date; and
 - (F) Twenty four hour reporting - The permittee shall report any noncompliance which may violate drinking water standards, or endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported within 24 hours:
 - (1) Any monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW; and
 - (2) Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between USDWs.

- (G) Other noncompliance - The permittee shall report all instances of noncompliance not reported under paragraphs (xii)(A)(D)(E) and (F) of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (xii)(F) of this section;
- (H) Other information - Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Secretary, it shall promptly submit such facts or information.

(xiii) Pre Operation Requirements

The permittee may not commence injection into a new injection well until construction is complete, and

- (A) The permittee has submitted notice of completion of construction to the Secretary; and
 - (1) The Secretary has inspected or otherwise reviewed the new injection well and finds it is in compliance with the conditions of the permit; or
 - (2) The permittee has not received notice from the Secretary of his or her intent to inspect or otherwise review the new injection well within 13 days of the date of the notice in paragraph (A)(1) of this section, in which case prior inspection or review is waived and the permittee may commence injection.

(xiv) Requirements prior to conversions or abandonment

The permittee shall notify the Secretary at least 180 days before conversion or abandonment of the well. With the notice, the permittee shall submit a revised plugging and abandonment plan updated as appropriate in compliance with the conditions of the permit and Appendix II, § 146.10;

(4) Additional requirements for UIC permits, when applicable:

- (i) Construction requirements as set forth in Appendix II, Part 146. Existing wells shall achieve compliance with such requirements according to a compliance schedule established elsewhere in this permit as a permit condition. The owner or operator of a proposed new injection well shall submit plans for testing, drilling, and construction as part of the permit application. (See appropriate application forms.) No construction may commence until a permit has been issued containing construction requirements. New wells shall be in compliance with these requirements prior to commencing injection operations. Changes in construction plans during construction may be approved by the Secretary as minor modifications (§ 13.UIC.13). No such changes may be physically incorporated into construction of the well prior to approval of the modification by the Secretary;

- (ii) Corrective action as set forth in 13.UIC.20 and Appendix II, § 146.7;
 - (iii) Operation requirements as set forth in Appendix II, Part 146; the permit shall establish any maximum injection volumes and/or pressures necessary to assure that fractures are not initiated in the confining zone, that injected fluids do not migrate into any underground source of drinking water, that formation fluids are not displaced into any underground source of drinking water, and to assure compliance with the Appendix II, Part 146 operating requirements;
 - (iv) Monitoring and reporting requirements as set forth in Appendix II, Part 146. The permittee shall be required to identify types of tests and methods used to generate the monitoring data;
 - (v) Plugging and abandonment. Any Class I, II or III permit shall include, and any Class V permit may include, conditions to ensure that plugging and abandonment of the well will not allow the movement of fluids either into an underground source of drinking water or from one underground source of drinking water to another. Any applicant for a UIC permit shall be required to submit a plan for plugging and abandonment. Where the plan meets the requirements of this paragraph, the Secretary shall incorporate it into the permit as a condition. Where the Secretary's review of an application indicates that the permittee's plan is inadequate, the Secretary shall require the applicant to revise the plan, prescribe conditions meeting the requirements of this paragraph, or deny the application. For purposes of this paragraph, temporary intermittent cessation of injection operations is not abandonment;
 - (vi) Financial responsibility. The permit shall require the permittee to maintain financial responsibility and resources, in the form of performance bonds or other equivalent form of financial assurance approved by the Secretary, to close, plug, and abandon the underground injection operation in a manner prescribed by the Secretary. In lieu of individual performance bonds, operators may furnish a bond or other equivalent form of financial guarantee approved by the Secretary covering all injection wells operated by the permittee in the State;
 - (vii) Mechanical integrity. A permit for any Class I, II, or III well or injection project which lacks mechanical integrity shall include, and for any Class V well may include, a condition prohibiting injection operations until the permittee shows to the satisfaction of the Secretary under Appendix II, § 146.08 that the well has mechanical integrity; and
 - (viii) Additional conditions. The Secretary shall impose on a case-by-case basis such additional conditions as are necessary to prevent the migration of fluids into underground sources of drinking water.
- (5) Schedule of Compliance

As a condition of this permit the permittee shall meet the following schedule of compliance. (See § 13.UIC.9 of the Regulations.)

- (6) Reporting of compliance or noncompliance per schedule of compliance. (See § 13.UIC.9 of the Regulations.)

Reports are due no later than 14 days following each interim date and the final date of compliance.

- (7) Monitoring Requirements

The following monitoring is required as a condition of this permit.
(See Appendix II, Part 146.)

- (9) Recording and Reporting of Monitoring Results

The following recording and reporting requirements are necessary to meet the terms of this permit. (See Appendix II, Part 146.)

- (10) Effect of this permit:

- (i) Except for Class II and III injection wells compliance with this permit during its term constitutes compliance, for purposes of enforcement, with Part C of the Safe Drinking Water Act.
- (ii) The issuance of this permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of other State or local law or regulations.

- (11) Additional Requirements.

SIGNATURE: _____
Brendan J. Whittaker, Secretary
Agency of Environmental Conservation

DATE: _____

STATE OF VERMONT
AGENCY OF ENVIRONMENTAL CONSERVATION
DEPARTMENT OF WATER RESOURCES
AND ENVIRONMENTAL ENGINEERING

WATER POLLUTION CONTROL PERMIT REGULATIONS, CHAPTER 13
UNDERGROUND INJECTION CONTROL, SUBCHAPTER UIC

FORM WR-UIC-III

CLASS V INJECTION WELL INVENTORY AND NOTIFICATION FORM

TO: Vermont Department of Water Resources and Environmental Engineering
State Office Building
Montpelier, Vermont 05602

FROM: _____ Phone Number _____
(Name of person completing form)

Address _____

REGARDING: Type of Injection Well: (Describe nature, source and treatment, if any,
of waste or fluid being injected.)

Depth of Well _____ Diameter _____ Discharge Rate _____
(in feet) (in inches) (in gallons
per minute
if known)

Date

Signature (optional)

Please complete page 2 - see instructions on page 3.

Form Approved OMB No. 158-R0170



II. FACILITY I.D. NUMBER

III. TRANSACTION TYPE ('X' one)

- ☐ 1. DELETION
☐ 2. FIRST TIME ENTRY
☐ 3. CHANGE OF ENTRY

IV. FACILITY NAME AND LOCATION

C	A. NAME																							
01																								
C	B. STREET ADDRESS OR ROUTE NUMBER																							
02																								
C	C. CITY OR TOWN												D. ST.	E. ZIP CODE	F. COUNTY	G. INDIAN LAND (mark 'X')								
03																								

V. LEGAL CONTACT: TYPE, NAME, PHONE, MAILING ADDRESS, AND OWNERSHIP

C		A. TYPE (mark 'X')										B. NAME (last, first, & middle initial)																				C. PHONE (area code & No.)									
04		<input type="checkbox"/> 1. OWNER <input type="checkbox"/> 2. OPERATOR																																							
14 15 16		C										D. ORGANIZATION																				E. STREET OR P.O. BOX									
05																																									
14 15 16		C										E. STREET OR P.O. BOX																				F. CITY OR TOWN									
06																																									
14 15 16		C										F. CITY OR TOWN																				G. ST. H. ZIP CODE									
07																																									
14 15 16		C										I. OWNERSHIP ('X' one)																				<input type="checkbox"/> P. PRIVATE <input type="checkbox"/> M. PUBLIC <input type="checkbox"/> O. OTHER (specify)									
												<input type="checkbox"/> S. STATE <input type="checkbox"/> F. FEDERAL																													

VI. WELL INFORMATION

UC = UNDER CONSTRUCTION AC = ACTIVE TA = TEMPORARILY ABANDONED
WELL OPERATION STATUS: PA = PERMANENTLY ABANDONED AND APPROVED BY STATE AN = PERMANENTLY ABANDONED AND NOT APPROVED BY STATE

C	A. CLASS AND TYPE	B. TOTAL NO. OF WELLS	C. WELL OPERATION STATUS					D. COMMENTS (optional)
			UC	AC	TA	PA	AN	
08								
09								
10								
11								
12								
13								
14								

Section I. Enter date in order of month, day, and year.

Section II. In the first two positions, insert the appropriate U.S. Postal Services State Code. In the remaining positions, insert the appropriate DUNS, GSA, or State Facility Number, preceded by a one position alphabetic identifier:

D - DUNS Number
G - GSA Number
S - State Facility Number

Example: A Federal facility (GSA - 123456789) located in Virginia would be entered as: VAG123456789.

Section III. Transaction type.

Deletion: Place an 'X' in this box and enter the Facility ID Number.

First time entry: Place an 'X' in this box and fill in all appropriate information.

Change of entry: Place an 'X' in this box, enter the Facility ID Number, and fill in the information to be changed.

Section IV. Facility Name and Location

Item A: Insert the official or legal name of the facility.

Item B, C, D, and E: Self-Explanatory.

Item F: Insert the numeric county code acquired from the Federal Information Processing Standards Publication (FIPS Pub 6-1) June 15, 1970, prepared by the U.S. Department of Commerce, National Bureau of Standards. For Alaska, use the Census Division Code developed by the U.S. Census Bureau.

Item G: Place an 'X' in the box if the facility is located on an Indian reservation.

Section V. Legal Contact.

Item A: Place an 'X' in the appropriate box to indicate the type of legal contract. For wells operated by a lease, the operator is the legal contact.

Items B, C: Self-Explanatory.

Item D: If the legal contact is an individual, give the name of his/her business organization to expedite mail distribution.

Item E, F, G, and H: Self-Explanatory.

Item I: Place an 'X' in the appropriate box to indicate the type of ownership.

Section VI. Well Information.

Item A: Enter in these two positions the class and type of injection wells to be inventoried at this facility. Use the most pertinent code selected from the list below. For example: 2R for enhanced recovery injection wells and 3M for solution mining wells, etc.

Item B: Enter the total number of injection wells for each specified class/type.

Item C: Insert the number of wells for each class/type under each operation status. 30

CLASSIFICATIONS AND TYPES OF INJECTION WELLS

WELL CODE CLASS/TYPE	PRIMARY FUNCTION OF INJECTION WELLS	WELL CODE CLASS/TYPE	PRIMARY FUNCTION OF INJECTION WELLS	WELL CODE CLASS/TYPE	PRIMARY FUNCTION OF INJECTION WELLS
Class I	Industrial, Municipal, and Nuclear Storage Wells That Inject Below Deepest Underground Source of Drinking Water.	2X	Other Class II wells	Class V	All Other Wells That Inject Into or above an Underground Source of Drinking Water
II	Industrial disposal well	Class III	Special Process Injection Wells	5A	Air conditioning/cooling water return well
1M	Municipal disposal well	3G	In situ gasification wells	5B	Salinity barrier well
1N	Nuclear waste disposal or storage well	3M	Solution mining well	5D	Storm water drainage well
1X	Other Class I wells	3S	Sulfur mining well by Frasch process	5F	Agricultural drainage well
Class II	Oil and Gas Production and Storage Related Injection Wells	3T	Geothermal well	5G	Other drainage wells
2A	Annular injection well	3U	Uranium mining well	5R	Recharge well
2D	Produced fluid disposal well	3X	Other Class III wells	5S	Subsidence control well
2H	Hydrocarbon storage well	Class IV	Hazardous Facility Wells That Inject Into or above an Underground Source of Drinking Water	5W	Waste disposal well
2R	Enhanced recovery injection well.	4H	Hazardous facility injection well	5X	Other Class V wells

APPENDIX II

ADDITIONAL PROVISIONS, CRITERIA, DEFINITIONS
AND STANDARDS AS EXTRACTED OR AMENDED FROM
40 CFR PART 146.

Note: Only those portions of 40 CFR Part 146 which are included herein are applicable to the Vermont Underground Injection Control Program.

**PART 148—UNDERGROUND
INJECTION CONTROL PROGRAM:
CRITERIA AND STANDARDS**

Subpart A—General Provisions

Sec.

- 148.01 Applicability and scope.
- 148.02 Law authorizing these regulations.
- 148.03 Definitions.
- 148.04
- 148.05 Classification of injection wells.
- 148.06 Area of review.
- 148.07 Corrective action.
- 148.08 Mechanical integrity.
- 148.09 Criteria for establishing permitting priorities.
- 148.10 Plugging and abandoning Class I-III wells.

**Subpart B—Criteria and Standards
Applicable to Class I Wells**

- 148.11 Applicability.
- 148.12 Construction requirements.
- 148.13 Operating, monitoring and reporting requirements.
- 148.14 Information to be considered by the Director.
- 148.15 Mid course evaluation requirements.

**Subpart C—Criteria and Standards
Applicable to Class II Wells**

- 148.21 Applicability.
- 148.22 Construction requirements.
- 148.23 Operating, monitoring, and reporting requirements.
- 148.24 Information to be considered by the director.
- 148.25 Mid course evaluation requirements.

**Subpart D—Criteria and Standards
Applicable to Class III Wells**

- 148.31 Applicability.
- 148.32 Construction requirements.
- 148.33 Operating, monitoring and reporting requirements.
- 148.34 Information to be considered by the Director.
- 148.35 Mid course evaluation requirements.

**Subpart F—Criteria and Standards
Applicable to Class V Injection Wells**

- 148.51 Applicability.
- 148.52 Inventory and Assessment.

Authority: Secs. 1421, 1422, 1423, 1431, 1445, 1447, and 1450 of the Safe Drinking Water Act, as amended, 42 U.S.C. 300(f) et. seq.

Subpart A—General Provisions

§ 148.01 Applicability and scope.

(a) This Part sets forth technical criteria and standards for the Underground Injection Control Program.

(b) Upon the approval, partial approval or promulgation of a State UIC program by the Administrator, any underground injection which is not authorized by the Director by rule or by permit is unlawful.

§ 148.02 Law authorizing these regulations.

The laws authorizing these regulations

include Sections 1421, 1422, 1423, 1431, 1445, 1447 and 1450 of the Public Health Service Act as amended by the Safe Drinking Water Act ("SDWA") (Pub. L. 93-523) and by the SDWA Amendments of 1977 (Pub. L. 95-190).

§ 148.03 Definitions.

The following definitions apply to the underground injection control program.

Abandoned well means a well whose use has been permanently discontinued or which is in a state of disrepair such that it cannot be used for its intended purpose or for observation purposes.

Casing means a pipe or tubing of appropriate material, of varying diameter and weight, lowered into a borehole during or after drilling in order to support the sides of the hole and thus prevent the walls from caving, to prevent loss of drilling mud into porous ground, or to prevent water, gas, or other fluid from entering or leaving the hole.

Catastrophic collapse means the sudden and utter failure of overlying "strata" caused by removal of underlying materials.

Cementing means the operation whereby a cement slurry is pumped into a drilled hole and/or forced behind the casing.

Confining bed means a body of impermeable or distinctly less permeable material stratigraphically adjacent to one or more aquifers.

Confining zone means a geological formation, group of formations, or part of a formation that is capable of limiting fluid movement above an injection zone.

Conventional mine means an open pit or underground excavation for the production of minerals.

Director means the Regional Administrator or the State Director, as the context requires, or an authorized representative. When there is no approved State program, and there is an EPA administered program, "Director" means the Regional Administrator. When there is an approved State program, "Director" normally means the State Director. In some circumstances, however, EPA retains the authority to take certain actions even where there is an approved State program. (For example, when EPA issued an NFDIS permit prior to the approval of a State program, EPA may retain jurisdiction over that permit after program approval, see § 123.89.) In such cases, the term "Director" means the Regional Administrator and not the State Director.

Effective date of a UIC program means the date that a State UIC program is approved or established by the Administrator.

Environmental Protection Agency ("EPA") means the United States Environmental Protection Agency.

Packer means a device lowered into a well to produce a fluid-tight seal.

Experimental technology means a technology which has not been proven feasible under the conditions in which it is being tested.

Fault means a surface or zone of rock fracture along which there has been displacement.

Flow rate means the volume per time unit given to the flow of gases or other fluid substance which emerges from an orifice, pump, turbine or passes along a conduit or channel.

Generator means any person, by site location, whose act or process produces hazardous waste identified or listed in 40 CFR Part 261.

HWM facility means "Hazardous Waste Management facility."

Injection zone means a geological "formation", group of formations, or part of a formation receiving fluids through a well.

Lithology means the description of

Plugging record means a systematic listing of permanent or temporary abandonment of water, oil, gas, test, exploration and waste injection wells, and may contain a well log, description of amounts and types of plugging material used, the method employed for plugging, a description of formations which are sealed and a graphic log of the well showing formation location, formation thickness, and location of plugging structures.

Pressure means the total load or force per unit area acting on a surface.

Project means a group of wells in a single operation.

SDWA means the Safe Drinking Water Act (Pub. L. 95-523, as amended by Pub. L. 95-190, 42 U.S.C. 300(f) et seq.).

Well plug means a watertight and gastight seal installed in a borehole or well to prevent movement of fluids.

Well stimulation means several processes used to clean the well bore, enlarge channels, and increase pore space in the interval to be injected thus making it possible for wastewater to move more readily into the formation, and includes (1) surging, (2) jetting, (3) blasting, (4) acidizing, (5) hydraulic fracturing.

Well monitoring means the measurement, by on-site instruments or laboratory methods, of the quality of water in a well.

Subsidence means the lowering of the natural land surface in response to: Earth movements; lowering of fluid pressure; removal of underlying supporting material by mining or solution of solids, either artificially or from natural causes; compaction due to wetting (Hydrocompaction); oxidation of organic matter in soils; or added load on the land surface.

Surface casing means the first string of well casing to be installed in the well.

§ 146.05 Classification of injection wells.

Injection wells are classified as follows:

(See § 13. UIC. 4 for descriptions of Classes I, II, III, and IV.)

(e) Class V—Injection wells not included in Class I, II, III, or IV. Class V wells include:

(1) Air conditioning return flow wells used to return to the supply aquifer the water used for heating or cooling in a heat pump;

(2) Cesspools including multiple dwelling, community or regional cesspools, or other devices that receive wastes which have an open bottom and sometimes have perforated sides. The UIC requirements do not apply to single family residential cesspools nor to non-residential cesspools which receive solely sanitary wastes and have the capacity to serve fewer than 20 persons a day.

(3) Cooling water return flow wells used to inject water previously used for cooling;

(4) Drainage wells used to drain surface fluid, primarily storm runoff, into a subsurface formation;

(5) Dry wells used for the injection of wastes into a subsurface formation;

(6) Recharge wells used to replenish the water in an aquifer;

(7) Salt water intrusion barrier wells used to inject water into a fresh water aquifer to prevent the intrusion of salt water into the fresh water;

(8) Sand backfill and other backfill wells used to inject a mixture of water and sand, mill tailings or other solids into mined out portions of subsurface mines.

(9) Septic system wells used to inject the waste or effluent from a multiple dwelling, business establishment, community or regional business establishment septic tank. The UIC requirements do not apply to single family residential septic system wells, nor to non-residential septic system wells which are used solely for the disposal of sanitary waste and have the capacity to serve fewer than 20 persons a day.

§ 144.08 Area of Review.

The area of review for each injection well or each field, project or area of the State shall be determined according to either paragraph (a) or (b) of this section. The Director may solicit input from the owners or operators of injection wells within the State as to which method is most appropriate for each geographic area or field.

(a) *Zone of endangering influence.* (1) The zone of endangering influence shall be:

that area the radius of which is the lateral distance in which the pressures in the injection zone may cause the migration of the injection and/or formation fluid into an underground source of drinking water.

(2) Computation of the zone of endangering influence may be based upon the parameters listed below and should be calculated for an injection time period equal to the expected life of the injection well or pattern. The following modified Theis equation illustrates one form which the mathematical model may take.

$$r = \left(\frac{2.25KHi}{810^2} \right)^{1/2}$$

where

$$x = \frac{4\pi KH(h_o - h_w)S_w C_w}{2.3Q}$$

r = Radius of endangering influence from injection well (length)

k = Hydraulic conductivity of the injection zone (length/time)

H = Thickness of the injection zone (length)

t = Time of injection (time)

S = Storage coefficient (dimensionless)

Q = Injection rate (volume/time)

h_o = Observed original hydrostatic head of injection zone (length) measured from the base of the lowermost underground source of drinking water

h_w = Hydrostatic head of underground source of drinking water (length) measured from the base of the lowest underground source of drinking water

$S_w C_w$ = Specific gravity of fluid in the injection zone (dimensionless)

π = 3.142 (dimensionless)

The above equation is based on the following assumptions:

(i) The injection zone is homogeneous and isotropic;

(ii) The injection zone has infinite area extent;

(iii) The injection well penetrates the entire thickness of the injection zone;

(iv) The well diameter is infinitesimal compared to "r" when injection time is longer than a few minutes; and

(v) The emplacement of fluid into the injection zone creates instantaneous increase in pressure.

Other models may be used as appropriate for different situations encountered in the field or where the model assumptions match more closely those situations.

(b) Fixed Radius

(1) A fixed radius around the well of not less than one-fourth ($\frac{1}{4}$) may be used.

(2) In determining the fixed radius, the following factors shall be taken into consideration: Chemistry of injected and formation fluids; hydrogeology; population and ground water use and dependence; and historical practices in the area.

(c) If the area of review is determined by a mathematical model pursuant to paragraph (a) of this section, the radius is the result of such calculation except that it shall not be less than one-fourth ($\frac{1}{4}$) mile.

§ 146.07 Corrective Action.

In determining the adequacy of corrective action proposed by the applicant under § 13.UIC.26 and in determining the additional steps needed to prevent fluid movement into underground sources of drinking water, the following criteria and factors shall be considered by the Secretary.

- (a) Nature and volume of injected fluid;
- (b) Nature of native fluids or by-products of injection;
- (c) Potentially affected population;
- (d) Geology;
- (e) Hydrology;
- (f) History of injection operation;
- (g) Completion and plugging records;
- (h) Abandonment procedures in effect at the time the well was abandoned; and
- (i) Hydraulic connections with underground sources of drinking water.

§ 146.08 Mechanical Integrity

(a) An injection well has mechanical integrity if:

- (1) There is no significant leak in the casing, tubing or packer; and
- (2) There is no evidence of fluid movement into an underground source of drinking water through vertical channels adjacent to the injection well bore.

(b) One of the following methods must be used to evaluate the absence of significant leaks under paragraph (a)(1) of this section:

- (1) Monitoring of annulus pressure; or
- (2) Pressure test with liquid or gas.

(c) In order to determine the absence of fluid movement under paragraph (a)(2) of this section all Class I, II, and III injection wells require the construction of at least one monitoring well adjacent to the injection well. At least one monitoring well will be open to each USDW within the area of review. Monitoring of water levels or pressure and periodic sampling of water quality as directed by the Secretary in the terms of the permit are required. A temperature or noise log on each Class I, II or III injection well is also required to determine adequate cementing.

(d) The Director may allow the use of a test to demonstrate mechanical integrity other than those listed in paragraphs (b) and (c) of this section with the written approval of the Administrator. To obtain approval, the Director shall submit a written request to the Administrator, which shall set forth the proposed test and all technical data supporting its use. The Administrator shall approve the request if it will reliably demonstrate the mechanical integrity of wells for which its use is proposed. Any alternate method approved by the Administrator shall be published in the Federal Register and may be used in all States unless its use is restricted at the time of approval by the Administrator.

(e) In conducting and evaluating the tests enumerated in this section or others to be allowed by the Director, the owner or operator and the Director shall apply methods and standards generally accepted in the industry. When the owner or operator reports the results of mechanical integrity tests to the Director, he shall include a description of the test(s) and the method(s) used. In making his/her evaluation, the Director shall review monitoring and other test data submitted since the previous evaluation.

§ 146.09 Criteria for Establishing Permitting Priorities.

In determining priorities for setting times for owners or operators to submit applications for authorization to inject

the Director shall base these priorities upon consideration of the following factors:

(a) Injection wells known or suspected to be contaminating underground sources of drinking water;

(b) Injection wells known to be injecting fluids containing hazardous contaminants;

(c) Likelihood of contamination of underground sources of drinking water;

(d) Potentially affected population;

(e) Injection wells violating existing State requirements;

(f) Coordination with the issuance of permits required by other State or Federal permit programs;

(g) Age and depth of the injection well; and

(h) Expiration dates of existing State permits, if any.

§ 146.10 Plugging and abandoning Class I—III wells.

(a) Prior to abandoning Class I—III wells the well shall be plugged with cement in a manner which will not allow the movement of fluids either into or between underground sources of drinking water. The Director may allow Class III wells to use other plugging materials if he is satisfied that such materials will prevent movement of fluids into or between underground sources of drinking water.

(b) Placement of the cement plugs shall be accomplished by one of the following:

(1) The Balance Method;

(2) The Dump Bailer Method;

(3) The Two-Plug Method; or

(4) An alternative method approved by the Director, which will reliably provide a comparable level of protection to underground sources of drinking water.

(c) The well to be abandoned shall be in a state of static equilibrium with the mud weight equalized top to bottom, either by circulating the mud in the well at least once or by a comparable method prescribed by the Director, prior to the placement of the cement plug(s).

(d) The plugging and abandonment plan required under this rule shall

demonstrate adequate protection of USDWs. The Director shall prescribe aquifer cleanup and monitoring where he deems it necessary and feasible to insure adequate protection of USDWs.

**Subpart B—Criteria and Standards
Applicable to Class I Wells**

§ 146.11 Applicability.

This subpart establishes criteria and standards for underground injection control programs to regulate Class I wells.

§ 146.12 Construction Requirements.

(a) All Class I wells shall be sited in such a fashion that they inject into a formation which is beneath the lowermost formation containing, within one quarter mile of the well bore, an underground source of drinking water.

(b) All Class I wells shall be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement used in the construction of each newly drilled well shall be designed for the life expectancy of the

well. In determining and specifying casing and cementing requirements, the following factors shall be considered:

- (1) Depth to the injection zone;
- (2) Injection pressure, external pressure, internal pressure, and axial loading;
- (3) Hole size;
- (4) Size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification, and construction material);
- (5) Corrosiveness of injected fluid, formation fluids, and temperatures;
- (6) Lithology of injection and confining intervals; and
- (7) Type or grade of cement.

(c) All Class I injection wells, except those municipal wells injecting non-corrosive wastes, shall inject fluids through tubing with a packer set immediately above the injection zone, or tubing with an approved fluid seal as an alternative. The tubing, packer, and fluid seal shall be designed for the expected service.

(1) The use of other alternatives to a packer may be allowed with the written approval of the Director. To obtain approval, the operator shall submit a written request to the Director, which shall set forth the proposed alternative and all technical data supporting its use. The Director shall approve the request if the alternative method will reliably provide a comparable level of protection to underground sources of drinking water. The Director may approve an alternative method solely for an individual well or for general use.

(2) In determining and specifying requirements for tubing, packer, or alternatives the following factors shall be considered:

- (i) Depth of setting;
- (ii) Characteristics of injection fluid (chemical content, corrosiveness, and density);
- (iii) Injection pressure;
- (iv) Annular pressure;
- (v) Rate, temperature and volume of

(d) Appropriate logs and other tests shall be conducted during the drilling and construction of new Class I wells. A descriptive report interpreting the results of such logs and tests shall be prepared by a knowledgeable log analyst and submitted to the Director. At a minimum, such logs and tests shall include:

(1) Deviation checks on all holes constructed by first-drilling a pilot hole, and then enlarging the pilot hole by reaming or another method. Such checks shall be at sufficiently frequent intervals to assure that vertical avenues for fluid migration in the form of diverging holes are not created during drilling.

(2) Such other logs and tests as may be needed after taking into account the availability of similar data in the area of the drilling site, the construction plan, and the need for additional information, that may arise from time to time as the construction of the well progresses. In determining which logs and tests shall be required, the following logs shall be considered for use in the following situations:

(i) For surface casing intended to protect underground sources of drinking water:

(A) Resistivity, spontaneous potential, and caliper logs before the casing is installed; and

(B) A cement bond, temperature, or density log after the casing is set and cemented.

(ii) For intermediate and long strings of casing intended to facilitate injection:

(A) Resistivity, spontaneous potential, porosity, and gamma ray logs before the casing is installed;

(B) Fracture finder logs; and

(C) A cement bond, temperature, or density log after the casing is set and cemented.

(e) At a minimum, the following information concerning the injection formation shall be determined or calculated for new Class I wells:

- (1) Fluid pressure;
- (2) Temperature;
- (3) Fracture pressure;
- (4) Other physical and chemical characteristics of the injection matrix; and

(5) Physical and chemical characteristics of the formation fluids.

§ 146.13 Operating, Monitoring and Reporting Requirements.

(a) *Operating Requirements.* Operating requirements shall, at a minimum, specify that:

(1) Except during stimulation injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to assure that the pressure in the injection zone during injection does not initiate new fractures or propagate existing fractures in the injection zone. In no case shall injection pressure initiate fractures in the confining zone or cause the movement of injection or formation fluids into an underground source of drinking water.

(2) Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.

(3) Unless an alternative to a packer has been approved under § 146.12(c), the annulus between the tubing and the long string of casings shall be filled with a fluid approved by the Director and a pressure, also approved by the Director, shall be maintained on the annulus.

(b) *Monitoring Requirements.* Monitoring requirements shall, at a minimum, include:

(1) The analysis of the injected fluids with sufficient frequency to yield representative data of their characteristics;

(2) Installation and use of continuous recording devices to monitor injection pressure, flow rate and volume, and the pressure on the annulus between the tubing and the long string of casing;

(3) A demonstration of mechanical integrity pursuant to § 146.08 at least once every five years during the life of the well; and

(4) The type, number and location of wells within the area of review to be used to monitor any migration of fluids into and pressure in the underground sources of drinking water, the parameters to be measured and the frequency of monitoring.

(c) *Reporting Requirements.* Reporting requirements shall, at a minimum, include:

(1) Quarterly reports to the Director on:

(i) The physical, chemical and other relevant characteristics of injection fluids;

(ii) Monthly average, maximum and minimum values for injection pressure, flow rate and volume, and annular pressure; and

(iii) The results of monitoring prescribed under subparagraph (b)(4) of this section.

(2) Reporting the results, with the first quarterly report after the completion, of:

(i) Periodic tests of mechanical integrity;

(ii) Any other test of the injection well conducted by the permittee if required by the Director; and

§ 146.14 Information to be Considered by the Director.

This section sets forth the information which must be considered by the Director in authorizing Class I wells. For an existing or converted new Class I well the Director may rely on the existing permit file for those items of information listed below which are current and accurate in the file. For a newly drilled Class I well, the Director shall require the submission of all the information listed below. For both existing and new Class I wells certain maps, cross-sections, tabulations of wells within the area of review and other data may be included in the application by reference provided they are current, readily available to the Director (for example, in the permitting agency's files) and sufficiently identified to be retrieved.

(a) Prior to the issuance of a permit for an existing Class I well to operate or the construction or conversion of a new Class I well the Director shall consider the following:

(1) Information required on the permit forms;

(2) A map showing the injection well(s) for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number, or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residence, and roads. The map should also show faults, if known or suspected.

(3) A tabulation of data on all wells within the area of review which penetrate into the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Director may require;

(4) Maps and cross sections indicating the general vertical and lateral limits of all underground sources of drinking water within the area of review, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the proposed injection;

(5) Maps and cross sections detailing the geologic structure of the local area;

(6) Generalized maps and cross sections illustrating the regional geologic setting;

(7) Proposed operating data:

(i) Average and maximum daily rate and volume of the fluid to be injected;

(ii) Average and maximum injection pressure; and

(iii) Source and an analysis of the chemical, physical, radiological and biological characteristics of injection fluids;

(8) Proposed formation testing program to obtain an analysis of the chemical, physical and radiological characteristics of and other information on the receiving formation;

(9) Proposed stimulation program;

(10) Proposed injection procedure;

(11) Schematic or other appropriate drawings of the surface and subsurface construction details of the well.

(12) Contingency plans to cope with all shut-ins or well failures so as to prevent migration of fluids into any underground source of drinking water;

(13) Plans (including maps) for meeting the monitoring requirements in § 146.13(b);

(14) For wells within the area of review which penetrate the injection zone but are not properly completed or plugged, the corrective action proposed to be taken under § 13. UIC. 26;

(15) Construction procedures including a cementing and casing program, logging procedures, deviation checks, and a drilling, testing, and coring program; and

(16) A certificate that the applicant has assured, through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well.

(b) Prior to granting approval for the operation of a Class I well the Director shall consider the following information:

(1) All available logging and testing program data on the well;

(2) A demonstration of mechanical integrity pursuant to § 146.06;

(3) The anticipated maximum pressure and flow rate at which the permittee will operate;

(4) The results of the formation testing program;

(5) The actual injection procedure;

(6) The compatibility of injected waste with fluids in the injection zone and minerals in both the injection zone and the confining zone; and

(7) The status of corrective action on defective wells in the area of review.

(c) Prior to granting approval for the plugging and abandonment of a Class I well the Director shall consider the following information:

(1) The type and number of plugs to be used;

(2) The placement of each plug including the elevation of the top and bottom;

(3) The type and grade and quantity of cement to be used;

(4) The method for placement of the plugs; and

(5) The procedure to be used to meet the requirements of § 146.10(c).

§ 146.15 Mid-course evaluation requirements.

The data to be submitted on each Class I permit at six month intervals during the first two years of operation of the State program shall at a minimum include the following:

(a) The data required in § 146.14(a)(1);

(b) The data required in § 146.14(a)(3) including, under location, the distance and direction from the injection well;

(c) The depth to the top and bottom of any USDW;

(d) The distance to the nearest down-gradient water supply well;

(e) A description of the geology and hydrology of the area;

(f) The construction characteristics of the well;

(g) The corrective action proposed as well as that performed;

(h) The type and results of all mechanical integrity tests reported to the Director; and

(i) Any reporting to the Director under terms of the permit.

**Subpart C—Criteria and Standards
Applicable to Class II Wells**

§ 146.21 Applicability.

This subpart establishes criteria and standards for underground injection control programs to regulate Class II wells.

§ 146.22 Construction requirements.

(s) All new Class II wells shall be sited in such a fashion that they inject into a formation which is separated from any USDW by a confining zone that is free of known open faults or fractures within the area of review.

b)(1) All Class II injection wells shall be cased and cemented to prevent movement of fluids into or between underground sources of drinking water. The casing and cement used in the construction of each newly drilled well shall be designed for the life expectancy of the well. In determining and specifying casing and cementing requirements, the following factors shall be considered:

- (i) Depth to the injection zone;
 - (ii) Depth to the bottom of all USDWs;
 - and
 - (iii) Estimated maximum and average injection pressures;
- (2) In addition the Director may consider information on:
- (i) Nature of formation fluids;
 - (ii) Lithology of injection and confining zones;
 - (iii) External pressure, internal pressure, and axial loading;
 - (iv) Hole size;
 - (v) Size and grade of all casing strings;
 - and
 - (vi) Class of cement.

(c) All Class II injection wells shall not inject fluids through tubing with a packer set immediately above the injection zone, or tubing with an approved fluid seal as an alternative. The tubing, packer, and fluid seal shall be designed for the expected service.

(1) The use of other alternatives to a packer may be allowed with the written approval of the Director. To obtain approval, the operator shall submit a written request to the Director, which shall set forth the proposed alternative and all technical data supporting its use. The Director shall approve the request if the alternative method will reliably provide a comparable level of protection to underground sources of drinking water. The Director may approve an alternative method solely for an individual well or for general use.

(2) In determining and specifying requirements for tubing, packer, or alternatives the following factors shall be considered:

- (i) Depth of setting;
- (ii) Characteristics of injection fluid (chemical content, corrosiveness, and density);
- (iii) Injection pressure;
- (iv) Annular pressure;
- (v) Rate, temperature, and volume of injected fluid; and
- (vi) Size of casing

§ 146.23 Operating, monitoring, and reporting requirements.

(a) Operating Requirements.

Operating requirements shall, at a minimum, specify that:

(1) Injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to assure that the pressure during injection does not initiate new fractures or propagate existing fractures in the confining zone adjacent to the USDW. In no case shall injection pressure cause the movement of injection or formation fluids into an underground source of drinking water.

(2) Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.

(3) Unless an alternative to a packer has been approved, the annulus between the tubing and the long string of casings shall be filled with a fluid approved by the Secretary and a pressure, also approved by the Secretary, shall be maintained on the annulus.

(b) Monitoring Requirements.

Monitoring requirements shall, at a minimum, include:

(1) Monitoring of the nature of injected fluids at time intervals sufficiently frequent to yield data representative of their characteristics;

(2) Observation of injection pressure, flow rate, and cumulative volume at least with the following frequencies:

(i) Weekly for produced fluid disposal operations;

(ii) Monthly for enhanced recovery operations;

(iii) Daily during the injection of liquid hydrocarbons and injection for withdrawal of stored hydrocarbons; and

(iv) Daily during the injection phase of cyclic steam operations;

And recording of one observation of injection pressure, flow rate and cumulative volume at reasonable intervals no greater than 30 days.

(3) A demonstration of mechanical integrity pursuant to § 146.08 at least once every five years during the life of the injection well;

(4) Maintenance of the results of all monitoring until the next permit review; and

(5) Hydrocarbon storage and enhanced recovery may be monitored on a field or project basis rather than on an individual well basis by manifold monitoring. Manifold monitoring may be used in cases of facilities consisting of more than one injection well, operating with a common manifold. Separate monitoring systems for each well are not required provided the owner/operator demonstrates that manifold monitoring is comparable to individual well monitoring.

(c) Reporting Requirements.

(1) Reporting requirements shall at a minimum include an annual report to the Director summarizing the results of monitoring required under paragraph (b) of this section. Such summary shall include monthly records of injected fluids, and any major changes in characteristics or sources of injected fluid. Previously submitted information may be included by reference.

(d) Appropriate logs and other tests shall be conducted during the drilling and construction of new Class II wells. A descriptive report interpreting the results of that portion of those logs and tests which specifically relate to (1) an USDW and the confining zone adjacent to it, and (2) the injection and adjacent formations shall be prepared by a knowledgeable log analyst and submitted to the Director. At a minimum, these logs and tests shall include:

(1) Deviation checks on all holes constructed by first drilling a pilot hole and then enlarging the pilot hole, by reaming or another method. Such checks shall be at sufficiently frequent intervals to assure that vertical avenues for fluid movement in the form of diverging holes are not created during drilling.

(2) Such other logs and tests as may be needed after taking into account the availability of similar data in the area of the drilling site, the construction plan, and the need for additional information that may arise from time to time as the construction of the well progresses. In determining which logs and tests shall be required the following shall be considered by the Director in setting logging and testing requirements:

(i) For surface casing intended to protect underground sources of drinking water in areas where the lithology has not been determined:

(A) Electric and caliper logs before casing is installed; and

(B) A cement bond, temperature, or density log after the casing is set and cemented.

(ii) For intermediate and long strings of casing intended to facilitate injection:

(A) Electric, porosity and gamma ray logs before the casing is installed;

(B) Fracture finder logs; and

(C) A cement bond, temperature, or density log after the casing is set and cemented.

(e) At a minimum, the following information concerning the injection formation shall be determined or calculated for new Class II wells or projects:

(1) Fluid pressure;

(2) Estimated fracture pressure;

(3) Physical and chemical characteristics of the injection zone.

2) Owners or operators of drcarbon storage and enhanced overy projects may report on a field project basis rather than an lvidual well basis where manifold nitoring is used.

46.24 Information to be considered by director.

This section sets forth the information ich must be considered by the ctor in authorizing Class II wells. ain maps, cross-sections, ulations of wells within the area of ew, and other data may be included he application by reference provided y are current, readily available to the ctor (for example, in the permitting cy's files) and sufficiently identified e retrieved. In cases where EPA es the permit, all the information in Section is to be submitted to the ministrator.

a) Prior to the issuance of a permit for existing Class II well to operate or construction or conversion of a new s II well the Director shall consider following:

(1) Information required on the mit forms;

2) A map showing the injection well project area for which a permit is ght and the applicable area of ew. Within the area of review, the must show the number or name and tion of all existing producing wells, ction wells, abandoned wells, dry a, and water wells. The map will show surface bodies of water, s (surface and subsurface), quarries other pertinent surface features iding residences and roads, and s if known or suspected; and

A tabulation of data

on all s within the area of review included e map required under paragraph) of this section which penetrate the oosed injection zone or, in the case lass II wells operating over the ure pressure of the injection ation, all known wells within the of review which penetrate ctions affected by the increase in ure. Such data shall include a iption of each well's type, uction, date drilled, location, record of plugging and ction, and any additional ction the Director may require.

(4) Proposed operating data:
(i) Average and maximum daily rate and volume of fluids to be injected;
(ii) Average and maximum injection pressure; and

(iii) Source and an appropriate analysis of the chemical and physical characteristics of the injection fluid.

(5) Appropriate geological data on the injection zone and confining zone including lithologic description, geological name, thickness and depth;

(6) Geologic name and depth to bottom of all underground sources of drinking water which may be affected by the injection;

(7) Schematic or other appropriate drawings of the surface and subsurface construction details of the well;

(8) In the case of new injection wells the corrective action proposed to be taken by the applicant under § 13. UIC. 26;

(9) A certificate that the applicant has assured through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well is required by

(b) In addition the Director may consider the following:

(1) Proposed formation testing program to obtain the information required by § 146.22(a);

(2) Proposed stimulation program;

(3) Proposed injection procedure;

(4) Proposed contingency plans, if any, to cope with well failures so as to prevent migration of contaminating fluids into an underground source of drinking water;

(5) Plans for meeting the monitoring requirements of § 146.23(b).

(c) Prior to granting approval for the operation of a Class II well the Director shall consider the following information:

(1) All available logging and testing program data on the well;

(2) A demonstration of mechanical integrity pursuant to § 146.06;

(3) The anticipated maximum pressure and flow rate at which the permittee will operate.

(4) The results of the formation testing program;

(5) The actual injection procedure; and

(6) For new wells the status of corrective action on defective wells in the area of review.

(d) Prior to granting approval for the plugging and abandonment of a Class II well the Director shall consider the following information:

(1) The type, and number of plugs to be used;

(2) The placement of each plug including the elevation of top and bottom;

(3) The type, grade, and quantity of cement to be used;

(4) The method of placement of the plugs; and

(5) The procedure to be used to meet the requirements of § 146.10(c).

§ 146.25 Mid-course evaluation requirements.

(a)

The data to be submitted on each new Class II permit at six months intervals during the first two years of operation of the State program shall at a minimum include the following:

(1) The data required in § 146.24(a)(1);

(2) The data required in § 146.24(a)(3) including, under location, the distance and direction from the injection well;

(3) The depth to the top and bottom of any USDW;

(4) The distance to the nearest down-gradient water supply well;

(5) A description of the geology and hydrology of the area;

(6) The construction characteristics of the well;

(7) The corrective action proposed as well as that performed; and

(8) Any reporting to the Director under terms of the permit.

(b) The Director shall also submit the type and results of all Mechanical Integrity tests reported on existing wells and new (conversion only) wells during the first two years of operation.

(c) The Director shall require a temperature log or noise log on all Class II wells.

**Subpart D—Criteria and Standards
Applicable to Class III Wells**

§ 146.31 Applicability.

This subpart establishes criteria and standards for underground injection control programs to regulate Class III wells.

§ 146.32 Construction requirements.

(a) All new Class III wells shall be cased and cemented to prevent the migration of fluids into or between underground sources of drinking water.

The casing and cement used in the construction of each newly drilled well shall be designed for the life expectancy of the well. In determining and specifying casing and cementing requirements, the following factors shall be considered:

- (1) Depth to the injection zone;
- (2) Injection pressure, external pressure, internal pressure, axial loading, etc.;
- (3) Hole size;
- (4) Size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification, and construction material);
- (5) Corrosiveness of injected fluids and formation fluids;
- (6) Lithology of injection and confining zones; and
- (7) Type and grade of cement.

(b) Appropriate logs and other tests shall be conducted during the drilling and construction of new Class III wells. A descriptive report interpreting the results of such logs and tests shall be prepared by a knowledgeable log analyst and submitted to the Director. The logs and tests appropriate to each type of Class III well shall be determined based on the intended function, depth, construction and other characteristics of the well, availability of similar data in the area of the drilling site and the need for additional information that may arise from time to time as the construction of the well progresses. Deviation checks shall be

conducted on all holes where pilot holes and reaming are used, unless the hole will be cased and cemented by circulating cement to the surface. Where deviation checks are necessary they shall be conducted at sufficiently frequent intervals to assure that vertical avenues for fluid migration in the form of diverging holes are not created during drilling.

(c) Where the injection zone is a formation which is naturally water-bearing the following information concerning the injection zone shall be determined or calculated for new Class III wells or projects:

- (1) Fluid pressure;
 - (2) Fracture pressure; and
 - (3) Physical and chemical characteristics of the formation fluids.
- (d) Where the injection formation is not a water-bearing formation, the information in paragraph (c)(2) of this section must be submitted.

(e) Where injection is into a formation which contains water with less than 10,000 mg/l TDS monitoring wells shall be completed into the injection zone and into any underground sources of drinking water above the injection zone which could be affected by the mining operation. These wells shall be located in such a fashion as to detect any excursion of injection fluids, process by-products, or formation fluids outside the mining area or zone. If the operation may be affected by subsidence or catastrophic collapse the monitoring wells shall be located so that they will not be physically affected.

(f) Where injection is into a formation which does not contain water with less than 10,000 mg/l TDS, no monitoring wells are necessary in the injection stratum.

(g) Where the injection wells penetrate an USDW in an area subject to subsidence or catastrophic collapse an adequate number of monitoring wells shall be completed into the USDW to detect any movement of injected fluids, process by-products or formation fluids into the USDW. The monitoring wells shall be located outside the physical influence of the subsidence or catastrophic collapse.

(h) In determining the number, location, construction and frequency of monitoring of the monitoring wells the following criteria shall be considered:

(1) The population relying on the USDW affected or potentially affected by the injection operation;

(2) The proximity of the injection operation to points of withdrawal of drinking water;

(3) The local geology and hydrology;

(4) The operating pressures and whether a negative pressure gradient is being maintained;

(5) The nature and volume of the injected fluid, the formation water, and the process by-products; and

(6) The injection well density.

§ 146.33 Operating, monitoring, and reporting requirements.

(a) **Operating Requirements.** Operating requirements prescribed shall, at a minimum, specify that:

(1) Except during well stimulation injection pressure at the wellhead shall be calculated so as to assure that the pressure in the injection zone during injection does not initiate new fractures or propagate existing fractures in the injection zone. In no case, shall injection pressure initiate fractures in the confining zone or cause the migration of injection or formation fluids into an underground source of drinking water.

(2) Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.

(b) **Monitoring Requirements.** Monitoring requirements shall, at a minimum, specify:

(1) Monitoring of the nature of injected fluids with sufficient frequency to yield representative data on its characteristics. Whenever the injection fluid is modified to the extent that the analysis required by § 146.34(a)(7)(iii) is incorrect or incomplete, a new analysis as required by § 146.34(a)(7)(iii) shall be provided to the Director.

(2) Monitoring of injection pressure and either flow rate or volume semi-monthly, or metering and daily recording of injected and produced fluid volumes as appropriate.

(3) Demonstration of mechanical integrity pursuant to § 146.06 at least once every five years during the life of the well.

(4) Monitoring of the fluid level in the injection zone semi-monthly, where appropriate and monitoring of the parameters chosen to measure water quality in the monitoring wells required by § 146.32(e), semi-monthly.

(5) Quarterly monitoring of wells required by 146.32(g).

(6) All Class III wells may be monitored on a field or project basis rather than an individual well basis by manifold monitoring. Manifold monitoring may be used in cases of facilities consisting of more than one injection well, operating with a common manifold. Separate monitoring systems for each well are not required provided the owner/operator demonstrates that manifold monitoring is comparable to individual well monitoring.

(c) **Reporting Requirements.** Reporting requirements shall, at a minimum, include:

(1) Quarterly reporting to the Director on required monitoring;

(2) Results of mechanical integrity and any other periodic test required by the Director reported with the first regular quarterly report after the

§ 146.34 Information to be considered by the Director.

This section sets forth the information which must be considered by the Director in authorizing Class III wells. Certain maps, cross sections, tabulations of wells within the area of review, and other data may be included in the application by reference provided they are current, readily available to the Director (for example, in the permitting agency's files) and sufficiently identified to be retrieved.

(a) Prior to the issuance of a permit for an existing Class III well or area to operate or the construction of a new Class III well the Director shall consider the following:

(1) Information required on the permit forms;

(2) A map showing the injection well or project area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name and location of all existing producing wells, injection wells, abandoned wells, dry holes, public water systems and water wells. The map will also show surface bodies of water, mines (surface and subsurface) quarries and other pertinent surface features including residences and roads, and faults if known or suspected.

(3) A tabulation of data

on all wells within the area of review included on the map required under paragraph (a)(2) of this section which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and completion, and any additional information the Director may require.

(4) Maps and cross sections indicating the vertical limits of all underground sources of drinking water within the area of review, their position relative to the injection formation, and the direction of water movement in every underground source of drinking water which may be affected by the proposed injection;

(5) Maps and cross sections detailing the geologic structure of the local area;

(6) Generalized map and cross sections illustrating the regional geologic setting;

(7) Proposed operating data:

(i) Average and maximum daily rate and volume of fluid to be injected;

(ii) Average and maximum injection pressure; and

(iii) Qualitative analysis and ranges in concentrations of all constituents of injected fluids.

(8) Proposed formation testing program to obtain the information required by § 146.32(c).

(9) Proposed stimulation program;

(10) Proposed injection procedure;

(11) Schematic or other appropriate drawings of the surface and subsurface construction details of the well;

(12) Plans (including maps) for meeting the monitoring requirements of § 146.33(b);

(13) Expected changes in pressure, native fluid displacement, direction of movement of injection fluid;

(14) Contingency plans to cope with all shut-ins or well failures so as to prevent the migration of contaminating fluids into underground sources of drinking water;

(15) A certificate that the applicant has assured, through a performance bond, or other appropriate means, the resources necessary to close, plug, or abandon the well;

(16) The corrective action proposed to be taken under § 13, UIC, 26.

(b) Prior to granting approval for the operation of a Class III well the Director shall consider the following information:

(1) All available logging and testing data on the well;

(2) A satisfactory demonstration of mechanical integrity for all new wells

pursuant to § 146.06;

(3) The anticipated maximum pressure and flow rate at which the permittee will operate;

(4) The results of the formation testing program;

(5) The actual injection procedures; and

(6) The status of corrective action on defective wells in the area of review.

(c) Prior to granting approval for the plugging and abandonment of a Class III well the Director shall consider the following information:

(1) The type and number of plugs to be used;

(2) The placement of each plug including the elevation of the top and bottom;

(3) The type, grade and quantity of cement to be used;

(4) The method of placement of the plugs; and

(5) The procedure to be used to meet the requirements of § 146.10(c).

§ 146.35 Mid-course evaluation requirements.

2.18(c)(4)(C) data to be submitted on each Class III permit at six month intervals during the first two years of operation of the State program shall at a minimum include the following:

(a) The data required in § 146.14(a)(i);

(b) The data required in § 146.34(a)(3) including, under location, the distance and direction from the injection well;

(c) The depth to the top and bottom of any USDW;

(d) The distance to the nearest down-gradient water supply well;

(e) A description of the geology and hydrology of the area;

(f) The construction characteristics of the well;

(g) The type and results of all mechanical integrity tests reported to the Director during the first two years of the program; and

(h) Any reporting to the Director under terms of the permit.

**Subpart F—Criteria and Standards
Applicable to Class V Injection Wells**

§ 146.51 Applicability.

This subpart sets forth Criteria and Standards for underground injection control programs to regulate all injection to Class V injection wells.

(a) Generally, wells covered by this Subpart inject non-hazardous fluids into or above formations that contain underground sources of drinking water. It includes all wells listed in § 146.05(e) but is not limited to those types of injection wells.

§ 146.52 Inventory and Assessment.

(a) The owner or operator of any Class V well shall, within one year of the effective date of an underground injection control program, notify the Director of the existence of any well meeting the definitions of Class V under his control, and submit the inventory information required in § 13. UIC. 25 (b).

(b) Within three (3) years of approval of the State program the Director shall complete and submit to EPA a report containing:

(1) The information on the construction features of Class V wells, and the nature and volume of the injected fluids;

(2) An assessment of the contamination potential of the Class V wells using hydrogeological data available to the State;

(3) An assessment of the available corrective alternatives where appropriate and their environmental and economic consequences; and

(4) Recommendations both for the most appropriate regulatory approaches and for remedial actions where appropriate.