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SUBCHAPTER 8. ADDITIONAL REQUIREMENTS FOR UNDERGROUND INJECTION CONTROL (UIC) PROGRAM

7:14A-8.1 Purpose and scope

- (a) This subchapter establishes a system of controls to ensure that underground injection practices do not endanger underground sources of drinking water (USDWs). The goal of this subchapter is preventive. The Department's policy is to liberally interpret and enforce this subchapter to prevent the contamination of the State's ground water resources.
- (b) This subchapter regulates the disposal of wastes by well injection as well as the underground storage of fluids (including gases) which have been emplaced by means of an injection well and the injection of water. Paragraph (b)1 below sets forth examples of the underground injection activities regulated under this subchapter. All injection wells are divided into five classifications, which are set forth at N.J.A.C. 7:14A-8.2.

1. The following injection wells are among the injection activities regulated under this subchapter:
 - i. Any injection well located on a drilling platform within the State's territorial waters;
 - ii. Any well, including any dug hole, that is deeper than its largest surface dimension, where the principal function of the well is emplacement of fluids;
 - iii. Any septic system, disposal bed, seepage pit, or cesspool used by a generator of hazardous waste, or by an owner or operator of a hazardous waste management facility to dispose of fluids containing hazardous waste;
 - iv. Any one subsurface disposal system or multiple subsurface disposal systems, on a single property, for which the aggregate sanitary wastewater design flow is in excess of 2000 gpd, calculated in accordance with the minimum standards for average facilities listed in the Department's Standards for Individual Subsurface Sewage Disposal Systems, at N.J.A.C. 7:9A-7.4; and
 - v. Any injection well used to inject industrial wastes, including but not limited to drywells, leaching fields, septic systems, and seepage pits.
2. The following injection activities are not regulated under this subchapter:
 - i. Any injection well located on a drilling platform or other site that is beyond the State's territorial waters;
 - ii. Any single family residential subsurface sewage disposal system that is designed, constructed, installed and operated in compliance with the Realty Improvement Sewerage and Facilities Act, N.J.S.A. 58:11-23 et seq., and the Department's Standards for Individual Subsurface Sewage Disposal Systems, N.J.A.C. 7:9A, where applicable;
 - iii. Any hole which is not used for emplacement of fluids underground;
 - iv. Any injection into a pre-constructed tank for the purpose of storage of fluids. Owners or operators of these injection wells may be subject to the Underground Storage Tank rules at N.J.A.C. 7:14B; and

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- v. Injection wells used for injection of hydrocarbons which are pipeline quality and are gases at standard temperature and pressure for the purpose of storage.

7:14A-8.2 Classification of injection wells

(a) Injection wells are classified as Class I, II, III, IV or V, as follows:

1. Class I wells are:
 - i. Wells used by generators of hazardous wastes or owners or operators of hazardous waste management facilities, or by any other person, to inject hazardous waste beneath the lowermost formation containing an underground source of drinking water; and
 - ii. Other industrial or municipal disposal wells which inject fluids beneath the lowermost formation containing an underground source of drinking water.
2. Class II wells inject fluids:
 - i. Which are brought to the surface in connection with conventional oil or natural gas production;
 - ii. For enhanced recovery of oil or natural gas; or
 - iii. For storage of hydrocarbons which are liquid at standard temperature and pressure.
3. Class III injection wells are used in processes to extract minerals or energy, including:
 - i. Mining of sulfur by the Frasch process;
 - ii. Solution mining of minerals, including sodium chloride, potash, phosphate, copper, uranium and any other minerals which can be mined by this process;
 - iii. In-situ combustion of fossil fuel, with the term "fossil fuel" including coal, tar sands, oil shale and any other fossil fuel which can be mined by this process; and
 - iv. Wells used in the recovery of geothermal energy to produce electric power, but not including wells used in heating or aquaculture, which fall under Class V.
4. Class IV injection wells are used by generators of hazardous wastes or of radioactive wastes, by owners or operators of hazardous waste management facilities, by owners or operators of radioactive waste disposal sites, or by any other person to dispose of hazardous wastes or radioactive wastes into or above a formation which, within two miles of the well bore, contains an underground source of drinking water (USDW).
5. Class V injection wells are injection wells not included in Class I, II, III or IV. Examples of Class V wells include:
 - i. Air conditioning return flow wells used to return the water used for heating or cooling in a heat pump;
 - ii. Cooling water return flow wells used to inject water previously used for cooling;
 - iii. Drainage wells used to drain storm runoff into a subsurface formation, except as regulated under Class IV;

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- iv. Recharge wells used to replenish the water in an aquifer;
- v. 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;
- vi. Sand backfill wells used to inject a mixture of water and sand, mill tailings or other solids into mined-out portions of subsurface mines;
- vii. All septic systems or other subsurface sewage disposal systems other than those excluded under N.J.A.C. 7:14A-8.1(b)2ii;
- viii. Subsidence control wells (not used for the purpose of oil or natural gas production) used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with the overdraft of fresh water; and
- ix. Geothermal wells and ground water heat pumps used in heating and aquaculture.

7:14A-8.3 Prohibition of unauthorized injection

Any underground injection is prohibited, except pursuant to a permit-by-rule under N.J.A.C. 7:14A-8.5, or pursuant to a UIC permit under N.J.A.C. 7:14A-8.8. The construction of any well required to have a permit (including, where applicable, a well permit) under this subchapter is prohibited, except pursuant to such permit-by-rule or UIC permit.

7:14A-8.4 Prohibition of movement of fluid into underground sources of drinking water

- (a) No UIC permit or approval under a permit-by-rule shall be issued or provided under this subchapter in the following circumstances:
 - 1. Where a Class I, II or III well may cause or allow movement of any contaminant into underground sources of drinking water;
 - 2. Where a Class IV or V well may cause or allow movement of fluid containing any contaminant into underground sources of drinking water, and the presence of that contaminant may adversely affect the health of persons; or
 - 3. Where a Class V well is:
 - i. A large-capacity cesspool (design flow greater than 2,000 gallons per day). All large-capacity cesspools authorized by this subchapter shall be closed by April 5, 2005. Large-capacity cesspools shall be closed in accordance with N.J.A.C. 7:14A-8.16(d). The owner or operator shall notify the Department of intent to close at least 30 days prior to closure; or
 - ii. Except as provided at (a)3ii(1) below, a motor vehicle waste disposal well. A motor vehicle waste disposal well is an injection well that receives or has received fluids from motor vehicle repair or maintenance activities, such as an auto body repair shop, automotive repair shop, car dealership, specialty repair shop (for example, transmission and/or muffler repair shop), or any facility that does any motor vehicle repair work.
 - (1) Motor vehicle waste disposal wells constructed prior to April 5, 2000 shall be authorized under a permit in accordance with N.J.A.C. 7:14A-8.8, closed in accordance with N.J.A.C. 7:14A-8.16(d), or converted to another type of Class V well in accordance with N.J.A.C. 7:14A-8.16(g).
 - (2) Motor vehicle waste disposal wells that continue to operate in accordance with a permit shall meet Ground Water Quality Standards, N.J.A.C. 7:9C, at the last accessible sampling point prior to waste fluids being released into the subsurface environment. The owner or operator shall notify the Department of intent to close at least 30 days prior to closure.

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- (b) For Class I, II and III wells, and any Class IV well allowed under N.J.A.C. 7:14A-8.7(b), if any monitoring indicates the movement of injection or formation fluids into underground sources of drinking water, the Department shall prescribe such additional requirements for construction, corrective action, operation, monitoring, or reporting (including closure of the injection well) as are necessary to control or prevent such movement. These additional requirements shall be imposed by modifying the permit in accordance with N.J.A.C. 7:14A-2.12, or the permit shall be terminated under N.J.A.C. 7:14A-2.13 if cause exists, or appropriate enforcement action shall be taken if the permit has been violated.
- (c) For Class V wells, if at any time the Department learns that a Class V well may cause a violation of the State primary drinking water rules under N.J.A.C. 7:10, or any Groundwater Quality Standards under N.J.A.C. 7:9C, the Department shall:
 - 1. Require the owner or operator of the injection well to obtain a UIC permit pursuant to N.J.A.C. 7:14A-8.8; and
 - 2. Order the owner or operator of the injection well to take such actions (including, where required, closure of the injection well) as may be necessary to prevent the violation and/or take enforcement action.
- (d) Whenever the Department finds that a Class V well may otherwise be adversely affecting the health of persons, the Department may prescribe such actions as may be necessary to prevent the adverse effect, including any action authorized under (c) above.
- (e) Notwithstanding any other provision of this section, the Department shall take emergency action upon receipt of information that a contaminant is present in or is likely to enter an underground source of drinking water that presents an imminent and substantial endangerment to the health of persons.

7:14A-8.5 Authorization of injection into Class V wells by permit-by-rule

- (a) Any owner or operator of a Class V underground injection well who has submitted the inventory information, pursuant to (c) below, prior to May 5, 1997 shall be deemed to have a permit-by-rule.
- (b) An owner or operator of any of the Class V injection wells described in (b)1 through 11 below is deemed to have a permit-by-rule under this subsection if the owner or operator complies with the applicable requirements specified in this subsection.
 - 1. Subsurface sewage disposal systems, other than those excluded under N.J.A.C. 7:14A-8.1(b)2, that are designed, constructed, installed and operated in compliance with the Realty Improvement Sewerage and Facilities Act, N.J.S.A. 58:11-23 et seq., and the Department's Standards for Individual Subsurface Sewage Disposal Systems, N.J.A.C. 7:9A, where applicable;
 - 2. Injection wells used as a component of closed loop heat pump systems constructed according to any well permit condition(s)/ standards adopted pursuant to N.J.S.A. 58:4A-4.1 et seq. All closed loop systems shall contain only fluids that are allowable under conditions of such well permit, and are leak proof such that the only discharge is heat content;
 - 3. Injection wells used as components of an open loop heat pump system constructed in accordance with all applicable well construction requirements of N.J.A.C. 7:9D. Any such injection well shall discharge water into the same aquifer from which the water was drawn and with a quality that is the same as the ambient ground water, except for heat content;
 - 4. Air conditioning or non-contact cooling water return flow injection wells that:

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- i. Are constructed in accordance with all applicable well construction requirements of N.J.A.C. 7:9D, or all applicable seepage pit construction requirements of N.J.A.C. 7:14A-8.18; and
 - ii. Discharge water into the same aquifer from which the water was drawn and with a quality that is the same as the ambient ground water, except for heat content;
 5. Underground injection of swimming pool filter backwash water and water softener backwash water into seepage pits, when the activity is conducted in accordance with N.J.A.C. 7:14A-8.18;
 6. Underground injection wells associated with the feasibility or engineering design studies necessary to obtain or comply with a water supply allocation permit pursuant to N.J.A.C. 7:19 or NJPDES permit pursuant to this chapter;
 7. Underground injection of stormwater runoff from the roofs of buildings, so long as the roofs are devoid of pollutant sources and devices (for example, motors, tanks, drums) that contain pollutants;
 8. Underground injection of stormwater discharges from municipal separate storm sewers that are not identified under N.J.A.C. 7:14A-25.2(a) or (b);
 9. Underground injection of stormwater discharges from residential areas (including residential streets, parking lots, easements, and open space), or from commercial areas other than areas of high pollutant loading as described under N.J.A.C. 7:14A-7.4(b)5ii, unless N.J.A.C. 7:14A-25.2(a) or (b) requires the operating entity to apply for a NJPDES permit for the discharge;
 10. Underground injection of stormwater discharges from animal feeding operations that do not require a NJPDES permit under N.J.A.C. 7:14A-2.13; and
 11. Underground injection wells used during the remediation of a contaminated site where the person conducting the remediation meets the conditions set forth at N.J.A.C. 7:14A-7.5(b).
- (c) The owner or operator of a Class V injection well shall submit inventory information to the Department at the address indicated in (i) below within 90 days of installation of the Class V injection well. The inventory information shall consist, at a minimum, of the following information:
1. The well drilling permit number, where applicable;
 2. The facility name and location;
 3. The name and address of the legal contact;
 4. The ownership of the facility;
 5. The nature and type of injection well(s);
 6. The operating status of injection well(s); and
 7. The type, quantity and quality of discharge.
- (d) The Department will notify pursuant to (e) below any owner or operator of any Class V injection well authorized by rule pursuant to this section to apply for and obtain a UIC permit pursuant to N.J.A.C. 7:14A-8.8, if:

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1. The injection well is no longer a Class V well;
 2. The protection of underground sources of drinking water (USDW) requires that the injection shall be subject to requirements such as corrective action, monitoring and reporting, or operation not required by the permit-by-rule;
 3. The injection well is likely to adversely affect the existing or potential use of the aquifer;
or
 4. The discharge is presumed to contravene the Ground Water Quality Standards in N.J.A.C. 7:9C.
- (e) The Department shall notify in writing the owner or operator of a Class V injection well required pursuant to (d) above to apply for and obtain a UIC permit pursuant to N.J.A.C. 7:14A-8.8. The notice shall include a brief statement of the reasons for the decision, instructions on how to apply for the UIC permit, a statement setting a time by which the owner or operator must apply for the permit, and a statement that upon the effective date of the UIC permit authorization the permit-by-rule under which the activity had been approved shall no longer apply.
- (f) Any owner or operator of a Class V injection well approved under a permit-by-rule pursuant to this section may request to be excluded from the authorization by applying for a UIC permit pursuant to N.J.A.C. 7:14A-8.8. The owner or operator shall provide reasons supporting the request to the Department. The Department shall not issue a permit for an injection well which is in violation of any other applicable statutes or regulations.
- (g) Any approval for a Class V injection well under a permit-by-rule pursuant to this section shall expire upon the effective date of a UIC permit authorization issued pursuant to N.J.A.C. 7:14A-8.8 for such injection well.
- (h) The owner or operator of a Class V injection well approved under a permit-by-rule pursuant to this section is prohibited from injecting into the well:
1. Upon the effective date of denial of an application;
 2. Upon failure to submit inventory or other information in a timely manner pursuant to this section;
 3. Upon failure to comply with the provisions of an enforcement action; and
 4. Upon notification by the Department to cease injection.
- (i) Inventory information required pursuant to (c) above shall be submitted to:

Department of Environmental Protection
Underground Injection Control Coordinator
PO Box 029
Trenton, New Jersey 08625-0029

7:14A-8.6 Identification of underground sources of drinking water

The Department may identify (by narrative description, illustrations, maps, or other means) and shall protect as an underground source of drinking water, all aquifers or parts of aquifers which meet the definition of an "underground source of drinking water" in N.J.A.C. 7:14A-1.2. Even if an aquifer has not been specifically identified by the Department as such, it is an underground source of drinking water if it meets the definition in N.J.A.C. 7:14A-1.2.

7:14A-8.7 Prohibition and elimination of underground injection of hazardous and radioactive wastes

- (a) Except as provided at (b) below, any underground injection of hazardous wastes or radioactive

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wastes is prohibited. This specifically prohibits the operation of Class IV injection wells, and prohibits hazardous and radioactive wastes from being injected into Class I injection wells.

- (b) The Department may, at its discretion, authorize the construction and/or operation of a Class IV or Class I well to inject ground water that has been treated and is being reinjected into the same formation from which it was drawn. The Department's implementation of this injection activity shall be pursuant to provisions for cleanup of releases under CERCLA, or RCRA, as described in 40 C.F.R. 144.13(c), or when conducted under Department oversight pursuant to the Underground Storage Tanks rules at N.J.A.C. 7:14B, the Industrial Site Recovery Act (N.J.S.A. 13:1K 6 et seq., as amended), or the Procedures for Department Oversight of the Remediation of Contaminated Sites at N.J.A.C. 7:26C. These injection activities shall generally be conducted to alleviate a situation posing a substantial danger to public health or safety or when necessitated by public health or environmental considerations (for example, when injection wells are used as a component of a ground water remediation program).
- (c) Abandonment and closure of any injection well that is injecting, or has ever injected, hazardous wastes (including Class IV and Class I injection wells) shall be performed in compliance with all applicable Department regulations for remediation of contaminated sites including the Procedures for Department Oversight of the Remediation of Contaminated Sites (N.J.A.C. 7:26C).

7:14A-8.8 Authorization by permit

- (a) Any underground injection well not authorized by a permit-by-rule in accordance with N.J.A.C. 7:14A-8.5 requires a UIC permit in accordance with this section .
- (b) The owner or operator shall apply for a UIC permit in accordance with N.J.A.C. 7:14A-4. An application for a well-drilling permit, if applicable, shall be submitted concurrently in accordance with N.J.S.A. 58:4A-4.1.
- (c) The information required by the Department for a UIC permit application for a Class I, II, III or V injection well is listed in N.J.A.C. 7:14A-8.17.

7:14A-8.9 Additional conditions applicable to Class I, II, III and V UIC permits

- (a) The following conditions, in addition to those set forth in N.J.A.C. 7:14A-2.5, apply to all UIC permits for Class I, II, III and V injection wells, and shall be incorporated into these UIC permits either expressly or by reference. If incorporated by reference, a specific citation to this subchapter shall be given in the permit.
 - 1. The permittee does not need to comply with certain provisions of N.J.A.C. 7:14A-6.10 when such noncompliance is authorized by a temporary emergency permit under N.J.A.C. 7:14A-6.14.
 - 2. The permittee shall maintain records concerning the nature and composition of injected fluids in accordance with the requirements of N.J.A.C. 7:14A-6.6.
 - 3. In addition to N.J.A.C. 7:14A-6.7, Notice requirements for facility alterations and additions, a new injection well shall not commence injection until construction is complete, the permittee has submitted the well report as required under N.J.S.A. 58:4A-4.1, where applicable, or has submitted notice of completion of construction to the Department; and
 - i. The Department has inspected or otherwise reviewed the new injection well and determined that it is in compliance with the conditions of the permit; or
 - ii. The permittee has not received notice from the Department of its intent to inspect or otherwise review the new injection well within 20 days of the date of the well report or the notice of completion of construction submitted to the Department pursuant to (a)3 above, in which case prior inspection or review is waived and the permittee may commence injection.

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4. The following shall be included as information which shall be reported within two hours under N.J.A.C. 7:14A-6.10:
 - i. Any monitoring or other information which indicates that any contaminant may cause an endangerment to a potable supply well; and
 - ii. Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into a potable supply well.
5. The following information shall be reported within 24 hours under N.J.A.C. 7:14A-6.10:
 - i. Any monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW other than as described at (a)4i above; and
 - ii. Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between USDWs other than as described at (a)4ii above.
6. The permittee shall submit written notice to the Department 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 N.J.A.C. 7:14A-8.10(a)5 and 8.12(d).

7:14A-8.10 Establishing UIC permit conditions

- (a) In addition to the conditions established under N.J.A.C. 7:14A-6.3, each UIC permit is to include conditions meeting the following requirements, when applicable:
 1. Construction requirements as set forth in N.J.A.C. 7:14A-8.13, 8.14 or 8.15. Existing wells shall achieve compliance with such requirements according to a compliance schedule established as a permit condition. The owner or operator of a proposed new injection well shall submit plans for testing, drilling, and construction when applying for the permit. Construction shall not commence until a permit has been issued containing construction requirements (see N.J.A.C. 7:14A-8.3 and N.J.S.A. 58:4A-4.1). New wells shall be in compliance with these requirements prior to commencing injection operations. Changes in construction plans during construction shall be approved by the Department as minor modifications pursuant to N.J.A.C. 7:14A-16.5(a). No such changes shall be physically incorporated into construction of the well prior to receipt of written approval of the modification from the Department;
 2. Corrective or preventive action as set forth in N.J.A.C. 7:14A-8.11 and 8.12(b);
 3. Operating requirements as set forth in N.J.A.C. 7:14A-8.13, 8.14 or 8.15. The permit shall establish any maximum injection volumes and/or pressures necessary to ensure 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 ensure compliance with the operating requirements in N.J.A.C. 7:14A-8.13, 8.14 or 8.15;
 4. Monitoring and reporting requirements as set forth in N.J.A.C. 7:14A-8.13, 8.14 or 8.15. The permittee shall be required to identify types of tests and methods used to generate the monitoring data;
 5. A permit for any Class I, II, III or V well, or any Class IV well allowed under N.J.A.C. 7:14A-8.7, shall 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

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water or from one underground source of drinking water to another. Each applicant for a UIC permit shall submit a plan for plugging and abandonment, taking into account the requirements of N.J.A.C. 7:14A-8.17(a). The plan shall meet, at a minimum, the requirements of N.J.A.C. 7:9D, where applicable. Where the plan meets the requirements of this section, the Department shall incorporate the plan into the permit as a condition. Where the Department determines that the permittee's plan is inadequate, the Department shall require the applicant to revise the plan, prescribe conditions meeting the requirements of this section, or deny permit authorization. For purposes of this section, temporary intermittent cessation of injection operations is not abandonment. Cessation of injection operations for a period of two years or more constitutes abandonment. The improper maintenance of a well may constitute abandonment of that well in accordance with N.J.S.A. 58:4A-4.1;

6. For Class I hazardous waste injection wells, the Department shall require the permittee to maintain financial responsibility and resources, in the form of a performance bond or other equivalent form of financial assurance in accordance with 40 C.F.R. Subpart F, 144.60 through 144.70, to guarantee the closing, plugging, and abandonment of the underground injection operation in a manner prescribed by the Department. In lieu of an individual performance bond, a permittee may furnish a bond or other equivalent form of financial guarantee approved by the Department covering all of the permittee's injection wells in the State;
7. A permit for any Class I, II or III well, or for any Class IV well allowed under N.J.A.C. 7:14A-8.7, or injection project which lacks mechanical integrity shall include, and for any Class V well, will include a condition prohibiting injection operations until the permittee shows to the satisfaction of the Department pursuant to N.J.A.C. 7:14A-8.12(c) that the well has mechanical integrity; and
8. The Department 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.

7:14A-8.11 Corrective or preventive action

- (a) Applicants for Class I, II or III injection well permits, or for any Class IV well allowed under N.J.A.C. 7:14A-8.7, shall identify the location of all known wells within the injection well's area of review as specified in N.J.A.C. 7:14A-8.12 which penetrate the injection zone. For wells which are improperly sealed, completed, or abandoned, the applicant shall submit a plan consisting of such steps or modifications as are necessary to prevent movement of fluid into underground sources of drinking water ("corrective or preventive action"). Where the plan is adequate, the Department shall incorporate it into the permit as a condition. Where the Department determines that the permittee's plan is inadequate pursuant to N.J.A.C. 7:14A-8.12(b), the Department shall:
 1. Require the applicant to revise the plan;
 2. Prescribe a plan for corrective or preventive action as a condition of the permit; or
 3. Deny the application.
- (b) Requirements for corrective or preventive action are as follows:
 1. For an existing injection well, the permit requiring corrective action shall include a compliance schedule for implementing any corrective action required pursuant to (a) above to be completed as soon as possible.
 2. For a new injection well, the permit shall prohibit injection until all required corrective or preventive action has been taken pursuant to (a) above.

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3. Where the Department determines that a more stringent corrective or preventive alternative is not feasible, the Department shall require as a permit condition that injection pressure in the injection zone does not exceed hydrostatic pressure at the site of any improperly sealed, completed, or abandoned well within the area of review, or alternatively, the Department shall require an injection pressure limitation be included as part of the compliance schedule until all other required corrective or preventive action has been taken. The Department shall only approve an injection pressure limitation in satisfaction of the corrective action requirement if the injection pressure limitation will not endanger groundwater resources. The Department reserves the right to deny permit authorization where it determines that the corrective or preventive plan is inadequate.
4. For Class III wells only, the Department shall consider the overall effect of the project on the hydraulic gradient in potentially affected USDWs and the corresponding changes in potentiometric surface(s) and flow direction(s) rather than the discrete effect of each well. If the Department determines that corrective action is not necessary, the monitoring program required pursuant to N.J.A.C. 7:14A-8.15(c)2 shall be designed to verify the validity of such determination.

7:14A-8.12 General operating criteria and construction standards

- (a) The area of review for each injection well or each field, project or area of the State shall be determined according to either (a)1 or 2 below. The Department strongly encourages owners and operators of injection wells to provide the Department with data concerning which method is most appropriate for each geographic area or field.
 1. The zone of endangering influence shall be that area, the radius of which is the lateral distance from an injection well, field or project, 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. Computation of the zone of endangering influence must be based upon the parameters listed below and must be calculated for an injection time period equal to the expected life of the injection well or pattern. The modified Theis equation in Appendix A, incorporated herein by reference, illustrates one form which the mathematical model may take. This equation is based on the following assumptions:
 - i. The injection zone is homogeneous and isotropic;
 - ii. The injection zone has infinite areal 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, such as those mentioned in the EPA publication Radius of Pressure Influence of Injection Wells (EPA-600/279-170), may be used for different situations encountered in the field or where the model assumptions match those situations more closely, if the Department approves of the model and determines that the model is appropriate.
 2. A fixed radius around the well, field or project, of not less than two miles, shall be determined based on the following:
 - i. Chemistry of injected and formation fluids;
 - ii. Hydrogeology;

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- iii. Population and groundwater use and dependence; and
 - iv. Historical practices in the area.
3. If the area of review is determined by a mathematical model pursuant to (a)1 above, the permissible radius resulting from such calculation may be less than two miles. Where the radius calculated is significantly less than two miles, however, the Department reserves the right to require the applicant to submit additional information as needed to assess the possible impact of the proposed injection.
- (b) In determining the adequacy of corrective action proposed by the applicant under N.J.A.C. 7:14A-8.11 and in determining the additional steps needed to prevent fluid movement into underground sources of drinking water, the Department shall consider the following criteria and factors:
1. The nature and volume of the injected fluids;
 2. The nature and native fluids or by-products of injection;
 3. The potentially affected population;
 4. Geology;
 5. Hydrology;
 6. The history of the injection operation;
 7. Completion and plugging records;
 8. The abandonment procedures in effect at the time the well was abandoned; and
 9. The hydraulic connections with underground sources of drinking water.
- (c) Requirements for mechanical integrity are as follows
1. An injection well has mechanical integrity if:
 - i. There is no significant leak in the casing, tubing or packer; and
 - ii. There is no fluid movement into an underground source of drinking water through vertical channels adjacent to the injection well bore.
 2. One of the following tests shall be used to determine the presence of significant leaks under (c)1i above:
 - i. Monitoring of annulus pressure between the casing and the injection tubing; or
 - ii. Pressure test with liquid or gas.
 3. One of the following methods shall be used to determine the presence of fluid movement under (c)1ii above:
 - i. For Class II injection wells only, well records demonstrating the presence of adequate cement to prevent such migration; or

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- ii. The results of a temperature or noise log.
 4. The Department shall allow the use of a test to demonstrate mechanical integrity other than those listed in (c)2 and 3ii above with the written approval of the EPA. The Department shall allow the use of any other alternate method approved by the EPA and published in the Federal Register unless the use of such method is restricted at the time of approval by the EPA.
 5. In conducting and evaluating the tests for mechanical integrity described in this subsection, the owner or operator of the injection well and the Department shall apply methods and standards generally accepted in the industry. When the owner or operator reports the results of mechanical integrity tests to the Department, he or she shall include a description of the test(s) and the method(s) used. In making its evaluation, the Department shall review monitoring and other test data submitted since the previous evaluations.
- (d) Requirements for plugging and abandoning Class I, II, III, and IV wells are as follows (for requirements applicable to Class V wells, see N.J.A.C. 7:14A-8.16(d)):
1. Prior to abandoning any Class I, II, III, and IV well, the well shall be plugged with cement or with other USEPA-approved material in a manner that will not allow the movement of fluids either into or between underground sources of drinking water. The abandoned well is to be, at a minimum, filled and sealed in conformance with the requirements of N.J.A.C. 7:9D, or in conformance with the requirements established in a NJPDES permit. The abandoned well shall be closed in a manner that prevents fluid movement that may cause a violation of the State primary drinking water rules under N.J.A.C. 7:10 or the Ground Water Quality Standards under N.J.A.C. 7:9C, or may adversely affect public health or safety.
 2. Placement of the cement plugs shall be accomplished by one of the following:
 - i. The balance method;
 - ii. The dump bailer method;
 - iii. The two-plug method; or
 - iv. Any other method acceptable to the Department and the EPA that is at least as protective of the ground water as the methods listed in (d)2i through iii.
 3. The abandoned well 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 Department, prior to the placement of the cement plug(s).
 4. The plugging and abandonment plan required under N.J.A.C. 7:14A-8.9(a)6 and 8.10(a)5 shall, in the case of a Class III well field, also demonstrate that no movement of contaminants from the mined zone into an underground source of drinking water will occur. The Department shall prescribe aquifer cleanup and monitoring where necessary and feasible to ensure that no migration of contaminants from the mined zone into an underground source of drinking water will occur.
 5. The Department shall require a permittee to monitor and submit reports for a period of time after the well has been plugged and abandoned.

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7:14A-8.13 Specific operating criteria and construction standards applicable to Class I wells

- (a) This section establishes the operating criteria and construction standards for Class I wells disposing of municipal and/or industrial wastes (other than hazardous wastes or radioactive wastes), where the injection stream quality meets limits established in an individual UIC permit based on primary drinking water standards or applicable ground water quality standards, including anti-degradation or non-degradation policies.
- (b) Construction requirements for Class I wells are as follows:
 1. Class I wells shall, at a minimum, be constructed in accordance with the requirements and specifications set forth in N.J.A.C. 7:9D. More stringent requirements will be imposed, based on an evaluation of the nature of the injection fluid and/or of geological conditions, or where the Department otherwise determines that it is appropriate.
 2. 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:
 - i. Depth to injection zone;
 - ii. Injection pressure, external pressure, internal pressure, and axial loading;
 - iii. Hole size;
 - iv. Size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specifications, and construction material);
 - v. Corrosiveness of injected fluid, formation fluids, and temperatures;
 - vi. Lithology of injection and confining intervals; and
 - vii. Type and grade of cement.
 3. All Class I injection wells 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.
 - i. To obtain approval of the use of an alternative to a packer, the operator of the injection well shall submit a written request to the Department, which shall set forth the proposed alternative and all technical data supporting its use. The Department shall approve the request if the alternative method will reliably provide a comparable level of protection to underground sources of drinking water. The Department may approve an alternative method solely for an individual well or for general use.
 - ii. In determining and specifying requirements for tubing, packer, or alternatives the following factors shall be considered:
 - (1) The depth of setting;
 - (2) The characteristics of injection fluid (chemical content, corrosiveness, and density);

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- (3) The injection pressure;
 - (4) The annular pressure;
 - (5) The rate, temperature and volume of injected fluids; and
 - (6) The size of casing.
4. 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 qualified log analyst and submitted to the Department. At a minimum, such 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 ensure that vertical avenues for fluid migration in the form of diverging holes are not created during drilling; and
 - 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. For surface casings and for intermediate and long strings of casings, the following logs shall be used:
 - (1) For surface casing intended to protect underground sources of drinking water:
 - (A) Resistivity, spontaneous potential, gamma ray, and caliper logs before the casing is installed; and
 - (B) A cement bond, temperature, or density log after the casing is set and cemented.
 - (2) 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.
5. 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 zone; and
 - v. Physical and chemical characteristics of the formation fluids.

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- (c) Operating, monitoring and reporting requirements for Class I wells are as follows:
1. Operating requirements shall, at a minimum, specify that:
 - i. Injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to ensure that the pressure in the injection zone during injection does not initiate new fractures or propagate existing fractures in the injection zone, initiate fractures in the confining zone or cause the movement of injection or formation fluids into an underground source of drinking water;
 - ii. Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited;
 - iii. Unless an alternative to a packer has been approved under (b)3 above, the annulus between the tubing and the long string of casings shall be filled with a fluid approved by the Department.
 2. Monitoring requirements shall, at a minimum, include:
 - i. The analysis of the injected fluids with sufficient frequency to yield data representative of the fluids' characteristics;
 - ii. 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;
 - iii. A demonstration of mechanical integrity pursuant to N.J.A.C. 7:14A-8.12(c) at least once every five years during the life of the well; and
 - iv. 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.
 3. Reporting requirements shall, at a minimum, include:
 - i. Quarterly reports to the Department on:
 - (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 prescribed under (c)2iv above; and
 - ii. The results of the following tests, submitted with the first quarterly report due after the respective test's completion:
 - (1) Periodic tests of mechanical integrity;
 - (2) Any other test of the injection well conducted by the permittee if required by the Department; and
 - (3) Any well repair.

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7:14A-8.14 Specific operating criteria and construction standards applicable to Class II wells

- (a) This section establishes operating criteria and construction standards for Class II wells.
- (b) Construction requirements for Class II wells are as follows:
 1. Class II wells shall, at a minimum, be constructed in accordance with the requirements and specifications set forth in N.J.A.C. 7:9D. More stringent requirements shall be imposed, based on an evaluation of the nature of the injection fluid and/or of geological conditions, or where the Department otherwise determines that it is appropriate, based on considering potential impacts on ground water quality.
 2. All new Class II wells shall be sited in such a fashion that they inject into a formation which has confining zones that are free of open faults or fractures within the area of review.
 3. 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 injection zone;
 - ii. Injection pressure, external pressure, internal pressure, and axial loading;
 - iii. Hole size;
 - iv. Size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specifications, and construction material);
 - v. Corrosiveness of injected fluids, formation fluids and temperatures;
 - vi. Lithology of injection and confining zones; and
 - vii. Type and grade of cement.
 4. 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 these logs and tests shall be prepared by a qualified log analyst and submitted to the Department. 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 ensure that vertical avenues for fluid movement in the form of diverging holes are not created during drilling; and
 - 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. For surface casings and for intermediate and long strings of casings, the following logs shall be used:
 - (1) Resistivity, spontaneous potential, gamma ray and caliper logs before the casing is installed;

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- (2) A cement bond, temperature, or density log after the casing is set and cemented; and
 - (3) Fracture finder logs, when intermediate and long strings of casing are intended to facilitate injection.
 5. At a minimum, the following information concerning the injection formation shall be determined or calculated for new Class II wells:
 - i. Fluid pressure;
 - ii. Temperature;
 - iii. Fracture pressure;
 - iv. Other physical and chemical characteristics of the injection zone; and
 - v. Physical and chemical characteristics of the formation fluids.
- (c) Operating, monitoring, and reporting requirements for Class II wells are as follows:
 1. Operating requirements shall, at a minimum, specify that:
 - i. Injection pressure at the well head shall not exceed a maximum which shall be calculated so as to ensure 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; and
 - ii. Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.
 2. Monitoring requirements shall, at a minimum, include:
 - i. Monitoring of injected fluids at time intervals sufficiently frequent to yield data representative of the fluids' characteristics;
 - ii. Monitoring of injection pressure, flow rate, and cumulative volume with at least the following frequencies:
 - (1) Weekly for produced fluid disposal operations;
 - (2) Monthly for enhanced recovery operations;
 - (3) Daily during the injection of liquid hydrocarbons and injection for withdrawal of stored hydrocarbons; and
 - (4) Daily during the injection phase of cyclic steam operations;
 - iii. A demonstration of mechanical integrity pursuant to N.J.A.C. 7:14A-8.12(c) at least once every five years during the life of the injection well;
 - iv. Maintenance of the results of all monitoring until the next permit review; and

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- v. 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 may not be required provided the owner or operator demonstrates that manifold monitoring is comparable to individual well monitoring.
3. Reporting requirements shall, at a minimum, include: An annual report to the Department summarizing the results of the monitoring required under (c)2 above. Previously submitted information may be included by reference.
 - i. Owners or operators of hydrocarbon storage and enhanced recovery projects may report on a field or project basis rather than an individual well basis where manifold monitoring is used.

7:14A-8.15 Specific operating criteria and construction standards applicable to Class III wells

- (a) This section establishes operating criteria and construction standards for Class III wells.
- (b) Construction requirements for Class III wells are as follows:
 1. Class III wells shall, at a minimum, be constructed in accordance with the requirements and specifications set forth in N.J.A.C. 7:9D. More stringent requirements shall be imposed, based on an evaluation of the nature of the injection fluid and/or of geological conditions, or where the Department otherwise determines that it is appropriate, based on considering potential impacts on ground water quality.
 2. 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:
 - i. Depth to the injection zone;
 - ii. Injection pressure, external pressure, internal pressure, and axial loading;
 - iii. Hole size;
 - iv. Size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specifications, and construction material);
 - v. Corrosiveness of injected fluid, formation fluids and temperatures;
 - vi. Lithology of injection and confining zones; and
 - vii. Type and grade of cement.
 3. 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 qualified log analyst and submitted to the Department. 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. At a minimum, such logs and tests shall include deviation checks conducted on all holes where pilot

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holes and reaming are used, at sufficiently frequent intervals to ensure that vertical avenues for fluid migration in the form of diverging holes are not created during drilling.

4. Where the injection zone is a water-bearing formation, the following information concerning the injection zone shall be determined or calculated for new Class III wells:
 - i. Fluid pressure;
 - ii. Temperature;
 - iii. Fracture pressure;
 - iv. Other physical and chemical characteristics of the injection zone;
 - v. Physical and chemical characteristics of the formation fluids; and
 - vi. Compatibility of injected fluids with formation fluids.
5. Where the injection zone is not a waterbearing formation, the information in (b)4 above shall be determined or calculated and submitted to the Department.
6. Where injection is into a formation which contains water with less than 10,000 mg/l total dissolved solids (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 so 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.
7. Where injection is into a formation which does not contain water with less than 10,000 mg/l TDS, monitoring requirements may be less stringent.
8. Where the injection wells penetrate an underground source of drinking water (USDW) in an area subject to subsidence or catastrophic collapse monitoring wells shall be installed into the USDW in sufficient numbers 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.
9. In determining the number, location, construction and frequency of monitoring of the monitoring wells, the following criteria shall be considered:
 - i. The population relying on the USDW affected or potentially affected by the injection operation;
 - ii. The proximity of the injection operation to points of withdrawal of drinking water;
 - iii. The local geology and hydrology;
 - iv. The operating pressures and whether a negative pressure gradient is being maintained;
 - v. The nature and volume of the injected fluid, the formation water, and the process by-products; and

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- vi. The injection well density.
- (c) Operating, monitoring, and reporting requirements for Class III wells are as follows:
 - 1. Operating requirements shall, at a minimum, specify that:
 - i. Injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to ensure that the pressure in the injection zone during the injection does not initiate new fractures or propagate existing fractures in the injection zone, initiate fractures in the confining zone, or cause the migration of injection or formation fluids into an underground source of drinking water; and
 - ii. Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.
 - 2. Where appropriate, 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 or operator demonstrates that manifold monitoring is comparable to individual well monitoring. Monitoring requirements shall, at a minimum, include:
 - i. Analyses of the injected fluids with sufficient frequency to yield data representative of the fluids' characteristics;
 - ii. Installation and use of continuous recording devices to monitor the injection pressure, flow rate and volume;
 - iii. A demonstration of mechanical integrity pursuant to N.J.A.C. 7:14A-8.12(c) at least once every five years during the life of the well;
 - iv. Weekly monitoring of fluid level and the parameters chosen to measure water quality in the injection zone; and
 - v. Quarterly monitoring of wells adjacent to the injection site to detect any migration from the injection zone into a USDW.
- (d) Reporting requirements shall, at a minimum, include:
 - 1. Quarterly reports to the Department on monitoring required;
 - 2. Results of mechanical integrity, and any other periodic test required by the Department, reported with the first regular report after completion of the test; and
 - 3. Monitoring may be reported on a project or field basis rather than on an individual well basis where manifold monitoring is used.

7:14A-8.16 Specific operating criteria and construction standards applicable to Class V injection wells

- (a) This section establishes the operating criteria and construction standards for Class V wells.
- (b) Class V wells shall, at a minimum, be constructed in accordance with the following requirements:

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1. Well drilling permit requirements:
 - i. Where applicable, any owner or operator of a new Class V well shall obtain a well drilling permit before the commencement of any construction, in accordance with the Well Construction and Maintenance; Sealing of Abandoned Wells rules (N.J.A.C. 7:9D). Information and applications for a well permit may be obtained from:

New Jersey Department of Environmental Protection

Division of Water Supply

Bureau of Water Systems and Well Permitting

PO Box 426

Trenton, New Jersey 08625-0426

2. Where applicable, subsurface sewage disposal systems shall be constructed in accordance with N.J.A.C. 7:9A, unless different requirements or specifications are set forth in a treatment works approval or NJPDES permit.

(c) Operating requirements for Class V wells are as follows:

1. Injection wells constructed in accordance with N.J.S.A. 58:4A-4.1 shall be maintained in accordance with N.J.A.C. 7:9D or any other pertinent regulations, or in accordance with requirements of the UIC permit.
2. Septic systems, disposal beds, or other subsurface sewage disposal systems shall be maintained in accordance with N.J.A.C. 7:9A or in accordance with the requirements of the UIC permit.

(d) Plugging and abandonment requirements for Class V wells are as follows:

1. Class V wells shall be plugged and abandoned in accordance with the requirements of N.J.S.A. 58:4A-4.1 et seq. and N.J.A.C. 7:9D, where applicable. Cessation of injection operations constitutes abandonment in accordance with the requirements of N.J.S.A. 58:4A-4.1. The improper maintenance of a well may constitute abandonment of that well in accordance with N.J.S.A. 58:4A-4.1. Class V wells shall be closed in a manner that prevents fluid movement that may cause a violation of the State primary drinking water rules under N.J.A.C. 7:10 or the Ground Water Quality Standards under N.J.A.C. 7:9C, or that may adversely affect public health or safety. Additional requirements are as follows:

- i. When it is necessary to abandon injection wells constructed or operated in accordance with N.J.A.C. 7:9A, such wells are, at a minimum, to be abandoned in accordance with N.J.A.C. 7:9A-12.8.
- ii. At a minimum, large-capacity cesspools as identified in N.J.A.C. 7:14A-8.4(a)3i and motor vehicle waste disposal wells as identified in N.J.A.C. 7:14A-8.4(a)3ii shall be closed in accordance with the following:
 - (1) Large-capacity cesspools and motor vehicle waste disposal wells shall be emptied of wastes. Any soil, gravel, or other loose material within two feet from the bottom and sides that were exposed to waste shall be removed

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(except for large-capacity cesspools that have not received industrial wastes). Additional material within or surrounding such cesspools and wells shall be removed where necessary to prevent fluid movement that may adversely affect human health. Following any emptying and removal required under this subparagraph, the cavity shall be filled with clean gravel, stones, or soil material;

- (2) All influent and effluent lines shall be excavated, removed or sealed such that no leaching of contaminants can occur; and
 - (3) All wastes or other materials emptied or removed under (d)2i(1) above shall be managed in accordance with this chapter and the State Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., and its implementing rules at N.J.A.C. 7:26, 7:26A and 7:26G.
- iii. Other Class V wells, not otherwise included in (d)1i or ii above, shall be plugged and abandoned in accordance with the terms of a UIC permit that includes the following conditions as applicable:
- (1) All septic systems, seepage pits, dry wells and cesspools shall be emptied of wastes and removed or filled with clean gravel, stones, or soil material;
 - (2) All influent and effluent lines shall be excavated, removed or sealed such that no leaching of contaminants can occur;
 - (3) Remove material where necessary to prevent fluid movement that may adversely affect human health; and
 - (4) When components or residuals (for example, gravel filter material, fill material, soil) from an abandoned individual subsurface sewage disposal system are removed from the ground, such components or residuals shall be managed in accordance with this chapter, the State Solid Waste Management Act (N.J.S.A. 13:1E-1 et seq.) and its implementing rules at N.J.A.C. 7:26, 7:26A and 7:26G.
- (e) The UIC permit-by-rule authorization for any Class V well which fails to comply with the requirements of this section automatically terminates.
- (f) Injection wells that exert a total pressure that exceeds the pressure exerted by the fluid under the influence of gravity at its height above the point of discharge plus the atmospheric pressure, shall be required to follow the standards described for Class I wells.
- (g) Requirements for converting a Class V motor vehicle waste disposal well to another type of Class V well are as follows:
1. An application for an individual UIC permit shall be submitted, and shall include:
 - i. The information required under N.J.A.C. 7:14A-8.17;
 - ii. A description of how the requirements in (g)2 and 3 below will be met; and
 - iii. A description of how all motor vehicle waste will be managed in accordance with this chapter and the State Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., and its implementing rules at N.J.A.C. 7:26, 7:26A and 7:26G;
 2. All motor vehicle waste is segregated from the intended discharge by physical barriers and is not allowed to enter the well. The use of a semi-permanent plug as the means to

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segregate waste is not sufficient to convert a motor vehicle waste disposal well to another type of Class V well;

3. The motor vehicle waste disposal well is emptied of wastes. Any soil, gravel, or other loose material within two feet from the bottom and sides which were exposed to waste is removed. All wastes or other materials emptied or removed are managed in accordance with this chapter and the State Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., and its implementing rules at N.J.A.C. 7:26, 7:26A and 7:26G;
4. The Department finds that injection of motor vehicle waste into the well following conversion is unlikely based on the facility's compliance history and records showing proper waste disposal; and
5. The Department approves such conversion in writing.

7:14A-8.17 Additional requirements for applications for individual UIC permits

(a) In addition to the information required to be submitted pursuant to N.J.A.C. 7:14A-4 and 8.8, and after consultation with the Department, an applicant for an individual NJPDES UIC permit for a Class I, II, III or V well shall submit those items in (a)1 through 5 below as required by the Department.

1. For a permit for an existing Class I, II, III and V well to operate or the construction or conversion of a new Class I, II, III and V well:
 - i. A map showing the injection well(s) for which a permit is sought and the applicable area of review, determined as per N.J.A.C. 7:14A-8.12(a). Within the area of review, the map shall show the number, or name, and location of all producing wells, injection wells, abandoned wells, dry holes, or wells, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. All wells, reservoirs, and other bodies of water used for public water supply that are within a five mile radius of the injection well shall be indicated. The map shall also show geologic faults, if known or suspected;
 - ii. 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, geological and geophysical logs, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Department may require;
 - iii. Geologic name(s), 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;
 - iv. Maps and cross sections detailing the geological structure of the local area;
 - v. Generalized maps and cross section illustrating the regional geologic setting;
 - vi. Proposed operating data as follows:
 - (1) Average and maximum daily rate and volume of the fluid to be injected;
 - (2) Average and maximum injection pressure; and

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- (3) Source and analysis of the chemical, physical, radiological and biological characteristics of injection fluids;
 - vii. Proposed formation testing program to obtain an analysis of the chemical, physical, and radiological characteristics of and other information on the receiving formation;
 - viii. Proposed stimulation program;
 - ix. Proposed injection procedure;
 - x. Engineering drawings of the surface and subsurface construction details of the system;
 - xi. Any expected changes in pressure, native fluid displacement, direction of movement of injection fluid;
 - xii. Contingency plans to address all shut-ins or well failures so as to prevent migration of fluids into any underground source of drinking water;
 - xiii. Plans (including maps) for meeting the monitoring requirements for Class I, II and III wells as specified in this section;
 - xiv. 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 N.J.A.C. 7:14A-8.11; and
 - xv. Construction procedures including a cementing and casing program, logging procedures, deviation checks, and a drilling, testing, and coring program.
2. For the approval of operation of a Class I, II, III and V well:
 - i. All available logging and testing program data on the well(s);
 - ii. A demonstration of mechanical integrity pursuant to N.J.A.C. 7:14A-8.12(c);
 - iii. The actual operating data;
 - iv. The results of the formation testing program;
 - v. The actual injection procedure;
 - vi. The compatibility of injected waste with fluids in the injection zone and minerals in both the injection zone and the confining zone; and
 - vii. The status of corrective or preventive action on defective wells in the area of review.
 3. For the approval of the plugging and abandonment of a Class I, II, III and V well or of a plan for same:
 - i. The type and number of plugs to be used;
 - ii. The placement of each plug including the elevation of the top and bottom;

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- iii. The type and grade and quantity of cement to be used;
 - iv. The method for placement of the plugs; and
 - v. The procedures to be used to meet the requirements of N.J.A.C. 7:14A-8.12(d)3.
- 4. For Class I, II and III wells, the corrective or preventive action proposed to be taken under N.J.A.C. 7:14A-8.11.
 - 5. For Class V wells which are subsurface disposal systems, other than those regulated under the Standards for Individual Subsurface Sewage Disposal Systems, N.J.A.C. 7:9A, the information set forth at N.J.A.C. 7:14A-7.13.

7:14A-8.18 Specific operating criteria and construction standards applicable to permit by rule authorizations for underground injection into seepage pits

- (a) This section sets forth the operating criteria and construction standards for underground injection into seepage pits under a permit-by-rule pursuant to N.J.A.C. 7:14A-8.5(b)4 or 5.
- (b) Design requirements are as follows:
 - 1. When required to protect against accumulation of fine particles that would impair the proper functioning of the seepage pit, a multiple compartment septic tank shall be designed and constructed in accordance with N.J.A.C. 7:9A-8.2.
 - 2. The percolating area shall be the total outside surface area of the seepage pit lining below the inlet and exclusive of any soil horizons with a percolation rate slower than 40 minutes per inch. The bottom of the seepage pit shall not be counted as part of the percolating area. The minimum percolating area shall be determined from the following table based upon the maximum daily volume of discharge and a weighted average of the percolation or permeability rates of all soil layers exposed in the sidewalls. In no case, however, shall the percolating area be less than 110 square feet.

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**MINIMUM AREA REQUIRED FOR SEEPAGE PITS, BASED ON ONE GALLON OF LIQUID PER DAY, AND
BASED ON THE PERCOLATION RATE OF THE SOIL**

Average Percolation Rate (<u>Min/inch</u>)	Minimum Area Per Gallon Per Day (<u>Square feet</u>)
10 or less	0.48
11 to 20	0.72
21 to 30	0.96
31 to 40	1.20
over 40	not acceptable

(c) Construction requirements are as follows:

1. Seepage pits shall be constructed within an excavation affording adequate working space and shall be constructed of stone, brick, cinder, precast concrete or concrete block, or similar material laid dry with open joints where permeable strata have been penetrated, except that if the seepage pit is not of circular construction or if the surrounding ground is subject to cave-in, all horizontal joints shall be mortared so as to prevent structural failure. The following requirements shall be met:
 - i. All joints above the inlet, in all cases, shall be made watertight;
 - ii. Before placement of backfill, all sidewall areas shall be scarified; and
 - iii. The bottom of the seepage pit shall be filled with coarse gravel to a depth of one foot unless the bottom is in a sand or gravel formation.
2. Seepage pits shall be backfilled according to the following procedure:
 - i. The space between the excavation and the seepage pit wall shall be backfilled with at least three inches of coarse gravel or filter material meeting New Jersey Department of Transportation's standards for coarse aggregate sizes 3, 4 and 24.
 - ii. Where cinder or concrete blocks are laid with core openings exposed, the space between the excavation and seepage pit wall shall be backfilled with at least six inches of two and one-half inch crushed stone or gravel.
 - iii. Backfill above the inlet shall be of earth similar to that found at the site which is free from large stones, tree stumps, broken masonry or waste construction material. and shall be thoroughly compacted by hand or mechanical tamping methods. The use of heavy machinery for this purpose is prohibited.
3. Covers shall be constructed of reinforced concrete, shall be a minimum of three inches in thickness, watertight, and shall be designed and constructed so as not to be damaged by any load which is likely to be placed upon them.
4. At least one access opening with a removable, watertight cover and a minimum dimension of 24 inches shall be provided. Access openings shall meet the following requirements:
 - i. Access shall be adequate to permit pumping out of the pit as well as inspection and

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maintenance of the inlet;

- ii. When the cover of the seepage pit is deeper than 12 inches below finished grade, the access opening shall be extended to within 12 inches of finished grade by means of a concrete riser with cast-iron manhole cover;
- iii. When the access opening is below finished grade, a permanent marker at finished grade shall be provided to indicate its location; and
- iv. When the access opening is at or above finished grade, the cover shall be bolted, locked or otherwise secured to prevent access by children.

(d) Requirements for the submission of certifications are as follows:

1. Any facility qualifying for this permit by rule shall submit an as-built certification from a New Jersey licensed professional engineer which certifies that the system was designed and constructed in accordance with the requirements of this section. The certification and a NJPDES-1 form shall be submitted within 30 days of the completion of construction to:

NJDEP

Division of Water Quality

Bureau of Nonpoint Pollution Control

PO Box 029

Trenton, New Jersey 08625-0029

APPENDIX A

EQUATION FOR AREA OF REVIEW

Modified Theis Equation for determining the "area of review" based on the assumption outlined in N.J.A.C. 7:14A-8.12

$$r := \frac{(2.25 K \cdot H \cdot t)^{0.5}}{s \cdot 10 \cdot X}$$

Where

$$X := \frac{4 \cdot \pi \cdot K \cdot H \cdot h_w - h_{bo} \cdot x \cdot S_p \cdot G_b}{2.3 \cdot Q}$$

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_{bo} = Observed original hydrostatic head of injection zone (length) measured from the base of the lowest 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

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SpG_b = Specific gravity of fluid in the injection zone (dimensionless)
 $\pi = 3.142$ (dimensionless)