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3745-34-01 Definitions.

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

(B) "Application" means the Ohio EPA standard forms for applying for a permit, including any additions, revisions or modifications to the forms; or forms approved by Ohio EPA, including any approved modifications or revisions. For a Class I hazardous waste facility, application also includes the information already required by the director~~direction~~ under section 3734.05 of the Revised Code.

(C) "Appropriate act and regulations" means the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) or Safe Drinking Water Act (SDWA), whichever is applicable; Chapter 3734. of the Revised Code and sections 6111.043 and 6111.044 of the Revised Code and all rules promulgated thereunder.

(D) "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.

(E) "Area of review" means the area surrounding an injection well described according to the criteria set forth in rule 3745-34-32 of the Administrative Code, or in the case of an area permit, the project area plus a circumscribing area of a width that is either one-quarter of a mile or a number calculated according to the criteria set forth in rule 3745-34-32 of the Administrative Code.

(F) "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.

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

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

(I) "Cesspool" means a "well" other than a "septic system" or a "subsurface fluid distribution system" that receives untreated sanitary waste containing human excreta, and which sometimes has an open bottom and/or perforated sides.

(J) "Cone of influence" means that area around the well within which increased injection zone pressure caused by injection into the hazardous waste injection well would be sufficient to drive fluids into an underground source of drinking water (USDW).

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

(L) "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.

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

(N) "Conventional mine" means an open pit or underground excavation for the production of minerals.

(O) "Corrective action" means the use of methods approved by the director to ensure that wells within the area of review do not serve as conduits for the movement of fluids into a USDW.

~~(O)~~ (P) "Director" means the director of the Ohio EPA or the director's duly authorized representative.

~~(P)~~ (Q) "Disposal well" means a well used for the disposal of waste into a subsurface formation.

~~(Q)~~ (R) "Draft permit" means a draft action as provided in rule ~~3745-47-05~~3745-49-02 of the Administrative Code.

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

~~(S)~~ (T) "Drywell" means a well, other than an improved sinkhole or subsurface fluid distribution system, completed above the water table so its bottom and sides are typically dry except when receiving fluids.

~~(T)~~ (U) "Effective date of a UIC program" means the date that a state of Ohio UIC program is approved or established by the United States environmental protection agency.

~~(U)~~ (V) "Emergency permit" means a UIC permit issued in accordance with rule 3745-34-19 of the Administrative Code.

~~(V)~~ (V) ~~"Exempted aquifer" means an aquifer or its portion that meets the criteria in the definition of underground source of drinking water but that has been exempted according to the procedures in 40 CFR 144.7.~~

(W) "Experimental technology" means a technology that has not been proven feasible under the conditions that are being tested.

(X) "Facility" or "activity" means any hazardous waste facility as defined in section 3734.01 of the Revised Code, UIC injection well, or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under Chapter 3734. or 6111. of the Revised Code and all rules promulgated thereunder.

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

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

(AA) "Fluid" means material or substance that flows or moves, whether in a semisolid, liquid, sludge, gas, or any other form or state.

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

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

(DD) "Generator" means any person, by site location, whose act or process produces hazardous waste identified or listed in Chapter 3745-51 of the Administrative Code.

~~(FF)~~ (EE) "Geologic sequestration" means the long-term containment of a gaseous, liquid, or supercritical carbon dioxide stream in subsurface geologic formations. This term does not apply to carbon dioxide capture or transport.

~~(EE)~~ (FF) "Ground water" means water below the land surface in a zone of saturation.

~~(FF)~~ (GG) "Hazardous waste" means a hazardous waste as defined in rule 3745-51-03 of the Administrative Code.

~~(GG)~~ (HH) "Hazardous waste management facility" or "HWM facility" ~~(HWM Facility)"~~ means all contiguous land, 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).

~~(HH)~~ (HH) ~~"HWM facility" means hazardous waste management facility.~~

(II) "Improved sinkhole" means a naturally occurring karst depression or other geologic setting which has been modified by man for the purpose of directing and emplacing fluids into the subsurface.

(JJ) "Industrial waste" means any liquid, gaseous, or solid waste substance resulting from any process of industry, manufacture, trade, or business, or from the development, processing, or recovery of any natural resource, together with such sewage as is present.

(KK) "Injection interval" means that part of the injection zone in which the well is screened, perforated or in which the waste is otherwise directly emplaced.

(LL) "Injection well" means a well into which fluids are being injected.

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

(NN) "Innovative technology" means any proposed innovative and experimental hazardous or industrial waste treatment technology or process for which research and development are necessary to establish technical or operational validity.

(OO) "Large capacity cesspool" means a multiple dwelling, community or regional cesspools, or other devices that receive sanitary wastes, containing human excreta that have an open bottom and sometimes have perforated sides. The UIC requirements neither~~do not~~ apply to single-family residential cesspools nor to non-residential cesspools that receive solely sanitary wastes and have only the capacity to serve fewer than twenty persons per day.

(PP) "Lithology" means the description of rocks on the basis of their physical and chemical characteristics.

(QQ) "Manifest" means the shipping document originated and signed by the generator which contains the information required by Chapter 3745-52 of the Administrative Code.

(RR) "Motor vehicle waste disposal well" means a well that has the potential to receive, receives, or has received fluids from vehicular repair or maintenance activities, such as an auto body repair shop, automotive repair shop, new and used car dealership, specialty repair shop (e.g., transmission and muffler repair shop), or any facility that does any vehicular repair work. Fluids disposed in these wells may contain organic and inorganic chemicals in concentrations that exceed the maximum contaminant levels (MCLs) established by the primary drinking water regulations. These fluids also may include waste petroleum products and may contain contaminants, such as heavy metals and volatile organic compounds, which pose risks to human

health, safety or the environment.

(SS) "Other wastes" means garbage, refuse, decayed wood, sawdust, shavings, bark, and other wood debris, lime, sand, ashes, offal, night soil, oil, tar, coal dust, dredged or fill material, or silt, other substances that are not sewage, sludge, sludge materials, or industrial waste, and any other "pollutants" or "toxic pollutants" as defined in the Federal Water Pollution Control Act that are not sewage, sludge, sludge materials, or industrial waste.

(TT) "Owner or operator" means the owner or operator of any facility or activity subject to regulation under Chapters 3734. and 6111. of the Revised Code and all rules promulgated thereunder.

(UU) "Packer" means a device lowered into a well to produce a fluid-tight seal.

(VV) "Permit" means an authorization, license, or equivalent document issued by Ohio EPA to implement the requirements of Chapter 6111. of the Revised Code. Permit does not include a draft permit, a permit issued by the hazardous waste facility approval board under Chapter 3734. of the Revised Code, or rule 3745-34-11 of the Administrative Code.

(WW) "Person" means an individual, association, partnership, the State of Ohio or any agency or employee thereof, the federal government or any agency or employee thereof, any other state or agency or employee thereof, any interstate agency, any municipal corporation, political subdivision, public or private corporation, or other entity.

(XX) "Plugging" means the act or process of stopping the flow of water, oil or gas into or out of a formation through a borehole or well penetrating that formation.

(YY) "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 that are sealed and a graphic log of the well showing formation location, formation thickness, and location of plugging structures.

(ZZ) "Point of injection" means the last accessible sampling point prior to waste fluids being released into the subsurface environment through a class V injection well. For example, the "point of injection" of a class V septic system might be the distribution box, which would be the last accessible sampling point before the waste fluids drain into the underlying soils. For a dry well, the point of injection ~~it~~ is likely to be the well bore itself.

(AAA) "POTW" or "publicly owned treatment works" means any device or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a state or municipality. This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

(BBB) "Pressure" means the total load or force per unit area acting on a surface.

(CCC) "Project" means a group of wells in a single operation.

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

(EEE) "Sanitary waste" means liquid or solid waste originating solely from humans and human activities, such as

wastes collected from toilets, showers, wash basins, sinks used for cleaning domestic areas, sinks used for food preparation, clothes~~cloths~~ washing operations, and sinks or washing machines where food and beverage serving dishes, glasses, and utensils are cleaned. Sources of these wastes may include single or multiple residences, hotels and motels, restaurants, bunkhouses, schools, ranger stations, crew quarters, guard stations, campgrounds, picnic grounds, day-use recreational areas, other commercial facilities, and industrial facilities provided the waste is not mixed with industrial waste.

(FFF) "Schedule of compliance" means a schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events leading to compliance with the appropriate act and regulations).

(GGG) "SDWA" means the Safe Drinking Water Act (P.L. 95-523, as amended by P.L. 96-502, 42 U.S.C. 300 (f) et seq.).

(HHH) "Septic system" means a "well" that is used to emplace sanitary waste below the surface and is typically comprised of a septic tank and subsurface fluid distribution system or disposal system.

(III) "Sewage" means any liquid waste containing sludge, sludge materials, or animal or vegetable matter in suspension or solution, and may include household wastes as commonly discharged from residences and from commercial, institutional, or similar facilities.

(JJJ) "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.

(KKK) "Sole source aquifer" means any aquifer which has been so designated by the administrator of the United States environmental protection agency pursuant to section 1424 (a) or (e) of the SDWA.

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

(MMM) "Subsidence" means the lowering of the natural land surface in response to: earth movement; lowering of fluid pressure; removal or 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.

(NNN) "Subsurface fluid distribution system" means an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground.

(OOO) "Surface casing" means the first string of well casing to be installed in the well.

(PPP) "Total dissolved solids" or "TDS" ~~(TDS)~~" means the total dissolved (filterable) solids as specified in 40 CFR part 136.

(QQQ) "Transmissive fault" or "transmissive ~~or~~ fracture" is a fault or fracture that has sufficient permeability and vertical extent to allow fluids to move between formations.

(RRR) "UIC" means the underground injection control program under part C of the Safe Drinking Water Act, or under sections 6111.043 and 6111.044 of the Revised Code.

(SSS) "Underground injection" means a well injection.

(TTT) "Underground source of drinking water" or "USDW" ~~(USDW)"~~ means ~~an~~a not exempted aquifer or a~~its~~ portion of the not exempted aquifer that does either of the following:

(1) Supplies any public water system as defined by Chapter 3745-81 of the Administrative Code.

~~(a)~~ (a) ~~That supplies any public water system as defined by Chapter 3745-81 of the Administrative Code; or~~

~~(b)~~ (b) ~~That contains a sufficient quantity of ground water to supply a public water system as defined by Chapter 3745-81 of the Administrative Code; and~~

~~(i)~~ (i) ~~Currently supplies drinking water for human consumption; or~~

~~(ii)~~ (ii) ~~Contains fewer than ten thousand mg/l total dissolved solids; and~~

(2) Contains a sufficient quantity of ground water to supply a public water system as defined by Chapter 3745-81 of the Administrative Code and does either of the following:

(a) Currently supplies drinking water for human consumption.

(b) Contains fewer than ten thousand mg/l total dissolved solids.

~~(2)~~ (2) ~~That is not an exempted aquifer.~~

~~(UUU)~~ (UUU) ~~"USDW" means underground source of drinking water.~~

~~(VVV)~~ (UUU) "Well" means any one of the following:

(1) A bored, drilled, or driven shaft whose depth is greater than the largest surface dimension.~~; or~~

(2) A dug hole whose depth is greater than the largest surface dimension.~~; or~~

(3) An improved sinkhole.~~; or~~

(4) A subsurface fluid distribution system as defined in this rule.

~~(WWW)~~ (VVV) "Well injection" means the subsurface emplacement of fluids through a well.

~~(XXX)~~ (WWW) "Well plug" means a watertight and gastight seal installed in a borehole or well to prevent movement of fluids.

~~(YYY)~~ (XXX) "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 any one of the following:~~(1) surging, (2) jetting, (3) blasting, (4) acidizing, and (5) hydraulic fracturing.~~

(1) Surging.

(2) Jetting.

(3) Blasting.

(4) Acidizing.

(5) Hydraulic fracturing.

~~(ZZZ)~~ (YYY) "Well monitoring" means the measurement, by on-site instruments or laboratory methods, of the quality of water in a well.

~~(AAAA)~~ (ZZZ) "Well work-over" means any work performed on a class I injection well which involves maintenance, repair or removal and reinstallation of injection tubing string.

RESCIND- NOT FOR FILING

3745-34-02 Considerations under federal law.

Permits shall be issued in a manner and shall contain conditions consistent with requirements of applicable federal laws. These laws may include:

(A) The Wild and Scenic Rivers Act, 16 U.S.C. 1273 et seq.

(B) The National Historic Preservation Act of 1966, 16 U.S.C. 470 et seq.

(C) The Endangered Species Act, 16 U.S.C. 1531 et seq.

(D) The Coastal Zone Management Act, 16 U.S.C. 1451 et seq.

(E) The Fish and Wildlife Coordination Act, 16 U.S.C. 661 et seq.

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3745-34-04 Classification of wells.

Injection wells are classified as follows:

(A) Class I.

(1) Wells used by generators of hazardous waste or owners or operators of hazardous waste management facilities to inject hazardous waste beneath the lowermost formation containing an underground source of drinking water within one quarter mile of the well bore.

(2) Other industrial and municipal disposal wells that inject fluids beneath the lowermost formation containing an underground source of drinking water within one quarter mile of the well bore.

(3) Radioactive waste disposal wells that inject fluids below the lowermost formation containing an underground source of drinking water within one quarter mile of the well bore.

(B) Class II. Wells which inject fluids~~:~~ that meet the following criteria:

(1) ~~That are~~Are brought to the surface in connection with natural gas storage operations or from the drilling, completion, stimulation, or production of~~conventional~~ oil or natural gas ~~production~~ and may be commingled with waste waters from gas plants that 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 including the following:

(1) Mining of sulfur by the Frasch process~~;~~.

(2) In-situ production of uranium or other metals; this category includes only in-situ production from ore bodies which have not been conventionally mined. Solution mining of conventional mines such as stopes leaching is included in class V~~;~~.

(3) Solution mining of salts or potash.

(D) Class IV.

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

(2) Wells used by generators of hazardous waste or of radioactive waste, by owners or operators of hazardous waste management facilities, or by owners or operators of radioactive waste disposal sites to dispose of hazardous waste or radioactive waste above a formation that within one-quarter mile of the well contains an underground source of drinking water.

(3) Wells used by generators of hazardous waste or owners or operators of hazardous waste management

facilities to dispose of hazardous waste, which cannot be classified under ~~paragraph~~ paragraph (A)(1), (D)(1), or (D)(2) ~~or paragraphs (D)(1) and (D)(2)~~ of this rule ~~(e.g., wells used to dispose of hazardous waste into or above a formation that contains an aquifer which has been exempted pursuant to rule 3745-34-31 of the Administrative Code)~~.

(E) Class V. Injection wells not included in class I, II, III, or IV. Typically, class V wells are shallow wells used to place a variety of fluids directly below the land surface into or above formations that contain USDWs. However, if the fluids placed in the ground qualify as a hazardous waste under the Resource Conservation and Recovery Act (RCRA), then the well is either a class I or class IV well, not a class V well. Class V wells include, but are not limited to the following:

(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) Large capacity cesspools including multiple dwelling, community or regional cesspools, or other devices that receive sanitary wastes, containing human excreta, that 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 that receive solely sanitary wastes and have the capacity to serve fewer than twenty 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 or used as part of an aquifer storage and recovery project~~;~~.

(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 whether what is injected is a radioactive waste or not~~;~~.

(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 that are used solely for the disposal of sanitary waste and have the capacity to serve fewer than twenty persons a day~~;~~.

(10) 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~~;~~.

(11) Injection wells associated with the recovery of geothermal energy for heating, aquiculture and production of electric power~~;~~.

(12) Radioactive waste disposal wells other than class IV or class I wells that inject radioactive material listed in 10 CFR part 20, "appendix B," "table II," column 2~~;~~.

(13) Wells used for solution mining of conventional mines such as stopes leaching~~;~~.

(14) Wells used to inject spent brine into the same formation from which it was withdrawn after extraction of halogens or their salts~~;~~.

(15) Injection wells used in experimental technologies~~;~~.

(16) Injection wells used for in-situ recovery of lignite, coal, tar sands, and oil shale~~;~~.

(17) Motor vehicle waste disposal wells as defined in rule 3745-34-01 of the Administrative Code~~; and~~.

(18) Wells used to inject fluids for the remediation of contaminated soils or ground water.

RESCIND- NOT FOR FILING

3745-34-05 Identification of underground sources of drinking water.

The director 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 rule 3745-34-01 of the Administrative Code. Even if an aquifer has not been specifically identified by the director, it is an underground source of drinking water if it meets the definition in rule 3745-34-01 of the Administrative Code.

RESCIND- NOT FOR FILING

3745-34-06 Prohibition of unauthorized injection.

Any underground injection, except as authorized by permit or rule issued under this chapter is prohibited. The construction of any well required to have a permit is prohibited until the permit has been issued.

DRAFT - NOT FOR FILING

3745-34-07 Prohibition of movement of fluid into underground sources of drinking water.

(A) No owner 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 an underground source of drinking water, if the presence of that contaminant may cause an exceedance in the underground source of drinking water of any primary drinking water standard established under Chapter 3745-81 of the Administrative Code 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) Injection into a class~~Class~~ V well shall not cause the migration of contaminants in a manner or at concentrations that cause an exceedance of water quality standards as established in Chapter 3745-01 of the Administrative Code.

(C) For class I wells, if any water quality monitoring of an underground source of drinking water indicates the movement of any contaminant into the underground source of drinking water, except as authorized under this chapter, the director shall prescribe such additional requirements for construction, corrective action, operation, monitoring, or reporting (including closure of the injection well) as are necessary to prevent such movement. These additional requirements shall be imposed by modifying the permit in accordance with rule 3745-34-23 of the Administrative Code or the permit may be terminated under rule 3745-34-24 of the Administrative Code if cause exists, or appropriate enforcement action may be taken if the permit has been violated.

(D) For class V wells, if at any time the director learns that a class V well may cause an exceedance of any primary drinking water standard established under Chapter 3745-81 of the Administrative Code or cause an adverse ecological impact per paragraph (B) of this rule, the director shall do one of the following:

(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 or correct the violation~~; or~~.

(3) Take enforcement action.

(E) Whenever the director learns that a class V well may be otherwise adversely affecting the health of persons, the director may prescribe such actions as may be necessary to prevent the adverse effect, including any action authorized under paragraph ~~(C)~~(D) of this rule.

(F) Notwithstanding any other provision of this rule, the director 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.

(G) The director may issue orders or require cessation of violations of this chapter, sections 6111.043 to 6111.047 of the Revised Code, or the terms or conditions of permits issued under them. The orders may require the elimination of conditions caused by the violation.

DRAFT - NOT FOR FILING

3745-34-08 Prohibition of class IV wells.

(A) The construction, operation or maintenance of any class IV well, as classified under rule 3745-34-04 of the Administrative Code is prohibited, except as provided in paragraph (C) of this rule.

(B) The owner or operator of a class IV well shall comply with the closure and post-closure requirements of paragraph (B) of rule 3745-34-09 of the Administrative Code. All class IV wells shall be closed in compliance with paragraph (A) of rule 3745-34-07 of the Administrative Code. Any soil, gravel, sludge, liquids, or other materials removed from or adjacent to the well being closed shall be disposed of or managed in accordance with all applicable federal, state or local regulations and requirements.

(1) The owner or operator of a class IV well shall notify the director of the intent to close the class IV well at least thirty days prior to commencing closure of the well. The intent to close notification shall include the submission of a plan for closing the well per the requirements of this paragraph. The submitted plan shall be approved by the director prior to implementation and shall be followed during closure of the well. This plan shall include the following:

(a) A copy of the information required in paragraph (L) of rule 3745-34-11 of the Administrative Code~~; and~~.

(b) Procedures for the removal of any solids and sludge from the class IV well being closed~~; and~~.

(c) Procedures for plugging the class IV well. This procedure shall be consistent with paragraph (A) of rule 3745-34-07 of the Administrative Code and all other applicable federal, state or local regulations and requirements~~; and~~.

(d) Any other information deemed necessary by the director.

(2) Upon completion of closure, the owner or operator shall certify to the director in a report per rule 3745-34-17 of the Administrative Code that the class IV well was closed in compliance with this rule.

(C) Injection wells used to inject contaminated ground water that has been treated and is being reinjected into the same formation from which it was drawn are authorized by rule for the life of the well despite the requirements of paragraphs (A) and (B) of this rule, if such subsurface emplacement of fluids is approved by the director and/or U.S. EPA as part of a remediation program pursuant to provisions for cleanup of releases under Chapter 3734. of the Revised Code and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. 9601-9675, or pursuant to requirements and provisions under the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901-6992k. The owner or operator shall submit to the director the information about the well required within paragraph ~~(L)~~(M) of rule 3745-34-11 of the Administrative Code. The owner or operator shall submit to the director semi-annual reports on the operation and status of the well, including the identification of the chemical constituents injected and the amount injected during the semi-annual period.

RESCIND- NOT FOR FILING

3745-34-10 Waiver of requirement by director.

(A) When injection does not occur into, through or above an underground source of drinking water, the director may authorize a well or project with less stringent requirements for area of review, construction, mechanical integrity, operation, monitoring, and reporting than required in this chapter or rule 3745-34-27 of the Administrative Code to the extent that the reduction in requirements will not result in an increased risk of movement of fluids into an underground source of drinking water.

(B) When injection occurs through or above an underground source of drinking water, but the radius of endangering influence when computed under paragraph (A) of rule 3745-34-32 of the Administrative Code is smaller or equal to the radius of the well, the director may authorize a well or project with less stringent requirements for operation, monitoring, and reporting than required in this chapter or rule 3745-34-27 of the Administrative Code to the extent that the reduction in requirements will not result in an increased risk of movement of fluids into an underground source of drinking water.

(C) When reducing requirements under paragraph (A) of this rule, the director shall prepare a fact sheet under rule 3745-47-06 of the Administrative Code explaining the reasons for the action. Such fact sheet shall include, but not be limited to, an explanation for the following criteria:

(1) Impact on the zone of endangering influence;

(2) Nature and volume of injection fluid;

(3) Nature of native fluids or by-products of injection;

(4) Potentially affected population;

(5) Geology;

(6) Hydrology;

(7) History of the injection operation;

(8) Completion and plugging records;

(9) Abandonment procedures in effect at the time the well was abandoned;

(10) Hydraulic connections with underground sources of drinking water;

(11) Surface waste handling operations;

(12) Mechanical integrity test results; and

(13) Demonstration that operating, monitoring, or reporting requirements can be reduced with no adverse health or environmental impact.

DRAFT - NOT FOR FILING

3745-34-12 Application by permit; authorization by permit.

(A) Permit application.

(1) Except for owners of class V wells authorized in accordance with the provisions of rule 3745-34-11 of the Administrative Code, all underground injection activities, including construction and operation of an injection well, are prohibited unless authorized by permit.

(2) Pursuant to sections 6111.043 and 6111.044 of the Revised Code, a UIC well owner must apply for a permit to drill or a permit to operate, as applicable. Obtaining a permit to drill under section 6111.044 of the Revised Code and Chapter 3745-34 of the Administrative Code satisfies the requirements of division (J) of section 6111.03 and section 6111.45 of the Revised Code.

(3) Obtaining a permit for a class II or class III well under Chapter 1509. of the Revised Code exempts the permit holder from permit requirements under this rule.

(4) Authorization for class V well injections for which permit applications have been submitted shall lapse for a particular class V well injection or project upon the effective date of the permit or permit denial for that well injection or project.

(B) Who applies. The owner of the proposed or existing underground injection well shall apply for the permit to drill and the permit to operate. The permit application shall be signed pursuant to rule 3745-34-17 of the Administrative Code.

(C) Time to apply. Any person who proposes an underground injection for which a permit will be required shall apply for and receive a permit to drill prior to drilling and constructing the underground injection well. Any person who proposes an underground injection for which a permit will be required shall apply for and receive a permit to operate before commencing injection into a well.

(D) Completeness. The director shall not issue a permit before receiving a complete application for a permit except for emergency permits. An application for a permit is complete when the director receives an application form and any supplemental information completed to the director's 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.

(E) Considerations of federal law. The director shall issue permits in a manner and with conditions consistent with requirements of applicable federal laws. The application for a permit shall include a certification that the application is consistent with the requirements of all applicable federal laws. These laws may include any of the following:

(1) The Wild and Scenic Rivers Act, 16 U.S.C. Section 1273 et seq.

(2) The National Historic Preservation Act of 1966, 16 U.S.C. Section 470 et seq.

(3) The Endangered Species Act, 16 U.S.C. Section 1531 et seq.

(4) The Coastal Zone Management Act, 16 U.S.C. Section 1451 et seq.

(5) The Fish and Wildlife Coordination Act, 16 U.S.C. Section 661 et seq.

~~(E)~~ (F) Information requirements. All applicants for permits shall provide the following information to the

director, using the application form provided by the director~~.~~:

(1) The activities conducted by the applicant which require it to obtain permits under the following federal or state laws:

(a) The Resource Conservation and Recovery Act (RCRA), (1976), 42 U.S.C. Section 321 et seq. as amended in 1986.

(b) The national pollution discharge elimination system (NPDES) program under the Clean Water Act (CWA), (1977), 33 U.S.C. Section 1252 et seq. as amended in 2002 if liquid or semi-liquid waste are discharged as a publicly owned treatment works (POTW)~~POTW~~. ~~Give~~The applicant shall provide the POTW NPDES permit number.

(c) Chapter 6111. of the Revised Code.

(d) The prevention of significant deterioration program (PSD) under the Clean Air Act (CAA), (1970), 42 U.S.C. Section 7401 et seq. as amended in 1990.

(e) Chapter 3704. of the Revised Code.

(2) Name, mailing address, and location of the facility~~.~~;.

(3) Up to four standard industrial classification (SIC) codes which best reflect the principal products or services provided by the facility~~.~~;.

(4) The operator's name, address, telephone number, ownership status of federal, state, private~~,~~ or public ~~or~~ entity, and if a corporation, the name and address of the statutory agent~~.~~;.

(5) Whether the facility is located on Indian lands~~.~~;.

(6) A listing of all permits or construction approvals received or applied for under any of the following programs:

(a) Hazardous waste management program under RCRA and Chapter 3734. of the Revised Code~~.~~;.

(b) Underground injection control (UIC) program under the Safe Drinking Water Act (SDWA), (1974), 42 U.S.C. Section 300 f et seq. as amended in 1996 and Chapter 6111. of the Revised Code~~.~~;.

(c) NPDES program under the CWA and Chapter 6111. of the Revised Code~~.~~;.

(d) Prevention of significant deterioration (PSD) program under the CAA and Chapter 3704. of the Revised Code~~.~~;.

(e) Nonattainment program under the CAA and Chapter 3704. of the Revised Code~~.~~;.

(f) National emissions for hazardous pollutants (NESHAPS) preconstruction approval under the CAA and Chapter 3704. of the Revised Code~~.~~;.

(g) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act (MPRSA),

(1972); 33 U.S.C. Sections 1411, 1414b, 1415, and 1417 as amended in 1988~~;~~.

(h) Dredge and fill permits under Section 404 of CWA and Chapter 3745-32 of the Administrative Code~~;~~.

(i) Other relevant environmental permits, including state permits.

(7) The location of the well or the location where the well is proposed to be drilled given by, the latitude and longitude to the nearest second~~;~~, and the location of the tract on which the well is to be drilled identified by section or lot number, city, village, township, and county.

(8) Designation of the well by name and number.

(9) The name of the geological formation to be tested or used and the proposed total depth of the well.

(10) The type of drilling, completion, and injection equipment to be used.

(11) The plan for disposal of water and other waste substances resulted, obtained, or produced in connection with drilling, conversion, or testing.

(12) The chemical composition and physical properties of the substance to be injected.

(13) A topographic map (or other map if a topographic map is unavailable), on a scale not smaller than four hundred feet to the inch, prepared by an Ohio registered surveyor and extending one mile beyond the property boundaries of the source, shall depict the location of all of the following:

(a) The facility.

(b) Each of the facilities intake and discharge structures.

(c) The proposed injection wells.

(d) Each of the facilities hazardous waste treatment, storage, and disposal units.

(e) Solid waste disposal units at the facility.

(f) Each well where fluids from the facility are injected underground.

(g) All wells permitted to inject fluids underground.

(h) Active, closed, and temporarily abandoned oil and gas wells.

(i) Those wells, springs, and other surface water bodies; and drinking water wells listed in public records or otherwise known to the applicant including the drinking water source protection area for all public water supply wells identified.

(j) If the injection well is currently or is proposed to be located within the excavations and workings of an active mine, the map shall include all of the following:

(i) The location of the mine.

(ii) The name of the mine.

(iii) The name of the person operating the mine.

(k) If the well is currently or is proposed to be located within the excavations and workings of an abandoned mine, the map shall include all of the following:

(i) The location of the mine.

(ii) The name of the mine, if known.~~Where known, the name of the mine.~~

(iii) The dates the mine operated, if known.~~Where known, the dates the mine operated.~~

(14) A brief description of the nature of business.

(15) A plugging and abandonment plan that meets the provisions of either of the following:

(a) Rule 3745-34-36 of the Administrative Code for class I UIC wells~~; or~~.

(b) Paragraph (H) of rule 3745-34-11 of the Administrative Code for class V UIC wells.

(16) A plan for the testing, drilling, and construction of the proposed new injection well shall be included within all permit to drill applications. The director may require a demonstration of knowledge and experience by the designer for projects containing a high degree of complexity, non-standard technology, unusual features, or deviations from standards and guidelines used by the agency.

(G) Requirements for recording and reporting of monitoring results. All applications shall specify the following:

(1) Requirements concerning the proper use, maintenance, and installation, when appropriate, of monitoring equipment or methods (including biological monitoring methods when appropriate).

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

(3) Applicable reporting requirements based upon the impact of the regulated activity as specified in this chapter. Reporting shall be no less frequent than specified in rule 3745-34-26 of the Administrative Code.

~~(F)~~ (H) Record keeping. Applicants shall keep records of all data used to complete permit applications and any supplemental information submitted under this rule for a period of at least three years from the date the application is signed or for the duration of the permitted life of the well, whichever time period is longer. This period may be extended by request of the director at any time.

~~(G)~~ (I) Permit application fees.

(1) An application for an injection well permit to drill shall be accompanied by a nonrefundable fee of ~~two~~three thousand dollars. An application for an injection well permit to operate shall be accompanied by a non-refundable fee of ~~two~~three thousand dollars.

(2) An application for a modification to a permit to operate for a class I well submitted pursuant to rule 3745-34-23 of the Administrative Code shall be accompanied by a nonrefundable fee of ~~five~~seven hundred and fifty dollars.

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3745-34-13 Class I permit application.

In addition to the information required in accordance with rule 3745-34-12 of the Administrative Code, the owner shall include the following in a permit application for a permit to drill or permit to operate a class I injection well:

(A) A statement of the relative expertise of the owner or operator of the proposed class I injection well in the operation of class I injection wells. Within the statement include:

(1) A listing of all class I injection wells that the owner or operator has operated and is operating;

(2) The date that each listed class I injection well was first placed in service or if the well was placed in service before the applicant acquired the well, the date that applicant acquired the well; and

(3) The date of issuance, identification number, and expiration date of the permits issued for each listed class I injection well by the United States or the state in which the listed injection well is located and, for each such permit, the name and address of the federal or state agency that issued the permit.

(B) The owner or operator of any facility containing one or more active class I injection wells must conduct such preliminary site investigations as are necessary to determine whether a release outside the permitted injection zone is occurring, has occurred, or is likely to have occurred.

(C) Owners and operators of facilities with existing class I injection wells or that are re-permitting a currently operating class I injection well shall submit all of the following information:

(1) For each active class I injection well at a facility seeking a permit, both the following:

(a) Dates the well was operated; and

(b) Specification of all wastes that have been injected into the well.

(2) All available information pertaining to any release of hazardous waste or constituents from any active injection well at the facility.

(D) Area of review. The owner shall identify the location of all known wells within the injection wells' area of review that penetrate the injection zone. The owner shall submit all of the following:

(1) A calculation of the area of review of the proposed injection well. This shall include a description of the method of determination of the area of review including all relevant calculations and data used in the calculations. The area of review shall be calculated in accordance with rules 3745-34-32 and 3745-34-52 of the Administrative Code.

(2) A description of the procedures that were used to identify all wells penetrating the confining zone or injection zone within the area of review and that were used to determine if the identified wells are adequately completed or plugged.

(3) A map showing the class I injection wells for which the permit is sought and the applicable area of review. The map must show the number or name, and the location of all of the following within the area of review:

(a) The location of all known wells that penetrate the injection zone within the injection well's area of review;

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~~(b) Actively producing oil and gas wells;~~

~~(c) Active, temporarily abandoned, and abandoned injection wells;~~

~~(d) Abandoned oil and gas wells including non-producing wells and boreholes;~~

~~(e) Surface bodies of water;~~

~~(f) Springs;~~

~~(g) Mines (surface and subsurface);~~

~~(h) Quarries;~~

~~(i) Water wells;~~

~~(j) Other pertinent surface features including residences and roads;~~

~~(k) Seismic areas and faults, if known or suspected; and~~

~~(l) Boundaries of the facility.~~

~~[Note: Only information of public record is required to be included on the map.]~~

~~(4) A tabulation of data on all wells within the area of review that penetrate into the proposed injection zone and are completed within three hundred vertical feet of the permitted injection interval. Such data shall include the following:~~

~~(a) Name of the well;~~

~~(b) Name of the owner and operator;~~

~~(c) Description of each well's type;~~

~~(d) Construction data including casing size, setting depth and cementing data for surface, intermediate and long string casings;~~

~~(e) Date drilled;~~

~~(f) Location in latitude and longitude to the nearest second;~~

~~(g) Depth; and~~

~~(h) Record of plugging and/or completion.~~

~~(i) Note the wells that were inadequately plugged or abandoned.~~

~~(ii) Note the wells for which there are incomplete records and include all available records.~~

~~(5) The drilling logs and completion logs for all known wells within the injection well's area of review that penetrate the injection zone that were completed within three hundred vertical feet of the permitted injection interval.~~

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(6) An applicable plan and compliance schedule for corrective action pursuant to rules 3745-34-30 and 3745-34-53 of the Administrative Code for all wells that are improperly sealed, completed, or abandoned and consisting of such steps or modifications as are necessary to prevent movement of fluid into or between USDW. The following information, criteria, and factors shall be included in the plan for corrective action:

(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 the injection operation;

(g) Completion and plugging records;

(h) Abandonment procedures in effect at the time the well was abandoned;

(i) Hydraulic connections with USDW; and

(j) Surface waste handling operations.

(7) A report describing all actions taken to date in implementing the plan of corrective action, including the status of corrective action on defective wells in the area of review and the schedule for completion of all actions described within the plan.

(8) Any additional information the director deems necessary to protect USDW.

(E) Geologic evaluation. The owner shall submit the following:

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

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

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

(4) Maps showing the location of, but not limited to, seismic areas, wetlands, flood hazard areas, carbonate formations that result in caverns, and underground mines, both active and abandoned;

(5) A plan for injectivity testing, including provisions to test for pressure/time relationships to determine permeability, transmissivity, and reservoir limits, if any; and

(6) A description of the lithology of the injection and confining intervals.

(F) The owner shall submit an analysis of the geologic suitability of the proposed location of the well. This analysis shall include:

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(1) An analysis of the structural and stratigraphic geology, the hydrogeology, and the seismicity of the region;

(2) An analysis of local geology and hydrogeology of the well site, including, at a minimum, detailed information regarding stratigraphy, structure and rock properties, aquifer hydrodynamics and mineral resources;

(3) A determination that the geology of the area can be described confidently and that limits of waste fate and transportation can be accurately predicted through the use of models;

(4) Lithology, permeability, porosity, thickness and areal extent of the injection and confining intervals;

(5) Maps and cross sections detailing the geologic structure and stratigraphy of the local area. Cross-sections should note the location of faults, major fractures, and carbonate formations that are known to contain or that may contain caverns;

(6) Generalized maps and cross sections illustrating the regional geologic setting. Cross-sections should note the location of faults, major fractures, and carbonate formations that are known to contain or that may contain caverns; and

(7) A demonstration that:

(a) The confining zone is separated from the base of the lowermost USDW by at least one sequence of permeable and less permeable strata that will provide an added layer of protection for the USDW in the event of fluid movement in an unlocated bore hole or transmissive fault; or

(b) Within the area of review, the piezometric surface of the fluid in the injection zone is less than the piezometric surface of the lowermost USDW, considering density effects, injection pressures and any significant pumping in the overlying USDW; or

(c) There is no USDW present.

(8) A demonstration for applications for class I hazardous waste injection wells that the well is sited in compliance with paragraph (C) of rule 3745-34-51 of the Administrative Code.

(G) The owner shall submit the information required by rule 3745-34-59 of the Administrative Code for permit applications for class I hazardous waste injection wells.

(H) Financial assurance. The owner shall submit certification and evidence of financial responsibility for operation and closure of the well including surety bond or other adequate assurance, such as a financial statement or other materials acceptable to the director. This demonstration must be consistent with the provisions of rules 3745-34-27, 3745-34-36, and 3745-34-62 of the Administrative Code.

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3745-34-13 Class I permit application.

(A) For a new class I injection well, the owner shall submit all information listed in this rule as part of the permit application except for those items of information which are current, accurate, and available in the existing permit record.

(B) In addition to the information required in accordance with rule 3745-34-12 of the Administrative Code, the owner shall include the following in a permit application for a permit to drill or permit to operate a class I injection well:

(1) A statement of the relative expertise of the owner or operator of the proposed class I injection well in the operation of class I injection wells. Within the statement include the following:

(a) A listing of all class I injection wells that the owner or operator has operated and is operating.

(b) The date that each listed class I injection well was first placed in service or if the well was placed in service before the applicant acquired the well, the date that applicant acquired the well.

(c) The date of issuance, identification number, and expiration date of the permits issued for each listed class I injection well by the United States or the state in which the listed injection well is located and, for each such permit, the name and address of the federal or state agency that issued the permit.

(2) The owner or operator of any facility containing one or more active class I injection wells must conduct such preliminary site investigations as are necessary to determine whether a release outside the permitted injection zone is occurring, has occurred, or is likely to have occurred.

(3) Owners and operators of facilities with existing class I injection wells or that are re-permitting a currently operating class I injection well shall submit all of the following information:

(a) For each active class I injection well at a facility seeking a permit, submit the following:

(i) Dates the well was operated.

(ii) Specification of all wastes that have been injected into the well.

(b) All available information pertaining to any release of hazardous waste or constituents from any active injection well at the facility.

(4) Area of review. The owner shall identify the location of all known wells within the proposed injection well's area of review that penetrate the injection zone or confining zone. The owner shall submit the following:

(a) A calculation of the area of review of the proposed injection well. This shall include a description of the method of determination of the area of review including all relevant calculations and data used in the calculations. The area of review shall be calculated in accordance with rule 3745-34-32 of the Administrative Code.

(b) A description of the procedures that were followed to identify, locate, and ascertain the condition of all wells penetrating the confining zone or injection zone within the area of review and that were followed to determine if the identified wells are adequately completed or plugged.

(c) A map showing the class I injection well for which the permit is sought and the applicable area of

review. The map must show the number or name, and the location of the following within the area of review:

(i) The location of all known wells that penetrate the injection zone or confining zone within the injection well's area of review.

(ii) Actively producing oil and gas wells.

(iii) Active, temporarily abandoned, and abandoned injection wells.

(iv) Abandoned and temporarily abandoned oil and gas wells including non-producing wells, plugged wells or dry holes, and stratigraphic boreholes.

(v) Surface bodies of water.

(vi) Springs.

(vii) Mines (surface and subsurface).

(viii) Quarries.

(ix) Water wells.

(x) Other pertinent surface features including structures intended for human occupancy, facility boundaries as well as state, tribal, and territory boundaries, and roads.

(xi) Seismic areas and faults, if known or suspected.

(xii) Boundaries of the facility.

(xiii) State-approved or United States environmental protection agency-approved subsurface cleanup sites.

(d) A tabulation of data on all wells within the area of review that penetrate into the proposed injection zone or confining zone. Such data shall include the following:

(i) Name of the well.

(ii) Name of the owner and operator.

(iii) Description of each well's type.

(iv) Construction data including casing size, setting depth and cementing data for surface, intermediate and long string casings.

(v) Date drilled.

(vi) Location in latitude and longitude to the nearest second.

(vii) Depth.

(viii) Record of plugging or completion.

(a) Note the wells that were inadequately plugged or abandoned.

(b) Note the wells for which there are incomplete records and include all available records.

(ix) Any additional information required by the director.

(e) The drilling logs and completion logs for all known wells within the injection well's area of review that penetrate the injection zone or confining zone.

(f) A plan and compliance schedule for corrective action consistent with rule 3745-34-30 of the Administrative Code for all wells within the area of review that are improperly sealed, completed, or abandoned. The plan shall consist of such corrective actions and steps or modifications as are necessary to prevent movement of fluid into or between USDWs. The following information, criteria, and factors shall be included in the plan for corrective action and shall be considered by the director when determing the adequacy of the plan:

(i) Nature and volume of injected fluid.

(ii) Nature of native fluids or by-products of injection.

(iii) Potentially affected population.

(iv) Geology.

(v) Hydrology.

(vi) History of the injection operation.

(vii) Completion and plugging records.

(viii) Abandonment procedures in effect at the time the well was abandoned.

(ix) Hydraulic connections with USDW.

(x) Surface waste handling operations.

(xi) Reliability of the procedures used to identify abandoned wells.

(xii) Any other factors which might affect the movement of fluids into or between USDW.

(g) A report describing all actions taken in implementing the plan of corrective action, including the status of corrective action on defective wells in the area of review and the schedule for completion of all actions described within the plan. This report shall be updated every sixty days after submittal of the permit application until a decision is made by the director on the permit application.

(h) Any additional information the director deems necessary to protect USDW.

(5) A demonstration that the class I well shall be sited in such a fashion that injection is into a formation which is beneath the lowermost formation containing, within one-quarter mile of the well bore, an underground source of drinking water. As part of this demonstration the owner shall submit an analysis of the geologic suitability of the proposed location of the well. This analysis shall include the following:

(a) An analysis of the structural and stratigraphic geology, the hydrogeology, and the seismicity of the region.

(b) An analysis of local geology and hydrogeology of the well site, including, at a minimum, detailed information regarding stratigraphy, structure and rock properties, aquifer hydrodynamics and mineral resources.

(c) A determination that the geology of the area can be described confidently and that limits of waste fate and transportation can be accurately predicted through the use of models.

(d) A description of the lithology, permeability, porosity, thickness and areal extent of the injection and confining intervals.

(e) Maps and cross-sections detailing the geologic structure and stratigraphy of the local area. Maps and cross-sections should note the location of, but not be limited to: seismic areas and faults, major fractures, wetlands, flood hazard areas, carbonate formations that are known to contain or that may contain caverns, and underground mines, both active and abandoned.

(f) Generalized maps and cross-sections illustrating the regional geologic setting. Maps and cross-sections should note the location of, but not be limited to: seismic areas and faults, major fractures, wetlands, flood hazard areas, carbonate formations that are known to contain or that may contain caverns, and underground mines, both active and abandoned.

(g) Maps and cross-sections indicating the general vertical and lateral limits of all USDW within the area of review, their position relative to the injection formation and the direction of water movement, where known, in each USDW that may be affected by the proposed injection.

(6) Information on the geologic structure and hydrogeologic properties of the proposed injection zone and overlying formations, including the following:

(a) Maps and cross-sections of the area of review.

(b) The location, orientation, and properties of known or suspected faults and fractures that may transect any confining zone in the area of review and a determination that the faults or fractures would not interfere with containment.

(c) Data on the depth, areal extent, thickness, mineralogy, porosity, permeability, and capillary pressure of any injection and confining zone; including geology/facies changes based on field data which may include geologic cores, outcrop data, seismic surveys, well logs, names, and lithologic descriptions.

(d) Geomechanical information on fractures, stress, ductility, rock strength, and in situ fluid pressures within any confining zone.

(e) Information on the seismic history including the presence and depth of seismic sources and a determination that the seismicity would not interfere with containment.

(f) Geologic and topographic maps and cross-sections illustrating regional geology, hydrogeology, and the geologic structure of the local area.

(7) Financial assurance. The owner shall submit certification and evidence of financial responsibility for operation and closure of the well including surety bond or other adequate assurance, such as a financial statement or other materials acceptable to the director. This demonstration shall be consistent with the provisions of rules 3745-34-27, 3745-34-36, and 3745-34-62 of the Administrative Code.

(8) The final report on the seismic reflection data survey in compliance with rule 3745-34-40 of the Administrative Code.

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3745-34-14 Class I permit to drill applications.

In addition to the information required in accordance with rules 3745-34-12 and 3745-34-13 of the Administrative Code, the owner shall include the following in a permit application for a permit to drill a class I injection well:

(A) The final report on the seismic reflection data survey in compliance with rule 3745-34-40 of the Administrative Code.

(B) Well construction. The owner shall submit the following information for a permit to drill application:

(1) A plan for the testing, drilling and construction of the proposed new class I injection well. Whenever required by the director to protect the public welfare or to safeguard life, health, or property, or whenever the contemplated expenditure by the state, any of its political subdivisions, or any municipal corporation for the completed project exceeds five thousand dollars, plans for the design of new class I wells shall be prepared by a professional engineer registered under Chapter 4733. of the Revised Code. In addition, for projects containing a high degree of complexity, non-standard technology, unusual features, or deviations from standards or guidelines used by the agency, the director may require that the owner or operator demonstrate the knowledge and experience of the project designer.

(2) A schematic or other appropriate drawings of the proposed well with proper setting depths, including wellhead and gauges and a written description of the proposed surface and subsurface construction details of the well including all of the following:

(a) Hole size;

(b) Surface casing, intermediate, long string casing, and injection tubing packer information, including all of the following:

(i) Size;

(ii) Weight;

(iii) Grade;

(iv) Depth-GL;

(v) Thickness;

(vi) Diameter;

(vii) Nominal weight;

(viii) Length;

(ix) Joint specification;

(x) Construction material; and

(xi) Tubing tensile, burst, and collapse strength.

(3) A written demonstration that for the design life of the well the casings, including any casing connections,

~~are rated to have sufficient structural strength to withstand:~~

~~(a) The maximum burst and collapse pressures which may be experienced during the construction, operation, and closure of the well; and~~

~~(b) The maximum tensile strength which may be experienced at any point along the length of the casing during the construction, operation, and closure of the well.~~

~~(4) Cement data, including the proposed type and class, additives, amount, and circulate for the surface casing, long string, and other casings;~~

~~(5) A description of the packer including all of the following:~~

~~(a) Proposed type;~~

~~(b) Name and model number;~~

~~(c) Setting depth; and~~

~~(d) Compatibility with proposed annular fluid and proposed injection fluid.~~

~~(6) A description of the proposed bottom hole completion.~~

~~(7) A plan for the proposed stimulation program.~~

~~(8) Construction procedures including a cementing and casing program, logging procedures, deviation checks, and a drilling, testing, and coring program. These procedures should address the applicable factors and requirements in rules 3745-34-37, 3745-34-54, and 3745-34-55 of the Administrative Code.~~

~~(9) A written analysis demonstrating that the various parts of the casing, tubing, and cement will be compatible with or resistant to corrosion from the formation fluid and injection fluids to which they will respectively be exposed.~~

~~(10) Procedures for core analysis, if performed, including analysis for at least:~~

~~(a) Permeability;~~

~~(b) Porosity;~~

~~(c) Percent saturation;~~

~~(d) Sample description;~~

~~(e) Sieve analysis of sand; and~~

~~(f) Compatibility testing of cores with waste stream for permeability reduction.~~

~~(C) Proposed formation testing program to obtain analysis of the chemical, physical and radiological characteristics of the receiving formation including, but not limited to:~~

~~(1) Fluid pressure;~~

~~(2) Temperature;~~

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(3) Fracture pressure;

(4) Physical and chemical characteristics of the injection matrix;

(5) Compatibility of the injected fluids with the formation fluids;

(6) Corrosiveness; and

(7) Other applicable information.

(D) Procedures for performing deviation checks in compliance with paragraph (D)(1) of rule 3745-34-37 of the Administrative Code.

(E) Procedures for performing the logging and testing requirements of paragraph (D) of rule 3745-34-37 of the Administrative Code.

(F) Procedures, forms, and methods for collecting all of the following information:

(1) Drilling and completion records including:

(a) Daily reports;

(b) Driller's log or record of strata;

(c) Casing and tubing records;

(d) Pipetallys;

(e) Detailed screen and liner setting;

(f) Details of centralizers, scratchers, and other such equipment; and

(g) Engineering drawings of:

(i) Well completion;

(ii) Packer assembly and setting; and

(iii) Well head parts list.

(2) Testing records including the following:

(a) Well testing:

(i) Static fluid level;

(ii) Bottom hole temperature and pressure;

(iii) Injectivity test result; permeability determination; reservoir limits and storage;

(iv) Spinner or tracer surveys; and

(v) Casing testing results including those to demonstrate mechanical integrity pursuant to the requirements of rule 3745-34-34 of the Administrative Code.

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~~(b) Laboratory testing results:~~

~~(i) Cores for permeability;~~

~~(ii) Cores for compatibility;~~

~~(iii) Cores for porosity;~~

~~(iv) Analysis of formation water; and~~

~~(v) Descriptive core analysis and sieve analysis.~~

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3745-34-14 Class I permit to drill applications.

(A) In addition to the information required in accordance with rules 3745-34-12 and 3745-34-13 of the Administrative Code, the owner shall include the following in a permit application for a permit to drill a class I injection well: a plan for the testing, drilling and construction of the proposed new class I injection well.

(B) Whenever required by the director to protect the public welfare or to safeguard life, health, or property, or whenever the contemplated expenditure by the state, any of its political subdivisions, or any municipal corporation for the completed project exceeds five thousand dollars, plans for the design of new class I wells shall be prepared by a professional engineer registered under Chapter 4733. of the Revised Code.

(C) In addition, for projects containing a high degree of complexity, non-standard technology, unusual features, or deviations from standards or guidelines used by the agency, the director may require that the owner or operator demonstrate the knowledge and experience of the project designer.

(D) The plan shall include the following:

(1) Design specifications demonstrating that the proposed class I injection well shall be constructed and completed by owners and operators to accomplish the following:

(a) Prevent the movement of fluids into or between underground sources of drinking water (USDWs) or into any unauthorized zones.

(b) Permit the use of appropriate testing devices and workover tools.

(c) Permit continuous monitoring of injection tubing and long string casing as required pursuant to rule 3745-34-56 of the Administrative Code.

(2) Documentation that the proposed class I well will be cased and cemented to prevent the movement of fluids into or between USDWs and that the casing and cement used in the construction of the well is designed for the life expectancy of the well, including the postclosure care period. The owner shall include a discussion of the following factors in this documentation:

(a) Depth to the injection zone.

(b) Injection pressure, external pressure, internal pressure, and axial loading.

(c) Hole size.

(d) Size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification, and construction material).

(e) Corrosiveness of injected fluid, formation fluids, and temperatures.

(f) Down hole temperatures.

(g) Lithology of injection and confining intervals.

(h) Type or grade of cement. Cement used shall be American petroleum insitute class A cement or equivalent and shall meet the provisions of paragraph (D)(3)(e) of this rule.

(i) Quantity and chemical composition of the injected fluid.

(3) A design for the class I injection well that includes the following:

(a) At a minimum, one surface casing string that extends into the confining bed below the lowest formation that contains a USDW and extends at least one hundred feet below the bottom of the lowest formation that contains a USDW. A sufficient number of centralizers shall be used including, at a minimum, one centralizer for every other joint of casing. The design shall specify that the surface casing string is cemented by circulating cement from the base of the casing to the surface, using a minimum of one hundred twenty per cent of the calculated annular volume. The director may require more than one hundred twenty per cent when the geology or other circumstances warrant to protect USDWs.

(b) At least one long string casing. The design of the long string casing shall conform to the following:

(i) Use a sufficient number of centralizers including, at a minimum one spacer for each joint of casing in the bottom five hundred feet of the long string casing and every one hundred feet above that elevation for the length of the long string casing.

(ii) Extend to the injection zone.

(c) Cementing the long string casing by circulating cement from the base of the casing to the surface in two or more stages. The director may approve an alternative method of cementing in cases where the cement cannot be recirculated to the surface, provided the owner or operator can demonstrate by using logs that the cement is continuous and does not allow fluid movement behind the well bore and the final well construction is still protective of USDWs. The cement design shall include:

(i) Sufficient quantity and quality of cement to withstand the maximum operating pressure.

(ii) A quantity no less than one hundred twenty per cent of the calculated volume necessary to fill the annular space. The director may require more than one hundred twenty per cent when the geology or other circumstances warrant to protect USDWs.

(iii) Cement data, including the proposed type and class, additives, amount, and circulate for the surface casing, long string, and other casings.

(d) Casings, including any casing connections, that shall be rated to have sufficient structural strength to withstand, for the design life of the well.

(i) The maximum burst and collapse pressures that may be experienced during the construction, operation, and closure of the well.

(ii) The maximum tensile stress that may be experienced at any point along the length of the casing during the construction, operation, and closure of the well.

(e) Cement and cement additives must be compatible with the injected waste and formation fluids and of sufficient quality and quantity to maintain integrity over the design life of the well. The integrity and location of the cement shall be verified using technology capable of evaluating cement quality radially and identifying the location of channels to ensure that USDWs are not endangered.

(4) A design for the class I injection well that includes injection through tubing with a packer set immediately

above the injection zone or point approved by the director. The tubing and packer seal shall be designed for the expected service.

(a) In determining and specifying requirements for tubing and packer, the following factors shall be considered in the design:

(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.

(vi) Size of casing.

(vii) Tubing tensile, burst, and collapse strengths.

(b) The plan shall include a description of the packer including the following:

(i) Proposed type.

(ii) Name and model number.

(iii) Setting depth.

(iv) Compatibility with proposed annular fluid and proposed injection fluid.

(5) A written analysis demonstrating that the various parts of the casing, tubing, and cement will be compatible with or resistant to corrosion from the formation fluid and injection fluids to which the casing, tubing, and cement will respectively be exposed. This shall include design specifications demonstrating that all well materials used in the construction of the proposed class I injection well shall be compatible with fluids with which the materials may be expected to come into contact. This shall include a design for the proposed class I injection well where all areas of the proposed well that may come into contact with corrosive wastes shall be constructed of corrosion-resistant materials. A well shall be deemed by the director to have compatibility as long as the materials used in the construction of the well meet or exceed the requirements of this chapter.

(6) A schematic or other appropriate drawings of the proposed well with proper setting depths, including wellhead and gauges and a written description of the proposed surface and subsurface construction details of the well including the following:

(a) Hole size.

(b) Surface casing, intermediate, long string casing, and injection tubing packer information, including the following:

(i) Size.

(ii) Weight.

(iii) Grade.

(iv) Depth-ground level.

(v) Thickness.

(vi) Diameter.

(vii) Nominal weight.

(viii) Length.

(ix) Joint specification.

(x) Construction material.

(xi) Tubing tensile, burst, and collapse strength.

(7) A description of the proposed bottom hole completion.

(8) A plan for the proposed stimulation program including a description of the stimulation fluids to be used and a determination that stimulation will not interfere with containment.

(9) Plans for recovering whole cores or sidewall cores of the confining and injection zones and formation fluid samples from the injection zone. The director may accept cores from nearby wells if the owner or operator can demonstrate that core retrieval is not possible and that such cores are representative of conditions at the well. The director may accept cores from nearby wells if the owner or operator can demonstrate that core retrieval is not possible and that such cores are representative of conditions at the well. The director may require the owner or operator to core other formations in the bore hole.

(10) Procedures for core analysis including analysis for at least the following:

(a) Permeability.

(b) Porosity.

(c) Percent saturation.

(d) Sample description.

(e) Sieve analysis of sand.

(f) Compatibility testing of cores with waste stream for permeability reduction.

(11) Proposed formation testing program to obtain analysis of the chemical, physical and radiological characteristics of and other information on the injection formation and the confining zone including, but not limited to the following:

(a) Fluid pressure and static water level.

(b) Temperature, pH, and specific conductivity.

(c) Fracture pressure.

(d) Other physical and chemical characteristics of the injection formation and confining zone including formation fluids.

(e) Compatibility of the injected fluids with the formation fluids.

(f) Corrosiveness.

(g) Other applicable information.

(12) Plans for conducting appropriate logs, surveys, and other tests during the drilling and construction of new class I wells to determine or verify the depth, thickness, porosity, permeability, and rock type of, and the salinity of any entrained or formation fluids in all relevant geologic units to ensure conformance with performance standards of this rule and to establish accurate baseline data against which future measurements may be compared. At a minimum, such logs and tests shall include the following:

(a) Deviation checks during drilling 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 determine the location of the borehole and to ensure that vertical avenues for fluid migration in the form of diverging holes are not created during drilling.

(b) 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 USDWs, the following:

(a) Resistivity, spontaneous potential, and caliper logs before the casing is installed.

(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, the following:

(a) Resistivity, spontaneous potential, porosity, caliper, and gamma ray logs before the casing is installed.

(b) Fracture finder logs.

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

(iii) The director may allow the use of an alternative to the above logs when an alternative will provide equivalent or better information.

(c) Mechanical integrity tests consisting of the following:

(i) A pressure test with liquid or gas.

(ii) A radioactive tracer survey.

(iii) A temperature or noise log.

(iv) A casing inspection log.

(v) Any other test required by the director.

(13) A plan for injectivity testing, including provisions to test for pressure/time relationships to determine permeability, transmissivity, and reservoir limits, if any.

(14) Procedures, forms, and methods for collecting the following information:

(a) Drilling and completion records including:

(i) Daily reports.

(ii) Driller's log or record of strata.

(iii) Casing and tubing records.

(iv) Pipe tally.

(v) Detailed screen and liner setting.

(vi) Details of centralizers, scratchers, and other such equipment.

(vii) Engineering drawings of the following:

(a) Well completion.

(b) Packer assembly and setting.

(c) Wellhead parts list.

(b) Testing records including the following:

(i) Well testing including the following:

(a) Static fluid level.

(b) Bottom hole temperature and pressure.

(c) Injectivity test result; permeability determination; reservoir limits and storage.

(d) Spinner or tracer surveys.

(e) Casing testing results including those to demonstrate mechanical integrity pursuant to the requirements of rule 3745-34-34 of the Administrative Code.

(ii) Laboratory testing results including the following:

(a) Cores for permeability.

(b) Cores for compatibility.

(c) Cores for porosity.

(d) Analysis of formation water.

(e) Descriptive core analysis and sieve analysis.

(15) A proposed schedule of all logging and testing. This schedule shall be updated and given to the director thirty days prior to conducting the initial test. The director reserves the right to witness all logging and testing required by this rule.

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3745-34-15 ~~Class I permit to operate applications~~.

~~In addition to the information required in accordance with rules 3745-34-12 and 3745-34-13 of the Administrative Code, the owner shall include the following in an application for a permit to operate a class I injection well:~~

~~(A) The results of the formation testing program, including a completion report for the injection well that includes all the following information:~~

~~(1) Drilling and completion reports including:~~

~~(a) Daily reports;~~

~~(b) Driller's log or record of strata;~~

~~(c) Casting and tubing records, including the pipetallys;~~

~~(d) Cement records;~~

~~(e) Details of centralizers, scratchers, and other such information; and~~

~~(f) Engineering drawings of the following:~~

~~(i) Well completion;~~

~~(ii) Packer assembly and setting; and~~

~~(iii) Well head, including the parts list.~~

~~(2) Testing records including the following:~~

~~(a) Well testing:~~

~~(i) Static fluid level and fluid pressure;~~

~~(ii) Bottom hole temperature and pressure;~~

~~(iii) Injectivity test result, permeability determination, reservoir limits, and storage;~~

~~(iv) Fracture pressure;~~

~~(v) Spinner or tracer surveys; and~~

~~(vi) Casing testing results including a demonstration of mechanical integrity pursuant to rules 3745-34-34 and 3745-34-58 of the Administrative Code.~~

~~(b) Laboratory testing results:~~

~~(i) Cores for permeability;~~

~~(ii) Cores for compatibility;~~

~~(iii) Cores for porosity; and~~

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(iv) Descriptive core analysis and sieve analysis.

(3) The data from the formation testing program including the analysis of the chemical, physical and radiological characteristics of and other information on the receiving formation.

(B) The final report of the seismic reflection data survey in compliance with rule 3745-34-40 of the Administrative Code.

(C) A plan for conducting a passive seismic monitoring program if the director determines that the operation of the class I injection well may cause seismic disturbances.

(D) The proposed injection procedure including all of the following:

(1) Average and maximum daily rate and volume of the substance(s) to be injected.

(2) Average and maximum injection pressure.

(E) A description of all of the following:

(1) The chemical composition and physical properties of the substance(s) to be injected. This should include the source and an analysis of the chemical (including corrosiveness), physical (including density and temperature), radiological and biological characteristics of the injection fluid.

(2) The compatibility of substance(s) to be injected with the fluids in the injection zone and minerals in both the injection zone and confining zone.

(F) A determination accompanied by supporting documentation describing all areas around the well where formation pressures are predicted by the applicant to be increased due to the operation of the well and an evaluation of whether any resulting potential exists for contamination of any underground source of drinking water or migration of substances injected into the well outside the anticipated injection zone. The determination shall be made through the use of an hydraulic model acceptable to the director.

(G) A descriptive report interpreting the results of logs and tests performed during the drilling and construction of the injection well shall be submitted. This report shall be prepared by a knowledgeable log analyst. At a minimum, this report shall contain the applicable information required by paragraph (D) of rule 3745-34-37, and rule 3745-34-55 of the Administrative Code. This report shall include the final prints of all logs run on the well and the results of the directional and inclinational survey.

(H) 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.

(I) A plan for ensuring the annual review and testing of the integrity of the well casing and associated well features. This plan shall comply with the requirements of rule 3745-34-34 of the Administrative Code. Renewal permit applications shall include results of all mechanical integrity tests performed on the injection well since the issuance of the previous permit. If the results of the mechanical integrity tests have already been submitted to Ohio EPA they may be included in the permit application by reference.

(J) A plan for monitoring the lowermost underground source of drinking water near the injection well.

(K) A plan for plugging and abandonment pursuant to the applicable provisions of paragraph (B)(5) of rule 3745-34-27, rule 3745-34-36, paragraph (C) of rule 3745-34-39, rule 3745-34-60, and rule 3745-34-61 of the Administrative Code. The plugging and abandonment plan shall including all of the following

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~~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 use;~~

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

~~(5) The procedure to be used to meet the applicable requirements of paragraph (B)(5) of rule 3745-34-27, rule 3745-34-36, paragraph (C) of rule 3745-34-39, rule 3745-34-60, and rule 3745-34-61 of the Administrative Code.~~

~~(L) Plans (including maps) for meeting the applicable testing and monitoring requirements of rules 3745-34-38 and 3745-34-57 of the Administrative Code; and~~

~~(M) If hazardous waste is to be injected and is generated at the same facility where the injection well will be placed, provide a certification that:~~

~~(1) The generator of the hazardous waste has a program to reduce the volume or quantity and toxicity of such waste to the degree determined by the generator to be economically practicable; and~~

~~(2) Injection of the waste is that practicable method of disposal currently available to the generator which minimizes the present and future threat to human health and the environment.~~

~~(N) A report submitting the applicable information required by and demonstrating compliance with the applicable requirements of rules 3745-34-37, 3745-34-54, and 3745-34-55 of the Administrative Code.~~

~~(O) Procedures and forms for collecting and submitting the information required by rule 3745-34-58 of the Administrative Code.~~

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3745-34-15 Class I permit to operate applications.

(A) For a new class I injection well, the owner shall submit all information listed in this rule as part of the permit application except for those items of information which are current, accurate, and available in the existing permit record.

(B) In addition to the information required in accordance with rules 3745-34-12 and 3745-34-13 of the Administrative Code, the owner shall include the following in an application for a permit to operate a class I injection well:

(1) Drilling and completion reports including the following:

(a) Daily reports.

(b) Driller's log or record of strata.

(c) Casting and tubing records, including the pipe tally.

(d) Cement records.

(e) Details of centralizers, scratchers, and other such information.

(f) Engineering drawings of the following:

(i) Well completion.

(ii) Packer assembly and setting.

(iii) Wellhead, including the parts list.

(2) The data from the formation testing program including the analysis of the chemical, physical and radiological characteristics of and other information on the injection formation and confining zone. This includes in situ and laboratory test results and records for the following:

(a) Fluid pressure.

(b) Temperature.

(c) pH.

(d) Specific conductivity.

(e) Fracture pressure.

(f) Other physical and chemical characteristics of the injection matrix.

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

(h) Static fluid level and fluid pressure.

(i) Bottom hole temperature and pressure.

(j) Spinner or tracer surveys.

(k) Descriptive core analysis and sieve analysis.

(3) A report detailing the results of the injectivity testing, including the tests for pressure/time relationships. This should include results for permeability, transmissivity, and reservoir limits and storage.

(4) A determination accompanied by supporting documentation describing all areas around the well where formation pressures are predicted by the applicant to be increased due to the operation of the well and an evaluation of whether any resulting potential exists for contamination of any underground source of drinking water or migration of substances injected into the well outside the anticipated injection zone. The determination shall be made through the use of an hydraulic model acceptable to the director.

(5) A descriptive report interpreting the results of all logs and tests including casing tests performed during the drilling and construction of the injection well shall be submitted. This report shall be prepared by a knowledgeable log analyst. This report shall include the final prints of all logs run on the well and the results of the directional and inclinational survey.

(6) A report demonstrating that the well siting conforms to the following:

(a) The injection zone has sufficient permeability, porosity, thickness and areal extent to prevent migration of fluids into USDWs.

(b) The confining zone conforms to the following:

(i) Is laterally continuous and free of transecting, transmissive faults or fractures over an area sufficient to prevent the movement of fluids into USDWs.

(ii) Contains at least one formation of sufficient thickness and with lithologic and stress characteristics capable of preventing vertical propogation of fractures.

(7) A report demonstrating any one of the following:

(a) The confining zone is separated from the base of the lowermost USDW by at least one sequence of permeable and less permeable strata that will provide an added layer of protection for the USDW in the event of fluid movement in an unlocated bore hole or transmissive fault.

(b) Within the area of review, the piezometric surface of the fluid in the injection zone is less than the piezometric surface of the lowermost USDW, considering density effects, injection pressures and any significant pumping in the overlying USDW.

(c) There is no USDW present.

(8) A description of the following:

(a) The chemical composition and physical properties of any substance to be injected. This should include the source and an analysis of the chemical (including corrosiveness), physical (including density and temperature), radiological and biological characteristics of the injection fluid.

(b) The compatibility of substance(s) to be injected with the fluids in the injection zone and minerals in both the injection zone and confining zone and the materials used to construct the well.

(9) A plan for conducting a passive seismic monitoring program if the director determines that the operation of the class I injection well may cause seismic disturbances.

(10) Proposed injection procedure including the proposed operating data including the following:

(a) Average and maximum daily rate and volume of any substance to be injected.

(b) Average and maximum injection pressure and calculation of proposed maximum injection pressure.

(11) Contingency plans to cope with all shut-ins or well failures so as to prevent migration of fluids into any USDW.

(12) A plan for ensuring the annual review and testing of the integrity of the well casing and associated well features. This plan shall comply with the requirements of rule 3745-34-34 of the Administrative Code. Permit applications for new wells shall include data demonstrating that the well has mechanical integrity. Renewal permit applications shall include results of all mechanical integrity tests performed on the injection well since the issuance of the previous permit. If the results of the mechanical integrity tests have already been submitted to Ohio EPA they may be included in the permit application by reference.

(13) A plan for monitoring the lowermost underground source of drinking water near the injection well.

(14) A plan for plugging and abandonment pursuant to the applicable provisions of paragraph (B)(5) of rule 3745-34-27, rule 3745-34-36, paragraph (C) of rule 3745-34-39, rule 3745-34-60, and rule 3745-34-61 of the Administrative Code. The plugging and abandonment plan shall including the following information:

(a) The type and number of plugs to be used.

(b) The placement of each plug including the elevation of the top and bottom.

(c) The type and grade and quantity of cement to be use.

(d) The method for placement of the plugs.

(e) The procedure to be used to meet the applicable requirements of paragraph (B)(5) of rule 3745-34-27, rule 3745-34-36, paragraph (C) of rule 3745-34-39, rule 3745-34-60, and rule 3745-34-61 of the Administrative Code.

(15) Plans (including maps) for meeting the applicable testing and monitoring requirements of rules 3745-34-38 and 3745-34-57 of the Administrative Code.

(16) If hazardous waste is to be injected and is generated at the same facility where the injection well will be placed, provide a certification of the following:

(a) The generator of the hazardous waste has a program to reduce the volume or quantity and toxicity of such waste to the degree determined by the generator to be economically practicable.

(b) Injection of the waste is that practicable method of disposal currently available to the generator which minimizes the present and future threat to human health and the environment.

(17) Procedures and forms for collecting and submitting the information required by rule 3745-34-58 of the Administrative Code.

(18) The means of disposing of any sludges, solid wastes, or semi-solids or liquids generated in the treatment of any wastes received.

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3745-34-19 Emergency permits.

(A) Coverage. Notwithstanding any other provision of this chapter, the director may temporarily permit a specific underground injection which has not otherwise been authorized by rule or permit if the following criteria are met:

(1) An imminent and substantial endangerment to the health of persons will result unless a temporary emergency permit is granted~~; and~~.

(2) Timely application for a permit could not practicably have been made~~; and~~.

(3) The injection will not result in the movement of fluids into underground sources of drinking water.

(B) Requirements for issuance.

(1) Any temporary permit under paragraph (A) of this rule shall be for no longer term than required to prevent the hazard.

(2) Notice of any temporary permit under this paragraph shall be published in accordance with Chapter 3745-49~~rule 3745-47-07~~ of the Administrative Code within ten days of the issuance of the permit.

(3) The temporary permit under this rule may be either oral or written. If oral, it must be followed within five calendar days by a written temporary emergency permit.

(4) The director shall condition the temporary permit in any manner the director~~he or she~~ determines is necessary to ensure that the injection will not result in the movement of fluids into an underground source of drinking water.

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3745-34-22 Transfer of permits.

(A) Transfers by modification. Except as provided in paragraph (B) of this rule, 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 paragraph (B)(2) of rule 3745-34-23 of the Administrative Code), or a minor modification made under paragraph (D) of rule 3745-34-25 of the Administrative Code, to identify the new permittee and incorporate such other requirements as may be necessary under Chapter 6111. of the Revised Code.

(B) Automatic transfers. As an alternative to transfers under paragraph (A) of this rule, any UIC permit for a well not injecting hazardous waste may be automatically transferred to a new permittee if the following criteria are met:

(1) The current permittee notifies the director at least thirty days in advance of the proposed transfer date referred to in paragraph (B)(2) of this rule~~;~~.

(2) The notice includes a written agreement between the existing and new permittees containing a specific date for transfer or permit responsibility, coverage, and liability between them, and the notice demonstrates that the financial responsibility requirements of paragraph ~~(B)(6)~~(B)(7) of rule 3745-34-27 of the Administrative Code will be met by the new permittee~~; and~~.

(3) The director does not notify the existing permittee and the proposed new permittee of the director's~~his or her~~ intent to modify or revoke and reissue the permit. A modification under this paragraph may also be a minor modification under rule 3745-34-25 of the Administrative Code. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph (B)(2) of this rule.

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3745-34-23 Modification or revocation and reissuance of permits.

When the director receives any information (for example, inspects the facility, receives information pertinent to the permit submitted by the permittee as required in the permit [see rule 3745-34-26 of the Administrative Code], receives a request for modification or revocation and reissuance or conducts a review of the permit file), the directorhe or she may determine whether or not one or more of the causes listed in paragraphs (A) and (B) of this rule for modification, or revocation and reissuance, or both exist. If cause exists, the director may modify or revoke and reissue the permit accordingly, subject to the limitations of paragraph (C) of this rule, and may request an updated application if necessary. 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 then reissued for a new term. If cause does not exist under this rule or rule 3745-34-25 of the Administrative Code, the director shall not modify or revoke and reissue the permit. If a permit modification satisfies the criteria in rule 3745-34-25 of the Administrative Code for minor modifications, the permit may be modified without a draft permit or public review. Otherwise, a draft permit must be prepared and other procedures in Chapter 3745-493745-47 of the Administrative Code must be followed.

(A) Causes for modification. The following are causes for modification. For class I hazardous waste injection wells the following may be cause for revocation or and reissuance oras well as modification; and for all other wells the following may be cause for revocation oras well as modification when the permittee requests or agrees.

(1) Alterations. There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.

(2) Information. The director has received information pertinent to the permit. Permits 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. For UIC area permits (rule 3745-34-18 of the Administrative Code), this cause shall include any information indicating that cumulative effects on the environment are unacceptable.

(3) New rules. The standards or regulations on which the permit was based have been changed by promulgation of amended rules. Permits may be modified during their terms for this cause only as follows:. For promulgation of amended standards or regulations, when:

(a) For promulgation of amended standards or regulations, when the following criteria are met:

(i) The permit condition requested to be modified was based on a rule within this chapter.

(ii) The director has revised, withdrawn, or modified that portion of the regulation on which the permit condition was based.

(iii) A permittee requests modification within ninety days after the effective date of the rule or director's action on which the request is based.

(b) For judicial decisions, a court of competent jurisdiction has remanded and stayed Ohio environmental protection agency promulgated regulations if the remand and stay concern that portion of the regulations on which the permit condition was based and a request is filed to Ohio environmental protection agency by the permittee within ninety days of judicial remand.

~~(a) The permit condition requested to be modified was based on a rule within this chapter; and~~

~~(b) The director has revised, withdrawn, or modified that portion of the regulation on which the permit condition was based; and~~

~~(c) A permittee requests modification within ninety days after the effective date of the rule or director's action on which the request is based.~~

~~(4) For judicial decisions. When a state court of competent jurisdiction has remanded and stayed Ohio environmental protection agency promulgated regulations if the remand and stay concern that portion of the regulations on which the permit condition was based and a request is filed to Ohio environmental protection agency by the permittee within ninety days of judicial remand.~~

~~(5)~~ (4) Compliance schedules. The director determines good cause exists for modification of a compliance schedule, such as an act of God, strike, flood, or materials shortage or other events over which the permittee has little or no control and for which there is no reasonably available remedy. See also paragraph (C) of rule 3745-34-25 of the Administrative Code (minor modifications).

(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 rule 3745-34-24 of the Administrative Code and the director determines that modification or revocation and reissuance is appropriate.

(2) The director has received notification (as required in the permit-see paragraph (D) of rule 3745-34-25~~3845-34-25~~ of the Administrative Code) of a proposed transfer of the permit. A permit also may be modified to reflect a transfer after the effective date of an automatic transfer (paragraph (B) of rule 3745-34-22 of the Administrative Code) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new permittee.

(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 was unknown at the time of permit issuance.

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3745-34-24 Termination of permits.

(A) The director may terminate a permit during its term, or deny a permit renewal application for any of the following causes:

(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 fully disclose ~~fully~~ all relevant facts, or the permittee's misrepresentation of any relevant facts at any time~~; or~~.

(3) A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination.

(B) The director shall follow the applicable procedures in Chapter 3745-49~~3745-47~~ of the Administrative Code in terminating any permit under this rule.

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3745-34-29 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 (including biological monitoring methods when appropriate);

(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 as specified in this chapter. Reporting shall be no less frequent than specified in rule 3745-34-26 of the Administrative Code.

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3745-34-30 Plan of corrective action.

(A) Coverage. Applicants for class I well permits shall identify the location of all known wells within the injection well's area of review which penetrate the injection zone. For such wells which are improperly sealed, completed, or abandoned, as determined by the director, 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 ("corrective action"). Where the plan is adequate, the director shall incorporate it into the permit as a condition. Where the director's review of an application indicates that the permittee's plan is inadequate (based on the factors in rule 3745-34-33 of the Administrative Code), the director shall require the applicant to revise the plan, prescribe a plan for corrective action as a condition of the permit under paragraph (B) of this rule, or deny the application.

(B) Requirements.

(1) Existing injection wells. Any permit issued for an existing injection well requiring corrective action shall include a compliance schedule requiring any corrective action accepted or prescribed under paragraph (A) of this rule to be completed as soon as possible.

(2) New injection wells. No owner or operator of a new injection well may begin injection until all required corrective action has been taken.

(3) Injection pressure limitation. The director may require as a permit condition that injection pressure be so limited that pressure in the injection zone does not exceed hydrostatic pressure at the site of any improperly completed or abandoned well within the area of review. This pressure limitation shall satisfy the corrective action requirement. Alternatively, such injection pressure limitation can be part of a compliance schedule and last until all other required corrective action has been taken.

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3745-34-30 Corrective Action.

(A) Any permit issued for an existing injection well requiring corrective action other than pressure limitations shall include a compliance schedule requiring any corrective action accepted or prescribed under this chapter. Any such compliance schedule shall provide for compliance no later than two years following issuance of the permit and shall require observance of appropriate pressure limitations under paragraph (C) of this rule until all other corrective action measures have been implemented.

(B) New injection wells. No owner or operator of a new injection well may begin injection until all required corrective action has been taken.

(C) The director may require pressure limitations in lieu of plugging. If pressure limitations are used in lieu of plugging, the director shall require as a permit condition that injection pressure be so limited that pressure in that injection zone at the site of any improperly completed or abandoned well within the area of review would not be sufficient to drive fluids into or between USDWs. The pressure limitation shall satisfy the corrective action requirement. Alternatively, such injection pressure limitation may be made part of a compliance schedule and may be required to be maintained until all other required corrective actions have been implemented.

(D) The director may require the owner or operator of a class I injection well to provide the information required by paragraph (B)(4) of rule 3745-34-13 of the Administrative Code.

3745-34-32 **Area of review.**

The area of review of each injection well or each field or project shall be determined according to ~~either paragraph (A) or (B) of~~ this rule. The area of review of class I hazardous waste injection wells shall be determined in accordance with paragraph (D) of this rule. 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) In the case of an application for a well permit under rule 3745-34-12 of the Administrative Code, the zone of endangering influence is the area for which the radius is the lateral distance where the pressures in the injection zone may cause the migration of the injection 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.

$$r = [(2.25KHt) \setminus (S10^{x})]^{1/2}$$

where

$$x = (4\pi KH [h_w - h_{bo} (S_p G_b)]) \setminus 2.3Q$$

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_{bo} = 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_pG_b = Specific gravity of fluid in the injection zone (dimensionless)

π = 3.142 (dimensionless)

The above equation is based on the following assumptions:

(a) The injection zone is homogenous and isotropic~~;~~.

(b) The injection zone has infinite area extent~~;~~.

(c) The injection well penetrates the entire thickness of the injection zone~~;~~.

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

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

(B) Fixed radius.

(1) In the case of an application for ~~a~~any well permit~~permit(s)~~ under rule 3745-34-12 of the Administrative Code, a fixed radius around the well of not less than one-fourth mile 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 used 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 rule, the permissible radius is the result of such calculation even if it is less than one-fourth mile.

(D) The area of review for class I hazardous waste injection wells shall be at least a two-mile radius around the well bore. The director may specify a larger area of review based on the calculated cone of influence of the well.

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Prior Effective Dates: 7/25/1984

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3745-34-33 Corrective action.

In determining the adequacy of corrective action proposed by the applicant under rule 3745-34-30 of the Administrative Code 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 director:

(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 the injection operation;

(G) Completion and plugging records;

(H) Abandonment procedures in effect at the time the well was abandoned;

(I) Hydraulic connections with underground sources of drinking water; and

(J) Surface waste handling operations.

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3745-34-34 Mechanical integrity.

(A) An injection well has mechanical integrity if the following are met:

(1) There ~~is~~ are no ~~leak~~ leaks in the casing, tubing or packer ~~during operation; and~~.

(2) There is no 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~~shall be used to evaluate the absence of leaks under paragraph (A)(1) of this rule:

(1) Monitoring of the tubing-casing annulus pressure with sufficient frequency to be representative, as determined by the director, while maintaining an annulus pressure different from atmospheric pressure measured at the surface~~; or~~.

(2) Pressure test with liquid or gas.

(C) The results of a temperature or noise log shall be used to determine the absence of significant fluid movement under paragraph (A)(2) of this rule.

(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 rule with the written approval of the director. The director 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 director shall be published pursuant to the requirements of Chapter 3745-49~~3745-47~~ of the Administrative Code.

(E) In conducting and evaluating the tests enumerated in this rule 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 any test~~the test(s)~~ and any method~~the method(s)~~ used shall be included. In making an~~his/her~~ evaluation, the director shall review monitoring and other test data submitted since the previous evaluation.

(F) The director or the director's~~his~~ authorized representative shall be present during the test for demonstration of mechanical integrity, unless the director or the director's~~his~~ authorized representative waives this requirement before the test occurs.

(G) The director may require additional or alternative tests if the results presented by the owner or operator under paragraph (E) of this rule are not satisfactory to the director to demonstrate that there is no movement of fluid into or between USDWs resulting from the injection activity.

(H) No injection shall occur into a class I well that cannot demonstrate mechanical integrity as defined by paragraph (A) of this rule. In the event that a loss of mechanical integrity of a class I well is discovered, the owner or operator shall follow the requirements of paragraph (H) of rule 3745-34-56 of the Administrative Code.

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3745-34-35 Criteria for establishing permitting priorities.

In determining priorities for setting times for owners to submit applications for authorization to operate under the procedures of paragraphs (A) and (C) of rule 3745-34-12, and paragraphs (B) and (C) of rule 3745-34-13 of the Administrative Code, 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 requirements of this chapter and Chapters 6111. and 3734. of the Revised Code;

(F) Coordination with the issuance of permits required by other permit programs;

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

(H) Expiration dates of existing permits, if any.

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3745-34-37 Construction requirements for class I wells.

(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:

(a) Depth of setting;

(b) Characteristics of injection fluid (chemical content, corrosiveness, and density);

(c) Injection pressure;

(d) Annular pressure;

(e) Rate, temperature and volume of injected fluid; and

(f) Size of casing.

(3) All areas of a well that may come into contact with corrosive wastes shall be constructed of

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corrosion-resistant materials.

(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:

(a) For surface casing intended to protect underground sources of drinking water;

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

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

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

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

(ii) Fracture finder logs; and

(iii) 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;

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

(6) Compatibility of injected fluids with formation fluids.

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3745-34-39 Information to be considered by the director in authorizing class I wells.

This rule 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 in rules 3745-34-12, 3745-34-13, and 3745-34-14 of the Administrative Code;

(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 residences and roads. The map should also show faults, if known or suspected. Only information of public record is required to be included on this map;

(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:

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

(b) Average and maximum injection pressure; and

(c) 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;

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

(13) Plans (including maps) for meeting the monitoring requirements in paragraph (B) of rule 3745-34-38 of the Administrative Code;

(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 rule 3745-34-30 of the Administrative Code;

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

(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 as required by paragraph (B)(6) of rule 3745-34-27 of the Administrative Code;

(17) Location, including, but not limited to, seismic areas, wetlands, flood hazard areas, carbonate formations that result in caverns, and underground mines, both active and abandoned; and

(18) The means to dispose of any sludges, solid wastes, or semi-solids or liquids generated in the treatment of any wastes received.

(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 rule 3745-34-34 of the Administrative Code;

(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 rule 3745-34-36 of the Administrative Code.

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3745-34-40 Seismic reflection survey requirements for class I wells.

(A) A seismic reflection data survey shall be conducted at each injection site where a class I injection well is located or is proposed to be located in order to determine the presence or absence of such geologic features as may be identified by seismic reflection survey data within or near the area around the well where the formation pressures may be increased due to the operation of the well. "Geologic features" for the purpose of this rule mean~~means~~ lateral stratigraphic changes, faults, fractures, ~~and/or~~or other structural irregularities.

(B) A new seismic reflection data survey is not required, if, prior to the effective date of this rule, a seismic reflection data survey was conducted at an injection site~~ in accordance with a work plan approved by the director or a seismic reflection data survey was conducted at an injection site and the results were approved in writing by the director~~.

(C) The owner of a class I injection well shall re-evaluate the seismic reflection data collected per paragraph (A) or (B) of this rule~~,~~ if there is a change in the area of review of an injection well or if the owner or operator is proposing a new well to be located at the injection site. The director may require the owner or operator to submit additional seismic reflection data as may be necessary or appropriate, if the director determines that the existing data are inadequate to determine the presence or absence of geologic features as may be identified by seismic reflection survey data within the altered area of review or within the area of pressure buildup of the new well.

(D) At least sixty days prior~~Prior~~ to conducting a seismic reflection data survey, the owner or operator shall submit ~~for approval by~~to the director, a work plan detailing the activities and methods to be used in data acquisition, processing, interpreting and reporting the seismic reflection data. This work plan shall, at a minimum, include the following:

(1) Provisions for data acquisition, processing, and plotting no less than three seconds of data~~;~~.

(2) Proposed line locations and appropriate acquisition and processing parameters for the data. The survey shall include adequate horizontal data coverage which will image and properly identify any known or unknown geologic features that may affect the site, both during operation and post-closure periods of the well(s)~~;~~.

(3) A detailed discussion of the proposed acquisition of any checkspot survey or~~and/or~~ vertical seismic profile (VSP)~~;~~.

(4) Provisions for keeping detailed and dated field notes and records of all geophysical investigations~~;~~.

(5) Provisions for headers on final line plots to indicate the shotpoint ranges of the various energy sources~~,~~ if multiple energy sources are utilized within a survey~~, headers on final line plots to indicate the shotpoint ranges of the various energy sources~~. Any changes in shooting or processing parameters utilized should be specified within the headers as well~~;~~.

(6) Provisions for having lines plotted at an appropriate vertical scale~~;~~.

(7) Identification of any well~~well(s)~~ used for synthetic seismographs, checkshots or~~and/or~~ VSP~~vertical seismic profile (VSP); and~~.

(8) Provisions for the generation of root mean square velocity panels at intervals to be specified by the director in the approval of the work plan.

(E) The owner shall submit to the director four copies of the final report and digital data with all appropriate header information detailing the results of the seismic reflection data survey. This report shall be submitted with the permit to drill application required by rules 3745-34-12 and 3745-34-13 of the Administrative Code. The report shall be certified in accordance with rule 3745-34-17 of the Administrative Code. The report shall, at a minimum, include the following:

(1) A copy of the seismic reflection field digital data. The field digital data shall be submitted in a format approved by the director within the work plan required~~;~~.

(2) A surveyed base map illustrating the following:

(a) Surveyed line locations with shot points annotated~~;~~.

(b) All wells in the area that penetrate the confining zone, with permit numbers, total depth and standard symbols utilized to denote these wells. The producing zone(s) of these wells should be listed within the final report~~;~~.

(c) The facility property boundaries~~;~~.

(d) County and township boundaries and names (or numbers)~~; and~~.

(e) Highways, pipelines, railways and transmission lines~~;~~.

(3) Provisions for including digital data and mylar plots of seismic profiles in the final report including, but not limited to the following:

(a) Brute stack~~;~~.

(b) Structure stack~~; and~~.

(c) Migration stack~~;~~.

(4) The compilation and presentation of processing step notes with the data. These notes should be detailed so the entire processing sequence may be duplicated by an outside party. Intermediate data, specific procedures and the technical basis for selected procedures applied in all static corrections should be provided in digital form~~;~~.

(5) A copy of the field tapes and all digital processed data, in a format and medium approved by the director.

(6) A copy of interpreted brute stack, structure stack, migration stack sections, and other sections as requested by the director with all significant geologic horizons annotated. The stratigraphic nomenclature shall be

that currently in use by the Ohio department of natural resources, division of geologic survey. Wellbores shall be projected along regional geologic strike and annotated on nearby sections. The distance and azimuth of the projection shall be noted on anythe seismic linelines) for each well location. One copy of the uninterpreted migrated seismic sections shall be included within the report;.

(7) The interpreter's data sheets listing the time and geologic nomenclature of the seismic reflections correlated at each shotpoint, if compiled during the interpretation;.

(8) Clearly defined procedures for and final results of velocity analysis;.

(9) A line-by-line discussion addressing all geologic features in evidence on the data;.

(10) An explanation of zones where shot loss is apparent;.

(11) Maps detailing time and depth structure, isochron and isopachs. All maps shall be reasonably scaled to allow identification of all significant features. All maps shall have data points posted at every twentieth shotpoint. Depths and thicknesses of geologic units penetrated by wells within the area of review shall be integrated into the depth or thickness maps constructed from the seismic data. Depths to formation tops and thicknesses of units shall be correlated accurately with those stratigraphic terms currently used by the Ohio department of natural resources, division of geologic survey;.

(12) A list of velocities used in depth or thickness conversions, along with the source(s) for the velocity data. A discussion of depth and thickness conversions shall be presented;.

(13) The approximate vertical resolution of the data, along with a discussion as to the method of determination of this resolution; and.

(14) Unless waived by the director in the approved work plan, the construction of at least one synthetic seismogram. Two copies of each synthetic seismogramseismograph, checkshot survey or vertical seismic profile (VSP) shall be provided with each copy of the report submitted. If a synthetic seismogramseismograph is constructed from a deviated wellbore, it shall be corrected to true depth prior to its use in the interpretation. If sonic and density logs are available for more than one wellbore within the area of review, a synthetic seismogramseismograph shall be generated for each of the wells.

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~~3745-34-50 Criteria and standards for class I injection wells.~~

~~The requirements set forth in rule 3745-34-50 to 3745-34-62 of the Administrative Code apply to owners and operators of class I hazardous waste injection wells, and in some cases, the owners and operators of all class I injection wells. These rules supplement the requirements set forth in rules 3745-34-01, 3745-34-04, and 3745-34-32 to 3745-34-39 of the Administrative Code.~~

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3745-34-51 Minimum criteria for siting class I hazardous waste injection wells.

(A) All class I hazardous waste injection wells shall be sited such that they inject into a formation that is beneath the lowermost formation containing, within one quarter mile of the well bore, an underground source of drinking water.

(B) Upon a finding by the director, the siting of class I hazardous waste injection wells shall be limited to areas that are geologically suitable. The director shall determine geologic suitability based upon information submitted by the applicant including:

(1) An analysis of the structural and stratigraphic geology, the hydrogeology, and the seismicity of the region; and

(2) An analysis of the local geology and hydrogeology of the well site, including, at a minimum, detailed information regarding stratigraphy, structure and rock properties, aquifer hydrodynamics and mineral resources; and

(3) A determination that the geology of the area can be described confidently and that limits of waste fate and transport can be accurately predicted through the use of models.

(C) Class I hazardous waste injection wells shall be sited such that:

(1) The injection zone has sufficient permeability, porosity, thickness and areal extent to prevent migration of fluids into USDWs.

(2) The confining zone:

(a) Is laterally continuous and free of transecting, transmissive faults or fractures over an area sufficient to prevent the movement of fluids into USDW; and

(b) Contains at least one formation of sufficient thickness and with lithologic and stress characteristics capable of preventing vertical propagation of fractures.

(D) The owner or operator shall submit information to the director adequate to demonstrate that:

(1) The confining zone is separated from the base of the lowermost USDW by at least one sequence of permeable and less permeable strata that will provide an added layer of protection for the USDW in the event of fluid movement in an unlocated bore hole or transmissive fault; or

(2) Within the area of review, the piezometric surface of the fluid in the injection zone is less than the piezometric surface of the lowermost USDW, considering density effects, injection pressures and any significant pumping in the overlying USDW; or

(3) There is no USDW present.

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~~3745-34-52 Area of review.~~

~~For the purposes of class I hazardous waste wells, this rule shall apply to the exclusion of rule 3745-34-32 of the administrative code. The area of review for class I hazardous waste injection wells shall be a two-mile radius around the well bore. The director may specify a larger area of review based on the calculated cone of influence of the well.~~

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3745-34-53 Corrective action for wells in the area of review.

For the purposes of class I hazardous waste wells, this rule shall apply to the exclusion of rule 3745-34-33 of the Administrative Code.

(A) As part of the permit to install or operate a class I injection well application, the owner or operator of a class I hazardous waste well shall submit a plan to the director outlining the protocol used to:

(1) Identify all wells penetrating the confining zone or injection zone within the area of review; and

(2) Determine whether wells are adequately completed or plugged.

(B) The owner or operator of a class I hazardous waste well shall identify the location of all wells within the area of review that penetrate the injection zone or the confining zone and shall, as required in rule 3745-34-59 of the Administrative Code, submit:

(1) A tabulation of all wells within the area of review that penetrate the injection zone or the confining zone; and

(2) A description of each well or type of well and any records of its plugging or completion.

(C) The owner or operator of a class I hazardous waste injection well, shall as part of the application for a permit to drill or operate submit a plan consisting of such steps or modification as are necessary to prevent movement of fluids into or between USDWs, for wells that the director determines are improperly plugged, completed, or abandoned, or for which plugging or completion information is unavailable. Where the plan is adequate, the director shall incorporate it into the permit as a condition. Where the director's review of an application indicates that the permittee's plan is inadequate, the director shall:

(1) Require the applicant to revise the plan;

(2) Prescribe a plan for corrective action as a condition of the permit; or

(3) Deny the application.

(D) Any permit issued for an existing class I hazardous waste injection well requiring corrective action other than pressure limitations shall include a compliance schedule requiring any corrective action accepted or prescribed under this section. Any such compliance schedule shall provide for compliance no later than two years following issuance of the permit and shall require observance of appropriate pressure limitations under paragraph (D)(2) of this rule until all other corrective action measures have been implemented.

(1) No owner or operator of a new class I hazardous waste injection well may begin injection until all corrective actions required under this rule have been taken.

(2) The director may require pressure limitations in lieu of plugging. If pressure limitations are used in lieu of plugging, the director shall require as a permit condition that injection pressure be so limited that pressure in the injection zone at the site of any improperly completed or abandoned well within the area of review would not be sufficient to drive fluids into or between USDWs. This pressure limitation shall satisfy the corrective action requirement. Alternatively, such injection pressure limitation may be made part of a compliance schedule and may be required to be maintained until all other required corrective actions have been implemented.

(E) In determining the adequacy of corrective action proposed by the applicant under this rule and in determining

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~~the additional steps needed to prevent fluid movement into and between USDWS, factors considered by the director shall include:~~

~~(1) Nature and volume of injected fluid; and~~

~~(2) Nature of native fluids or byproducts of injection; and~~

~~(3) Geology; and~~

~~(4) Hydrology; and~~

~~(5) History of the injection operation; and~~

~~(6) Completion and plugging records; and~~

~~(7) Closure procedures in effect at the time the well was closed; and~~

~~(8) Hydraulic connections with USDWs; and~~

~~(9) Reliability of the procedures used to identify abandoned wells; and~~

~~(10) Any other factors which might affect the movement of fluids into or between USDWs.~~

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3745-34-54 Construction requirements.

(A) All existing and new class I hazardous waste injection wells shall be constructed and completed by owners and operators to:

(1) Prevent the movement of fluids into or between USDWs or into any unauthorized zones;

(2) Permit the use of appropriate testing devices and work over tools; and

(3) Permit continuous monitoring of injection tubing and long string casing as required pursuant to rule 3745-34-56 of the Administrative Code.

(B) All well materials used in the construction of new class I hazardous waste injection wells must be compatible with fluids with which the materials may be expected to come into contact. A well shall be deemed by the director to have compatibility as long as the materials used in the construction of the well meet or exceed the requirements of this rule.

(C) Casing and cementing of new wells.

(1) Casing and cement used in the construction of each newly drilled well shall be designed for the life expectancy of the well, including the post-closure care period. The casing and cementing program shall be designed to prevent the movement of fluids into or between USDWs, and to prevent potential leaks of fluids from the well. In establishing casing and cementing requirements of the permit, the director shall consider the following information as required by rule 3745-34-59 of the Administrative Code.

(a) Depth to the injection zone;

(b) Injection pressure, external pressure, internal pressure and axial loading;

(c) Hole size;

(d) Size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification and construction material);

(e) Corrosiveness of injected fluid, formation fluids and temperature;

(f) Lithology of injection and confining zones;

(g) Type or grade of cement; and

(h) Quantity and chemical composition of the injected fluid.

(2) One surface casing string shall, at a minimum, extend into the confining bed below the lowest formation that contains a USDW and be cemented by circulating cement from the base of the casing to the surface, using a minimum of one hundred twenty per cent of the calculated annular volume. The director may require more than one hundred twenty per cent when the geology or other circumstances warrant to protect underground sources of drinking water.

(3) At least one long string casing, using a sufficient number of centralizers, shall extend to the injection zone and shall be cemented by circulating cement to the surface in one or more stages:

(a) Of sufficient quantity and quality to withstand the maximum operating pressure; and

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(b) In a quantity no less than one hundred twenty per cent of the calculated volume necessary to fill the annular space. The director may require more than one hundred twenty per cent when the geology or other circumstances warrant to protect underground sources of drinking water.

(4) Circulation of cement may be accomplished by staging. The director may approve an alternative method of cementing in cases where the cement cannot be recirculated to the surface, provided the owner or operator can demonstrate by using logs that the cement is continuous and does not allow fluid movement behind the well bore and it is still protective of underground sources of drinking water.

(5) Casings, including any casing connections, must be rated to have sufficient structural strength to withstand, for the design life of the well;

(a) The maximum burst and collapse pressures that may be experienced during the construction, operation, and closure of the well; and

(b) The maximum tensile stress that may be experienced at any point along the length of the casing during the construction, operation, and closure of the well.

(6) At a minimum, cement and cement additives must be of sufficient quality and quantity to maintain integrity over the design life of the well.

(D) Tubing and packer.

(1) All class I hazardous waste injection wells shall inject fluids through tubing with a packer set at a point approved by the director.

(2) In determining and specifying requirements for tubing and packer, the director shall consider the following factors, among others:

(a) Depth of setting;

(b) Characteristics of injection fluid (chemical content, corrosiveness, temperature and density);

(c) Injection pressure;

(d) Annular pressure;

(e) Rate (intermittent or continuous), temperature and volume of injected fluid;

(f) Size of casing; and

(g) Tubing tensile, burst, and collapse strengths.

(3) The director may approve the use of fluid seal if the director finds that the following conditions are met:

(a) The operator demonstrates that the seal will provide a level of protection comparable to a packer;

(b) The operator demonstrates that the staff is, and will remain, adequately trained to operate and maintain the well and to identify and interpret variations in parameters of concern;

(c) The permit contains specific limitations on variations in annular pressure and loss of annular fluid;

(d) The design and construction of the well allows continuous monitoring of the annular pressure and

~~mass balance of annular fluid; and~~

~~(c) A secondary system is used to monitor the interface between the annulus fluid and the injection fluid and the permit contains requirements for testing the system every three months and recording the results.~~

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3745-34-55 Logging, sampling, and testing prior to new well operation.

(A) During the drilling and construction of a new Class I hazardous waste injection well, appropriate logs and tests shall be run to determine or verify the depth, thickness, porosity, permeability, and rock type of, and the salinity of any entrained fluids in, all relevant geologic units to assure conformance with performance standards of rule 3745-34-54 of the Administrative Code and to establish accurate baseline data against which future measurements may be compared. A descriptive report interpreting results of such logs and tests shall be prepared by a knowledgeable log analyst and submitted to the director. Such logs and tests shall include:

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

(2) Such other logs and tests as may be required by the director 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. At a minimum, the following logs shall be required in the following situations:

(a) Upon installation of the surface casing:

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

(ii) A cement bond and variable density log, and a temperature log after the casing is set and cemented.

(b) Upon installation of the long string casing;

(i) Resistivity, spontaneous potential, porosity, caliper, gamma ray, and fracture finder logs before the casing is installed; and

(ii) A cement bond and variable density log, and a temperature log after the casing is set and cemented.

(c) The director may allow the use of an alternative to the above logs when an alternative will provide equivalent or better information; and

(3) A mechanical integrity test consisting of:

(a) A pressure test with liquid or gas; and

(b) A radioactive tracer survey; and

(c) A temperature or noise log; and

(d) A casing inspection log, if required by the director; and

(e) Any other test required by the director.

(B) Whole cores or sidewall cores of the confining and injection zones and formation fluid samples from the injection zone shall be taken. The director may accept cores from nearby wells if the owner or operator can

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~~demonstrate that core retrieval is not possible and that such cores are representative of conditions at the well. The director may require the owner or operator to core other formations in the bore hole.~~

~~(C) The fluid temperature, pH, conductivity, pressure and the static fluid level of the injection zone must be recorded.~~

~~(D) At a minimum, the owner or operator of a Class I hazardous waste injection well shall submit for review by the director determinations or calculations of the following for the injection and confining zones:~~

~~(1) Fracture pressure; and~~

~~(2) Other physical and chemical characteristics of the injection and confining zones; and~~

~~(3) Physical and chemical characteristics of the formation fluids in the injection zone.~~

~~(E) Upon completion, but prior to operation, the owner or operator shall conduct the following tests to verify hydrogeologic characteristics of the injection zone:~~

~~(1) A pump test; or~~

~~(2) Injectivity tests.~~

~~(F) The director reserves the right to witness all logging and testing required by this rule. The owner or operator shall submit a schedule of such activities to the director thirty days prior to conducting the initial test.~~

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3745-34-59 Information to be evaluated by the director.

(A) For a new class I hazardous waste injection well, the owner shall submit all information listed in paragraph (B) of this rule as part of the permit application except for those items of information which are current, accurate, and available in the existing permit record. For both existing and new class I hazardous waste injection 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 and readily available to the director and sufficiently identifiable to be retrieved.

(B) Prior to the issuance of a permit for an existing class I hazardous waste injection well to operate or the construction or conversion of a new class I hazardous waste injection well, the director shall review the following to assure that the requirements of this chapter are met:

(1) Information required by rules 3745-34-12, 3745-34-13, and 3745-34-14 of the Administrative Code;

(2) 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;

(3) A tabulation of all wells within the area of review which penetrate the proposed injection zone or confining 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) The protocol followed to identify, locate and ascertain the condition of abandoned wells within the area of review which penetrate the injection or the confining zones;

(5) 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;

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

(7) Maps and cross-sections illustrating the regional geologic setting;

(8) Proposed operating data:

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

(b) Average and maximum injection pressure and calculation of proposed maximum injection pressure.

(9) Proposed formation testing program to obtain an analysis of the chemical, physical and radiological characteristics of and other information on the injection formation and the confining zone;

(10) Proposed stimulation program;

(11) Proposed injection procedure;

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

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~~(13) Contingency plans to cope with all shut-ins or well failures so as to prevent migration of fluids into any USDW;~~

~~(14) Plans (including maps) for meeting monitoring requirements of rule 3745-34-57 of the Administrative Code;~~

~~(15) For wells within the area of review which penetrate the injection zone or the confining zone but are not properly completed or plugged, the plan and comprehensive schedule for corrective action to be taken under rule 3745-34-53 of the Administrative Code;~~

~~(16) Construction procedures including a cementing and casing program, well materials specifications and their life expectancy, logging procedures, deviation checks, and a drilling, testing and coring program; and~~

~~(17) 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 for post closure care.~~

~~(C) Prior to the director's granting approval for the operation of a Class I hazardous waste injection well, the owner shall submit to the director for review the following information, which shall be included in the completion report:~~

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

~~(2) A demonstration of mechanical integrity pursuant to rule 3745-34-58 of the Administrative Code;~~

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

~~(4) The results of the injection zone and confining zone testing program as required in rule 3745-34-60 of the Administrative Code;~~

~~(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 confining zone and with materials used to construct the well;~~

~~(7) The calculated area of review based on data obtained during logging and testing of the well and the formation, and where necessary revisions to the information submitted under rule 3745-34-60 of the Administrative Code; and~~

~~(8) The status of corrective action on wells identified in rule 3745-34-60 of the Administrative Code.~~

~~(D) Prior to granting approval for the plugging and abandonment or closure of a Class I hazardous waste injection well, the director shall review the information required by rules 3745-34-61 and 3745-34-62 of the Administrative Code.~~

~~(E) Any permit issued for a Class I hazardous waste injection well for disposal on the premises where the waste is generated shall contain a certification by the owner or operator that:~~

~~(1) The generator of the hazardous waste has a program to reduce the volume or quantity and toxicity of such waste to the degree determined by the generator to be economically practicable; and~~

~~(2) Injection of the waste is that practicable method of disposal currently available to the generator which~~

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~~minimizes the present and future threat to human health and the environment.~~