

2009 5-year Rule Review Draft Changes – December 1, 2009

1501:21-1-01 Notice of public hearing to adopt, amend, or rescind rules.

- (A) Public notice of hearings to be conducted by the division of soil and water resources, department of natural resources, shall be advertised in the register of Ohio. In addition to public notice given in the register of Ohio, the division may give whatever other notice it reasonably considers necessary to ensure notice constructively is given to all persons who are subject to or affected by the proposed rule, amendment or rescission
- (B) Said notice shall be given at least thirty days, but not more than sixty days, prior to the hearing. The notice shall state the division's intention to consider adopting, amending, or rescinding a rule; shall include a synopsis or full text of the proposed rule, amendment, or rule to be rescinded or a general statement of the subject matter to which such proposed rule relates; and shall enumerate the date, time, and place of the hearing on the proposed action. The notice shall also state the place from which copies of the proposed rule, amendment, or rule to be rescinded may be obtained.

Effective: January 16, 2005

1501:21-1-02 Authority for rules.

Division-level 1501:21 of the Administrative Code prescribed by the chief of the division of soil and water resources of the department of natural resources, state of Ohio, in accordance with Chapter 119. of the Revised Code and the authority vested in the chief by Chapter 1521. of the Revised Code to issue permits for construction of dams and levees, to make periodic inspections of existing dams and levees, to collect annual fees for dams, and to exempt certain dams and levees from the provisions of sections 1521.06 and 1521.062 of the Revised Code.

Effective: January 16, 2005

1501:21-3-01 Definitions.

The following definitions shall apply to the terms used in division-level 1501:21 of the Administrative Code:

- (A) "Applicant" means the individual, corporation, partnership, proprietor, or public agency which is making an application for a construction permit.
- (B) "Chief" means the chief of the division of soil and water resources of the department of natural resources, state of Ohio.
- (C) "Conveyance" is the hydraulic term applied to the measurement of the carrying capacities of stream channels and overbank areas. Conveyance is directly proportional to discharge.
- (D) "Critical flood" means the flood that would result in no additional loss of life, health or property along a critical routing reach downstream of the dam from overtopping failure of the dam when compared to the potential for loss of life, health or property caused by the flood in the absence of a dam overtopping failure.
- (E) "Critical routing reach" means the entire floodplain area downstream of the dam where life, health, or property is potentially affected by failure of a dam.
- (F) "Dam" means any artificial barrier together with any appurtenant works, which either does or may impound water or other liquefied material. Upground reservoirs and lagoons are considered to be dams. A fill or structure intended solely for highway or railroad use that does not permanently impound water or other liquefied material as determined by the chief is not considered a dam.
- (G) "Design flood" is the runoff from the design storm taking into account the physiographic, topographic, hydrologic, and hydraulic characteristics of the drainage area.
- (H) "Division" means the division of soil and water resources of the department of natural resources, state of Ohio.
- (I) "Emergency spillway" means a discharge system designed to operate at an elevation above the principal spill way to safely convey discharges that exceed the principal spill way's capacity without jeopardizing the safety of the dam.
- (J) "Encroachment" means a reduction of conveyance for flood flows along a stream.
- (K) "Enlargement" means increasing the elevation of the top of an existing dam for the purpose of increasing the elevation of the normal pool level of the impoundment, or increasing the elevation of the top of an existing levee.
- (L) "Equal degree of encroachment" means an equal percentage reduction of conveyance for flood flows along both sides of a stream.
- (M) "Flood" means a general and temporary condition of partial or complete inundation of normally dry land area.
- (N) "Flood profile" means a graph or longitudinal plot of maximum water surface elevations of a flood event versus measured distance along a stream from a fixed point of reference.
- (O) "Floodplain" means the land area adjoining a watercourse which may be inundated during a flood.
- (P) "Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than the allowable rise as designated by the federal emergency management agency, not exceeding one foot.
- (Q) "Freeboard" means the vertical dimension between the top of the dam or levee(without camber) and the reservoir at normal pool level or stream water surface.
- (R) "Height-of-dam" means the vertical dimension as measured from the elevation of the

natural stream bed, watercourse, or lowest ground elevation at the downstream or outside toe of a dam to the elevation of the top of the dam.

- (S) “Levee” means any artificial barrier together with any appurtenant works that will divert or restrain the flow of a stream or other body of water for the purpose of protecting an area from inundation by flood waters.
- (T) “One-hundred-year flood” means the flood having a one per cent probability of being equaled or exceeded in any given year.
- (U) “Overtopping” means an event that occurs when the pool or stream elevation exceeds the elevation of the top of a dam or levee.
- (V) “Owner” means those who own, or propose to construct a dam or levee.
- (W) “Pipe conduit” means any tube or hollow channel which conveys water to or from a reservoir, or through a levee.
- (X) “Primary or principal spillway” means the first discharge system designed to begin operation after the normal design storage capacity has been exceeded.
- (Y) “Probable maximum flood” or “PMF” means the flood that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the drainage basin under study. The “PMF” is derived from the probable maximum precipitation and is determined by using a hydrologic model to simulate the drainage basin’s response to those critical conditions which produce the most severe flood runoff.
- (Z) “Probable maximum precipitation” or “PMP” means theoretically, the greatest depth of precipitation for a given duration that is physically possible over a given size storm area at a particular geographic location. The “PMP” is determined on the basis of data obtained by the national oceanic and atmospheric administration or other sources accepted by the chief.
- (AA) “Reservoir” means any impoundment, or any potential impoundment, that will be created by a dam.
- (BB) “Special flood hazard area” means the land in the floodplain that has been identified by the national flood insurance program and adopted by a political subdivision of the state as being subject to a one per cent or greater chance of flooding in any given year.
- (CC) “Spillway level” means the elevation of the primary (principal) spillway or the elevation of the top of the dam if there is no spillway.
- (DD) “Storage volume” or “storage capacity” means the volume of water or other liquefied material, which is or may be impounded by a dam at a given elevation above the natural stream bed or above the natural grade for upground reservoirs. Impounded material that can be shown to the satisfaction of the chief to be non-liquefied can be excluded from the storage volume.
- (EE) “Total storage volume” means the total volume of water or other liquefied material impounded when the pool level is at the top of the dam immediately before it is overtopped. Impounded material that can be shown to the satisfaction of the chief to be non-liquefied can be excluded from the total storage volume.
- (FF) “Upground reservoir” means a reservoir formed by artificial barriers on two or more sides and which impounds water or liquefied material pumped or otherwise imported from an exterior source. Lagoons are considered upground reservoirs.
- (GG) “Length-of-dam” means the horizontal dimension as measured along the crest of the dam from natural abutment to natural abutment. Spillways systems over the dam but not in the abutment area are included in the length determination. For upground reservoirs the length is the continuous distance around the crest of the dam.
- (HH) “Appurtenant Works” means Interrelated elements or components of the dam

including but not limited to outlet works and spillway channels.

Effective: January 16, 2005

1501:21-3-02 Registered professional engineer and surveyor requirement.

- A) Registered professional engineers who are qualified in the design, construction, and inspection of dams and levees and who are practicing in accordance with the laws of Ohio shall:
- (1) Prepare design reports, plans and specifications for the construction, modification or repair of dams and levees;
 - (2) Inspect the construction, modification or repair of dams and levees;
 - (3) Perform periodic inspections, detailed investigations, and analyses of dams and levees; and
 - (4) Prepare plans and specifications for and inspect the removal of existing dams and levees unless specifically exempted by the chief.
- (B) Throughout division-level 1501:21 rules of the Administrative Code, the term "engineer" shall mean such a registered professional engineer as described in this rule.
- (C) Registered professional surveyors who are practicing in accordance with the laws of Ohio may be required by the chief to prepare survey data for investigations including but not limited to storage volume calculations, critical flood analyses, or dam failure inundation mapping. Throughout division-level 1501:21 rules of the Administrative Code, the term "surveyor" shall mean such a registered professional surveyor as described in this rule.
- (D) Engineering and construction inspection and testing services for all dam construction shall be hired by the applicant and or dam owner or the applicant and or dam owner's engineer and shall not be affiliated with the construction contractor.

Effective: January 16, 2005

1501:21-5-04 The final design report.

The final design report shall include:

- (A) All investigations required by 1501:21-11. Stability and settlement analyses, and seepage and underseepage studies shall be required, unless the applicant can demonstrate to the satisfaction of the chief that these analyses are not necessary.
- (B) The bases, references, calculations, and conclusions relative to hydrologic, hydraulic, and structural design studies, and to the design of spillways and outlet works. Design procedures that have been established by the United States army corps of engineers, the United States department of interior bureau of reclamation, the federal energy regulatory commission, and the United States department of agriculture natural resources conservation service are generally accepted as sound engineering practice. A written summary of the design references and assumptions that are used shall be included in the information that is submitted to the chief.
- (C) Steps to minimize erosion during construction.
- (D) Detailed cost estimates of the following:
 - (1) Construction of the structure and its appurtenances;
 - (2) Performance of construction inspections and materials testing; and
 - (3) Preparation of the operation, maintenance, and inspection manual, the emergency action plan, and the as-built plans.The design cost for the project is not included.
- (E) For all class I structures except upground reservoirs, an emergency action plan for use during construction.
- (F) For all dams, a first filling monitoring plan.
- (G) Any other studies, investigations, and pertinent design information as may be required by the chief.

Effective: January 16, 2005

1501:21-5-05 The plans.

The plans shall consist of a bound portfolio of the drawings with all sheets being of the same size not larger than twenty-four inches by thirty-six inches. The plans shall also be provided in a digital file format acceptable to the chief.

- (A) Sheet one shall show: the name of the project; its location, e.g. section, township, and county; the name of the owner or applicant; and the classification of the structure. Sheet one shall also contain a vicinity map that shows the project location with respect to the boundaries of political subdivisions, streams, highways, airports, and railroads.
- (B) Topographic and cross-section surveys shall be made with sufficient accuracy to locate the proposed construction. Locations of baselines, centerlines, and other horizontal and vertical control points shall be shown on a topographic map of the site.
- (C) A map shall be included that shows the locations of borings, test pits, proposed borrow areas, known farm tiles, utility lines, and other areas pertinent to the design and construction of the structure. The location of proposed borrow areas may be excluded from the map if acceptable to the chief.
- (D) The remainder of the plans shall be accurately drawn in sufficient detail as to clearly indicate the extent and complexity of the work.
- (E) The engineer shall affix the engineer's stamp, signature and date on each page of the plans.

Effective: January 16, 2005

1501:21-11-05 Hydrologic and hydraulic investigations.

- (A) Hydraulic and hydrologic analyses shall be accomplished using methodologies and computer analyses developed by the division of soil and water resources, the United States army corps of engineers, the United States geological survey, the natural resources conservation service, the United States bureau of reclamation, the national weather service, or others which employ sound engineering basis and are specifically approved by the chief. Both present and projected future land uses shall be considered in determining the runoff characteristics of the drainage areas. The more severe of these two conditions shall be used in the design.
- (B) For dams, the hydrologic and hydraulic assumptions and design calculations used in spillway designs shall be included in the design submittal. These shall include, but not be limited to:
- (1) Rainfall and runoff data;
 - (2) Reservoir inflow hydrographs;
 - (3) Reservoir area-storage volume elevation data to the top of dam elevation;
 - (4) Spillway elevation-discharge data;
 - (5) Reservoir flood routings and backwater analyses, except as provided in rule 1501:21-13-03 of the Administrative Code; and
 - (6) A dam failure analysis as may be required by the chief for downstream hazard evaluation.
- (C) For levees, the hydrologic and hydraulic assumptions and design calculations used shall be included in the design submittal. These shall include, but not be limited to:
- (1) Discharge/probability data;
 - (2) Hydrographs;
 - (3) Valley cross-sections;
 - (4) Descriptive hydraulic information concerning bridges and other structures that influence the hydraulic characteristics of the watercourse;
 - (5) Stream elevation-discharge-storage data; and
 - (6) Stream flood routings and flood profiles.

Effective: January 16, 2005

1501:21-13-06 Requirements for drains and other pipe conduits.

- (A) Dams in class I, class II, and class III shall include a device to permit draining the reservoir within a reasonable period of time as approved by the chief. Pipe conduits used for lake drains shall have a minimum inside diameter of not less than four inches.
- (B) Valves or sluice gates in pipe conduits shall be installed upstream from the centerline of the dam unless otherwise approved by the chief.
- (C) All pipe conduits used as drains, water supply lines, or other pressure-flow conduits, regardless of classification of the dam, shall meet the requirements of paragraphs (A), (B), (C), and (E) of rule 1501:21-13-04 of the Administrative Code and - paragraphs (A), (C), and (D) of rule 1501:21-13-05 of the Administrative Code.
- (D) When the drain outlets into a pipe-conduit upstream from the centerline of the dam, seepage control devices may be omitted from the drain.
- (E) All new dam construction shall include a bulkhead for the outlet works unless specifically exempted by the chief.

Effective: January 16, 2005

1501:21-13-08 Additional design requirements for dams.

- (A) The safety factors for the various elements of the dam shall conform to good engineering practice as approved by the chief. The safety factors and the design standards that are used by the applicant shall agree with the approved design assumptions.
- (B) Inspection devices such as piezometers, settlement platforms, stand-pipes, tell-tale stakes, monitoring weirs, inclinometers, and permanent bench marks, may be required by the chief for the division's and the owner's use in the inspection of the structure during and after completion of construction.
- (C) The chief may require dams to have a staff gauge to allow monitoring of lake levels within a range from the lower of five feet below normal pool or the normal drawdown level, to the top of dam elevation. The design of the staff gauge will be reviewed and approved by the chief.
- (D) Grass vegetation or other vegetation of similar properties are the only acceptable vegetative covers for earthen dam embankment surfaces or vegetated earth spillways. Trees and brush are not acceptable surface covers.
- ~~(D)~~(E) The applicant shall demonstrate to the satisfaction of the chief that the structure will be consistent and in accordance with all applicable state and local floodplain regulations and requirements.

Effective: January 16, 2005

1501:21-13-13 Freeboard requirements for levees.

- (A) For levees in class I, the minimum elevations of the top of the levee shall be at least three feet higher than the maximum adjacent water surface elevations during passage of the design flood. The chief may approve a lower freeboard requirement with acceptable documentation.
- (B) For levees in class II and class III, the minimum elevations of the top of the levee shall be two feet higher than the maximum adjacent water surface elevations during passage of the design flood.
- (C) Where special conditions of severe frost damage, ice damage, stream obstruction, wave action, or impact of other structures may occur, the chief may require elevations higher than required in paragraph (A) of this rule.

Effective: January 16, 2005

1501:21-15-06 Operation, maintenance, and inspection manual.

A manual detailing the operation, maintenance, and inspection of the dam or levee and the appurtenances thereto, shall be prepared for the owner's use during the life of the structure. Manuals shall be required for all class I, class II, and class III structures. The manual shall be submitted to the chief for approval upon the completion of construction or as otherwise directed by the chief. The manual shall be provided in both a paper and a digital file format acceptable to the chief. The necessary detail and complexity of the manual will depend upon the complexity of the specific structure for which it is being prepared. However, the manual shall include, but not be limited to, the following:

- (A) An operation plan including, if applicable, a plan for the initial filling of the reservoir;
- (B) A program of scheduled maintenance;
- (C) A program of regular inspection and monitoring of any inspection devices;
- (D) Procedures for safe-rate drawdown of the reservoir;
- (E) Provisions for inspection of the structure and its appurtenances by a qualified engineer;
- (F) Any other measures necessary to insure the continued safe operation and use of the structure.

Effective: January 16, 2005

1501:21-15-07 Emergency action plan.

An emergency action plan shall be required for all class I, II and III structures. The emergency action plan for all class I structures shall include but not be limited to an inundation map of the critical routing reach. An inundation map may also be required for class II and III dams as designated by the chief. The required detail of this map depends upon the complexity of the downstream hazard and shall be acceptable to the chief. Three copies of the emergency action plan shall be submitted to the chief for approval upon the completion of construction or as otherwise directed by the chief. The chief may require additional copies as necessary. The plan shall also be provided in a digital file format acceptable to the chief.

Effective: January 16, 2005

1501:21-19-02 Inspection exemptions for dams and levees.

- (A) The following procedure shall be used for applying for an inspection exemption under section 1521.064 of the Revised Code.
- (1) The owner of the dam or levee shall submit a letter to the chief requesting an exemption under section 1521.064 of the Revised Code.
 - (2) The owner shall also provide a map showing the location of the dam or levee ~~including county, township and section lines, the outline of the reservoir, the location of state, county and township roads, the location of utilities, the topography, and the area downstream of the dam, dike or levee.~~
 - (3) The ~~owner shall submit~~ chief may require submittal of documentation verifying that no person, structure or facility will be damaged by failure of the dam or levee. This documentation may include but not be limited to inundation maps, dam break studies and other calculations and information as deemed necessary by the chief.
 - (4) The owner shall submit a written certification that they accept liability for any injury, death, or loss to persons or property caused by the rupturing of or other structural damage to the dam or levee. This liability certification is not transferable. If the ownership of the dam or levee changes, the new owner shall submit a new liability certification to continue the exemption.
- (B) The dam or levee shall meet the following standards before it can be exempted under section 1521.064 of the Revised Code.
- (1) A dam shall have sufficient discharge/storage capacity to pass the one-hundred-year flood, or other design flood as deemed appropriate by the chief, safely through the appurtenant spillway system.
 - (2) The dam or levee shall be in ~~good~~ a condition sufficient to reasonably assure its continued operation and meet all requirements deemed necessary by the chief.
 - (3) The chief may require the dam or levee ~~shall to~~ have an approved operation, maintenance and inspection manual and an emergency action plan.
- (C) In order to maintain the exemption, the chief will review the status of the dam or levee on an annual basis. The review will follow this procedure.
- (1) The owner will submit a notice to the chief certifying that the downstream hazard of the dam or levee has not changed. This notice will be due to the chief by June thirtieth of each year.
 - (2) The owner shall submit notification to the chief of a change in ownership of the dam or levee.
 - (3) The chief may make periodic site visits to verify the exemption status.
 - (4) If any fact becomes apparent to indicate that the hazard of the dam or levee has changed, the chief shall rescind the exemption and classify the dam or levee based on rule 1501:21-13-01 of the Administrative Code.

Effective: January 16, 2005

1501:21-21-04 Owner's responsibilities in the operation, maintenance, and inspection of dams and levees.

- (A) Pursuant to the provisions of section 1521.062 of the Revised Code, the owner of a dam or levee shall be responsible for the continued safe operation and use of the structure so that it does not constitute a hazard to life, health, or property.
- (B) ~~In the interest of safeguarding life, health, and property, the chief may require the~~ The owner ~~to~~ of a dam or levee shall prepare a written manual detailing the operation, maintenance, and inspection procedures necessary for the continued safe operation and use of the dam or levee, and an emergency action plan. The contents of such manual and plan shall be as described respectively in rules 1501:21-15-06 and 1501:21-15-07 of the Administrative Code. The emergency action plan shall be updated on at least an annual basis including updating all emergency contact information. The owner or the owner's representative shall meet with the local county emergency management director annually and provide an annual update of the emergency action plan signed by the county director to the division.

Effective: January 16, 2005

1501:21-24-01 The annual fee.

The fee schedule for the annual fee established by section 1521.063 of the Revised Code shall be as follows:

- (A) For any dam classified as a class I dam under rule 1501:21-13-01 of the Administrative Code, ~~thirty~~ three hundred dollars plus ten dollars per foot of height of dam, five cents per foot of length of the dam, and five cents per acre-foot of total storage volume impounded by the dam.
- (B) For any dam classified as a class II dam under rule 1501:21-13-01 of the Administrative Code, ~~thirty~~ ninety dollars plus six dollars per foot of height of dam, five cents per foot of length of the dam, and five cents per acre-foot of total storage volume impounded by the dam.
- (C) For any dam classified as a class III dam under rule 1501:21-13-01 of the Administrative Code, ~~thirty~~ ninety dollars plus four dollars per foot of height of dam, five cents per foot of length of the dam, and five cents per acre-foot of total storage volume impounded by the dam.

For purposes of this rule, height of dam is the vertical height, to the nearest foot, as determined by the division under section 1521.062 of the Revised Code. For purposes of this rule, length of the dam is the horizontal dimension as measured along the crest of the dam from natural abutment to natural abutment as determined by the division. Spillways systems over the dam but not in the abutment area are included in the length determination. For upground reservoirs the length is the continuous distance around the crest of the dam. For purposes of this rule, total storage volume impounded by the dam is the total volume of water or other liquefied material impounded when the pool level is at the top of the dam immediately before it is overtopped, to the nearest acre-foot with a maximum of three thousand acre-feet, as determined by the division.

Effective: May 15, 2006

1501:21-24-02 Compliant Dam Discount Program

The compliant dam discount program established by section 1521.063 of the Revised Code shall be administered as follows:

(A) The owner of the dam shall receive an annual ten per cent discount, to the nearest dollar, off the annual fee if the dam has an approved and up-to-date operation, maintenance and inspection manual and emergency action plan in accordance with rule 1501:21-21-04. In order to maintain the discount, the owner must submit the emergency action plan update required by rule 1501:21-21-04 to the chief by May 1 of each year.

(B) The owner of the dam shall receive an annual fifteen per cent discount, to the nearest dollar, off the annual fee if the dam is in good condition and meets all requirements deemed necessary by the chief in accordance with rule 1501:21-21-04. For purposes of this discount, the chief will evaluate the condition of the dam at each periodic inspection as required by rule 1501:21-21-01 or more frequently as necessary. The dam owner will provide whatever documentation is necessary to verify the condition of the dam.

(C) The discounted amount shall be reflected on the annual invoice sent to the dam owner.

(D) If the annual fee is not paid within sixty days following the statutory due date, the full amount of the fee plus penalty and interest is owed as established by section 1521.063 of the Revised Code.