CHAPTER 62-672

MINIMUM REQUIREMENTS FOR EARTHEN DAMS USED IN PHOSPHATE MINING AND BENEFICIATION OPERATIONS AND FOR DIKES USED IN PHOSPHOGYPSUM STACK SYSTEM IMPOUNDMENTS

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62-672.100 General. (Repealed)

Rulemaking Authority 403.06l(22), 403.4155 FS. Law Implemented 403.061(22), 403.4155 FS. History - Revised 12-8-72, Formerly 17-9.01, 17-9.001, 17-672.100, Amended 6-28-99, Repealed 2-16-12.

62-672.200 Definitions.

(1) 100-Year Rainfall Event - A rainfall event which is characterized by a mean return period of one hundred years ,i.e., a rainfall event which has a 99% probability for not being exceeded during any given year.

(2) 100-Year Annual Rainfall - The 100-Year rainfall event representing total annual rainfall of 76 inches.

(3) Abandoned dam - An abandoned dam is one associated with a settling area from which sufficient water has been removed to make the residue no longer a pollutional threat to surface waters or a hazard of any type to land areas.

(4) Above-Grade Perimeter Earthen Dike - A perimeter earthen dike that has its design freeboard above the adjacent ground surface.

(5) Active dam - An active dam is one associated with a settling area into which wastewater is being introduced for purposes of clarification or in which free water remains in contact with the dam.

(6) Auxiliary holding pond (AHP) - a lined storage pond, designated by the operator and approved by the department in accordance with Rule 62-673.320, F.A.C., typically used to hold untreated process water. AHPs are intended to increase system storage above that otherwise provided by cooling/surge ponds and are typically located within the footprint of a phosphogypsum stack system. An existing AHP may be unlined where it was authorized by a permit issued in accordance with Rule 62-673.320, F.A.C., to be in use as of July 19, 2006 or was otherwise subject to a demonstration provided in accordance with subsection 62-673.650(2), F.A.C.

(7) Backup power - A secondary source of power not likely to fail simultaneously with the primary source.

(8) Beach or Delta - A gently sloping area of gypsum deposited within the settling compartment, above the process water level.

(9) Beneficiation - The processing of phosphate ore to separate the phosphate rock from the associated sand and clays.

(10) Berm - A shelf that breaks the continuity of the slope of an embankment in order to arrest the velocity of storm water flowing down the face and/or to enhance the stability of the embankment.

(11) Cast dam - A cast dam is one constructed of fill which was put in place by a dragline or other machine capable of free dumping, and is not mechanically compacted in progressive layers.

(12) Cooling/surge pond – impounded areas within the phosphogypsum stack system, excluding settling compartments atop the phosphogypsum stack, that provide cooling capacity, surge capacity, or any combination thereof, for the phosphoric acid

process water recirculation system including phosphogypsum stack transport, runoff, and leachate water from the process watershed.

(13) Core - A zone of relatively impervious material within the dam to resist the flow of water through the dam.

(14) Cut-off-Trench - An excavation into the foundation material to accept an extension of the core.

(15) Department – The Florida Department of Environmental Protection.

(16) Dike - A barrier to the flow of phosphogypsum and process water which is constructed of naturally occurring soil (earthen dike) or of phosphogypsum and which is a component of a phosphogypsum stack system.

(17) Drain - A material more pervious than the surrounding fill which allows seepage water to drain freely while preventing piping or internal erosion of the fill material.

(a) Blanket drain is a continuous horizontal drain layer within or beneath the downstream portion of the dam.

(b) Chimney drain is a continuous sloping drain layer within the downstream portion of the dam.

(c) Toe drain is a wedge-shaped drain supporting the downstream toe of the dam.

(18) Earthen dam or dam - A barrier to the flow of liquids which is constructed of naturally occurring soil and which is a component of a clay settling area.

(19) Earthen dike - A barrier to the flow of phosphogypsum and process water which is constructed of naturally occurring soil and which is a component of a phosphogypsum stack system.

(20) Emergency diversion impoundment (EDI) - a storage area designated in the facility's site-specific water management plan to be used only when necessary to avoid an unpermitted surface water discharge resulting from dike overtopping or failure in accordance with subsection 62-672.870(3), F.A.C. An EDI is typically located outside the footprint of a phosphogypsum stack system.

(21) Engineer -- An engineer registered in the State of Florida in accordance with Chapter 471, F.S. and with experience in the design, construction, and operation of systems covered by this rule.

(22) Event Storage – The amount of rainfall occurring in a 24 hour period that can be stored within a phophorgypsum stack system, at or below maximum design levels, during the same 24 hour period through any combination of gravity flow or use of the emergency measures identified in the operation plan for the phosphogypsum stack system pursuant to subsection 62-672.780(7), F.A.C., but specifically excluding use of temporary measures identified in rule 62-672.870, F.A.C.

(23) Filter - A zone of material sufficiently more pervious than the dam or foundation so that free water will drain through the filter, but at the same time sufficiently fine grained to prevent piping of the fill material.

(24) Freeboard -- The height of the lowest point on the crest of the dam or dike crest, excluding the emergency spillway, above the highest adjacent liquid surface within the impoundment.

(25) Gypsum dike - The outermost dike constructed within the perimeter formed by a starter dike for the purpose of raising a phosphogypsum stack and impounding phosphogypsum and/or process water. This term specifically excludes any dike inboard of a rim ditch, any partitions separating stack compartments, or any temporary windrows placed on the gypsum dike.

(26) Inside (upstream) slope - The face of the dam or dike which will be in contact with the impounded liquids.

(27) Log - A written record maintained by the owner of an earthen dam or a phosphogypsum stack system that contains a schedule of inspections of system components, the findings of such inspections, and any remedial measures taken in response to such findings.

(28) Maximum Design Level – the maximum process water elevation when the water level is at the operating design freeboard for an impoundment as determined using generally accepted good engineering practices, or the minimum freeboard allowed by subsection 62-672.600(1)(c), F.A.C., for perimeter earthen dikes. For the purposes of this chapter, generally accepted good engineering practices for determining the permitted operating design freeboard includes, at a minimum, evaluation of wind surge, wave height, and wave run-up analyses, erosion protection measures, and protection of dike integrity and inner rim-ditch geometry.

(29) Maximum Potential Storage – the maximum amount of rainfall that can be contained within a phosphogypsum stack system, including AHPs and the top areas of phosphogypsum stacks, and temporary use of design freeboards in accordance with the provisions of subsection 62-672.870(1), F.A.C.

(30) New perimeter earthen dike - A perimeter earthen dike which is the subject of a complete application for a department permit to construct or laterally expand a phosphogypsum stack system submitted to the department after June 28, 1999.

(31) Non-clay phosphate mining impoundments – Above-grade, non-clay phosphate mining/reclamation berms and impoundments such as:

(a) units under reclamation receiving hydraulic fill;

(b) units constructed for impounding stormwater runoff;

(c) structures located in mine cuts that could impound water above grade, and where a failure of such structure could result in a release of waters to waters of the state; and

(d) perimeter ditch and berm systems that impound water above grade.

(32) Operation plan - The operation plan required by 62-673.340(3).

(33) Outside (downstream) slope - The face of the dam or dike which will not be in contact with the impounded liquids.

(34) Perimeter earthen dike - The outermost earthen dike surrounding a phosphogypsum stack system that has not been closed or any other earthen dike the failure of which could cause a release of process water outside the phosphogypsum stack system.

(35) Phosphogypsum or gypsum - The definition of "phosphogypsum" set forth in rule 62-673.200(13) is adopted and incorporated by reference.

(36) Phosphogypsum stack or stack - The definition of "phosphogypsum stack" set forth in rule 62-673.200(14) is adopted and incorporated by reference.

(37) Phosphogypsum stack system – The definition of “phosphogypsum stack system” set forth in rule 62-673.200(15) is adopted and incorporated by reference.

(38) Phreatic Surface - The upper surface of the water table within the mass of the dam or dike. It would be the elevation of the water surface if an open hole were dug into the dam.

(39) Piping - Progressive erosion of soil or solid material within the dam or dike, starting downstream and working upstream, creating a tunnel into the dam or dike. Piping occurs when the velocity of the flow of seepage water is sufficient for the water to transport material from the embankment.

(40) Process Water - The definition of "process wastewater" set forth in rule 62-673.200(16) is adopted and incorporated by reference.

(41) Process Watershed – the aggregate of all areas that contribute to or generate additional process water from direct precipitation, rainfall runoff, or leachate to a phosphogypsum stack, process water cooling/surge ponds, or any other storage, collection, or conveyance system associated with the transport of phosphogypsum or process water for a particular phosphogypsum stack system.

(42) Qualified Company Employee – An employee trained pursuant to rule 62-672.800 specifically in the area of their job duties.

(43) Regional Holding Pond (RHP) – a lined storage pond typically used to hold untreated process water which is constructed for the purpose of temporarily storing process water from more than one facility and which is approved by the department in accordance with Rule 62-673.320, F.A.C.

(44) Retired dam - A retired dam is one associated with a settling area into which no additional wastewater is currently being introduced but which could be reactivated.

(45) Rolled dam - A rolled dam is one constructed of fill which is placed in layers which are mechanically compacted individually prior to placement of the next higher layer.

(46) Safety Factor - A numerical value which represents the ratio of the ultimate strength of a material or structure to the stress which will be applied to that material or structure.

(47) Settling area - A phosphate mining clay settling area surrounded by dams, embankments, or natural soil masses in which liquids are introduced for the purpose of separating suspended solid matter from water used for transportation of such matter.

(48) Starter Dike – The initial dike constructed at the base of a phosphogypsum stack to begin the process of storing phosphogypsum.

(49) System storage – the amount of rainfall that can be contained within a phosphogypsum stack system at or below maximum design levels, including AHPs and the top areas of phosphogypsum stacks.

(50) Tailwater level -- The elevation of the water at the downstream toe of the dam or dike.

(51) Third-party engineer – An engineer who is not an employee of any entity that owns or operates a phosphate mine or phosphate fertilizer manufacturing facility.

(52) Toe -- The toe of the dam or dike is the junction between the face of the dam or dike and the adjacent terrain.

(53) Wave height – the average height of the waves that may be determined for design purposes as a function of sustained wind speed, effective fetch length, and wind duration. Sustained wind speed shall be determined based on either an estimated 100-year return frequency wind speed adjusted to a sustained wind speed for a 10-minute duration, or a 110 miles per hour (mph) fastest-mile wind speed for locations within 25 miles of the seacoast and a 95 mph fastest-mile wind speed at other inland locations where the fastest-mile wind speeds are adjusted to a sustained wind speed for a 10-minute duration.

(54) Wave run-up – the difference in vertical height between the maximum elevation attained by wave run up or uprush on a slope and the still water elevation at the inboard toe of the slope.

(55) Wind surge or setup – the vertical rise in base water-surface elevation, exclusive of the wave height, above the still water elevation, caused by wind-induced stresses and mounding of the water surface in the leeward direction.

Specific Authority 403.061(22), 403.4155 FS. Law Implemented 403.061(22), 403.4155 FS. History - Revised 12-8-72, Formerly 17-9.02, 17-9.020, 17-672.200, Amended 6-28-99, 7-19-06.

Part I - Phosphate Mining and Beneficiation Operations

62-672.300 Construction of New Dams.

(1) Design.

(a) Site investigation - The general area desired for use as a settling area shall be carefully inspected by the design engineer prior to selection of the exact location for a dam. Areas of uneven natural subsidence, sink-hole, pockets of organic matter, or other unstable soils shall be avoided, unless special provisions are made for their correction.

(b) Soil testing - A program of soil sampling and testing adequate to determine the characteristics of the foundation material which will support the proposed dam and of the material to be used for construction of the dam shall be performed. Sampling shall include borings or in-place samples from the exposed excavation face.

All borings shall be logged using a recognized engineering soil classification system, (such as Unified System) with location and depths of all samples recorded on the log. Tests such as the determination of in-place densities, shear-strength; and permeabilities of the foundation and embankment soils shall be performed. Tests on foundation soils shall be performed on either undisturbed samples or on the in-place soil. Tests on embankment soils shall be performed on samples remolded to the densities to be used in construction.

(c) Cross Section design - There shall be a minimum freeboard of five feet (5') below the inside crest. The outside crest of the top of the dam shall be higher than the inside crest in order to force all crest drainage to the inside of the dam. Both inside and outside slopes shall be no steeper than two horizontal to one vertical. The design shall provide positive seepage control features, such as:

1. Cut-off trench in natural soil foundations.
2. Clay core.
3. Blanket drain.
4. Chimney drain and toe drain.

The top of the dam shall include a roadway which will permit wheeled vehicle traffic at all times. The design shall also incorporate an all-weather roadway near the downstream toe which will permit wheeled vehicle traffic around the perimeter of the dam for purposes of inspection of the slope, toe and natural ground beyond the toe, as well as maintenance.

(d) Stability analysis - A flow net analysis shall be made to determine the location of the phreatic surface, flow lines, and lines of equal head within the foundation and fill being designed. This analysis may be based on graphical construction, electrical or liquid analogs, soil prototype methods, or other accepted methods. The flow net and stability analysis shall use the maximum pool elevation with not less than five feet (5') of clear water, this elevation being five feet (5') below the inside crest of the dam. Possible fluctuations of the tailwater level shall be included in the analyses.

(e) Design safety factors - The designing engineer shall use the following minimum safety factors: 1.75 for horizontal shear at base of fill; 1.5 for horizontal shear within the fill due to seepage through the outer face; 1.5 for bearing capacity of foundation soils; 1.5 for protection against shear failure of any circular arc in either inside or outside slope. It is imperative that water pressure distribution be included in the analyses.

(f) If a cast dam is to be constructed where adequate site preparation, as defined in rule 62-672.300(2) below, has not been accomplished; or where the fill materials do not meet the requirements of rule 62-672.300(3) below; then the design shall incorporate either of the following alternatives:

1. A portion of the material which forms the downstream slope shall be removed and the foundation thus exposed shall be prepared in the same manner as is prescribed herein for a rolled dam. Fill material shall then be placed as a rolled embankment which shall be of such design that the safety factor with respect to

downstream movement of the rolled section shall be no less than 1.2 when assuming that the remaining cast material below the phreatic surface has become liquid.

2. Sand tailings shall be placed against the downstream slope to the extent that the wedge so formed shall have a safety factor with respect to downstream movement of no less than 1.2 when assuming that the cast material below the phreatic surface has become liquid.

(g) When the foundation for a cast dam meets the requirements of rule 62-672.300(2) and the materials used for the fill meet the requirements of rule 62-672.300(3), then the dam shall be designed in accordance with rules 62-672.300(1)(a)(b)(c)(d) and (e); except that the computations of all required safety factors shall be based on only seventy-five percent (75%) of the indicated strengths of the cast materials which are tested at the same density as will exist within the dam.

(2) Site Preparation - Ground which will become the foundation of earthen dams shall be stripped of all vegetation and organic detritus or residue, including muck, mud, slimes, or other material which would flow or undergo excessive consolidation under heavy loading. All earth foundation surfaces on which fill is to be placed shall be scarified or moistened and compacted prior to spreading of first course of fill material, and the dam base shall be well drained during construction, except when placing hydraulic fill.

(3) Material to be Used - Material used for earthen dams shall be free of stumps, vegetation, trees, palmettos, muck, and other extraneous matter which could affect the compactability, density, permeability, or shear strength of the finished dam. Tailings may be used for dam fill when such a completed dam will meet the seepage and structural requirements in rule 62-672.300(1).

(4) Water level control-Sufficient water level control structures shall be installed in the impoundment area behind an earthen dam to maintain the minimum 5' freeboard and to accommodate the release of storm water resulting from heavy rainfall. Such structures shall be adequate to accommodate twelve (12) inches of rainfall on the watershed involved during any period of twenty-four (24) hours. All settling areas covering an area greater than fifty (50) acres shall have no fewer than two (2) water level control structures.

(5) Methods of Construction.

(a) Each new dam shall be constructed to meet or exceed the minimum safety requirements of the specifications and design for that dam. Draglines, drag scrapers, tractor or other appropriate earth moving equipment shall be used to place materials in dam construction. Materials used in rolled dams shall be blended prior to compaction. The soil shall be compacted and density tests shall be performed to ensure that the designed densities are obtained. During dam construction, quality control/quality assurance inspections shall be conducted by the engineer of record or a personal representative under his or her direct supervision. A third-party engineer or his or her representative shall be on site at all times during dam construction and during installation of all spillways. The department shall be advised 48 hours prior to

construction or shaping of a new dam so that a department representative can inspect the site.

(b) Tailings may be deposited hydraulically on the upstream slopes of existing dams provided that the elevation of the discharge water is never higher than five feet below the adjacent crest of the dam. If water is impounded above natural ground level, tailings may be deposited on the downstream portion of a dam by either of the following procedures:

1. If the tailings are dewatered to not less than 50% solids by weight at the discharge point, the tailings may be deposited continuously.

2. If the discharge point is at or beyond the point at which the toe meets the foundation, or the discharge point is at least seventy-five (75) feet from the point at which water meets the dam, the tailings may be deposited continuously by hydraulic methods.

(c) Areas around any water level control structure pipe, any other conduit, or any surface of discontinuity between materials within the mass of the dam shall be carefully installed to avoid potential concentration of seepages. The design of spillway structures associated with earthen dams shall ensure that soils under and around a culvert are uniformly compacted and are in continuous contact with the external culvert surface. All conduits through dams shall have two or more seepage collars spaced in accordance with good engineering practices pertinent to the material used for the fill. Two collars will be installed within the core when there is a core within a dam. A third-party engineer shall evaluate the potential for piping around culverts and the engineering design shall reduce or eliminate such potential based upon site specific conditions. All pipes and joints in pipes extending through a dam shall be made leakproof and shall be constructed of materials suitable for the fluids carried and the load imposed. The elevation difference of any spillway pipe from its inlet to the outlet at the discharge ditch shall not cause supercritical flow conditions within the culvert. In order to avoid leaks associated with differential settlement, conduits through dams shall not be rigidly supported by piles or piers. Backfill around conduits shall be of a density that is equal to or greater than those of the surrounding embankment. Particular attention shall be devoted to the lower third of the conduit. The engineering design for the construction of a culvert shall require the use of a lean concrete cradle and gravel drain system or a design resulting in an equivalent level of protection.

(6) Documentation.

(a) After completion of construction and before the above-grade deposition of industrial waste behind the dam, the permittee shall contact the department to arrange for a department representative to inspect the facility in the company of the permittee. The owner of an earthen dam shall maintain in a permanent file the following construction records pertaining to said dam. The owner shall furnish a copy of the file and certification of completion of construction within 30 days after completion of the dam to the department.

1. Aerial photo of construction site after mining in the immediate area has been terminated and before shaping of the final dam.
2. Design drawings and calculations.
3. Design specifications.
4. Results of all soil tests on foundations and fill materials.
5. Logs of borings and engineering geology reports.
6. Certified copies of construction progress inspections pertinent to core trench, toe drain, internal drains, and other significant phases of the structure. Photographs of various structural items may be included in the file.
7. Aerial photo of completed dam taken within 30 days after construction is completed, weather permitting.
8. Description of and justification for all deviations or variances from the design plans or specifications.

Specific Authority 403.06l(22) FS. Law Implemented 403.06l(22), FS. History - Revised 12-8-72, Formerly 17-9.03,17-9.030, 17-672.300, Amended 6-28-99.

62-672.400 Operational Requirements.

(1) Active dams - The water level in a settling area shall not be raised or lowered more than one (1) foot during any twenty-four (24) hour period, except under emergency conditions. The water level shall not be lowered more than five (5) feet per month. Each active settling area shall be inspected as prescribed in rule 62-672.500(2). Instrumentation for monitoring of seepage pore pressures within dams shall be installed and operated unless the department has been provided reasonable assurance during the permitting process that such monitoring is unnecessary to ensure dam integrity. New or yet unused spillways shall be placed into operation during the daylight and morning hours when their performance can be effectively monitored by the dam inspectors and waste system operators. Vegetative cover adequate to inhibit wind and water erosion shall be established and maintained on all exposed surfaces of the dam. Such vegetation shall be maintained sufficiently low to permit visual inspection of the soil surfaces in critical areas outlined in rule 62-672.500.

(2) Retired dams - The department shall be notified prior to the retirement of a dam. The vegetative cover on retired dams shall be maintained sufficiently low to permit visual inspection of the soil surfaces in critical areas outlined in rule 62-672.500. In addition, the water level control structures in retired dams shall be adjusted to suit the circumstances of storm drainage requirements as the solids concentrations of the impounded liquids becomes progressively higher. Pools of trapped stormwater and/or clarified wastewater shall be drained away from the upstream face of the dam to the greatest extent possible. A dam shall not be considered as retired so long as pools of free water remain in contact with the dam.

Specific Authority 403.061(22) FS. Law Implemented 403.061(22) FS. History - Revised 12-8-72, Formerly 17-9.04, 17-9.040, 17-672.040, 17-672.400, Amended 6-28-99.

62-672.500 Inspections.

Personnel or agents of the department may accompany inspectors on any inspection required by this rule, or inspect settling areas at any other time which is reasonable under the circumstances involved. They may also examine any inspection reports and be furnished copies thereof upon request.

(1) A completed new dam shall be thoroughly inspected prior to the deposition of industrial wastes above ground level behind it. Toe drains, spillways and water level control structures shall be certified by the design engineer as meeting all specifications of the design, and degree of compaction of the fill shall also be certified. Legible photographs, either aerial or ground, may be used to document this initial inspection, but shall not in themselves constitute certification. A complete file describing the items inspected and their condition shall be maintained by the owner, and a copy shall be furnished to the department prior to the above-grade deposition of industrial wastes behind the dam.

(2) Active dams shall be inspected weekly unless a defect has been disclosed, in which event the defective area of the dam shall be inspected daily until corrective maintenance has cured such defect. Inspections shall be made by employees of the owner of the dam who have been trained in accordance with rule 62-672.500(9). The findings on each inspection shall be recorded, signed by the inspector, and filed after any necessary corrective action is initiated by supervisory personnel. The inspector shall travel on foot, horseback, or wheeled vehicle suitable for traversing the terrain involved at slow speeds. Dams shall be inspected from the crest and from the toe through the use of all-weather toe roads or other means of direct inspection from the toe of the dam. Items to be noted on weekly (or daily) inspections shall include:

(a) Condition of vegetation on dam and in area for fifty feet (50') downstream from the outside toe.

(b) Piezometric levels within the mass of the dam when instrumentation has been installed.

(c) Condition of soil surfaces on top and slopes of the dam and in area for fifty feet (50') downstream from the outside toe.

(d) Condition of drainage ditches in the area of the base of the dam.

(e) Liquid surface elevation and amount of freeboard. (This is to be recorded daily when limitations could be violated during a week of operations.)

(f) Condition of spillways and water level control structures, including all conduits exiting the dams.

(3) Retired dams shall be inspected monthly by a competent employee of the owner of the dam who has been instructed and tested by a qualified engineer regarding items to be checked. The findings on each inspection shall be recorded, signed by the inspector, and filed after any necessary corrective action is initiated by supervisory personnel. Such inspection shall include:

(a) Condition of soil surfaces on the crest, slopes, and area fifty feet (50') downstream from the dam.

(b) Determination of piezometric levels within the mass of the dam while instrumentation of the dam has been determined to be necessary by an engineer.

(c) Determination of seepage characteristic through analyses of infra-red aerial photographs or thermal imagery when surveillance by such means has been proposed by the owner of the dam and approved by the department.

(d) Condition of Spillway and water level control structures, including all conduits exiting the dam, and any wooden structures which are subject to rotting.

(4) When a critical condition as listed in rule 62-672.500(7) is suspected during a weekly or monthly inspection, the inspector shall ensure that a technical representative of the dam owner is made aware of the condition immediately. If the existence of the critical condition is confirmed, the department shall be notified immediately. A written report of the condition and the actions proposed for its correction shall be made to the department within seven (7) days from the time existence of the critical condition is confirmed.

(5) Each active and each retired dam shall be inspected annually by a third-party engineer who is experienced in the field of construction and maintenance of dams. Costs for such inspections shall be borne by owners of the dams. One copy of the report pertaining to such annual inspections shall be furnished to the department, and the original of the report shall be retained by the owner. These inspections shall include:

(a) Analyses of seepage or other significant items shown on all aerial photographs of the dam which have been taken for any reason since the date of last annual inspection.

(b) Condition of soil surfaces on top and slopes of the dam and in areas for fifty feet (50') downstream from the outside toe.

(c) Review of all weekly, daily and monthly inspection reports to evaluate the effectiveness of maintenance which was done to the dam during the period since the last annual inspection.

(d) Examination and interpretation of data obtained from any instrumentation installed in the mass of the dam.

(e) Condition of spillway and water level control structures, including all conduits exiting the dam and any wooden structures which are subject to rotting. The annual inspection report shall include recommendations and corrective measures taken. If corrective measures are not completed by the time of annual submittal, then follow up inspections shall be conducted by the third-party engineer with quarterly project reports submitted until completion of all corrective measures.

(6) A retired dam which is to be abandoned shall be inspected by an engineer registered in Florida who is competent to determine that no further impoundment is being accomplished by the dam involved and that no further surveillance or maintenance is required. A copy of the final inspection used by the engineer for making his determination as above shall be furnished to the department, and a copy shall be retained by the owner of the dam. The department shall be notified prior to

abandonment of any dam. Costs for such terminal inspections shall be borne by the owners of the dams which are to be abandoned.

(7) Any of the following items shall be considered as indicating a critical condition which requires immediate investigation and may require emergency maintenance action:

(a) Seepage on outer face or downstream from the toe in which there are boils, sand cones or deltas.

(b) Silt accumulations, boils, deltas, or cones in the drainage ditches at dam bases.

(c) Cracking of soil surface on crest or either face of the dam.

(d) Bulging of the downstream face of the dam.

(e) Seepage, damp area, or boils in vicinity of or erosion around a conduit through the dam.

(f) Any subsidence of the crest or faces.

(8) The following items shall be considered as indicating potential trouble areas which should be closely checked on subsequent inspections and repaired as necessary:

(a) Overgrowth patches of vegetation on downstream face or close area downstream from the toe.

(b) Surface erosion, gullying, or wave erosion of the upstream face of the dam.

(c) Surface erosion, gullying or damp areas on the downstream face of the dam, including the berm and the area downstream from the outside toe.

(d) Erosion below any conduit exiting the dam.

(e) Wet areas or soggy soil in downstream face of dam or in natural soil below dam.

(9) The owner of a dam shall provide annual training to all dam inspection personnel by an engineer experienced in dam design, construction, operation and inspection, and shall provide training to all appropriate employees in the implementation of the contingency plan required by rule 62-672.550. The owner shall maintain records documenting such training.

(10) In the event of a dam failure which permits deleterious substances to enter waters controlled by the State or to cause other damages, the chairman of the Environmental Regulation Commission may convene at once a special panel of experts with experience in design and construction of earthen dams from government, industry, private engineering firms and/or educational institutions to gather data and to investigate the cause of the failure and to make recommendations for corrective actions. The owner of a failed dam shall take immediate action to arrest the flow of deleterious material when such is possible, and shall have the failed area of the dam photographed at the earliest practicable time. If feasible, the owner shall construct a coffer dam upstream from the failed area to impound materials. This will preserve the area of failure

for detailed investigation and thus contribute to factual data to be used in future safety considerations.
Specific Authority 403.061(22) FS. Law Implemented 403.061(22) FS. History - Revised 12-8-72. Formerly 17-9.05, 17-9.050, 17-672.500, Amended 6-28-99.

62-672.550 Contingency Plans.
The owner of a dam shall prepare contingency plans to be followed in the event of a dam failure. Each plan shall include mapping showing areas subject to downstream flooding and a notification of local and state officials. The contingency plans shall be maintained on file for review by the department upon request.
Specific Authority 403.061(22) FS. Law Implemented 403.061(22) FS. History - New 6-28-99.

62-672.570 Non-Clay Phosphate Mining Impoundments.
Each owner of a non-clay phosphate mining impoundment shall implement best management practices for such impoundment in accordance with "BMPs for Non-Clay, Phosphate Mining and Reclamation Berms and Impoundments," dated July 23, 1996, which is adopted and incorporated by reference. Upon request by the department, each such owner shall provide verification of implementation of the foregoing best management practices to representatives of the department's Bureau of Mine Reclamation during quarterly inspections of affected facilities.
Specific Authority 403.061(22) FS. Law Implemented 403.061(22) FS. History - New 6-28-99.

Part II – Phosphogypsum Stack System Impoundments

62-672.600 Construction of New Perimeter Earthen Dikes.
(1) Design.
(a) Site investigation. The general area desired for construction of a perimeter earthen dike shall be carefully inspected by the design engineer prior to selection of the exact location for the dike. Areas of uneven natural subsidence, sinkholes, pockets of organic matter, or other unstable soils shall be avoided, unless special provisions are made for their mitigation.
(b) Soil testing. The requirements for soil testing set forth in rule 62-672.300 (1) (b) are adopted and incorporated by reference.
(c) Cross section design. The design freeboard of an above-grade perimeter earthen dike shall not be less than five (5) feet unless a design freeboard of less than five (5) feet is justified based on results of seepage and stability analyses and wave run-up analyses. However, in no event shall the design freeboard of an above-grade perimeter earthen dike be less than three (3) feet. The crest on the top of the dike shall be graded toward the inside or the outside slope. If the dike exceeds 10 feet in height and crest runoff is directed toward the outside slope, runoff controls shall be used to

protect the outside slope against erosion. Both inside and outside slopes shall be no steeper than two and one-half (2.5) horizontal to one (1.0) vertical. Seepage control shall be provided by means of a liner placed on the inside slope of the dike and constructed in accordance with rule 62-673.400. The top of the dike shall include a roadway which will permit wheeled vehicle traffic at all times. The design of the outermost earthen dike shall also incorporate an all-weather roadway near the downstream toe which will permit wheeled vehicle traffic around the perimeter of the dike for purposes of inspection of the slope, toe and natural ground beyond the toe, as well as maintenance.

(d) Stability analysis. A seepage or flow net analysis shall be made, when applicable, for use in the stability analysis. The stability analysis shall consider the minimum fluid level as well as the fluid level at the design freeboard on the upstream slope of the dike, and possible fluctuations of the tail water level.

(e) Design safety factors. The design safety factors set forth in rule 62-672.300(1)(e) are adopted and incorporated by reference.

(2) Site preparation. The site preparation requirements of rule 62-672.300(2) are adopted and incorporated by reference.

(3) Material to be used. The requirements for materials to be used are set forth in rule 62-672.300 (3) and are adopted and incorporated by reference.

(4) Process water control design. Conveyance ditches, pumps, pipes, and hydraulic structures located within a phosphogypsum stack system shall have adequate capacity to circulate the process water stream(s), if applicable, and to contain or transfer runoff on the process watershed upstream of the water control structures resulting from a storm event generating 12 inches of rainfall in 24 hours while maintaining at the same time the design freeboard of the perimeter earthen dike. If provisions are made to contain some or all of the storm surge resulting from such event within the phosphogypsum stack system upstream from the conveyance system or water control structures, then the transfer capacity of the ditches, pumps, pipes, and related structures may be reduced accordingly.

(5) Methods of construction.

(a) Each new dike shall be constructed to meet or exceed the minimum safety requirements of the specifications and design for that dike. Appropriate earthmoving equipment shall be used to place materials in dike construction. The soil shall be compacted and density tests shall be performed to ensure that the designed densities are obtained. A representative of the third-party engineer shall be present on the site during construction of the dike and liner, and during construction and installation of spillways and penetrations through the dike or liner. The department shall be advised of the date on which construction of a new dike will begin so that a department representative can inspect the site.

(b) Areas around any water level control structure pipe, any other conduit, or any surface of discontinuity between materials within the mass of the dike shall be carefully inspected to avoid potential concentration of seepages and to ensure that soils

under and around a culvert are uniformly compacted and are in continuous contact with the external culvert surface. All penetrations through the liner on the upstream slope of the dike shall be made using water tight joints or connections and shall be capable of maintaining their integrity under anticipated in-use conditions. All pipes and joints in pipes or conduits extending through a dike shall be made leak proof and shall be constructed of materials suitable for the fluids carried and the load imposed. In order to avoid leaks associated with differential settlement, conduits through dikes shall not be rigidly supported by piles or piers. Backfill around conduits shall be of a density that is equal to or greater than those of the surrounding embankment. Particular attention shall be devoted to the lower third of the conduit.

(6) Documentation. Applicable provisions of the documentation requirements set forth in rule 62-672.300(6) are adopted and incorporated by reference with the following exception. The owner shall furnish a certification of completion of construction within 30 days after completion of the dike. The remaining documents shall be submitted within six (6) months of placing the facility into operation.

Specific Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99, Amended 7-19-06.

62-672.620 Assessment of Existing Perimeter Earthen Dikes. (Repealed)

Rulemaking Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99, Amended 7-19-06, Repealed 2-16-12.

62-672.650 Operational Requirements for Perimeter Earthen Dikes.

(1) All perimeter earthen dikes shall be operated so as to maintain the design freeboard in accordance with 62-672.600(1)(c) unless temporary incursions into the freeboard are demonstrated to be safe pursuant to rules 62-672.650(2) or 62-672.870. Each perimeter earthen dike shall be inspected as prescribed in rule 62-672.670. Vegetative cover adequate to inhibit wind and water erosion shall be established and maintained on the outside slope of the dike. Such vegetation shall be maintained sufficiently low to permit visual inspection of the soil surfaces and critical areas outlined in rule 62-672.670.

(2) Temporary Nonemergency Use of Design Freeboard.

(a) To assure system safety and integrity or to reduce the probability of discharge, the department shall approve temporary use of the design freeboard of a perimeter earthen dike upon justification by the owner and review of written documentation prepared by a third-party engineer demonstrating that such use can occur while maintaining the safety and stability of the dike. Any department approval shall include as conditions any specific limitations or other requirements recommended by the third-party engineer as necessary to maintain dike integrity and shall establish a specific time limit for such use. The third-party engineer shall base their recommendations on:

1. an inspection of the facility;

2. dike design and construction information;

3. results of seepage and stability analyses (including monitoring of seepage pressures within the dike if such monitoring is deemed necessary); and

4. wind surge and wave run-up analyses.

(b) The report by the third-party engineer shall specify conditions under which such use may be authorized, such as:

1. acceptable wind speeds in forecast;

2. acceptable rainfall levels in the forecast;

3. increased inspection frequencies; and

4. weekly monitoring of piezometric levels within the mass of the dike, if and as needed.

(c) No temporary use of the design freeboard pursuant to this section may be authorized unless the facility either:

1. prior to initiation of such temporary use has storage capacity adequate to contain a storm event generating 12 inches of rainfall in 24 hours below the design freeboard fluid level; or

2. such action has been approved by the department under an action plan submitted pursuant to rule 62-672.780(8).

(d) Fluctuation in freeboard shall not result in activation of emergency overflow spillways.

(e) Changes in water levels during such temporary use shall not be deemed to reach any of the triggers established under 62-672.780.

Specific Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99.

62-672.670 Inspection and Maintenance Requirements For Perimeter Earthen Dikes.

(1) Personnel or agents of the department may accompany inspectors on any inspection required by this rule, or inspect perimeter earthen dikes at any other time which is reasonable under the circumstances involved. They may also examine any inspection reports and be furnished copies thereof upon request.

(2) A completed new perimeter earthen dike shall be thoroughly inspected prior to the placement of process water behind it. Spillways and water level control structures shall be certified by the design third-party engineer as meeting all specifications of the design, and degree of compaction of the fill shall also be certified. Legible photographs, either aerial or ground, may be used to document this initial inspection, but shall not in themselves constitute certification. A complete file describing the items inspected and their condition shall be maintained by the owner, and a copy shall be furnished to the department for approval prior to the deposition of process water behind the dike.

(3) All perimeter earthen dikes and water control structures shall be inspected weekly unless a critical condition listed in rule 62-672.670(6) has been disclosed, in which event the defective area of the dike shall be inspected daily until corrective

maintenance has cured such defect. Water level elevations and freeboard compliance shall be determined at least every 12 hours. Piezometric water levels within the dike shall be measured quarterly if piezometers have been installed. The inspections shall be made by a qualified company employee or contractor employed or retained by the owner of the dike which employee or contractor has been trained in accordance with rule 62-672.800. The findings of each inspection shall be recorded in a log which log shall be made available to the department upon request.

(4) When a critical condition listed in rule 62-672.670(6) is suspected during an inspection, the inspector shall ensure that a technical representative of the dike owner is made aware of the condition immediately. If the existence of the critical condition is confirmed, the department shall be notified immediately. A written report of the condition and the actions proposed for its correction shall be made to the department within seven (7) days from the time existence of the critical condition is confirmed.

(5) Each perimeter earthen dike shall be inspected annually by a third-party engineer with experience in the field of construction and operation of perimeter earthen dikes. One copy of the report pertaining to such an inspection shall be furnished to the department, and the original report shall be retained by the owner. These inspections shall include:

(a) Analyses of seepage or other significant items shown on all aerial photographs of the dike which have been taken for any reason since the date of the last annual inspection.

(b) Condition of soil surfaces and top and slopes of the dike and in areas for fifty feet (50') downstream from the outside toe.

(c) Review of all periodic inspection reports to evaluate the effectiveness of maintenance which was done to the dike during the period since the last annual inspection.

(d) Examination and interpretation of data obtained from any instrumentation installed in the mass of the dike.

(e) Condition of spillway and water level control structures, including all conduits exiting the dike.

The annual inspection report shall include recommendations and corrective measures taken. If corrective measures are not completed by the time of annual submittal, then follow up inspection shall be conducted by the third-party engineer with quarterly project reports submitted until completion of all corrective measures.

(6) Any of the following items shall be considered as indicating a critical condition which requires immediate investigation and may require emergency maintenance action:

(a) Concentrated seepage on the downstream slope, at the toe of slope, or downstream from the toe of slope (e.g., boils, soil cones, springs or deltas).

(b) Evidence of slope instability including sloughing, bulging or heaving of the downstream slope, or subsidence of the dike slope or crest.

(c) Cracking of surface on crest or either face of the dike.

(d) General or concentrated seepage in the vicinity of or around any conduit through the dike.

(e) Observed or suspected damage to the liner system.

(7) The following items shall be considered as indicating potential trouble areas which should be closely checked on subsequent inspections and repaired as necessary:

(a) Abnormal dead vegetation or damp areas on the downstream slope, at the toe of slope, or downstream from the toe of slope that could be indicative of pond water seepage.

(b) Surface erosion, gullying or wave erosion on the upstream slope of the dike.

(c) Surface erosion or gullying on the downstream slope of the dike.

(d) Erosion below any conduit through the dike near or at the toe of slope of the dike.

(8) All logs and reports required under this section shall be retained by the owner of the phosphogypsum stack system for a period of not less than three years from the date of the last entry in the log or from the date of the report.

Specific Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99.

62-672.700 Construction of New Phosphogypsum Stacks.

(1) Any new phosphogypsum stack or lateral expansion thereof as defined in rule 62-673.200(9) shall be designed in accordance with the minimum standards of rule 62-673, F.A.C., with an overall factor of safety of 1.5 for any potential failure surface encompassing the impoundment on top of the stack and passing through the gypsum slope or bottom liner interfaces, or extending into earthen material in contact with the bottom liner.

(2) The maximum height of a starter dike for new phosphogypsum stacks or lateral expansions thereof shall be equal to or lower than the height of the associated lined perimeter dike.

Specific Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99.

62-672.720 Assessment Of Existing Phosphogypsum Stacks. (Repealed)

Rulemaking Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99, Repealed 2-16-12.

62-672.750 Procedures For Raising Phosphogypsum Stacks.

Phosphogypsum stacks shall be raised in accordance with the following minimum standards:

(1) The crest width of each gypsum dike shall not be less than eighteen (18) feet.

(2) When constructing a gypsum dike, the thickness of each gypsum lift shall not exceed five (5) feet.

(3) The overall average exterior slope of the phosphogypsum stack shall be established based on the results of stability analyses previously performed by a third-party engineer to demonstrate or certify the safety and stability of the stack throughout the life of the stack. The overall average exterior slope of the phosphogypsum stack shall be no steeper than two (2.0) horizontal to one (1.0) vertical for stacks greater than 50 feet in height.

(4) Except as provided in rule 62-672.750(5), sufficient lengths of the inboard dike, levee, or windrow used to create a rim ditch shall be maintained at a lower elevation than the crest of the associated gypsum dike so that the rim ditch will always discharge inward into a stack settling compartment.

(5) The fluid level in the rim ditch shall not be allowed to rise above the crest elevation of the gypsum dike in the vicinity unless site specific provisions or precautionary measures specifically outlined in the operation plan referred to in rule 62-672.780 are implemented. In no case shall the water level in the settling compartment be allowed to rise within 6 inches of the crest of the gypsum dike or be allowed to rise to such an extent to cause flooding and submergence of perimeter rim ditches associated with an active settling compartment, making them no longer functional for their intended use.

Specific Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99, Amended 7-19-06.

62-672.760 Procedures For Decanting Process Water From Top Of Phosphogypsum Stack.

The owner of a phosphogypsum stack system, including inactive stacks or temporarily inactive stacks, shall comply with the following requirements for decanting process water from the top of phosphogypsum stacks.

(1) One or more of the following three methods may be used to decant water from the top of a phosphogypsum stack:

(a) overflow broad crested weir dug in gypsum, such as controlled flow through an open cut;

(b) decant pipe placed in a backfilled cut; or

(c) siphon line or positive pressure line that does not penetrate the gypsum dike.

Any exception to the above shall be specifically recommended, on a case-by-case basis, by a third-party engineer and approved by the department upon a demonstration that such exception will maintain the integrity of the impoundment. Any exception to the requirements specified in rules 62-672.760(2)-(14) shall be specifically recommended, on a case-by-case basis, by a third-party engineer and the department shall be notified of the exception in a timely manner.

(2) The maximum depth of any open cut used to decant water and any cut made to place or remove a decant pipe shall be limited to no more than 10 feet. The depth of cut shall be measured from the top of the fluid level elevation in the rim ditch at the decant location, i.e., from the maximum elevation of the slurry flowing in the rim ditch at any time prior to making the cut. The depth shall be measured to the bottom invert elevation of the decant pipe or open cut beneath the centerline of the gypsum dike.

(3) Each facility shall select a range of bottom widths and side slopes for any cut to be made that are consistent with the site-specific decanting and backfilling procedures adopted by that facility.

(4) The minimum distance from the decant location (within the settling compartment on top of the stack) to the outer edge of any cut on the exterior slope of the stack, measured along the invert of the cut, shall be no less than 40 feet. Moreover, if the distance from the decant location to the outer edge of the cut on the exterior slope is less than 55 feet, either one of the following additional precautionary measures shall be implemented:

(a) the cut made across the inner levee (upgradient from the rim ditch) shall be offset at least 15 feet relative to the cut made across the gypsum dike crest; or

(b) a gypsum "beach" or delta shall be placed or built into the inner settling compartment at the decant location prior to making the cut.

(5) The invert of any cut through a gypsum dike shall be located in material that has been allowed to consolidate and age for no less than 2 weeks.

(6) The centerline of a new decant cut shall be offset a minimum distance of 50 feet from the location of the most recently backfilled cut (i.e., older cut which is no longer being used to decant water).

(7) If an open cut is used to decant water, the depth of water over the broad-crested weir opening shall be controlled at less than 2 feet. If a decant pipe is used, the diameter of the pipe shall be no greater than 30 inches, and the pressure rating of the pipe shall be no less than 50 psi (e.g., for High Density Polyethylene (HDPE) pipes, the Standard Dimension Ratio (SDR) shall be no greater than 32.5; and for Polyvinyl Chloride (PVC) pipes, the pipe Schedule shall be equal to or greater than 40). Moreover, the horizontal section of any decant pipe placed in a backfilled trench shall be extended no less than 2 feet and no more than 5 feet beyond the edge of the cut on the exterior slope of the stack, or the discharge end of the pipe shall be laid along the exterior slope of the stack.

(8) Additional measures for decant pipe.

(a) If a decant pipe is used, and a cut is made to place or remove the pipe, the following precautionary measures shall be implemented prior to making the cut:

1. place a gypsum "beach" or delta into the inner settling compartment extending no less than 30 feet from the inside edge of crest of the inner levee, then lower the water level in the settling compartment below the bottom invert elevation of

the decant pipe, and construct a temporary cofferdam on the gypsum beach as an added safety measure; or alternatively,

2. place a gypsum "beach" or delta into the inner settling compartment extending no less than 100 feet from the inside edge of crest of the inner levee, temporarily isolate the compartment where the decant is located to prevent the introduction of additional water or slurry, and construct a temporary gypsum cofferdam as needed to isolate the decant location. The cofferdam shall have a minimum crest width of 20 feet. The excavation shall not be allowed to extend across an imaginary 3.0 Horizontal: 1.0 Vertical line projected from the outside toe of the cofferdam towards the exterior slope of the stack; or alternatively,

3. place a gypsum "beach" or delta into the inner settling compartment extending no less than 500 feet from the inside edge of crest of the inner levee, and temporarily isolate the compartment where the decant is located to prevent the introduction of additional water or slurry.

(b) Once the excavation has progressed below the water level elevation in the settling compartment, the cut shall be completed and the excavation backfilled as expeditiously as possible but no later than within 48 hours.

(9) Prior to backfilling a cut, the exposed gypsum surface shall be scarified (e.g., with the dozer tracks or with the backhoe bucket) as needed to break up and remove any cemented surface crust, if present.

(10) Only moist or wet gypsum may be used in backfilling operations. Dry gypsum shall not be used unless it is moisture-conditioned prior to or during placement. Moreover, gypsum used in backfilling a decant cut shall have an equivalent texture and consistency to freshly sedimented gypsum excavated from the rim ditch.

(11) Backfilling operations shall incorporate one or more of the following construction steps or procedures, as applicable, or other methods certified as equivalent by a third-party engineer.

(a) Any open cut through the gypsum dike shall be backfilled with wet or moist gypsum placed in lifts not exceeding 18 inches in thickness, as needed to ensure that the gypsum backfill is in intimate and complete contact with the sides of the cut and with the external surface of the decant pipe, when present.

(b) Either tracked equipment (e.g., dozer) shall be used to roll the surface and compact each lift of moist to wet gypsum, scarifying between lifts as needed; or the bucket of a hydraulic excavator (backhoe) shall be used to place and tamp wet to very wet (e.g., "sluiced" or flowable) gypsum, having a saturated paste consistency, in lifts, scarifying between lifts as needed. The latter method is suited for use in filling all around a decant pipe, when present, provided the pipe is restrained and prevented from being uplifted during any such filling operation.

(c) Construction equipment shall not be allowed to travel directly over any buried decant pipe until a gypsum cover thickness sufficient to prevent damage to the pipe has been placed over the pipe (as approved by a registered professional engineer).

(d) If saturated gypsum has been used in backfilling a cut through the gypsum dike (i.e., wet to very wet gypsum placed and tamped with the bucket of a hydraulic excavator), then the freshly backfilled plug shall be allowed to set for at least 48 hours before the remainder of the cut inboard of the restored outer dike is backfilled with gypsum slurry via the rim ditch, and before water is allowed to flow in the rim ditch across the backfilled cut.

(12) Backfilling of any decant cut through the gypsum dike shall be done during daylight hours only (unless the entire work area is well lighted); and shall be inspected and monitored by a qualified company employee familiar with the specified backfilling procedures.

(13) The placement in service and initial operation of the rim ditch adjacent to any backfilled cut shall be inspected and monitored by a qualified company employee, with periodic monitoring to continue at least once every 12 hours during the first 36 hours after re-activating the area adjacent to the cut. Any of the following items shall be considered as indicative of a potentially critical condition requiring immediate notification of supervisory personnel and performance of more frequent inspections until the situation has stabilized or remedial action has been implemented: concentrated seepage on the outer face of the backfilled cut, any sign of sediment transport, cracking or subsidence of the exposed surface on the crest and downstream face, and concentrated seepage or boils in the vicinity of a decant pipe.

(14) All inspections shall be documented in writing and the findings shall be recorded, signed by the qualified company employee who conducted the inspection and maintained at the facility for a period of not less than three years.

Specific Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99.

62-672.770 Phosphogypsum Stack Inspection And Maintenance.

(1) Personnel or agents of the department may accompany inspectors on any inspection required by this rule, or inspect starter dikes or gypsum dikes at any other time which is reasonable under the circumstances involved. They may also examine any inspection reports and shall be furnished copies thereof upon request.

(2) A completed new phosphogypsum stack system, including the starter dike, shall be thoroughly inspected prior to the deposition of process water in it. The liner, spillways and water level control structures shall be certified by the design third-party engineer as meeting all specifications of the design, and the degree of compaction of the fill shall also be certified. Legible photographs, either aerial or ground, may be used to document this initial inspection, but shall not in themselves constitute certification. A complete file describing the items inspected and their condition shall be maintained by the owner, and a copy shall be furnished to the department.

(3) All stack compartments, including any noted areas containing critical conditions as listed in rule 62-672.770(6) until corrected, shall be inspected daily. Stack slopes, collection ditches, and drain outlets shall be inspected weekly. Flow from drain outlets shall be checked quarterly. The total areal coverage of water on the stack shall

be estimated each month and the total water inventory on top of the stack shall be estimated annually. The required inspections and estimates shall be carried out by a qualified company employee or contractor employed or retained by the owner of the phosphogypsum stack which employee or contractor has been trained in accordance with rule 62-672.800. The results of the required inspections and estimates shall be recorded in a log which shall be maintained by the owner of the phosphogypsum stack and made available to representatives of the department upon request.

(4) When a critical condition listed in rule 62-672.770(6) is suspected during an inspection, the inspector shall ensure that a competent technical representative of the phosphogypsum stack system owner is made aware of the condition immediately. If the existence of the critical condition is confirmed, the department shall be notified immediately. A written report of the condition and the actions proposed for its correction shall be made to the department within seven (7) days from the time existence of the critical condition is confirmed.

(5) Each phosphogypsum stack shall be inspected annually by a third-party engineer with experience in the field of construction and operation of phosphogypsum stacks at the same time that the annual inspection of the associated perimeter earthen dike occurs as required by rule 62-672.670. One copy of the report pertaining to such an inspection shall be furnished to the department, and the original report shall be retained by the owner. The report shall include an updated aerial photograph and shall state the area of the top of the stack and the current height and elevation of the stack. The annual inspection report shall include recommendations and corrective measures taken. If corrective measures are not completed by the time of annual submittal, then follow up inspections shall be conducted by the third-party engineer on a quarterly basis with quarterly project reports submitted until completion of all corrective measures.

(6) Any of the following items shall be considered as indicating a critical condition which requires immediate investigation and may require emergency maintenance action:

(a) Concentrated seepage (e.g., springs or boils) on the face of a stack slope, at the toe of the slope, or beyond the toe of slope with active signs of piping at the point of seepage (e.g., a gypsum or soil cone or delta at the point of seepage).

(b) Evidence of slope instability including sloughing, bulging or heaving of the face of the stack or the toe of the slope.

(c) Lateral movement or subsidence of the slope or crest of the stack.

(d) Formation of new non-shrinkage cracks or enlargement of wide cracks in the surface of the slope or crest of the stack.

(e) Observed or suspected damage to the liner system.

(f) Drains discharging turbid water.

(g) Concentrated seepage (i.e., springs or boils) in the vicinity of a decant pipe.

(7) The following items shall be considered as indicating potential trouble areas which should be closely checked on subsequent inspections and repaired as necessary:

(a) Concentrated seepage (e.g., springs or boils) on the face of a stack or at the toe of slope without active signs of piping at the point of seepage.

(b) Previously observed localized sloughing at the toe of slope of the stack.

(c) Previously observed cracks in the surface of the slope or crest of the stack.

(d) Nonflowing drains.

(8) All logs and reports required under this section shall be retained by the owner of the phosphogypsum stack system for a period of not less than three years from the date of the last entry in a log or from the date of the report.

Specific Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99.

62-672.780 Phosphogypsum Stack System Operation Plans.

The following items shall be included in the operation plan for each phosphogypsum stack system and shall be approved by an engineer experienced in the construction and operation of phosphogypsum stacks:

(1) The method used to raise and operate the stack.

(2) A description of the source and consistency of gypsum used in constructing the gypsum dikes and the method used for shaping and/or rolling the gypsum.

(3) The overall average exterior slope for raising the phosphogypsum stack and the maximum design height of the stack.

(4) The procedures used to assure that pipes used to transport phosphogypsum to the phosphogypsum stack systems and to return process water to the phosphate fertilizer production facilities are operated and maintained in a safe manner.

(5) The procedures used to decant process water from the top of the phosphogypsum stack.

(6) The location of pumps, spillways, and staff gauges.

(7) Provisions that address emergency measures to be taken in the event of mechanical failure of a pump or in the event of a power failure for any portion of a phosphogypsum stack system that relies on pumps or power to operate monitoring equipment or to transfer process water and/or rainfall-runoff from low areas to the main cooling pond. Such emergency provisions may include:

(a) back-up power (e.g., on-site power; diesel generator, etc.) and/or back-up pump which would be activated in the event of electrical or mechanical failure; or

(b) sufficient surge storage capacity or emergency surge capacity within the conveyance system to contain the process water stream(s) , if applicable, as well as runoff from a storm event generating 12 inches of rainfall in 24 hours; or

(c) increased inspection frequencies or continuous monitoring (e.g., remote video camera or automatic water level control device tied to a warning system) to provide early warning of an imminent spill prior to its occurrence; and an emergency action plan that would be undertaken to prevent or contain an accidental spill.

(8) A site-specific water management plan updated annually to reflect changes in process watershed area, storm surge,and projected water balances. The updated plan, consistent with water quality based effluent limits applicable to the facility, shall be submitted to the department by February 1 of each year.

(a) Each plan shall specify, at a minimum, a set of specific actions, including minimum process water consumption and transfer rates, that are put into motion when certain "triggers" are exceeded in the cooling/surge pond system. The plan shall specify additional actions that shall be implemented prior to exceeding such triggers in the cooling/surge pond system, where such actions are determined to be necessary based on water balance model results for the rainfall scenarios described in subsection (9) below. For facilities with approval to store process water in an AHP or RHP, such additional actions shall, at a minimum, specify the operational conditions for transferring to or removing process water from each authorized AHP, whether lined or unlined, or any RHP. Each trigger shall correspond to the event or system storage volume or operating water level(s) needed to contain the storm surge (or a fraction of the storm surge) in the system from a specific design storm (e.g., 12 inches in 24 hours, or the 25-year/24-hour event). If provisions are made to contain the direct rainfall quantity from a storm event generating 12 inches of rainfall in 24 hours in the settling compartments atop the phosphogypsum stack, then the top area of the stack need not be considered in calculating the process watershed of the cooling/surge pond system and corresponding storm surge capacity.

1. The trigger levels in the cooling/surge pond system shall include:

a. The "action plan" trigger corresponding to the event storage volume or operating water level(s) required to contain the rainfall quantity from a storm event generating 12 inches of rainfall in 24 hours. When this level is exceeded for 72 consecutive hours, the owner of the system shall notify the department in conjunction with the weekly reporting required under paragraph (c) of this subsection and present for the department's review a site specific action plan (or refer the Department to a previously submitted site-specific action plan) for process water inventory management and/or consumption.

b. The "may treat" trigger corresponding to the event storage volume or operating water level (s) required to contain the 25-year/24-hour storm event. When this trigger is exceeded for 48 consecutive hours, the owner of the system shall notify the department on the next working day and begin implementing activities needed for activating any permitted treatment station(s), or, alternatively, the owner shall undertake actions to increase the available surge storage capacity within the process system which could include reductions in the volume of water reporting to the process water system, transfer of process water within the phosphogypsum stack system, or transfer

of process water to one or more AHPs or RHPs. Incorporation of process water treatment and discharge as a specific action in the site-specific water management plan at this level by facilities that have a department permit to discharge is optional.

c. The "must treat" trigger corresponding to the system storage volume or operating water level(s) required to contain one half of the 25-year/24-hour storm event. When this level is reached or exceeded, the owner of the system for which the department has issued a discharge permit shall notify the department in writing, within 24 hours. Whenever the “must treat” trigger is exceeded for 24 consecutive hours or more, the owner or operator of the system shall treat process water for reuse or discharge in accordance with the facility’s site-specific water management plan.

2. For purposes of establishing the “action plan” and “may treat” triggers, the portion of the storage capacity of a department-approved AHP corresponding to that which would be available during a 24-hour period, through any combination of gravity flow and emergency measures identified in the operation plan, shall be taken into account.

3. For facilities that are authorized to use a department-approved RHP, the storage capacity of the RHP shall not be taken into account in establishing the “action plan,” “may treat,” and “must treat” triggers. However, use of an RHP may be part of a facility’s site-specific water management plan.

4. When process water is to be moved into an AHP or RHP that does not contain process water, the owner of the system shall notify the department, in advance when feasible, but not later than one business day after transfer begins. Whenever process water is stored in a RHP, the owner shall implement all measures needed to consume, remove or treat the water from the RHP as soon as practicable. When an AHP or RHP is emptied of process water, the owner of the system shall notify the department within 7 days. An RHP is required to have either a separate operation and contingency plan, or be included as part of a single facility’s operation and maintenance plan.

5. Whenever the “action plan,” “may treat,” and “must treat” triggers are exceeded, the owner or operator of the system shall implement the applicable specific actions in accordance with the facility’s site-specific water management plan. Where the plan specifies that additional actions are to be implemented prior to exceeding the “action plan,” “may treat,” and “must treat” triggers, the owner or operator of the system shall implement such additional actions in accordance with the facility’s site-specific water management plan.

(b) Each facility’s water management plan shall be site-specific and shall be based on a water balance analysis performed annually which considers the rainfall scenarios described in paragraph (9), below.

(c) Each facility must maintain records for at least three years to identify the “trigger” levels. This record should contain as a minimum a site-specific water balance summary sheet which includes the following elements:

1. water levels in each impoundment area;

2. operating levels and trigger levels of each impoundment area;
3. acreage of each impoundment area;
4. acreage of watershed that contributes to the impoundment area;
5. available storage capacity at the various operation levels, in inches of rainfall runoff and acre feet;
6. available event and system storage, in inches of rainfall runoff and acre feet; and
7. available maximum potential storage, in inches of rainfall runoff and acre feet, where determined in accordance with subsection 62-672.870(1), F.A.C.

Each facility shall provide the department the water balance summary sheets at the following frequency:

(i) Monthly by the 15th of each month when water levels are below the "action plan" trigger. The summary sheet provided shall contain the required information for the last day of the preceding month.

(ii) Weekly on the Tuesday of each week when the "action plan" trigger is exceeded. The summary sheet provided shall contain the required information for the preceding Friday.

(iii) Daily, (except weekends and holidays), when either the "may treat" or "must treat" triggers are exceeded. The summary sheet provided shall contain the required information for the preceding day.

Each facility shall also regularly monitor water levels as required elsewhere by this rule as well as be able to demonstrate the water levels and available event, system, and maximum potential storage capacity at any time upon the request of the department.

(d) For the purposes of this subsection, information to be provided to the Department, including notifications required herein, may be provided by facsimile, electronic mail, or other electronic means where established by the department.

(9) The adequacy of the facility's site-specific water management and action plans and emergency measures shall be based on a five-year water balance analysis which shall be updated annually.

(a) The water balance analysis shall use October 1 as the beginning date for the analysis. The analysis shall identify the rates of all water inputs and outputs, any manufacturing production changes, and changes in process watershed area considered in the analysis. A third party engineer shall verify the accuracy of the analysis. A summary of the analysis and the water balance analysis results shall be included in the annual updated site-specific water management plan required in subsection (8) above.

(b) The water balance calculations shall be performed for the 5-year period using input rainfall quantities which shall include either:

1. the 100-year September rainfall occurring during the 100-year Annual Rainfall as defined herein, and multi-year rainfall events that have an equivalent probability for not being exceeded during the 5-year period as that of the 100-year Annual Rainfall Event. Rainfall events other than the 100-year Annual Rainfall shall be determined based on a long-term rainfall record from a National Oceanic & Atmospheric

Administration or equivalent weather station in the vicinity of the facility. For the multi-year rainfall events other than the 100-year annual rainfall, the annual rainfall quantities exceeding or less than the long-term average annual rainfall shall be distributed amongst the various months of the year in proportion to the normal monthly rainfalls determined from the corresponding long-term record. For the 100-year annual rainfall, the annual rainfall quantities exceeding or less than the long-term average annual rainfall shall be distributed amongst the various months of the year, other than the month for the 100-year September rainfall, in proportion to the normal monthly rainfalls determined from the corresponding long-term record; or

2. the input rainfall quantities for each of the 5-year extreme rainfall scenario listed below:

	Rainfall, inches					
	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Scenario 1	76	60	56	56	52	300
Scenario 2	60	76	56	56	52	300
Scenario 3	56	60	76	56	52	300
Scenario 4	52	56	60	76	56	300
Scenario 5	52	56	56	60	76	300

For the 100-year annual rainfall and the multi-year rainfall events, the annual rainfall quantities shall be distributed amongst the various months of the year proportionally based on the values shown for each month as listed below:

	Portion of Annual Rainfall Amount, Percent	
	100-Year Annual Rainfall	Other Multi-year Rainfall Events
January	3.2	4.5
February	3.7	5.2
March	4.1	5.8

April	3.4	4.8
May	5.7	8.0
June	15.2	14.8
July	15.9	15.4
August	14.5	14.1
September	24.8	13.9
October	4.1	5.8
November	2.5	3.5
December	2.9	4.2

(c) The water balance analysis for any phosphogypsum stack system shall indicate whether the system storage will be less than any of the following water balance targets:

1. 16.25 inches of rainfall run-off on June 1 of any year,
2. 12 inches of rainfall run-off on October 1 of any year; and
3. water levels that exceed impoundment maximum design levels at any time during a year.

If the water balance for any phosphogypsum stack system indicates that system storage is less than the water balance targets, the owner must provide reasonable assurance that additional process water consumption or management items, not already included as outputs in the water balance analysis, are readily available and capable of maintaining these water balance targets. Use of available storage within an AHP or RHP, up to their maximum design levels, may be used to provide this assurance. For a period not to exceed three years following July 19, 2006, a company may utilize water levels corresponding to maximum potential storage to provide reasonable assurance that water balance targets will be met. In subsequent years, if the modeling results of the annual water balance analysis provide reasonable assurance that the water balance targets will be met utilizing only system storage on or after June 1, 2011, a company may continue, at its discretion, to utilize water levels corresponding to maximum potential storage for modeled periods prior to June 1, 2011. Whenever a company relies on the use of maximum potential storage, the water balance analysis must specify the assumptions that were used to determine the temporary use of the design freeboards.

(d) If the water balance indicates that at any time during the five year period that process water levels, in conjunction with additional available process water consumption or management items as described in paragraph (c) of this subsection, will not meet the water balance targets, the owner must provide additional process water consumption or management items, and submit an alternatives plan and implementation schedule for department approval for the additional consumption or management measures within 90 days of submittal of the water balance analysis. The plan and schedule shall include, at a minimum, the following elements:

1. A listing and description of the additional process water consumption or management items to be evaluated, including the identification of items that that can be rapidly implemented to achieve the water balance targets

2. A listing of interim measures that can be implemented to prevent an unpermitted release of process water in the event that actual rainfall events contribute to process water levels exceeding maximum design levels.

3. A proposed schedule for the evaluation, selection, engineering, design, and construction, installation or implementation for the items and interim measures needed to increase water consumption, reduce inventories, or any combination of such actions that will result in achievement of the water balance targets.

4. Where such alternatives or interim steps may include a new or increased discharge to surface waters of the state, the evaluation of the new or increased discharge shall include:

a. identification of any impaired waters and parameters included on a verified list, determined in accordance with chapter 62-303, F.A.C., for any water body or water body segment existing at or downstream of the proposed new or increased discharge;

b. identification of any Total Maximum Daily Load, adopted in chapter 62-304, F.A.C., for any water body or water body segment existing at or downstream of the proposed new or increased discharge;

c. preliminary estimates of any proposed new or increased loading and concentrations, expressed on an annual average basis, and a description of the expected frequency and duration of discharge events that would be needed to meet the water balance targets and terms of this paragraph for each of the identified impaired parameters;

d. a description of and estimated quantity for potential pollutant loading offsets that may be available for any proposed receiving water body or water body segments, if needed to implement any alternative including a proposed new or increased discharge to impaired surface waters of the state.

The department shall approve the plan upon a demonstration that implementation of the plan will result in achievement of the water balance targets. Upon receipt of an alternatives plan, the department shall approve or deny the alternatives plan following the procedural steps outlined in section 120.60, F.S. Any such additional process water consumption capacity or other management items necessary to meet the terms of this paragraph shall be installed in accordance with the approved plan or within 18 months

of receipt by the owner of all necessary permits or other prior approvals whichever occurs later.

(10) The site-specific water management plan and action plans, based on an updated water balance analysis performed in accordance with subsection 99) herein for each phosphogypsum stack system and complying with all of the provisions of this section, shall be submitted to the department by no later than February 2, 2007 and annually thereafter.

Specific Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99, Amended 7-19-06.

62-672.800 Training.

The owner of a phosphogypsum stack system shall provide annual training in inspection and operations requirements and contingency plan requirements to appropriate personnel. Newly hired personnel shall receive training prior to engaging in inspection or operations activities addressed by this rule. A training plan consistent with the requirements of this section shall be maintained at each facility and be available for inspection by the department upon request. Records demonstrating that appropriate personnel have received the necessary training shall be maintained by the facility owner for a period of three years.

Specific Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99.

62-672.850 Contingency Plans.

The owner of a phosphogypsum stack system shall prepare, by January 1, 2000, and update annually thereafter, a contingency plan to address unplanned releases of process water. The elements of such a plan shall address the applicable elements of the "National Response Team's Integrated Contingency Plan Guidance [61 Fed. Reg. 28,641 (June 5, 1996)] which is incorporated herein by reference and shall demonstrate the ability to mobilize equipment and manpower to respond to emergency situations. The plan shall be maintained at the facility and be available for inspection by the department upon request.

Specific Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99.

62-672.870 Temporary Measures.

(1) Temporary use of the design freeboard. For purposes of this rule, the design freeboard shall mean the vertical distance from the water surface, when water levels are at the maximum design level, to the lowest elevation of the top of the surrounding dike.

(a) Temporary use of the design freeboard of a perimeter earthen dike or a gypsum dike is authorized when the water level is at the design freeboard and when such use is necessary to prevent the release of untreated process water. Such use of the freeboard shall only be allowed when a third-party engineer has approved such use and when documentation demonstrating the continued safety and stability of the dike is

submitted to the department. Such documentation shall include a listing of any operational limitations or constraints recommended by the third-party engineer as set forth in this section together with confirmation that the owner will comply with such recommendations. The third-party engineer shall base their recommendations on:

1. an inspection of the facility;
2. dike design and construction information;
3. results of seepage and stability analyses (including monitoring of seepage pressures within the dike if such monitoring is deemed necessary); and
4. wind surge and wave run-up analyses.

(b) The report by the third-party engineer shall specify conditions under which such use may be undertaken so as not to jeopardize the integrity of the dike, such as:

1. acceptable wind speeds in forecast;
2. increased inspection frequencies; and
3. weekly monitoring of piezometric levels within the mass of the dike, if and as needed.

(c) The third-party engineer shall reevaluate the facility each time such action is proposed by the owner. The department shall be informed of the proposed use and the engineer's recommendations prior to or within 24 hours of each such occurrence.

(2) If the perimeter earthen dike of the phosphogypsum stack system is an above-grade earthen dike, the system may incorporate an emergency spillway to allow for the controlled release of process water during emergencies and avoid overtopping of the perimeter earthen dike. The spillway shall be located so as to minimize the environmental impact of any release to the extent practicable. This provision shall not be deemed to authorize a discharge from the spillway and shall not be construed to limit the department’s exercise of its enforcement discretion in the event that such discharge causes or contributes to a violation of applicable department rules.

(3) Notwithstanding any provision of rule 62-673, the department is authorized to allow the temporary use of an emergency diversion impoundment (EDI) to receive and store discharges of process water through a spillway authorized by rule 62-672.870(2) or by pumping where necessary to avoid or reduce the unpermitted discharge of process water to surface waters of the state. Following any such discharge, the owner of the system shall submit a plan within 30 days to the department and initiate all steps reasonably necessary to remove the process water from the emergency diversion impoundment as expeditiously as practicable but not to exceed 120 days following such discharge, or to otherwise mitigate the discharge to prevent violations of applicable department rules. Any department approval under this section or any other department approval of measures designed to mitigate impacts of emergency discharges of process water shall not be construed to limit the department’s exercise of its enforcement discretion in the event that such measures cause or contribute to a violation of applicable department rules.

Specific Authority 403.4155 FS. Law Implemented 403.4155 FS. History - New 6-28-99.