CHARLES SOIL CONSERVATION DISTRICT

SMALL POND SUBMITTAL GUIDELINES

Prepared by:
Charles Soil Conservation District
4200 Gardiner Road
Waldorf, Maryland 20601
Phone: (301) 638-3028
Website: www.charlesscd.com

Date of Publication:
May 2025

Table of Contents

CHARLES SOIL CONSERVATION DISTRICT

DESIGN REVIEW JOB AID FOR SMALL PONDS AND DAMS

SCD Pond Number (to be assigned) _____ Date _____

SCD File Number (to be assigned) _____ County/Municipality File Number _____

Owner(s) _____ Applicant _____

Project Name _____ Design Firm/Engineer in Charge_____

THIS DESIGN REVIEW JOB AID IS INTENDED TO BE A RESOURCE FOR DESIGNERS AND SCD STAFF. IT DOES NOT SUPERCEDE REGULATORY REQUIREMENTS. AS EACH PROJECT IS UNIQUE CERTAIN ELEMENTS ON THIS JOB AID CHECKLIST MAY NOT APPLY, AND ITEMS NOT ON THE JOB AID CHECKLIST MAY ALSO BE REQUIRED BY THE REVIEWING AUTHORITY.

In accordance with the Annotated Code of Maryland, Environment Article, §5-503: "A person shall obtain a permit from the Department to construct, reconstruct, or repair any reservoir, dam, or waterway obstruction, to make, construct, or permit to be made or constructed any change or addition to any reservoir, dam, or waterway obstruction, to make or permit to be made any change in, addition to, or repair of any existing waterway obstruction, or in any manner to change in whole or part the course, current, or cross section of any stream or body of water within the State, except tidal waters. The permit is obtained upon written application to the Department.

MDE has created an Embankment Design Category Flow Chart to aid designers, owners, and others to determine the appropriate embankment design category and approval authority for dams and small ponds.

SMALL POND EXEMPTIONS: Soil Conservation District small pond approval is not required for small class "a" structures that meet the exemption criteria in MDE Dam Safety Policy Memorandum No. 23 – Small Ponds Exempt from Approvals.

To correctly determine the embankment height, please reference MDE Dam Safety Policy Memorandum No. 22 – Determining Embankment Height.

Designer (check off)			SCD Reviewer		Submission Item	Design/Review Aids
YES	NO	N/A	received (yes/no)	correct (yes/no)		
GENERAL REQUIREMENTS						
					Construction plan set with Professional Engineer's certification, seal, signature, and date	See "Construction Plans" section for additional details Stamped/sealed plans only required for final submission
					Basis of Design report with Professional Engineer's certification, seal, signature, and date	Separate from Stormwater Management Report See "Basis of Design Report" section for additional details
					Completed Charles SCD Small Pond Agreement	See Appendix.
					Completed MDE Small Pond Summary Sheet	MDE Small Pond Summary Sheet
					Completed Engineer-In-Charge Affidavit	Engineer-In-Charge (EIC) Affidavit
					Geotechnical report with Professional Engineer's certification, seal, signature, and date	See "Soils Investigation / Geotechnical Report" section for additional details
					Dam breach analysis and proposed hazard classification with Professional Engineer's certification, seal, signature, and date	Analysis and hazard classification shall be performed based on MDE Guidance Document
					Project Construction Specifications	On plans or as standalone document Review MDE Policy Memo #15.
					Operation and Maintenance Plan	O&M requirements may be included on plans for small ponds.
					Relevant easements, maintenance agreements, or similar documents that may affect dam operation/maintenance	In cases where a pond is to be located on two or more adjoining properties, under different ownership, the District shall require the property owners to sign an agreement stipulating construction and maintenance responsibilities for the pond prior to review and approval assistance. This agreement shall be filed in the District office and recorded in the Land Records of Charles County.
					Point by point response to comment(s) (if applicable)	Ensure all comments are adequately addressed

Designer (check off)			SCD Reviewer		Submission Item	Design/Review Aids
YES	NO	N/A	received (yes/no)	correct (yes/no)		
CONSTRUCTION PLANS						
TITLE SHEET(S)						
					Project name, street address, parcel no., latitude, longitude	
					Owner/Developer name, address and phone number	
					Design Professional name, address and phone number	Provide separate information for Engineer-In-Charge if that individual differs from the design professional.
					Professional Engineer's certification, seal, signature, and date	
					SCD File Number	To be assigned by SCD at time of submittal
					SCD Pond Number	To be assigned by SCD at time of submittal
					Vicinity map to scale (1"=2000') with major roads identified and site delineated	
					Legend	
					Sheet index	
					Note to notify "Miss Utility" at 410-792-2401 or 1-800-257-777 at least 48 hours before beginning the construction.	
					Blank space for SCD approval block (2 in. x 4 in.)	
					As-Built Certification Block / Statement	To be executed after project completion

GENERAL INFORMATION (ALL SHEETS)						
					Preferred Plan scale range: 1” = 10’ to 1” = 50’	
					Preferred Profile scale: 1” = 5’ vertical, 1” = 50’ horizontal	
					Provide Scale Bars	
					Preferred Maximum Drawing Size: 22” x 34”	ANSI D preferred
					North arrow (plan sheets)	
					Match lines labeled and referenced	
					Profiles, details, and cross-sections drawn to scale	See below for all required profiles and cross-sections
					Sheets numbered, consecutively; revisions noted with date and clouded	
					Professional Engineer’s certification, seal, signature, and date	
DRAINAGE AREA MAP(S)						
					Existing and ultimate drainage area (DA) limits delineated	Preferred 1” = 200 ft scale (or less) Include sub-areas as applicable
					Existing and ultimate land uses delineated	
					Existing and ultimate time of concentration paths shown	
					Hydrologic Soil Groups depicted and labeled	USDA Web Soil Survey
					Provide table with breakdown of drainage area size, land uses organized by HSG, and time of concentration.	These should match the inputs in the Design Report. Provide for each sub-area if there are multiple.

PLAN VIEW OF DAM AT SCALE OF 1" = 50' OR LESS show and label the following:						
					Property lines and easements with owners information	Dams, including spillways and appurtenances should be limited to a single parcel where practicable. Where the dam, spillway or appurtenances are located on multiple parcels, an agreement that assigns maintenance and inspection obligations may be required. Both owners will have to be listed and sign all applicable certifications and agreements. The "No Woody Vegetation Buffer Zone" must be located within the same parcel as the dam, spillways and appurtenances. If the buffer zone extends onto a separate parcel, a permanent maintenance easement will be required.
					Existing and proposed contours (2' interval maximum) with index contours clearly labeled	All elevations to be referenced to NAVD88
					Location of cross-sections	
					Locations of test borings and bench mark(s)	See "Soils Investigation / Geotechnical Report" section for additional details
					Inflow channel(s) or pipe(s); erosion protection	
					Outflow pipe, outlet protection, outfall channel	
					Low flow channel (if applicable)	
					Forebays and internal berms	
					Control structure	
					Principal spillway	
					Seepage control (e.g., filter diaphragm, anti-seep collars, toe drains)	See Dam Safety Policy Memo No. 21 for additional design requirements
					Limits of impervious core and cutoff	See Dam Safety Policy Memo No. 14 for additional design requirements
					Emergency/Auxiliary spillway and outlet channel	See 210-NEH-628-50, "Earth Spillway Design" for additional design requirements Earthen spillways must be located in cut
					Stationing of all profiles and cross-sections	
					Site features and existing/proposed grading to 200 ft (minimum) beyond dam/reservoir limits	
					Clearing areas and limits of disturbance	

					"No woody vegetation" zone delineated	See Dam Safety Policy Memo No. 1 for additional design requirements. If embankment is created by cutting into an existing slope, the toe of the embankment shall be considered to be the pond bottom transposed to the downstream side of the embankment and the non-woody vegetation zone would be applied from there. Any existing trees within this zone would have to be removed in accordance with Memo No.1
					Upstream and Downstream Storm drainage system (conveyance system), size, material (existing and proposed) with easements clearly identified	See Dam Safety Policy Memo No. 20 for additional design requirements
					Utilities (existing and proposed) with easements clearly identified	See Dam Safety Policy Memo No. 10 for additional design requirements
					100-year (1% annual chance) floodplain limits	
					Relevant Water Surface Elevations (WSELs) shown, including Design High Water (DHW).	Do not used SWM-ESD Reduced Runoff Curve Number. Small Pond WSELs may differ from SWM water surface elevations.
					Wetland boundary and wetland buffer labeled	
					Chesapeake Bay Critical Area Boundary labeled	
					Waters of the U.S. labeled	
					Forest conservation easements labeled	
					Sinkholes and rock outcrops labeled	
					Maintenance access	Maintenance access must consider vehicle turn-around areas and be adequately sized for heavy duty pickups at a minimum
					Fencing (if applicable)	Fencing requirements around dams and small ponds are generally dictated by local ordinances Fencing must not inhibit adequate maintenance (e.g., mowing, woody vegetation removal, access to spillway). Fencing must not obstruct flow in auxiliary spillway. Fence posts are not acceptable in auxiliary spillway.
					Limits of impervious liner (if applicable)	See Dam Safety Policy Memo No. 16 for additional design requirements See NRCS Conservation Practice Standard (CPS) 520 for Compacted Soil/Clay Liners See NRCS CPS 521 for Geomembrane or Geosynthetic Clay Liners

					PROFILE OF DAM ALONG PRINCIPAL SPILLWAY (i.e. transverse profile at principal spillway) – show and label the following:	
					Existing and proposed ground surface	Include constructed and settled crest elevation
					Slope of embankment sides	2H:1V max, 3H:1V strongly preferred. Ability to adequately maintain slope must be considered. Combined US/DS slopes: Minimum 5H:1V Slope stability analysis may be required
					Embankment crest top width	Refer to MD378 (2000) Table 2
					Cutoff trench (dimensioned); bottom width 4’ minimum; side slopes 1:1 maximum; depth 4’ minimum below spillway/concrete cradle (must intercept impervious stratum)	See Dam Safety Policy Memo No. 14 for additional design requirements Sample Note: “Actual length and depth of the cutoff trench to be determined by the geotechnical engineer in the field and must intercept an impervious stratum. The backfill for the cutoff trench and impervious core shall conform to unified soil classifications CL, SC, CH, or GC. If no suitable material can be found on the site, soils conforming to these same classifications shall be obtained off site and shall be verified by a Maryland registered professional geotechnical engineer.”
					Impervious Core; side slopes; top width; top elevation	Minimum top elevation is 10-yr water surface elevation (WSEL)
					Control structure	
					Trash rack	
					Relevant Water Surface Elevations (WSELs) shown, including Permanent Pool, 10 yr, and 100 yr (DHW).	Do not used SWM-ESD Reduced Runoff Curve Number. Small Pond WSELs may differ from SWM water surface elevations.
					Principal spillway pipe (barrel): inside diameter and dimensions; length; slope; invert elevations in and out; material	Specify water tight joints. (Provide detail) Specify first joint must be within 4’ of riser structure. Specify concrete collar. (Provide detail) Material: for concrete pipe, ASTM C-361; for PVC pipe, ASTM D-1785 or D-2241; for HDPE, AASHTO M294 Type S; for HDPE ≤ 10”, AASHTO M252 Type S For concrete pipe, specify concrete spillway cradle.

					Seepage Control	Filter diaphragm recommended Anti-Seep collars allowable as described in MDE Dam Safety Policy Memo No. 21
					Outlet protection: median riprap size (d_{50}); thickness; length, width; cross-section detail (reference location); filter cloth	Design for full pipe discharge of design storm. Include design flow and velocity on plan view. Plunge pool or flat apron style pad are both acceptable. Plunge Pool recommended for higher velocities and steeper principal spillways.
					Specification of construction height and settled height for dam construction elevations	At each cross section, minimum 5% of fill height or as recommended geotechnical report. Settlement equal to or greater than 12 inches will require additional geotechnical evaluation and calculation of pipe joint extensibility
					Freeboard	Minimum 1ft above DHW, or minimum 2 ft without emergency/auxiliary spillway

PROFILE OF EMERGENCY/AUXILIARY SPILLWAY detail drawn to scale to show and label the following:						
					Existing and proposed ground surface.	Emergency spillway must be located in natural undisturbed ground to depth of design flow The channel side slopes shall not be steeper than 2:1. Exit channel centerline shall be perpendicular to the level section downstream edge and must be straight for a distance beyond the downstream toe, so that discharges will not flow along or towards the earthen embankment. Geometry must not direct flow towards embankment "Token spillways" not accepted
					Invert elevations - inlet, control and outlet sections	The minimum difference in elevation between the crest of the emergency spillway and the settled top of dam shall be 2.0 feet.
					Dimensions of inlet, control, and outlet sections	The emergency spillway shall have a bottom width of not less than 8 feet The level section shall be at least 25 feet in length and shall be rectangular or square.
					Slopes of inlet, control and outlet sections	
					Design flow and velocity	
					Protection of channel including material type and size	See USDA, NRCS, 210-NEH, Part 654, Chapter 8, "Threshold Channel Design", Table 8-6 for acceptable grass cover types by slope and flow velocity Refer to MD378 (2000) for acceptable velocities per grass type
					Cross-section detail of emergency spillway with invert (crest) elevation, 100-year WSEL, bottom width, existing and proposed ground surface, side slopes labeled.	

PROFILE OF DAM ALONG CENTERLINE (longitudinal cross section) drawn to scale and stationed to show the following:						
					Top of dam and elevation	Include constructed and settled crest elevation
					Location and elevations of principal spillway	
					Existing ground surface	Include original ground if area contains fill
					Proposed ground surface	
					Top of impervious core and elevations; limits shaded	
					Bottom of cutoff trench and elevation; limits shaded	Cutoff trench along full length of embankment extending to points where top of dam intersects natural ground, not stopping at intersection with 10-yr WSEL See Dam Safety Policy Memo No. 14 for additional design requirements Sample Note: "Actual length and depth of the cutoff trench to be determined by the geotechnical engineer in the field and must intercept an impervious stratum. The backfill for the cutoff trench and impervious core shall conform to unified soil classifications CL, SC, CH, or GC. If no suitable material can be found on the site, soils conforming to these same classifications shall be obtained off site and shall be verified by a Maryland registered professional geotechnical engineer." Sample Note: "Entire embankment, including cutoff/core trench, to be construction in continuous lifts. A plan revision approved by the Charles Soil Conservation District will be required if embankment must be excavated into at any point. This should also be reflected on the as-built."
					Location and crest elevation of emergency spillway	Emergency spillway must be located in natural undisturbed ground to depth of design flow
					Normal pool, 10-yr, and 100-yr WSELs denoted	
					Utility locations, type, and elevations	
					Soil Boring Profiles	

CONTROL STRUCTURE DETAIL						
					Provide construction detail(s) for the control structure. Specify whether structure will be cast-in-place or precast.	See Dam Safety Policy Memo No. 12 for additional design requirements. Precast risers cannot be substituted if plans call for cast-in-place structure, unless reviewed by design engineer and approved by the Charles Soil Conservation District as a formal plan revision prior to construction. Sections of precast structures must be anchored together for stability and floatation requirements. Watertight joints between the riser sections and between the riser and barrel are required.
					Riser/Weir crest elevation(s) and invert elevations of all openings	
					All openings dimensioned	
					Show and label trash rack – all openings.	Flat (i.e., horizontal) trash racks not permitted if below design high water surface elevation. Trash rack should be sloped at 3H:1V to 5H:1V. See Dam Safety Policy Memo No. 12 for additional design requirements
					Inside dimensions (diameter or width, length, height)	
					Riser base: length, width, thickness or gage (if metal)	Sample Note: Riser base shall not be constructed on gravel/stone
					Concrete collar shown and labeled	
					Key joint detail	
					Reinforcing steel layout, dimensions, details (if applicable), required cover	
					Waterstop details	
					Low flow orifice anchor and support labeled with dimensions, elevations	
					Dewatering device shown and labeled	
					Access to riser and valve operators	
					Valve(s)	See “Gate Valve Detail” section for additional details

					Specify minimum bearing strength for soil under structure.	Must have a F.S. > 3.0 per MDE Policy Memo #12. Include note similar to: “Geotech must certify soil bearing capacity prior to riser construction. Certified soil bearing capacity must be submitted with as-built.”
					Specify on plan view that all control structure requirements are met for concrete structures.	See MD-378 (2000) and Dam Safety Policy Memo No. 12 for design requirements. Recommended notes include: 1. Concrete shall be MSHA Mix No. 6 (FC=4,000 PSI and a max water-cement ratio of 0.42) 2. Reinforcement stell shall meet ASTM Standard A 615 Grade 6.0. 3. All joints shall be watertight. 4. (*If applicable*) Shop drawings to be provided by a MD Professional Structural Engineer and approved by the Charles Soil Conservation District prior to structure being ordered.

TRASH RACK DETAIL(S)						
					Material specified; galvanized and removable	Flat (i.e., horizontal) trash racks not permitted if below design high water surface elevation. Trash rack should be sloped at 3H:1V to 5H:1V. See Dam Safety Policy Memo No. 12 for additional design requirements. **The plan shall clearly state that "The trash rack must be hot dipped galvanized after fabrication."**
					Opening sizes dimensioned	Min 6", Max ½ of the barrel conduit diameter. Must project 8" minimum outward, extend 8" minimum below weir crest.
					Anti-vortex device	An anti-vortex device is not required if weir control is maintained in the riser through all flow stages.
					Access to riser interior	Ensure access points align with steps in riser
					Provide detail/specification for attachment to riser	Attached to riser with galvanized or stainless steel bolts.
FILTER DIAPHRAGM DETAIL						
					Aggregate/filter material specifications noted	Sample Note: "Geotextiles / Filter Fabric shall not be used to construct filter diaphragm or around drain pipe" See Dam Safety Policy Memo No. 21 for additional design requirements See USDA, NRCS, 210-NEH, Part 628, Chapter 45, "Filter Diaphragms." for diaphragm sizing See USDA, NRCS, 210-NEH, Part 633, Chapter 26, "Gradation Design of Sand and Gravel Filters" for filter compatibility requirements
					Indicate dimensions	
					Drain pipe diameter, material, perforation size/type	Provide sweeps or 45 degree bends to facilitate video inspection and cleanout.
					Indicate minimum 2 ft. cover between filter diaphragm and ground surface	

ANTI-SEEP COLLAR(S) DETAIL						
					Provide anti-seep construction detail with dimensions	Design anti-seep collar using specifications in MD-378 and Dam Safety Policy Memo No. 21 Design using sizing criteria in 2011 MDE Erosion and Sediment Control Manual. When anti-seep collars are installed around pipes with concrete bedding, projection must be measured from the outside edge of the concrete bedding
					Anti-seep collars must be made of the same material as the spillway pipe.	
					Indicate minimum 2 ft. cover between top of anti-seep collar and ground surface	

GATE VALVE DETAIL						
					Indicate valve type, size, manufacturer	Provide cut sheet/specifications. Consider means of valve replacement in the design and selection.
					Operator support structure	Design with sufficient mass/bulk to resist forces generated during opening and closing of the gate under full reservoir head Ensure valve operator connection details/strength at base are adequate to prevent pull-out
					Valve stem anchors/spacing per manufacturer specifications	Consider valve stem/operator location to ensure operation is feasible during high flow events and/or does not require confined space entry procedures.
					Electrical Systems	For outlet gates and equipment that operate by electricity, accessible standby generators or appropriate manual operators must be available and periodically tested.
					Gate leak testing	Suggested note for High and Significant hazard dams: “Gate shall be tested under normal pool conditions to verify leakage is within manufacturer tolerances”

STORM DRAINAGE PROFILES (inflow systems, systems through pond, systems adjacent to pond)						
					Structure locations numbered and stationed	Drainage structures must not be located within the embankment and are strongly discouraged from being located within a distance of twice the embankment height (measured vertically from the upstream toe to the crest) or within 15 feet from the downstream toe, whichever is greater. Manholes, inlets and field connections that are located closer to the embankment than indicated above must be made fully watertight by means of specifically designed sealants/wraps that meet ASTM C-990, ASTM C-877, or AASHTO M-198.
					Size, material and inverts of all pipes at the structure	
					Structure inverts labeled upstream and downstream at each structure	
					Label limits of road, pavement, right-of-way above profile	
					Existing and finished ground line at centerline of storm drain shown	
					Structure and pipe schedules	

LANDSCAPING PLAN						
					Include plant material, number, spacing, location, and size.	Recommended seeding mixtures, planting dates, and fertilizer application rates for dams and small ponds are provided in Appendix B-4-5, "Standards and Specifications for Permanent Stabilization" in the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control.
					"No woody vegetation" zone delineated	See Dam Safety Policy Memo No. 1 for additional design requirements
					Ensure that embankment fill material is covered with topsoil or other material with sufficient organic content to facilitate vegetation growth	

REPORTS AND CALCULATIONS						
BASIS OF DESIGN REPORT						
General						
					Cover Page	Provide Project Name and location; Owner/Developer name, address, point of contact; Design Engineer name, address, point of contact Stamped/sealed reports only required for final submission
					Provide contact information for owner(s) and operator(s)	

Assessment of Existing Facility (If Applicable)						
					Description of facility purpose and need	Project narrative
					Description of dam / impoundment / spillways	Describe spillway configuration, dimensions, and materials Describe embankment geometry (crest width, upstream and downstream heights, upstream and downstream slopes) Provide key elevations (e.g., crest, spillway elevations, emergency spillway crest, normal pool, 10-yr WSEL, 100-yr WSEL, design storm WSEL, freeboard) Provide table showing/comparing original, as-built and current survey elevations/dimensions, as applicable Provide table of inflow and discharges for 2, 10, 100-yr 24-hr storm events. Describe seepage control (e.g., impervious core and cutoff materials and dimensions, location and dimensions of internal filters and drains, anti-seep collars, seepage monitoring points) Describe existing utilities or easements within or adjacent to the dam and reservoir if applicable Provide original design reports, analyses, as-built drawings in appendix Note modifications made to original design, as applicable
					Description of dam/spillway condition	Include inspection checklist/report and representative photographs in appendix
					Description of inspection / maintenance / repair / incident history	Include a recently completed dam inspection report

					Hazard Classification	Describe basis of classification if breach analysis is under separate cover (e.g., date of study, type of study) Provide general description of structures, infrastructure, area in downstream danger reach Provide discussion of downstream development that has occurred since last classification which may change hazard

Assessment of Proposed Facility						
					Description of facility purpose and need	Project narrative
					Description of repair/retrofit changes proposed (if existing)	
					Description of dam / impoundment / spillways	Describe spillway configuration, dimensions, and materials Describe embankment geometry (crest width, upstream and downstream heights, upstream and downstream slopes) Provide key elevations (e.g., crest, spillway elevations, emergency spillway crest, normal pool, 10-yr WSEL, 100-yr WSEL, design storm WSEL, freeboard) Provide table of inflow and discharges for 2, 10, 100-yr 24-hr storm events. Describe seepage control (e.g., impervious core and cutoff materials and dimensions, location and dimensions of internal filters and drains, seepage monitoring points)
					Hazard Classification	Describe basis of classification if breach analysis is under separate cover (e.g., date of study, type of study) Provide general description of structures, infrastructure, area in downstream danger reach

Hydrology						
					Indicate source of all information	
					Existing and ultimate conditions drainage area map (1" = 200' scale or less)	Existing and ultimate D.A. limits delineated Sub areas delineated Existing and ultimate land uses delineated Existing and ultimate time of concentration paths shown Soils types and hydrologic soil groups delineated Storm drain network
					Narrative description of watershed	Provide a description of the watershed characteristics. If watershed contains a storm drain network, consider capacity of network and possible overland flow if network is at capacity
					Provide table with drainage area size, runoff curve number (RCN), time of concentration (tc) for all drainage areas/sub areas	Existing and ultimate conditions. Do not used SWM-ESD Reduced Runoff Curve Number
					Provide statement confirming ultimate land use used on computation of RCN	
					Provide RCN calculations	Use TR-55 / NRCS methodology/software RCN reduction not accepted
					Provide Tc calculations	Sheet flow path length limited to 100 feet Provide velocity, slope, Manning's coefficient for each segment
					Provide USDA Web Soil Survey	
					Provide runoff computations	Note that proprietary software may not be accepted. NRCS methodologies (TR-20/55, HEC-1, HEC-HMS) preferred Computer programs using NRCS hydrology methods with identifiable inputs and outputs may be accepted by the reviewing agency with prior coordination. 2, 10, and 100-yr 24 hr rainfall depth and distribution to be NOAA Atlas 14 Use of Rational method is not acceptable
					Provide table with 2, 10, 100-yr, 24-hr peak inflows	
					Provide 2, 10, 100-yr, 24-hr inflow hydrographs.	

Hydraulics / Routings						
					Provide description of basin routing and any assumptions	
					Provide principal spillway description (spillway type, number of pipes, size of pipes, pipe material, invert elevations, length, slope)	
					Provide riser dimensions and weir elevations	Include low-flow orifice size and elevations
					Provide auxiliary spillway description (dimensions, bottom width, side slopes, critical elevations, level section length, surface material, roughness coefficient)	
					Provide stage-storage-discharge table (and associated calculations)	Provide increments at 0.5 ft intervals, and at all weir/orifice elevations and grade changes Provide values to min. of 1 ft above dam crest or design high water, whichever is greater Include both principal and auxiliary spillway discharges. Include any low-flow orifice openings Account for tailwater conditions as needed
					Provide routed discharges for 10 and 100-yr, 24-hr storms.	
					Provide routed discharge velocities for 10 and 100-yr, 24-hr storms.	

Outfall / Downstream Analyses						
					Describe existing conditions / stability	
					Flow rates and velocities, after development, for 10-yr, and 100-yr design storms	
					Calculations for energy dissipation structure (e.g., plunge pool, flat apron pad)	Demonstrate stability for full range of anticipated discharges
					Elevation at end of outlet protection	
					Property lines, easements, utility crossings, floodplain limits, waters of US, wetlands and wetland buffers, location and first floor elevation of critical structures.	

Dam Breach Analysis						
					Guidelines for evaluating the potential consequences of failure and assigning the appropriate hazard classification for dam projects in Maryland are described in the document "Guidelines for Hazard Classification" (May 2018, or latest revision). These Guidelines will be used to check Dam Breach Analysis and Hazard Classification Reports submitted for approval.	Some small impoundments may automatically qualify for a low hazard classification (class "a"). See MDE Policy Memo #4.
					Describe the location of the dam and floodplain and a summary discussion of the floodplain land uses that will affect the hazard classification.	
					Detailed description of breach hydrograph estimation process	
					Description of baseline conditions assumed for breach analysis	Baseline conditions include the starting water surface elevation, impounded volume in the reservoir, and the assumed failure mode.
					Detailed description of routing breach hydrograph downstream of dam	Procedures used to route the breach hydrograph downstream to estimate the hydraulic conditions at critical locations shall be satisfactorily documented. Examples of required information include: Names of all computer programs; hydrologic or hydraulic routing; 1- dimensional or 2-dimensional modeling; steady or fully dynamic unsteady flow analysis, consideration of off-site drainage area routed to downstream breach reach
					Dam failure inundation maps showing hydraulics at critical locations	The map should include the location and alignment of the cross-sections used in the analysis, water surface elevation, arrival time of the initial and peak flood wave (from start of the dam breach), and average velocity in feet per second at each cross-section.
					Appropriate annotated cross sections or spot locations	Critical sections or locations should illustrate any improved or habitable structures impacted by the dam failure flood wave and show the lowest habitable floor elevation.
					Describe consequence estimation methods	Provide well reasoned explanations of why certain conditions do or do not contribute to population at risk estimates.
					Conclusions and statement of recommended hazard classification	The recommended hazard classification for the dam shall be clearly stated.

SOILS INVESTIGATION / GEOTECHNICAL REPORT						
					Appropriate geotechnical and geologic investigations must be performed	Borings should be provided at intervals not to exceed 200 ft along the centerline of the dam, at the approximate left and right abutment contacts, within 25 feet of the riser location, and at auxiliary spillway location (if not at abutment contact) All borings should extend into the foundation material a minimum depth equal to the upstream height by no less than 10 feet. Borings should be extended to intercept an impervious stratum at the cutoff trench bottom elevation. Borings shall be advanced using hollow stem augers (ASTM D6151) or direct push methods Continuous SPT sampling is recommended. Boreholes must be abandoned with a cement or bentonite slurry placed using tremie methods. Backfill with drill cuttings is not acceptable. Use of geophysical methods to estimate top of rock elevation and rock characteristics is recommended where rock is expected to be encountered in excavations and is required in karstic areas. Use of in-situ techniques such as cone penetration test (CPT), field shear vane, flate plate dilatometer, and pressuremeter are acceptable provided adequate documentation is provided in the report to support engineering analyses and conclusions derived from these methods.
					Records of all boring logs	ASTM Standard D5434 may be used as guidance and a checklist. Soils logged using Unified Soil Classification System (USCS) (ASTM D2487) Ground elevation of the borehole must be provided based on the datum established for the project Provide blow counts, elevations, and location of groundwater Describe existing fill, if any
					Provide discussion/narrative on local geohazards or problematic soils that may affect the dam (e.g., sinkholes, karst, active or abandoned mines, uncontrolled fills, dispersive soils, marine clays, corrosive conditions, highly permeable layers). Provide recommendations to mitigate risks caused by geohazards that have been identified.	

					Provide discussion/narrative or calculations regarding potential for seepage through or below embankment. Discuss necessary cutoff depths/elevations and or means to control seepage.	Reference: Montana Seepage and Stability Guidance for Embankment Dams **Table 3-1: Typical Permeability Ranges by Soil Type (Cedergren 1989)** Soil Type / Permeability, k (cm/s) **Clays** / $1x10^{-7}$ to $1x10^{-9}$ **Very Fine Sands, Silts, Mixtures of Sand Silt and Clay** / $1x10^{-7}$ to $1x10^{-3}$ **Clean Sand, Clean Sand and Gravel Mixtures** / $1x10^{-3}$ to 1 **Clean Gravel** / 1 to $1x10^{2}$
					Provide discussion/narrative or calculations regarding slope stability.	Provide references or relationships used to determine soil strength and permeability characteristics. Minimum Factor of Safety as follows: ● End of Construction: F. S. 1.3 ○ $k>10^{-4}$ cm/sec – can be assumed fully drained (effective stress). Other less permeable soils should be assumed undrained (total stress) ● Steady-State Seepage (Long-Term stability): F. S. 1.5 ○ Can be assumed fully drained (effective stress analysis) with phreatic surface determined by seepage analysis (assume reservoir at normal pool) ● Flood State: F. S. 1.3 ○ Essentially same initial conditions as steady state, except driving forces increased based on water at top of dam (or to PMF elevation), whichever is less. ● Rapid (or Sudden) Drawdown: F. S. 1.2 ○ $k>10^{-4}$ cm/sec – can be assumed fully drained (effective stress). Other less permeable soils should be assumed undrained (total stress) ● Earthquake: F. S. 1.1 Use of cohesion for impervious and semi-pervious fine grained soils is a common practice. A conservative value (lower end value) of cohesion should be used in the analysis. Cohesion value of free draining material is generally not considered acceptable. Use of commercial software recommended, but sufficient supporting input/output data must be included in the report as the

						Dam Safety program does not maintain licenses for all software. Reference: Montana Seepage and Stability Guidance for Embankment Dams
					Provide discussion/narrative or calculations regarding ultimate and allowable bearing strength for structures (e.g., riser, endwall, spillways). Provide recommendations for acceptable subgrade materials and provisions for protection and stabilization of subgrade.	Determine bearing strength for soil under structure. Must have a F.S. > 3.0 per MDE Policy Memo #12
					Provide discussion/narrative or calculations regarding potential for immediate and long-term settlement of the embankment and structures.	If settlement is anticipated to be greater than or equal to 5% of embankment height, the effect of the settlement on spillway alignment, slopes, and joints must be evaluated. Settlement should be evaluated at multiple points along embankment length and crest elevation constructed accordingly to avoid high/low spots on embankment crest.
					Provide discussion/narrative on control of groundwater during construction and steps necessary to protect the subgrade soils	
					Filter diaphragm compatibility calculations	Filter Design Criteria - NRCS Not required for small ponds if ASTM C-33 fine aggregate (concrete sand) is used. If gravel aggregate is used inconjunction with C-33 sand, provide compatibility calculations between the proposed aggretate and the C-33 sand.
					Filter diaphragm pipe and perforation sizing.	Calculations to support internal drain pipe diameters must be provided for all high and significant hazard dams. Provide calculations to support slot/performation sizing for all dams and small ponds.
					Boring logs plotted on dam profile and plan view	
					Provide results of all laboratory testing	

STRUCTURAL ANALYSIS / REPORT						
					Structural design of the dam structure and/or appurtenances should include documentation of material properties, applied loads, loading conditions and combinations, and analytical methods. Documentation of analytical models should include key model development information and model output. Sensitivity studies should be performed as needed to support the identification and selection of key structural parameter values and development of design details	See Dam Safety Policy Memo No. 12 for additional design requirements Hydraulic structures, such as spillways, have unique serviceability requirements that need to be considered as part of their design. Specifically, spillway structures are expected to be durable structures with a design life in excess of 50 years. Where cast-in-place construction is proposed, the design shall incorporate the requirements of the latest edition of American Concrete Institute (ACI) 318 Building Code Requirements for Structural Concrete and ACI 350 Code Requirements for Environmental Engineering Concrete Structure. Where pre-cast riser wall heights equal or exceed ten (10) feet, the design must incorporate the requirements of ACI 350. The minimum compressive strength of concrete used in any part of construction of a dam, small pond, or outlet works (excluding mud mats or pipe cradles) must be 4,000 psi. In general, MDOT SHA Mix #6 is adequate.
					Riser flotation analysis	The flotation analysis for the riser must assume all openings are plugged. The factor of safety against flotation must be 1.2 or greater if the soil backfill (and any water and connected structures) is not included in the computations. Where the buoyant unit weight of soil backfill is included in the computations, the factor of safety must be 1.5 or greater. The flotation analysis must assume the entire riser and riser base as submerged.
					Weir Walls	Ensure minimum factor of safety of 3.0 for sliding and 1.5 for overturning Design considering at-rest earth pressures unless deflection analysis indicates sufficient deflection to mobilize active pressures Passive resistance should not be used unless the resisting element is protected from scour (i.e., under concrete footing set back from downstream face)

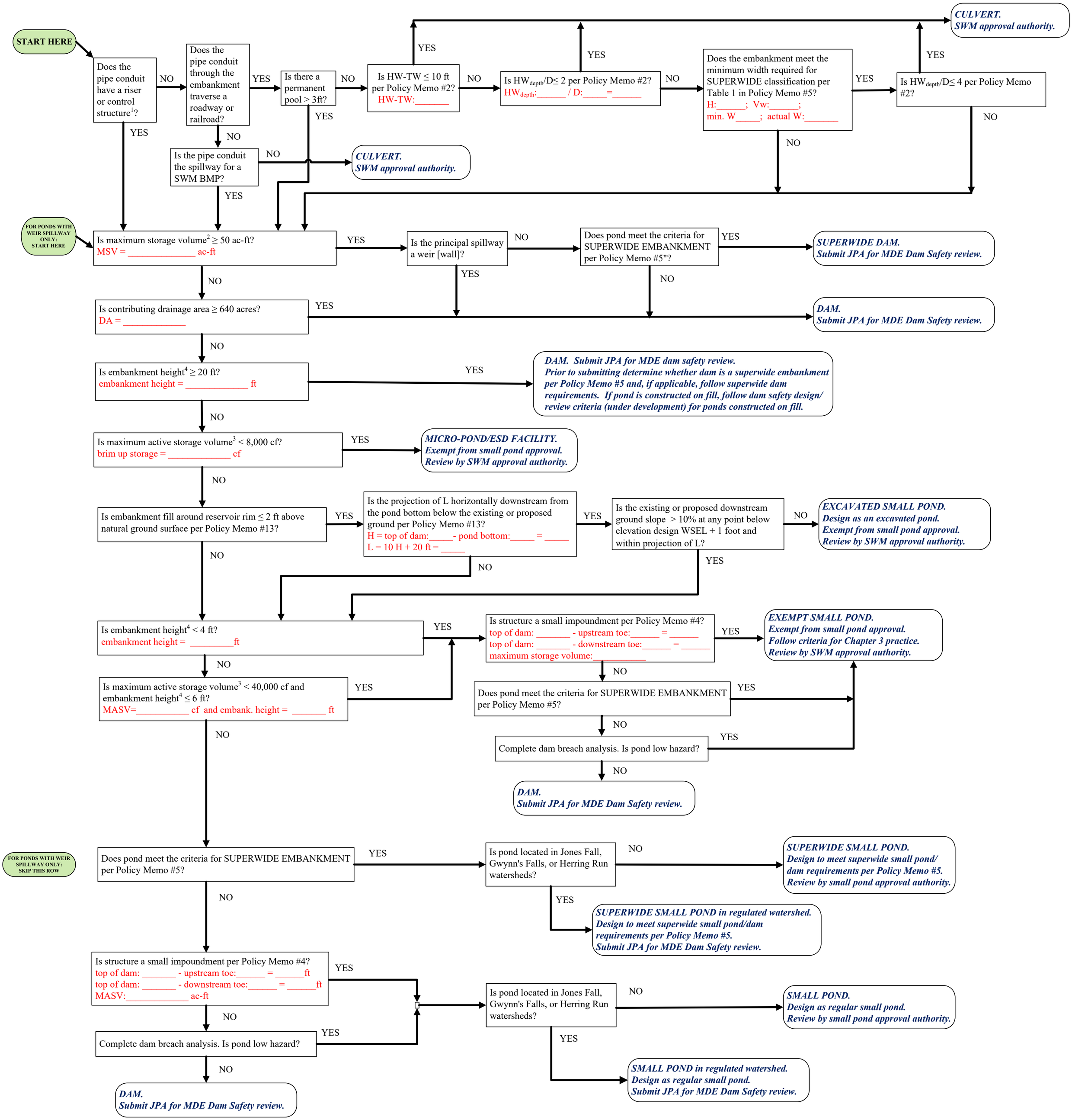
ADDITIONAL NOTES:

APPENDIX

February 25, 2025

MDE Stormwater, Dam Safety, and Flood Management Program

Flow Chart for Determining Embankment Design Category and Approval Authority



Definitions:

[1]Control Structure: Any device that controls the flow into the pipe including, but not limited to a riser, orifice plate, weir, or gabion baskets. An open culvert is not considered a control structure provided the pipe diameter is uniform through the embankment or increases in diameter in the downstream direction when additional flow is added.

[2]Maximum Storage Volume ("Brim Full" or "Brim Up"): The National Inventory of Dams defines maximum storage as the total storage space in a reservoir below the maximum attainable water surface elevation. This is the "brim full" volume. If the probable maximum flood (PMF) does not fill the storage space, then the PMF volume can be used as the maximum storage volume, and using the brim full volume would be conservatively acceptable. The upper limit of the storage volume is the top of dam/incipient point of overflow, not the invert of the emergency spillway. For media ponds, include the volume of water in the pore space (voids) of the filter media, which can be approximated using a porosity of 0.4.

[3]Maximum Active Storage Volume: This is the portion of the maximum storage volume that would contribute to the breach volume. Dead storage below the elevation of the downstream toe of embankment that does not contribute to the breach volume may be excluded from the maximum storage volume for the referenced purposes. For media ponds, if the filter media is part of the embankment height, the maximum storage volume includes the volume of water in the pore space (voids) of the filter media, which can be approximated using a porosity of 0.4.

[4]Embankment height has been defined by the MDE Dam Safety Division as the vertical distance between the lowest point of fill on the upstream face of the dam to the lowest point on the crest of the dam (excluding the auxiliary spillway). Oftentimes this is found at the principal spillway location but can be at other locations along the embankment. For the purposes of this definition, the lowest point of fill includes human-placed materials such as spillway conduits and cradles. Refer to MDE Dam Safety Policy Memorandum No. 22 – Determining Embankment Height for background information and diagrams.

Note regarding Ponds in Use III and Use IV watersheds:

Effective June 14, 2021, small ponds located in Use III and IV watersheds no longer require a permit from the Dam Safety Division. Thermal concerns in accordance with DNR guidance must be addressed and upheld by the small pond approval authority.

References:

USDA Natural Resources Conservation Service Maryland Conservation Practice Standard Pond Code 378, January 2000 or latest revision.

MDE Dam Safety Policy Memorandum No. 2 - Roadway/Railroad Embankment with Culvert Crossing, February 15, 2022 or latest revision.

MDE Dam Safety Policy Memorandum No. 4 - Hazard Classification of Small Impoundments, January 29, 2025 or latest revision.

MDE Dam Safety Policy Memorandum No. 5 - Superwide Roadway/Railroad Embankments, February 16, 2022 or latest revision.

MDE Dam Safety Policy Memorandum No. 13 - Excavated Ponds, April 24, 2023 or latest revision.

MDE Dam Safety Policy Memorandum No. 20 - Spillways Discharging to Storm Drain Networks, October 27, 2023 or latest revision.

MDE Dam Safety Policy Memorandum No. 22 – Determining Embankment Height, January 29, 2025 or latest revision.

MDE Dam Safety Policy Memorandum No. 23 – Small Ponds Not Requiring Small Pond Approval, January 29, 2025 or latest revision.

POND SUMMARY SHEET

Maryland Department of the Environment
Dam Safety Program

Part 1: General Information

APPROVAL TYPE

- ☐ New Small Pond
- ☐ Modify/Repair/Retrofit Small Pond
- ☐ Geotechnical Investigation
- ☐ Work in Reservoir Only
- ☐ Remove Small Pond
- ☐ As-Built Approval
- ☐ Other (Specify below):

PROJECT NAME / LOCATION

Project Name:
MDE/SCD File No.:
Pond/BMP ID No.:
*Cold Water Resource Area Map: https://bit.ly/3gXAI3U

Latitude *(decimal deg)*
Longitude *(decimal deg)*
Stream Name
Use Class
Cold Water? ☐ Y / ☐ N

PROPERTY OWNER INFORMATION

Owner Company:
Point of Contact:
Street Address:
Phone Number:
Email:

ENGINEER IN CHARGE INFORMATION

Owner Company:
Point of Contact:
Street Address:
Phone Number:
Email:
Maryland PE No.:

Part 2: Structure Information

HAZARD POTENTIAL CLASSIFICATION

Hazard Classification

- ☐ High
- ☐ Significant
- ☐ Low
- ☐ Low (Small Pond)

Breach Analysis Method

- ☐ Screening
- ☐ Simplified
- ☐ Standard
- ☐ Other

Population at Risk

*If relying on a previously approved breach analysis, provide a copy with application

POND CHARACTERISTICS

- ☐ Excavated
- ☐ Embankment
- ☐ Both
- ☐ Superwide

Distance Below Pond to:

Property Line (feet)
Public Road (feet)
Will embankment serve as roadway/railway? ☐ Y / ☐ N

POND SUMMARY SHEET

PURPOSE OF STRUCTURE (Check all that apply)

☐ Stormwater Management-Wet Pond	☐ Tailings / Dredged Material	☐ Water Supply/Irrigation
☐ Stormwater Management-Dry Pond	☐ Sediment Control	☐ Wildlife/Fish
☐ Infiltration	☐ Flood Control	☐ Fire Control
☐ Submerged Gravel Wetland	☐ Recreation	☐ Other (Specify Below)
☐ Bioretention	☐ Waste Water	

PROPERTIES OF DAM AND RESERVOIR

Length of Dam	(feet)	Surface Area (normal pool)		(acres)
Crest Width	(feet)	Surface Area (brim full)		(acres)
Embankment Ht.	(feet)	Storage (normal pool)		(acre-ft)
(Height measured from lowest upstream point to crest of dam)		Storage (IDF)		(acre-ft)
Dam Crest Elev.	Datum:	Storage (brim full)		(acre-ft)
Normal Pool Elev.		Side Slopes, US	H : 1V	
IDF Pool Elev.		Side Slopes, DS	H : 1V	
Freeboard	(feet)			
Drainage Area	(acres | sq. mi.)			

IDF = Inflow Design Flood (24-hr, 100-year for low hazard, ½ PMF for significant hazard, PMF for high hazard)

SPILLWAY CHARACERISTICS

Principal Spillway Type	*Auxiliary Spillway Type*	*Auxiliary Spillway Protection*
☐ Riser & Barrel	☐ Earthen Channel	☐ Grass
☐ Weir Wall	☐ Rock Channel	☐ Riprap Class:
☐ Weir & Channel	☐ None	☐ Gabions
☐ Other (specify below)	☐ Other (specify below)	☐ Other (specify below)

Principal Spillway Material

☐ RCP	☐ CMP / BCCMP	☐ Alum (CAP)	☐ PVC / HDPE
☐ Ductile Iron	☐ Cast-in-place concrete	☐ Pre-cast concrete	☐ Other _____

Riser & Barrel

Barrel Diameter (in.)	Capacity at IDF (cfs)
Riser Dimensions	Anti-flotation FS

Weir Wall / Weir & Channel

Weir Length (ft)	Overturning FS
Weir Coefficient	Sliding FS

Auxiliary Spillway

Crest Elevation	Capacity at IDF (cfs)
Bottom Width (ft)	Maximum Velocity (ft/sec)
Side Slopes H : 1V	

SMALL POND DESIGN CERTIFICATION

I CERTIFY THAT THIS DESIGN PLAN FOR THE CONSTRUCTION OF THE EMBANKMENT AND/OR EXCAVATED POND(S) REPRESENTS A HAZARD CLASS "A" POND(S) AND WAS DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE USDA, NATURAL RESOURCES CONSERVATION SERVICE - MARYLAND STANDARDS AND SPECIFICATIONS FOR PONDS, (MD-378) AND ALL REGULATIONS AND POLICIES OF THE MARYLAND DEPARTMENT OF THE ENVIRONMENT – DAM SAFETY DIVISION. I HAVE REVIEWED THIS PLAN WITH THE OWNER/DEVELOPER.

SIGNATURE_____ PHONE # _____
NAME (PRINTED) _____
ADDRESS _____
_____
MD LICENSE # _____

SEAL

_____
Signature

_____
Date

AFFIDAVIT
ENGINEER IN CHARGE
SCD Pond No. _____(provided by SCD)

My name is _____. I am a registered Professional Engineer in the State of Maryland (Registration No. _____). In accordance with COMAR 26.17.04.05 A(1) I am qualified in the field of dam design and construction to prepare the designs and specifications, and to provide supervision during the construction/alteration/repair of SCD Dam No. _____ (provided by SCD) at location _____(lat/long).

I have reviewed the plans, specifications, design reports (geotechnical, structural, hydrologic, and hydraulic analyses) and am familiar with the assumptions made during the design process.

I agree, if retained by the owner to perform construction inspection, to assure that the construction will be carried out in accordance with the approved plans and specifications and under the provision of any permit issued by the Maryland Department of the Environment, Water Management Administration.

This affidavit is to serve as written certification of my qualification to act as Engineer-in-Charge for the project.

I, _____, hereby declare that all information contained in this affidavit is true to the best of my knowledge.

Attach a resume' of pertinent experience.

Date: _____

_____
(Signature)

_____
(Type Name Here)

Subscribed and sworn to
before me this _____ day of
_____, 20___.

_____
Notary Public

My Commission Expires: _____

AFFIDAVIT ATTACHMENT FOR ENGINEERING TEAM
PLANNED FOR DESIGN AND CONSTRUCTION OF DAMS AND RESERVOIRS
SCD Pond No. _____(provided by SCD)

> "If an engineering team is planned for the design and construction, one registered professional engineer shall act as engineer-in-charge. However, each individual on the project team shall document that individual's area of responsibility and technical experience. This documentation shall accompany the permit application" (COMAR 26.17.04.05 A(2))

Attach this to the Affidavit to fulfill requirement if an engineering team is planned for either the design or construction inspection.

DESIGN FIRM: _____

DESIGN ENGINEER'S NAME: _____

AREA OF RESPONSIBILITY: _____

TECHNICAL EXPERIENCE: _____

_____

GEOTECHNICAL FIRM: _____

GEOTECHNICAL ENGINEER'S NAME: _____

AREA OF RESPONSIBILITY: _____

TECHNICAL EXPERIENCE: _____

_____

OTHERS: _____

_____

_____

_____

_____

_____

_____ _____

Date EIC Signature

Charles Soil Conservation District

SMALL POND APPROVAL CERTIFICATION

AGENCY FILE NO. **EFFECTIVE DATE**

_____ _____
Completed by Charles SCD Completed by Charles SCD

In accordance with §§5-501 through 5-514, et seq. of the Environment Article, Annotated Code of Maryland (2013 Replacement Volume, as amended), permission is hereby granted **[ADD APPLICANT INFORMATION HERE],** hereinafter referred to collectively as "the Owner", by the Charles Soil Conservation District to **[Construct, Repair, Etc.] [Name Of POND/PROJECT]** as shown on sheets ___ through ___ on plans prepared by **[EIC NAME AND COMPANY]** and approved by the Charles Soil Conservation District on _____.

The site is located near _____ (Road, intersection, etc.) on _____ stream in Charles County, at latitude ___ degrees north, longitude -___ degrees west.

Sincerely,

_____
[*signature*]

Charles Soil Conservation District Manager

SMALL POND APPROVAL ACCEPTANCE

This Approval and its conditions including the Operation and Maintenance Guidelines are accepted.

Owner Signature: _____

Print Name and Title: _____

Date: _____

* *

This **SMALL POND APPROVAL** is granted subject to the following:

GENERAL CONDITIONS

1. This Approval is valid only for use by the Owner. Permission to transfer the Approval must be obtained from the Department in writing.

2. This Approval is issued based on this structure being classified as a low hazard dam that meets the permit exemption requirements of §§5-503(b) of the Environment Article. Downstream development within the dam break flood zone may cause a change in the hazard classification and may require safety modifications to the structure and submittal of an Emergency Action Plan.

3. This Approval shall become null and void if the construction authorized herein has not begun within two (2) years from the date of this Approval. If the construction authorized herein has not been completed within five (5) years from the date of this Approval. After construction has been completed, the Operation and Maintenance Conditions shall remain in effect.

4. This Approval is subject to all laws and regulations now in effect and may be revoked if it becomes at variance with the laws of the State, or if the Owner fails to comply with the conditions of this Approval.

5. If future repairs, additions, or modifications other than routine maintenance must be made to the structure following completion of construction, a separate Approval must be obtained.

6. The Owner shall notify the Charles Soil Conservation District at least five (5) days prior to commencement of construction and no later than five (5) days following completion of construction at 301-638-3028.

7. This Approval does not preclude the need to obtain required authorizations or approvals from other State, federal or local agencies as required by law.

CONSTRUCTION CONDITIONS

8. The Owner is responsible for implementing all required erosion and sediment controls as approved by the Charles Soil Conservation District. The approved erosion and sediment control plan shall be maintained at the construction site for reference during the construction period. The Owner is responsible for implementing the erosion and sediment control plan.

9. The bed and banks of the waterway shall be disturbed as little as possible. Following initial soil disturbance or redisturbance, permanent or temporary stabilization is required within three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and seven (7) calendar days as to all other disturbed areas on

the project site except for those areas under active grading. Should construction be interrupted or delayed for more than seven (7) days, the Owner, as directed by the Department, shall implement temporary measures to prevent soil erosion during that period. All erosion and sediment control practices during construction shall be in accordance with the 2011 Maryland Standards and Specifications for Erosion and Sediment Control or an approved equivalent. The discharge of untreated sediment laden waters is strictly prohibited.

10. Instream construction in Use I waters is prohibited between the dates of March 1st and June 15th, inclusive, of each calendar year.

11. Instream construction in Use II waters is prohibited between the following dates of each calendar year:

SAV Closure: 4/15 to 9/15 or 4/15 to 10/15
Ruppia Closure: 4/15 to 10/14
Fish Closure: 2/15 to 6/15 or 3/1 to 6/15
Oysters Closure: 12/15 to 3/31 or 6/1 to 9/30 for spat
Turtles Closure: 2/16 to 9/30
Historic Waterfowl Closure: 11/15 to 3/1

12. Instream construction in Use III waters is prohibited between the dates of October 1st and April 30th, inclusive, of each calendar year.

13. Instream construction in Use IV waters is prohibited between the dates of March 1st and May 31st, inclusive, of each calendar year.

14. Motor driven construction equipment is allowed to be used within the stream channel only for that work that is authorized by this Approval and located within the project right-of-way. Spoil material/debris shall be disposed of outside the floodplain. Any temporary excavation or filling within the stream channel or floodplain shall be restored to the elevation existing prior to construction unless the Charles Soil Conservation District requires otherwise.

15. Construction activities, operation, and maintenance shall be carried out in strict accordance with Code of Maryland Regulations (COMAR) 26.17.04.05 and this Approval. The location, dimensions and type of all structures, excavation, or filling is to be in strict accordance with the Approved Plans and specifications unless written approval for any changes is granted by the Charles Soil Conservation District. If any changes to the Approved Plans are found to be necessary, they shall be submitted to the Charles Soil Conservation District for approval prior to ordering the execution of such change.

16. A person (including Owner, its employees, agents or contractors) who violates or fails to comply with the terms and conditions of this Approval, Approved Plans or an administrative order may be subject to penalties in accordance with §5-514 and §5-911, Environment Article, Annotated Code of Maryland (2013 Replacement Volume, as amended).

17. A copy of the Approved Plans and this Approval shall be kept at all times at the construction site for reference during the construction period.

18. If the Owner, its employees, agents or contractors fail to comply with this Approval or Approved Plans, the Charles Soil Conservation District may, in its discretion refer the case to the Maryland Department of the Environment (The Department) Dam Safety program to issue an administrative order requiring Owner, its employees, agents and contractors to cease and desist any activities that violate this Approval, or the Department may take any other enforcement action available to it by law, including filing civil or criminal charges.

19. This Approval may be suspended or revoked by the Department for cause, including violation of Approval conditions, obtaining an Approval by misrepresentation, failing to disclose a relevant or material fact, or change in conditions. The Department shall notify the violator in writing and provide an opportunity for a hearing, if the Owner: (a) submits false or inaccurate information in the Approval application or subsequently required submittals; (b) deviates from the Approved Plans, specifications, terms and conditions; (c) violates, or is about to violate terms and conditions of this Approval; (d) violates, or is about to violate, any regulation promulgated pursuant to Title 5, Department of the Environment Article, Annotated Code of Maryland as amended; (e) fails to allow authorized representatives of the Department to enter the site of authorized activities at any reasonable time to conduct inspections and evaluations; (f) fails to comply with the requirements of an administrative action or order issued by the Department; or (g) does not have vested rights under this Approval and new information, changes in site conditions, or amended regulatory requirements necessitate revocation or suspension.

20. Overall design of the project has been under the supervision of **[Engineer in Chg (Name)] (Maryland PE Registration No. _____), [EIC Company],** hereinafter referred to as Engineer-In-Charge (EIC). The EIC may not be changed without written approval from the Charles Soil Conservation District. Construction shall be under the supervision of the EIC, who shall notify the Charles Soil Conservation District upon the commencement of construction activities and thereafter maintain a record of the results of all field and laboratory material testing, delivery tickets for materials, shop drawings, and several representative digital photographs of the work.

21. The EIC or their representative shall be present and document their findings during all phases of construction including, but not limited to: a) site preparation, b) cutoff trench installation, c) spillway construction, d) embankment construction, and e) upon completion of construction.

22. Within sixty (60) days following substantial completion of construction, the EIC shall submit the documentation described in the above conditions, "As-Built" drawings, and a completed “Project Completion Report” (Form 1) to the Charles Soil Conservation District. The "As-Built" drawings shall include the contract drawings annotated with all changes in elevation, location, quantity, material specification, and any supplemental drawings issued during the construction period. All submittals shall be electronic. Special attention shall be directed toward documenting the foundation conditions encountered during construction. Where "... or equal" substitutions are made, the As-Built plans shall reflect these installed items.

OPERATION AND MAINTENANCE CONDITIONS

23. The Owner and any heirs, successors, or assigns are responsible for the safety of the dam and the continued operation, surveillance, inspections, and maintenance in accordance with the conditions described herein. The Owner shall promptly notify the Charles Soil Conservation District and the Department of significant changes in conditions.

24. In accepting the Approval, permission is hereby granted to representatives of the Charles Soil Conservation District and the Department to enter in or upon the subject premises at any reasonable time for the purpose of conducting inspections pursuant to the provisions of Title 5 of the Environment Article, Annotated Code of Maryland, as amended.

25. The dam shall be operated in accordance with the approved Operation and Maintenance Guidelines appended to this Small Pond Approval.

26. If the dam is not operated or maintained in full compliance with this Approval, the Owner shall repair all or any part of the structure at his sole cost and expense, as directed by the Charles Soil Conservation District or the Department.

27. Inspections of the facility shall be made by the Owner and/or qualified engineer on a triennial basis. Records of each inspection shall be maintained by the Owner. Triennial inspection reports shall be submitted to the Department within sixty (60) days of each inspection. Extensions may be granted under extenuating circumstances. At a minimum, annual inspection reports shall include a dam inspection checklist (Form 2), photographs of the dam, overall assessment of the condition of the dam and appurtenant works, a review of the downstream danger reach to determine if any new structures exist, etc.

28. Inspections of the facility will also be made during and after storms with significant runoff, by the Owner, to uncover any structural or operational problems. These inspections will include checking of the reservoir pool, spillway and conduit, to assure that they are free of any restricting debris. Records of these inspections shall be maintained by the Owner and submitted to the Department with the triennial inspection report.

29. Maintenance work such as the removal of all new tree growth and mowing of the dam will be scheduled as determined necessary during the Owner's inspections. Mowing of the dam shall be accomplished at least twice each year by the Owner. Any emergency maintenance will also be accomplished by the Owner.

30. The Owner agrees not to plant or allow the growth of any trees or woody vegetation on or around the dam. The growth of this vegetation shall be removed by the Owner.

31. The costs of the inspection, regular maintenance and emergency repairs will be accomplished by the Owner as warranted or at the direction of the Charles Soil Conservation District or the Department.

OPERATION AND MAINTENANCE PLAN GUIDELINES

Project Name: _____

Pond Address: _____

Pond No./ID: _____
Completed by SCD

Accepted by Owner: _____ **Date:** _____

The following are to be considered in the preparation of an Operations and Maintenance plan (O&M). By checking applicable items, these guidelines may be used as a standard O&M plan if deemed appropriate by the design engineer, or may be used in the preparation of a custom O&M plan (complete signature section required). O&M is to be designed to ensure that the facility continues to operate in a safe and effective manner and that problems are prevented or quickly identified and corrected. The O&M is to be in conformance with this document, NRCS MD 378, and COMAR 26.17.04.

In general, operation items are required for the following major areas: Embankment, Reservoir, Spillway, and Outlet Works.

The term "owner" used in these operation and maintenance plan guidelines refers to the property owner(s) where the pond embankment, spillway and appurtenant works are located.

OPERATIONS

I. Support Data

☐ A.) Background Information – The owner shall maintain a complete up to date as-built plan and design specifications for the dam. A copy of the completed Small Pond Sheet (MD-14) should be available.

☐ B.) Record Keeping – Written records of maintenance and observations should be kept. Photographs are valuable for recording observations and changes.

II. Inspections

☐ A.) Inspection Guidelines – Owners are to make a visual inspection at least once a year. Inspections are to be made after extreme rainfall events. Owners are encouraged to have an inspection by a registered professional engineer at least once every three (3) years.

☐ B.) Dam Inspection Checklist – Shall be included as part of the operation and maintenance plan and completed at least triennially. A visual inspection shall be conducted on an annual basis to detect blockages of the principal spillways that would cause the facility to not function as designed. In addition, if there are any visible trees, shrubs, or other woody growth on the embankment at time of annual inspection, it shall be removed prior to the next inspection.

III. Emergency Procedures

☐ A.) Surveillance – Inspect daily or more often under adverse conditions of heavy or extended rainfall, flash flood warnings or snow melt. Inspect for overtopping failures, piping or seepage failures, and structural failures. If any of the following conditions are noted, emergency procedures are warranted; muddy water is flowing from the downstream slope or toe; cracks or depressions are forming on the embankment; or flood flow over the top of the embankment is imminent.

☐ B.) Mitigation – Provide for lowering the reservoir or sandbagging before overtopping. Action to be taken for piping includes lowering the pool and attempting to plug the upstream end with suitable material.

☐ C.) Notification – Time permitting, consult a professional engineer experienced in dam design and operation to determine the extent of the damage and necessary repairs. Before major repairs, contact the Maryland Dam Safety Permits Division for approval. In the case of anticipated dam failure, the local fire and rescue or police department should be notified regarding the potential emergency. The ultimate responsibility for implementation of a warning plan, that includes the danger reach, rests with dam owner.

MAINTENANCE

IV. Embankment

☐ A.) Vegetation – Proper vegetation is required on earth dams. The proper selection of grasses, seeding rates, planting dates, and vegetation maintenance is available in the current MD Standards and Specifications for Soil Erosion and Sediment Control.

☐ B.) Tree and Brush – Trees and shrubs will not be allowed on the embankment. Trees that have been allowed to grow on the dam shall be removed completely, including all roots in accordance with Dam Safety Policy Memorandum No. 1.

☐ C.) Mowing and Brush Removal – Mowing is necessary to control the establishment of woody growth and to maintain the vegetative cover. The embankment, a fifteen (15) foot wide buffer strip adjacent to the toe, upstream and downstream of the embankment, and the area within 25 feet of the control structures need to be mowed.

☐ D.) Erosion and Slope Protection – The rate of erosion is directly related to the lack of vegetation. Prompt repair of eroding areas is required. Vegetation should be inspected in the early spring and late summer, and any bare or eroded areas repaired and reseeded. Problem erosion areas of pedestrian traffic or abundant contacts should be controlled with filter cloth and rock rip rap. The upstream face of a dam can be protected from wave erosion by the same method.

☐ E.) Seepage – Must be controlled in quantity and velocity to minimize damage to the dam. Regular monitoring to detect wet areas, “spring” flow, “piping, and “boils” on the downstream embankment should be done. Excessive seepage pressure can threaten the downstream slope stability. Seepage flow which is muddied by soil is evidence of “piping” and “boils”. When this occurs, complete failure may happen within hours and professional advice must be obtained immediately. Typical methods used to control the quantity of seepage are installation of an upstream blanket, or the installation of drainage trenches or drains. Non-emergency repairs must be approved by the Dam Safety Permits Division before installation.

☐ F.) Stability – Large cracks, slides, sloughing, and excessive settlement are signs of embankment distress and indicated that remedial work is required. Soil added to restore an embankment must be properly "keyed" into the base material. Repair of these conditions is not considered routine maintenance and must be approved by the Dam Safety Permits Division.

☐ G.) Rodent Guard – Control of rodents such as beavers, groundhogs, and muskrats is required as they can damage structural integrity and performance of the embankment and spillway. Groundhog and muskrat burrows serve as pathways for seepage. Beavers may plug the spillway and raise the pool level. Rodent removal and elimination of burrows is required when encountered.

☐ H.) Crest of Dam – Should be graded to direct all surface drainage into the impoundment. When access roads cross the dam any ruts that develop should be repaired as soon as possible.

V. Spillway and Outlet Works

☐ A.) Conduits – All conduits should be inspected thoroughly once a year. Inspect for improper alignment (sagging), elongation, and displacement at joint, cracks, leaks, surface wear, loss of protective coatings, corrosion and blockage.

☐ B.) Trash Racks – The trash rack unit should be checked periodically and especially after storm events. Accumulated debris should be removed, and maintenance performed if necessary. Under no circumstances should the trash rack be removed for an extended period. Annual maintenance for corrosion protection should be provided.

☐ C.) Concrete – Surfaces should be inspected for cracking, spalling, displacement or movement, and deterioration by weathering, chemical reactions or leaching. Extensive cracking, slab or wall movement, large areas of exposed reinforced steel and severe undermining require professional advice and Dam Safety Permits Division approval before repairs can be made. Minor repairs of patching, grouting, and coatings can be performed during routine maintenance.

☐ D.) Vegetated Earth Spillways – An emergency spillway is designed to pass infrequent large flood flows around the dam to prevent overtopping. The vegetative cover should be maintained the same as the embankment to provide a vigorous grass cover. Prompt repair of erosion damage and removal of flow obstructions are required.

☐ E.) Outlet – Erosion at the spillway outlet is common maintenance problem. Severe undermining, displacement of pipes, and dam failure can occur. Often the outlet is adequate for normal flow, but not for extreme storm flows. Periodically, and especially after storm events, the stilling basin, plunge pool, or rip rap energy dissipator should be inspected. Provide prompt repair of damages.

☐ F.) Drains/Mechanical Equipment – Drains should always be operable to provide draw down in the case of an emergency for necessary repairs. The gate or valve controlling the drain should be operated fully at least once a year or as recommended by the manufacturer. It should be inspected, and all appropriate parts lubricated and repaired before operations. Annual maintenance of metal operating mechanisms should be performed by keeping parts greased or painted to prevent corrosion. All equipment controls should be checked for proper security to prevent vandalism.

V. Reservoir

☐ A.) Pool Level – When it is necessary to draw down the pool level it should be done gradually over a period of time to prevent slope failures. An annual inspection of the pond/lake perimeter should be done. Potentially damaging fallen trees, debris, and sediments should be removed. Periodic removal of floating debris to prevent clogging of the spillways should be done. During extended periods of severe freezing weather inspection for ice damage or ice formation at the spillways and outlets should be performed.

VII. Additional Requirements

***TEMPLATE TO BE COMPLETED AFTER PROJECT COMPLETION ***

Form 1: Project Completion Report

[AGENCY]

[AGENCY ADDRESS]

PROJECT COMPLETION REPORT
Small Pond Approval No. **[Number]**
Date _____

I (We) hereby certify that [construct, repair, etc.] of **[Name of Dam or Pond]** in **[County]** County was completed on _____, 20___, in accordance with the plans and specifications approved by the **[AGENCY NAME]**. Any minor differences between the As-Built plans and the approved construction plans will not affect the safety of the dam including hydraulic performance or the minimum freeboard criteria.

Very truly yours,

[Engineer in Chg (Name)]
Engineer-In-Charge

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No._____, Expiration Date:_____.

Signature of Owner

_____
[Permittee (person)]
[Permittee Company]

_____
Title
Enclosed: As-Built plans, project history

Dam:_____ **Weather:** _____ **Date:** _____

Inspectors:_____ **Pool Level:**_____

MARYLAND DAM INSPECTION CHECKLIST	**Y**	**N**	**Monitor Repair**
1. CREST			
Ground cover in good condition			
Settlements Depressions Cracks			
2. UPSTREAM SLOPE			
Ground cover in good condition			
Riprap in good condition			
Erosion Animal Burrows Trees Shrubs			
Settlements Depressions Bulges Cracks			
3. DOWNSTREAM SLOPE			
Ground cover in good condition			
Erosion Animal Burrows Trees Shrubs			
Settlements Depressions Bulges Cracks			
Seepage _____ gpm			
4. INTERNAL DRAINAGE SYSTEM			
Seepage/drain flow: Left _____ gpm Right _____ gpm Other _____ gpm			
Does seepage contain fines?			
5. ABUTMENT CONTACTS			
Trees Shrubs Erosion			
Seepage _____ gpm			
6. SPILLWAY/RISER STRUCTURE Concrete or Metal Pipe			
Spalling Cracking Corrosion Erosion Scaling Exposed Reinforcement			
Joints: Displacement Leakage Loss of joint material			
Trash racks: Operational Broken Bent Rusted Debris Obstructed			
Sluice/Drain gates: Operational Broken Bent Corroded Leaking			
7. SPILLWAY CONDUIT Concrete or Metal Pipe			
Debris Cracking Leakage Spalling Exposed reinforcement			
Joints: Displacement Leakage Loss of joint material			
8. STILLING BASIN/PLUNGE POOL Riprap or Concrete			
Spalling Cracking Erosion Scaling Exposed Reinforcement Joint Deterioration			
Undercutting Eroding			
Outlet channel condition:			
Tailwater elevation and flow condition:			
9. EMERGENCY SPILLWAY			
Ground cover in good condition			
Erosion Trees Shrubs Obstructions			
OVERALL CONDITION: Excellent Good Fair Poor Unsafe			