

**ANNE ARUNDEL
SOIL CONSERVATION
DISTRICT**

**SMALL POND APPROVAL
CHECKLIST**

September, 2015

Heritage Office Complex
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Annapolis, MD 21401
410-571-6757
www.aascd.org

SMALL POND APPROVAL CHECKLIST

The following items must be addressed when preparing the pond design and computations. **Include a copy of this checklist with the plan sheet and/or computation booklet page number noted beside each item. In addition, tab and label the computations booklet.**

- _____ 1. If seeking an exemption to Small Pond Approval, the engineer must state and justify directly onto sheet 1 of the plans as to how the pond meets the “Exemptions” criteria found in MD-378.
- _____ 2. The pond plans and computations submitted for review and approval by either the Anne Arundel Soil Conservation (AASCD) or Maryland Department of the Environment (MDE) must adhere to the current USDA, Natural Resources Conservation Service (NRCS), Maryland Conservation Practice Standard Pond, Code 378 (MD-378).
- _____ 3. For AASCD/NRCS review, the **dam must not be greater than 20 feet in height** (measured vertically from the lowest point on the top of the dam to the lowest point of excavation, excluding the cutoff trench along the centerline of dam) **with a hazard class of “a”**. The ponds will be assigned a Small Pond number for tracking purposes. AASCD/NRCS approved ponds will require interim and final as-built plans to be submitted to I&P (one of which will be sent to AASCD via I&P).
- _____ 4. **Dams greater than 20 feet in height (measured same as above); a contributing drainage area of 640 acres and greater; or dams with a hazard class of “b” or “c” must be submitted to MDE for approval.** Submit plans and computations following this checklist directly to MDE with a courtesy copy to AASCD. The pond will be assigned a Small Pond number for tracking purposes. Once approval for the pond is given by MDE, provide a copy of the approval letter from MDE to AASCD. MDE approved ponds will require interim and final as-builts to be submitted directly to MDE with two copies to Inspection and Permits (I&P) (one of which will be sent to AASCD via I&P for informational purposes only).
- _____ 5. If retrofitting an existing pond (hazard class a), also provide the NRCS visible inspection checklists found in MD-378 (Appendix A) to be submitted to AASCD. In a cover letter, please provide the original project name, original grading permit number and existing Small Pond Number under which the existing pond was built. Provide a copy of the as-built plans and computations.
- _____ 6. Provide a dam breach analysis. The pond must be a class “a” as determined by potential hazard from failure. This determination must be made using the existing and ultimate development of the downstream area from the pond that will be affected by a possible dam breach. The pond classification must be stated on the plans and must be clearly documented and justified in the report. Danger reach study (dam breach study) must be done as per USDA, NRCS TR-66, Simplified Dam Breach Routing.
- _____ 7. Execute and submit the [Pond Summary Sheet \(MD-ENG-14\)](#) and the [Small Pond Approval Letter](#) directly to AASCD.
- _____ 8. Place the [Pond Summary Sheet \(MD-ENG-14\)](#), [Small Pond Approval Letter](#), [Pond Design Certification](#), [As-Built Certification](#) and the [MD-378 Construction Specifications](#) directly on the plans. Note that the minimum requirements of an acceptable as-built are outlined in the [Small Pond As-Built Checklist](#).

- _____ 9. A soils report is required which meets MD-378, "Soil Investigations."
- _____ a. The soils shall be identified according to the Unified Soil Classification System (USCS).
 - _____ b. At a minimum, the soils report must include information along the centerline of the proposed embankment (especially at the lowest point), in the emergency spillway location and on-site borrow areas.
 - _____ c. The soil boring locations and the on-site borrow areas should be clearly delineated on the plans.
 - _____ d. Earth fill shall be free of roots, stumps, wood, rubbish, stones greater than 6 inches, frozen or other objectionable materials.
 - _____ e. Fill material for the center of the embankment (embankment impervious core) and cut-off trench shall conform to the USCS CH or CL. GC and SC material may be used provided that at least 30% of the material passes the #200 sieve. The center of the embankment (embankment impervious core) must extend up to the 10-year design storm elevation.
 - _____ f. If borrow material is from off-site, place the following note on the plans: Fill material for the core trench and the embankment will be taken from an off-site borrow area. A professional engineer prior to placement must certify the fill material as meeting MD-378 pond specifications for fill material.
 - _____ g. Structural backfill and compaction must comply with MD-378.
- _____ 10. Any pond embankment, which is existing or created by excavation into an existing slope, must be totally reconstructed unless the engineer proves that all existing pond structure components (embankment, cut-off trench, spillway, anti-seep collars, etc.) meet the current MD-378 criteria.
- _____ 11. Excavated ponds which include a pipe or weir outlet control system shall be designed using the MD-378 Hydrologic Criteria for Ponds Table 1. Refer to principal and emergency spillway columns.
- _____ 12. Computations must adhere to the following and utilize NOAA-C rainfall amounts and distribution:
- _____ a. Use current version of NRCS TR-55 and TR-20, Formulation Hydrology Computer Program. Provide a schematic and label all input and output values.
 - _____ b. Provide a drainage area map at 40-scale, with contours delineating the overall pre-development and ultimate development drainage areas to the pond. The contours must justify the drainage divides shown. Spot elevations may be required on relatively flat drainage areas. Note the acreage of each drainage area. For larger drainage areas, drainage area maps at 100-scale may be utilized.
 - _____ c. On the ultimate development drainage area map, identify/delineate the Hydrologic Soil Groups of each soil type by clearly coloring each group (differentiating each group by color).

- _____ d. The runoff curve number (RCN) must be justified.
 - _____ 1. Submit a copy of the 40-scale drainage area maps delineating the Hydrologic Soil Groups, clearly identifying the land uses in each Hydrologic Soil Group.
 - _____ 2. Note the acreage in each drainage area for each Hydrologic Soil Group.
 - _____ 3. The consultant should prove that the cut and fill for the proposed development will not alter any Hydrologic Soil Group.
 - _____ 4. Downgrade the Hydrologic Soil Groups A and B to B and C, respectively, for the 100-year storm routings.
- _____ e. When time of concentration is computed, clearly show the travel time reaches on the 40-scale drainage area map. Provide computations to justify the velocities used for channel and pipe flow reaches. Sheet flow is not to exceed 100’.
- _____ f. Provide a [Stage Discharge Table](#) which takes into account all flow conditions. Provide equations with references, and show all variables.
 - _____ 1. Flow capacities must be computed at a minimum of 0.2 foot increments.
 - _____ 2. Each riser discharge component (i.e., low flow openings, low flow orifices, openings on top of riser, etc.) must have two columns. One column must show the discharge value and the other must show the hydraulic head (H) which was used to compute it.
 - _____ 3. Each riser component must be analyzed for weir and orifice flow to prove which flow condition governs.
 - _____ 4. Inlet control and outlet control columns must be provided for the spillway barrel.
 - _____ 5. The barrel discharge must be analyzed by using the total discharge from the riser components and computing the controlling head.
 - _____ 6. The controlling head (inlet or outlet) for the barrel will correspond to an elevation inside the riser. Therefore, include a column for the water surface inside the riser. If this water surface elevation has an affect on the riser discharge components, the values must be adjusted.
 - _____ 7. The outlet control calculations for the barrel must account for tail water during the 100-year frequency, 24-hour duration, NOAA-C rainfall amounts and distribution.
 - _____ 8. Measure the H value from the tail water elevation or the centerline of the outlet pipe (whichever is greater).
 - _____ 9. If the outlet is connected to an existing storm drain system (or is to be connected in the future) at a particular junction, measure the H value from the 100-year hydraulic gradient at that junction.
 - _____ 10. Submerged weir flows must be taken into account.

- g. Provide anti-flotation computations for the riser structure. The safety factor against flotation must be 1.2 or greater. Analyze the riser for flotation assuming all orifices and pipes are plugged and that the entire riser and its base are submerged.
- 13. Provide a stage storage table.
- 14. Provide a worst-case ultimate 100-year storm routing under the following assumptions:
 - a. Assume ultimate zoning land use.
 - b. Include any and all drainage area on site or off site, which could flow into the pond.
 - c. Ignore the presence of any riser opening with smallest dimension less than or equal to six inches.
 - d. Ignore the presence of any opening that does not have a trash rack or a trash rack that does not meet MD-378 specifications.
 - e. 100 year worst case routing must not overtop the embankment.
 - f. Begin discharge and storage values at the crest of the lowest opening. The lowest opening cannot be an opening that is being ignored as mentioned above in 14d.
- 15. Provide seepage control in accordance to MD-378. Either utilize anti-seep collar design computations or filter drainage diaphragm. Filter drainage diaphragms consist of sand or a sand/gravel mixture that is installed around the principal spillway barrel. The design gradation of the diaphragm is based on the gradations of the backfill material around the pipe and the foundation material at the diaphragm location. Fine aggregate concrete sand (ASTM C-33) is generally suitable for filter-drainage diaphragms. The drain material must be coarse enough to drain off seepage, but it also must be fine enough so that any soil particles being carried by the seepage are trapped at the upstream edge of the diaphragm.
- 16. Topographic data must include the following:
 - a. Show existing/proposed conditions of the site including existing improvements (buildings, walls, parking lots, roads, etc.) that are on adjacent properties and downstream of the proposed pond.
 - b. The topographic data must be provided to a stable outfall. Contours are to be adequately labeled and easily identified (spot elevations are to be shown if necessary).
 - c. Show the outlet peak velocities and peak discharges at outfalls for the 10-year and the 100-year frequency, 24-hour duration, NOAA-C rainfall amounts and distribution.
 - d. The outfall pad must be sized for maximum flow occurring at the outfall during the 100-year storm event.
 - e. Show the downstream 100-year storm event elevation at critical points.
 - f. Supplementary photographs may be required by AASCD.

- _____ 17. The pond construction is to be included in the sequence of construction on sheet 1 of the plans. Also include:
- _____ a. If applicable, specify how the existing watercourse will be diverted during installation of the principal spillway structure and embankment. The diversion method chosen must be shown on the plans and designed for the 2-year frequency.
 - _____ b. Note the installation of the following items in the sequence of construction: 1) clearing, stripping, and stockpiling of topsoil; 2) construction of the cut-off trench; 3) riser and spillway installation; 4) embankment construction; and 5) borrow area excavation.
 - _____ c. Note that all materials and principal components for the pond must be on site prior to work commencing.
 - _____ d. Describe the plugging and unplugging of the low flow orifice, the bricking and unbricking of the weir and the installation and removal of any dewatering devices for conversion of the sediment basin to a pond.
 - _____ e. State how the pond will be dewatered during the grading of the pond bottom. Provide an adequate dewatering detail (i.e. sump pit or dirtbag).
 - _____ f. Interim as-built plans are to be submitted within 45 days of sediment basin/pond construction.
 - _____ g. Note the installation of forebays/micropools upon sediment basin conversion to pond.
- _____ 18. Specific details and notes must be provided for all structures (i.e., riser, riser base, trash racks, etc.):
- _____ a. Provide riser base length, width and thickness.
 - _____ b. Note all openings in the riser structure.
 - _____ c. Note that the riser base is to be poured on original ground.
 - _____ d. Note that all risers are to be poured in place. If utilizing a precast structure, the shop drawings must be shown on the plans and signed and sealed by the professional engineer.
 - _____ e. Specify rebar size and steel reinforcement. Ensure rebar has a 2" minimum concrete cover.
 - _____ f. Trash rack details must meet MD-378 criteria. Project 8 inches minimum outward, extend 8 inches minimum below weir crest, and must be attached to the riser with galvanized or stainless steel bolts. Minimum spacing on trash rack bars must be 6 inches clear space.
 - _____ g. Clearly state that the trash rack will be hot dipped galvanized after fabrication and not field welded.
 - _____ h. Provide a specific detail of the trash rack fasteners.
 - _____ i. Provide anti-vortex device.
 - _____ j. Permanent low flow devices that utilize perforated pipes shall be wrapped in hardware cloth and stone only; not filter fabric.
- _____ 19. Specific details and notes must be provided for the principal spillway:
- _____ a. Pipe must be round. Indicate inside diameter, length, slope, type of material, gauge, joint locations, corrugation, etc. Note that pipe be ASTM C-361 and designate class. Show spigot section of principal spillway pipe from riser structure. First joint is to be within 4 feet of riser.

- _____ b. Trench cross-section for installing barrel spillway must have 2:1 slopes and a bottom width equal to the outside diameter of the pipe plus 4' and must be located 4' below the invert of the pipe.
 - _____ c. Watertight connection detail.
 - _____ d. Anti-seep collar detail or filter diaphragm required. Indicate size, spacing and location on pipe and provide detail. The projection of the anti-seep collar must be measured from the outside edge of the concrete bedding.
 - _____ e. Concrete bedding must meet MD-378. No gravel bedding allowed.
 - _____ f. Outlet protection sized according to the 100-year storm discharge rate. Outlet protection must meet the current Maryland Standards and Specifications for Soil Erosion and Sediment Control.
 - _____ 1. D50 and D max riprap size.
 - _____ 2. Length, width and thickness.
 - _____ 3. Filter cloth.
 - _____ 4. Extend profile of outlet to stable outfall.
- _____ 20. The plan view of the pond:
- _____ a. Plan view at a scale of 1"= 40' or less (i.e., 1" = 30', 1" = 20' are acceptable). Must show all adjacent property lines and environmental features and respective buffers.
 - _____ b. Stations along the centerline of the embankment.
 - _____ c. Note the Small Pond number within pond view on plans.
 - _____ d. Existing and final contours must be clearly labeled utilizing 2' intervals, showing all forebays for pretreatment.
 - _____ e. Label all structures in accordance to the storm drain plans.
 - _____ f. Provide a 15' wide grass strip from the toe of the embankment. Note that no trees or shrubs are allowed in this area or on the upstream and downstream of the embankment. Also, no trees or shrubs are allowed within a 25' radius of the riser structure.
 - _____ g. Locations of soil borings with borings clearly labeled. Minimum soil boring locations will be at the centerline of the embankment, principal spillway and borrow area.
 - _____ h. Provide riprap inflow protection at points of concentrated flows into pond and outfall protection (noting length, width, thickness, dmax, d50).
 - _____ i. Areas to be sodded.
 - _____ j. Emergency spillway design.
 - _____ k. Pond bottom dimensions.
 - _____ l. Fence.
 - _____ m. Provide a permanent mechanically stabilized access road to riser and all fore bays.
- _____ 21. Provide a cross-section of dam along centerline that includes:
- _____ a. Stationing along the top of dam.
 - _____ b. Top of dam elevations (settled and constructed).
 - _____ c. Location of emergency and principal spillways.
 - _____ d. Existing ground (show original).
 - _____ e. Top of impervious core (center of embankment) must extend vertically from the cutoff trench up to the 10-year storm elevation.

- _____ f. Bottom of cutoff trench shall extend 4' below pond bottom, pipe and anti-seep collar and have 1:1 side slopes.
- _____ g. Storm peak elevations (1, 2, 5, 10, 100 and 100 year worst case).
- _____ h. Show log and location of soil borings.
- _____ 22. Provide a cross-section of dam through principal spillway that includes:
 - _____ a. Existing ground (show original ground if area contains fill).
 - _____ b. Proposed ground surface (settled and constructed top of dam).
 - _____ c. The combined upstream and downstream side slopes of the settled embankment shall not be less than (5:1) with neither slope steeper than 2:1.
 - _____ d. Top width of dam (see Table 2 of MD-378).
 - _____ e. Cut-off trench must extend up to the 10-year storm elevation with bottom width (4' minimum) and impervious core (center of embankment), to extend 4' below final pond bottom with side slopes of 1:1.
 - _____ f. Indicate all orifice openings, sizes and respective inverts/elevations.
 - _____ g. Pipe must be round. Indicate inside diameter, lengths, slope, and type of material, gauge, joint locations, corrugation, etc. Note that the pipe, if concrete, be ASTM C-361 and designate class. Show spigot section of principal spillway pipe from riser structure. First joint is to be within 4 feet of riser. Provide a watertight connection detail.
 - _____ h. Phreatic line (4:1 slope) is measured from normal pool or the 10-year storm elevation to indicate saturated length.
 - _____ i. Anti-seep collar or filter diaphragm required. Indicate size, spacing and location on pipe and provide detail.
 - _____ j. Bedding detail must meet MD-378. No gravel bedding allowed.
 - _____ k. Emergency spillway crest.
 - _____ l. Outlet protection sized according to the 100-year storm discharge rate. Outlet protection must meet the current Maryland Standards and Specifications for Soil Erosion and Sediment Control.
 - _____ 1. D50 and Dmax riprap size.
 - _____ 2. Length, width and thickness.
 - _____ 3. Filter cloth.
 - _____ 4. Extend profile of outlet to stable outfall.
 - _____ m. Elevations shown must include:
 - _____ 1. Top of dam (provide 2' of freeboard from the 100 year storm elevation and 1' of freeboard if pond has an emergency spillway).
 - _____ 2. Crest of emergency spillway.
 - _____ 3. Weir crest of riser and all other openings.
 - _____ 4. Storm peak elevations (1, 2, 5, 10, 100 and 100 year worst case).
 - _____ 5. Top of impervious core (center of embankment).
 - _____ 6. Top and bottom of riser.
 - _____ 7. Bottom of cut-off trench.
 - _____ 8. Inlet and outlet inverts of pipe.
 - _____ 9. Show the constructed and settled elevations on the top of the embankment.

- _____ 23. Emergency Spillway:
 - _____ a. Capacity and design of emergency spillway must be sized according to MD-378 requirements.
 - _____ b. Excavated earth spillways must be located in undisturbed earth (cut not fill).
 - _____ c. Profile must show:
 - _____ 1. Existing ground (extend to a minimum of 100 feet below end of the exit channel).
 - _____ 2. Show 25' level section.
 - _____ 3. Inlet control and outlet sections.
 - _____ 4. Show side slope of spillway.
 - _____ 5. Design discharges and velocities.
 - _____ 6. Method of spillway stabilization.
 - _____ d. Cross-section of spillway must be provided.
- _____ 24. Fencing may be required in accordance to the County Code.
- _____ 25. Landscape Plan (provide a copy):
 - _____ a. Ensure that no trees or shrubs are allowed on the upstream and downstream sides of the embankment.
 - _____ b. Provide a 15' wide grass strip (no trees or shrubs) from the toe of the embankment.
 - _____ c. Minimum 25' radius around the inlet structure shall be kept free of trees and shrubs.
 - _____ d. Permanent stabilization is 95% vegetative coverage.

SMALL POND AS-BUILT CHECKLIST FOR INTERIM AND FINAL AS-BUILTS

A. Method:

- 1. The minimum information shall be shown in red on a copy of the approved plans.
- 2. A check mark must be made beside planned values if they were the constructed values. For changed values, line out the planned value and enter the actual value. Elevations to the nearest 0.1 foot are sufficient.
- 3. A check mark must be made next to each constructed pond component (i.e., core trench, trash racks, anti-seep collar, etc.).
- 4. Revised computations are required to address deviations from approved design.

B. Minimum Information Required:

- 1. A profile of the top of dam showing constructed and settled elevations, noting top width and side slopes. The top of fill elevation must be no less than the design elevation plus the allowance for settlement. Also show constructed core trench and spillways.
- 2. A cross-section of the emergency spillway at the control section.
- 3. A profile along the centerline of the emergency spillway. The emergency spillway exit slope may be 1-2% steeper, but not flatter nor less narrow than the design.
- 4. A profile along the centerline of the principal spillway extending at least 100 feet downstream of the fill. Show constructed core trench.
- 5. The elevation of the principal spillway crest.
- 6. The elevation of the principal spillway pipe invert (inlet and outlet).
- 7. The diameter, length and type of material for the riser.
- 8. The diameter, length and type of material for the pipe.
- 9. The size and type of anti-vortex and trash rack device and its elevations in relation to the principal spillway crest.
- 10. The number, size and location of the anti-seep collars.
- 11. The diameter and size of any low stage orifices or drain pipes.
- 12. Show the length, width and depth or contours of the pool area so that design volume can be verified.
- 13. Notes, measurements and elevations to show that any special design features were met.
- 14. Note fence installation and vegetative stabilization.
- 15. No trees or shrubs (woody vegetation) are allowed on the embankment (15' from toe and 25' radius from riser structure).
- 16. The top width and side slopes must be equal to or flatter than the design.
- 17. There must be a proper relation between the elevations of the principal spillway crest, the emergency spillway crest and the top of dam. All of these elevations should be greater than or equal to the design elevations.
- 18. Verify length, width, depth and stone size of riprap at outlet.
- 19. All as-built elevations must be noted next to the design elevations.
- 20. A certification statement and seal by a professional engineer that the as-built is accurate and complete and that the pond, as constructed, meets the requirements of the Standards and Specifications for Ponds.

**POND DESIGN CERTIFICATION FOR
SMALL POND NUMBER (S) _____**

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). I HAVE REVIEWED THIS PLAN WITH THE OWNER/DEVELOPER.

SIGNATURE _____ PHONE # _____
NAME (PRINTED) _____
ADDRESS _____

MD LICENSE # _____

SEAL
_____ Signature
_____ Date

NOTE: DO NOT EXECUTE AS-BUILT UNTIL POND HAS BEEN CONSTRUCTED.

Interim **Final**

**AS-BUILT CERTIFICATION FOR
SMALL POND NUMBER (S) _____**

I CERTIFY THAT THIS AS-BUILT IS ACCURATE AND COMPLETE AND THE POND(S) AS CONSTRUCTED MEETS THE REQUIREMENTS OF THE USDA, NATURAL RESOURCES CONSERVATION SERVICE MARYLAND STANDARDS AND SPECIFICATIONS FOR PONDS (MD-378). ANY POND DESIGN COMPONENTS NOT IDENTIFIED WITH AS-BUILT NOTATIONS WERE CONSTRUCTED AS PER THE APPROVED POND DESIGN.

SIGNATURE _____ PHONE # _____
NAME (PRINTED) _____
ADDRESS _____

MD LICENSE # _____

SEAL
_____ Signature
_____ Date

SMALL POND APPROVAL LETTER

As authorized by the Annotated Code of Maryland, Environment, Article 5-503, the Anne Arundel Soil Conservation (AASCD) hereby approves the plans and specifications for SMALL POND NUMBER _____ located at Maryland Coordinates _____ feet north and _____ feet east.

A. This approval is issued under the following conditions. Failure to comply with these conditions will constitute grounds for withdrawal of our approval and notification to MDE Dam Safety.

1. The approval is valid only for use by the developer/owner and may not be transferred to another unless written permission for such transfer is obtained from the AASCD.
2. The approval shall become null and void if the construction under the approval has not begun one year from the date of the approval and completed within eight (8) months after start of construction, except that these limits may be extended at the discretion of the AASCD.
3. Construction shall be in strict accordance with NRCS criteria for pond construction and the terms of this approval. The location, dimensions and type of all structures, as well as any excavation or filling, shall be in accordance with the aforementioned plans submitted by the developer/owner, unless written approval for any change is granted by the AASCD.
4. The pond shall be constructed under the supervision of a registered professional engineer. Within 45 days of the completion of construction, the developer/owner shall provide the AASCD with an "interim as-built" plan that meets the requirements of the AASCD Small Pond Approval Checklist. In addition, "final as-built" plans need to be submitted at completion of project. All as-built plans shall be sealed by a registered professional engineer. The registered professional engineer shall certify that the pond was constructed in accordance with the approved plans and specifications and that the entire as-built checklist has been addressed.
5. The pond construction shall at all times be in full conformance with Anne Arundel County/City of Annapolis and MDE Code. Any change or deviation from the approved plans must be redesigned and the revised plans must be approved by the AASCD prior to the performance of the work.

B. ACCEPTANCE

1. This approval and its conditions are accepted.
2. Permission is hereby granted to representatives of the AASCD to enter in or upon the subject premises at any reasonable time for the purpose of observing construction progress, reviewing the completed structure, and insuring adequate maintenance and repair of the completed structure.

Accepted by _____
(Developer/Owner's Signature) (Title) (Date)

Print/Type Name _____

Firm _____ Address _____

U. S. Department of Agriculture
 Natural Resources Conservation Service
 POND SUMMARY SHEET

Note: This form is to be used for NRCS Class "a" ponds only. Other ponds require a permit from Maryland Department of the Environment, Dam Safety Division.

PROJECT INFORMATION

Project Name: _____
 SCD File No: _____
 Pond No: _____

MARYLAND COORDINATES (to nearest 1000 feet)	
East	_____
North	_____
County	_____
ADC Map/Grid	_____/_____

OWNER INFORMATION

Name: _____
 Address: _____

TYPE OF POND: Excavated
 Embankment
 Both

Drainage Area: _____ Acres
 Surface Area: _____ Acres
 Normal Depth: _____ Feet
 Design Storm Frequency: _____ Years
 Storage at Design High Water (DHW): _____ Ac-ft

PURPOSE OF POND (Check all that apply)		
<input type="checkbox"/> Stormwater Management-Wet	<input type="checkbox"/> Sediment Control	<input type="checkbox"/> Wetland Mitigation
<input type="checkbox"/> Stormwater Management-Dry	<input type="checkbox"/> Livestock	<input type="checkbox"/> Wildlife/Fish
<input type="checkbox"/> Infiltration/Water Quality	<input type="checkbox"/> Flood Control	<input type="checkbox"/> Fire Control
<input type="checkbox"/> Water Supply/Irrigation	<input type="checkbox"/> Recreation	<input type="checkbox"/> Other (Specify below): _____
<input type="checkbox"/> Sand & Gravel Wash Pond	<input type="checkbox"/> Borrow Material	

EMBANKMENT		Maximum Fill Height	
Top Elevation	_____ Feet	_____	Feet
Normal Pool Elevation	_____ Feet	Top Width	_____ Feet
DHW Water Elevation	_____ Feet	Side Slopes: U.S.	_____ :1
		D.S.	_____ :1

Will embankment serve as public roadway? Yes No

PRINCIPAL SPILLWAY			
Barrel Size:	_____ Inches	Design Capacity at DHW:	_____ cfs
<input type="checkbox"/> BCCMP	<input type="checkbox"/> Alum (CAP)	<input type="checkbox"/> RCP	<input type="checkbox"/> PVC <input type="checkbox"/> Cast-in-Place Box Culvert
<input type="checkbox"/> Weir	<input type="checkbox"/> Channel	<input type="checkbox"/> Other:	_____
EMERGENCY SPILLWAY			
Velocity:	_____ Ft/sec	Design Capacity at DHW:	_____ cfs
Crest Elev:	_____ Ft	Bottom Width:	_____ Feet
Spillway Protection:	<input type="checkbox"/> Grass <input type="checkbox"/> Riprap	Side Slopes:	_____ :1
		<input type="checkbox"/> Gabions	<input type="checkbox"/> Other: _____

DISTANCES BELOW POND TO	
Property Line:	_____ Feet
Public Road:	_____ Feet

STAGE DISCHARGE TABLE

WATER ELEV IN POND	WATER ELEV IN RISER	LOWER OPENING WEIR FLOW		LOWER OPENING ORIFICE FLOW		RISER CREST WEIR FLOW		RISER CREST ORIFICE FLOW		BARREL Q4	HEAD REQUIRED FOR Q4 H4o FOR OUTLET CTRL H4i FOR INLET CTRL		EMERGENCY SPILLWAY		TOTAL Q
		H1w	Q1w	H1o	Q1o	H3w	Q3w	H3o	Q3o		Q1+Q3 = Q4	H4o due to Q4	H4i due to Q4	H5	
	Corresponds to greater of H4o or H4i														

NOTE:

- LIST ALL EQUATIONS , VARIABLES, ETC.
- ONCE THE WATER ELEVATION WITHIN THE RISER RISES ABOVE ANY ORIFICE OR WEIR, THE EFFECTS OF THE SUBMERGENCE MUST BE ANALYZED AND THE REDUCTION IN THE DISCHARGE MUST BE ACCOUNTED FOR.
- HEAD MUST BE MEASURED TO CENTERLINE OF PIPE OUTLET OR ACTUAL TAILWATER, WHICHEVER IS GREATER. THE “100 YEAR” HYDRAULIC GRADIENT CALCULATIONS ARE NEEDED IF OUTLET IS CONNECTED TO STORM DRAIN SYSTEM.

