

Phase II Nontidal Wetland Mitigation Plan – Required Information
Revised March 27, 2025

The information below is required by the Maryland Department of the Environment (MDE or Department) for the Phase II Wetland Mitigation Plan to be considered complete.

Plan view scaled drawings, including:

- A vicinity map showing the mitigation project location and existing land use.
- The location, type, and acreage of proposed mitigation activities. Plans should clearly show the boundaries of the areas being counted for each type of mitigation credit. A protected 25-foot buffer is required around all wetland mitigation sites and should also be shown on the plans.
- The proposed boundary of the site protection mechanism.
- The location of sediment and erosion control practices including a) Limits of Disturbance, b) location of stockpile areas, c) locations of all areas used to store machinery, equipment or supplies, and d) proposed source of borrow materials. Sediment and Erosion Control Plans may be required. Silt fence must be completely removed after construction has been completed. *Contact an MDE compliance inspector for confirmation that the site is stabilized prior to removal of silt fence.*
- Plans should clarify proper installation and use of geotextile fabrics to reduce incidental wildlife entrapment (e.g., snakes).
- Grading plans with existing and proposed elevations (minimum 1-foot interval). Include any proposed grading for the stream channel, wetlands, wetland buffer, floodplain, and site access. *Note: the design should reduce soil disturbance as much as possible since it is difficult to restore disturbed soil.*
- Location and conceptual drawing (plan and profile view) of all proposed structures (e.g., outfalls and in-stream structures). *Wetland sites with water control structures that can be easily manipulated/vandalized without Department approval (e.g., flashboard risers) will not be approved. Passive water control structures (e.g., riprap spillways) may be helpful to allow initial adjustment of water levels and are preferable to those requiring long-term maintenance. Ditch plug designs must follow NRCS specifications. Ditch plugs should only be used when an additional stable flow path is present, to improve long-term stability (otherwise consider a weir spillway).*
- A cross-section drawing showing existing and proposed site conditions, including grade, elevation and slope. Cross-sections should also include existing and proposed wetlands by type (e.g., PFO). Side slopes should be flat enough to reduce erosion potential and wildlife burrowing and blend in with the landscape (i.e., 6:1 or flatter).
- Existing well, piezometer, and soil boring locations.
- Proposed well locations.
- Location of all existing and proposed habitat features (e.g., wood duck boxes, vernal pools). *Inclusion of some open water may result in a more diverse system but will generally only get wetland credit if it is less than 10% of the total site restoration/creation/enhancement and is interspersed with the wetland as habitat pockets (e.g., not open water ponds).*
- Locations of any potentially conflicting land use (e.g., utility easements, existing easements or right-of-ways, trails, etc.).

- The type of physical protective barrier to be used to reduce human and livestock encroachment (e.g., mowing, dumping, ATVs, grazing, trampling) including signs, fences, etc. All borders must be marked with a metal post and sign at a minimum of every 50 feet (and at corners) designating the area for conservation. Areas of higher risk for encroachment may require closer signs or a fence. Protection methods will be determined on a case-by-case basis. For example, it may be acceptable to install signage around the perimeter of a site that has low risk for encroachment, but a fence will be required in areas where livestock currently exist or have the potential in the future, or where the risk for human encroachment is high.
- Identify proposed stream crossings. If livestock is adjacent to the mitigation site and the farmer desires future ability to cross the stream, the stream crossings should be kept to a minimum (i.e., only where necessary). Both sides of the crossing must have a gate so the livestock do not have unsupervised access to the crossing. The cattle crossing should not be allowed as a water source for the livestock. This crossing will not receive any mitigation credit. *In addition to the annual site inspection by the bank sponsor and (later) the long-term steward, the fence and stream crossing must be inspected frequently by the farmer to ensure there are no breaks in the fence. These inspections are especially important after storms, as debris or trees may create breaks in the fence, allowing livestock into the mitigation site.*
- Best Management Practices for working in nontidal wetlands, wetland buffers, waterways, and 100-year floodplains.
- Wetlands, wetland buffers, 100-year floodplains, and waterways.
- Existing forest and trees larger than 24 inches dbh.
- Specifications for soils, microtopography, decompaction, coarse woody debris, etc.
- Sites that include or are adjacent to streams should be designed to be successful with or without beaver activity.

Hydrology:

- Estimated seasonal depth, duration, and timing of inundation/saturation for each wetland zone during a “typical” year.
- Water budget showing the source and reliability of the water such as ground water, precipitation, surface water and overbank flow, over the different seasons of the year, consistent with the proposed wetland landscape position. Water budget should include expected monthly inputs and outputs, including a hydrograph showing monthly changes in water level. Water level elevations should be shown for a “typical” year, a “wet” year and a “dry” year. There should be resiliency built into the design to allow for uncertainty in modeling (e.g., if the model overestimated the contribution from overbank flooding, groundwater inputs will still provide adequate wetland hydrology).
- When possible, shallow monitoring wells and nested piezometers should be used for at least one fall to summer period.
- The project should not negatively affect adjacent land (e.g., decreasing water to nearby wetlands or increasing flooding to offsite properties). *If the mitigation project may directly or indirectly affect nearby wetlands (e.g., through reduced hydrology), the Department may consider the*

wetlands as a loss (deducting mitigation credit) and/or may require monitoring to ensure there are no negative impacts from the mitigation project.

- It may be desirable to delay planting until the contractor confirms that the constructed wetland has the desired hydrology. For example, after grading the site, the contractor may propose to monitor the site for at least six months, including a seasonally dry period, before planting the woody species.

Soils/substrate:

- A description of existing and planned soil and substrate conditions. Existing soils should be verified in the field. Soil borings may also be required by the Department. Soil profile descriptions, including identifying restrictive layers, are also important in determining appropriate well depths. Avoid sulfidic materials.
- If relying on a confining soil layer to maintain wetland hydrology, the layer must be at least 12 inches thick to prevent seepage. *A thinner layer (no less than 8 inches thick) may only be considered based on recommendations by a soil scientist.*
- An adequate amount of topsoil must be present through the site.
 - Where possible, soil should be similar to an appropriate Department-approved reference wetland. When proposing to use soils similar to a reference wetland, design plans and performance standards should specify an acceptable range of organic matter.
 - When it is not possible to mimic a reference wetland, and grading will occur or the topsoil was removed recently or historically, topsoil to a depth of at least 6 inches is required. Topsoil from the impacted wetland site should be salvaged whenever possible. *For sites being constructed in more disturbed settings (e.g., mitigation with extensive excavation or in old mine sites), higher amounts of topsoil may be required.*
 - Imported topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may only be used if recommended by a soil scientist and approved by the Department. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ inches in diameter. *Imported or salvaged topsoil should have minimal amounts of invasive plant species and should be free of contaminants. Include discussion on where the topsoil originates. If the topsoil has potential contamination, MDE may require monitoring for contamination.*
 - Unless you are using standards from an appropriate Department approved reference wetland, the entire depth of topsoil must have at least 2% organic matter to allow adequate vegetative growth. *If the soil surface has a Munsell value or chroma >3, then the soil organic matter must be tested using the Walkley-Black or Loss on Ignition method. Soil tests must be completed at a soil testing laboratory listed on the University of Maryland Extension website. If the test results in less than 2% organic matter, additional organic matter (beyond the standard 60 cy/acre - e.g., 500 cy/acre composted manure or hardwood chips) shall be incorporated into the topsoil to reach organic matter of 2%. Note: To convert total organic carbon to organic matter use this formula: total organic C (%) * 1.72 = OM (%).*
 - When adding topsoil, plans should specify that the site will be graded to below 6 inches of final grade, then 6 inches of topsoil spread over the site.

- For designs that propose to remove legacy sediment to expose buried hydric soils, provide a map of the buried hydric soils. This map should be based on a survey conducted at the site that includes soil profiles with depth to top of buried hydric soil layer and thickness of the hydric soil layer. The Department may require that the buried hydric soil layer be tested to ensure it has adequate organic matter.
- Soil and substrate amendments needed to meet hydric soil characteristics and maintain the specified plant species. A minimum of 60 cubic yards of organic matter (e.g., well-composted manure, hardwood chips, clean leaf compost, etc.) per acre is required. Organic matter should be thoroughly incorporated in the soil to a depth of 4 to 6 inches. Alternatively, if pre-construction soil monitoring demonstrates that there is an amount of stable carbon equivalent or higher to that in an appropriate Department-approved reference wetland, the addition of organic matter may not be required. *Note: It may be preferable for soil organic matter to be heterogeneous through the site to create “hot spots” of biogeochemical activity.*
- The surface of the soil must not be compacted to the extent that it limits plant establishment and microbial activity. Upon completion of initial grading (before adding topsoil), the subsoil must be ripped, disk plowed, or otherwise de-compacted to a depth of at least 8 inches. This should be completed when the soil is at field capacity. Unless the site is designed to be precipitation-driven, plans should include the requirement that subsoil has a bulk-density of less than 85 lbs/cubic foot (1.35 g/cc) for loamy and finer textured soils and less than 107 lbs/cubic foot (1.7 g/cc) for sands (prior to adding topsoil or organic matter). If subsoil bulk density is higher than these limits, it should be ripped or otherwise remediated to lower the bulk density below this threshold, before adding topsoil. *When adding topsoil, be sure you do not compact the soil.*
- Microtopography must be included. Microtopographic variations should be between 3 and 6 inches from design elevation, with no more than 25 percent of each wetland cell remaining at the design elevation. Alternatively, the design may include microtopography similar to an acceptable Department-approved reference wetland, with the proposed range clearly specified in the design plans and in the performance standards for the site.
- Supplemental coarse woody debris (CWD) should be added throughout the mitigation site, at a minimum rate of three dump truck loads per acre. This should include a combination of logs (e.g., at least 6 feet long with diameters of ≥ 6 inches), brush piles, root wads (remove the soil if from offsite), overturned stumps, standing snags (e.g., > 8 feet tall), etc. CWD should be screened before installation to ensure it is not a source of invasive plant/insect species, disease, or trash. *CWD may include trees removed as part of project construction or imported but should not be harvested just for this purpose.*

Planting plan showing:

- All planting zones separated by proposed vegetative types, including the size of each area.
- Limits of Disturbance cleared for the project should be reforested.
- The scientific and common names of all plant species to be used, with quantities and sizes of each.
 - All species planted within the wetland and wetland buffer shall be native to that region of the State and should be locally sourced genotypes. No cultivars should be used. Species should be selected based on nearby Department-approved reference wetlands and should encourage diversity and wildlife habitat, including for pollinator species. All species used for temporary or permanent seeding must be native or non-persistent. *Consideration should be given for the*

time of year that construction will be completed. If construction will be completed in summer, you may include native warm season grasses in your seed mix, to outcompete some of the invasive grasses that are more likely to germinate in the summer.

- Consideration should be given to what species may readily volunteer from surrounding forest (e.g., Sweetgum, Red Maple) and should not be planted or should only be planted in lower quantities. Planting Loblolly Pine is discouraged. Ash species should not be planted.
 - For proposed forested wetlands, since survival of shrub species has been reportedly low, a larger proportion of the plantings should be tree species.
 - Planting density should be high enough that the performance standards will be met.
- Provide an inventory of existing and potential sources of invasive species. Discuss the invasive species management for the site. For sites with a high risk of invasive species, preventative measures should include a) diverse seed mix at high application rate, b) higher tree planting density, and c) larger tree material. *Consideration may also be given for the use of early successional and faster growing tree species, as high tree canopy reduces cover of many invasive species.*
- With the exception of temporary stabilization species, all species planted in the wetland should have an Indicator Status of Obligate, Facultative Wet, or Facultative. No more than 50% shall be facultative.
- Planting dates for each species. *Trees/shrubs should be planted in early spring or in the fall.*
- The method to be used for plant protection from herbivory by deer, voles, beaver, etc. (including fencing, tubing or other protection). If tree/shrub protection is used, they must be removed prior to monitoring termination or their long-term maintenance must be addressed (e.g., maintenance of permanent fencing). If fencing is used, it should allow for passage by smaller animals.

Other considerations:

- Realistic and specific goals and objectives in terms of functions and values. The use of a conditional or functional assessment method (e.g., MDWAM) may be required for the pre-construction of the mitigation site and again during the monitoring period. *This assessment may help to justify estimates of potential functional uplift and may result in reductions of mitigation credit for sites that already contain resources (e.g., forest).*
- Describe how the mitigation work plan was designed to mimic a representative reference wetland/stream reach within the region or service area. Local reference sites should be utilized to determine appropriate design, including hydrology, plant material, grading, etc. Reference sites may also help to determine appropriate performance standards.
- Design should avoid/minimize impacts to other resources (e.g., forest, RTE species, historic resources, nearby airports). All outstanding issues with other agencies must be resolved prior to Phase II Mitigation Plan approval.
- Describe how the project will be sustainable in the long-term considering potential effects of climate change (e.g., sea level rise, more frequent intense storms, changes in precipitation patterns, saltwater intrusion, etc.).
- Are the proposed impacts or mitigation site(s) within an area identified in the Environmental Justice screening tool? If so, how will the proposed mitigation project benefit the community? Please describe any outreach related to the proposed mitigation project that has occurred within these communities. Please discuss results from the MDE screening tool

<https://mdewin64.mde.state.md.us/EJ/>.

- Determination of credits.
- Provide the Department with a GIS polygon layer showing the boundary of the area(s) getting mitigation credit. The polygon(s) should not include berms, buffers, upland pockets, etc. unless these areas are getting mitigation credit. If the applicant modifies the mitigation boundary during construction or during the monitoring period, the applicant should submit the updated mitigation boundary. This file should be a shapefile or feature class, in the coordinate system Maryland State Plane NAD 1983 (meters).
- A monitoring and maintenance schedule establishing responsibility for all requirements necessary to meet performance standards, including the removal of exotic and nuisance vegetation.
- Monitoring and performance standards shall follow the most recent Interagency Review Team (IRT) monitoring protocol and performance standard template document. Alternate monitoring may be proposed for mitigation projects restoring unique resources. Monitoring requirements should match the goals and objectives of the mitigation site. **Any proposed deviations from the IRT performance standards and monitoring protocol based on the site design must be clearly shown in the proposed performance standards.** Monitoring reports should also include the USACE Mitigation Monitoring Report Form and a monitoring and performance standards summary table.
- The person/consultant responsible for preparing and submitting the monitoring reports. This will require an agreement with a consultant or other qualified person in advance.
- Adaptive management plan tying specific performance standards to actions (e.g., if the project does not result in target hydrograph, invasive species, beaver, etc.).
- Any proposed impacts to floodplains, waterways, or regulated open water must get authorization from the MDE Waterways Division prior to Phase II Mitigation Plan approval.
- For mitigation projects proposing over two acres of permanent tree clearing located within a Tier II catchment with no assimilative capacity, the applicant must contact the Antidegradation Implementation Coordinator.
- Any disturbance over one acre must apply to MDE Compliance Program for a NOI permit.
- Does the mitigation project require a county grading permit? It is the applicant's responsibility to get all required permits and approvals for the work (e.g., sediment and erosion control, grading, etc.).
- Mitigation areas proposed for Forest Conservation Act requirements should be clearly shown.
- Wetland mitigation credit areas cannot also be used for TMDL credits.
- The type of financial assurances that shall be payable to the State and conditioned upon successful achievement of specific milestones (e.g., construction, monitoring completion, etc.) according to an approved mitigation plan. Financial assurances are due prior to commencing the authorized impacts or within 60 days of the Phase II Mitigation Plan approval, whichever comes first.
- A detailed description of the site protection mechanism to be used, including a draft that follows the IRT approved templates. Since conservation easements are the preferred option, if other mechanisms are proposed, provide justification why a conservation easement was not possible. The protection mechanism language must be approved by the Department prior to recordation. Documentation that the selected protection mechanism has been recorded must be submitted to the Department within 60 days of the completion of construction of the mitigation project.
- Evidence of a legal right to implement the proposed mitigation plan on the selected site(s).

Acceptable methods of securing legal right to undertake the mitigation project include recorded deeds, executed conservation easements, landowner agreements, or contracts of sale for the selected site.

- An "as-built" site design plan shall be submitted to the Department within 60 days of the completion of the mitigation project. The "as-built" plan must show the original contours, the previously proposed contours, as well as the constructed contours. The as-built plans must also show a polygon depicting the boundaries of the area(s) getting mitigation credit that includes the area calculation(s) called out in square feet.
- For all projects that qualify under the Maryland State Programmatic General Permit-6 (MDSPGP-6), the Mitigation Plan must also meet the requirements of the 2008 Federal Mitigation Rule, as specified in 33 CFR 332.4(c). Address in detail the 12 elements (attached).

The requested information listed above should be submitted to:

Maryland Department of the Environment
Wetlands and Waterways Protection Program
Mitigation and Technical Assistance Section
1800 Washington Boulevard, Suite 430
Baltimore, Maryland 21230

The Department will render a decision concerning the acceptability of Phase II of the mitigation plan within 45 days of receipt of a completed plan unless a final permit decision has not been made. If the Department fails to notify the applicant within the 45-day period, the plan shall be considered acceptable unless a final permit decision has not been made.

12 Components of a Compensatory Mitigation Plan /
Elements of the 2008 Mitigation Rule

1. **Objectives.** A description of the resource type(s) and amount(s) that will be provided, the method of compensation (restoration, establishment, preservation etc.), and how the anticipated functions of the mitigation project will address watershed needs.
2. **Site selection.** A description of the factors considered during the site selection process. This should include consideration of watershed needs, onsite alternatives where applicable, and practicability of accomplishing ecologically self-sustaining aquatic resource restoration, establishment, enhancement, and/or preservation at the mitigation project site.
3. **Site protection instrument.** A description of the legal arrangements and instrument including site ownership, that will be used to ensure the long-term protection of the mitigation project site.
4. **Baseline information.** A description of the ecological characteristics of the proposed mitigation project site, in the case of an application for a DA permit, the impact site. This may include descriptions of historic and existing plant communities, historic and existing hydrology, soil conditions, a map showing the locations of the impact and mitigation site(s) or the geographic coordinates for those site(s), and other characteristics appropriate to the type of resource proposed as compensation. The baseline information should include a delineation of waters of the United States on the proposed mitigation project site. A prospective permittee planning to secure credits from an approved mitigation bank or in-lieu fee program only needs to provide baseline information about the impact site.
5. **Determination of credits.** A description of the number of credits to be provided including a brief explanation of the rationale for this determination.
 - For **permittee-responsible mitigation**, this should include an explanation of how the mitigation project will provide the required compensation for unavoidable impacts to aquatic resources resulting from the permitted activity.
 - For **permittees intending to secure credits from an approved mitigation bank or in-lieu fee program**, it should include the number and resource type of credits to be secured and how these were determined.
6. **Mitigation work plan.** Detailed written specifications and work descriptions for the mitigation project, including: the geographic boundaries of the project; construction methods, timing, and sequence; source(s) of water; methods for establishing the desired plant community; plans to control invasive plant species; proposed grading plan; soil management; and erosion control measures. For stream mitigation projects, the mitigation work plan may also include other relevant information, such as planform geometry, channel form (e.g., typical channel cross-sections), watershed size, design discharge, and riparian area plantings.
7. **Maintenance plan.** A description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed.
8. **Performance standards.** Ecologically-based standards that will be used to determine whether the mitigation project is achieving its objectives.
9. **Monitoring requirements.** A description of parameters monitored to determine whether the mitigation project is on track to meet performance standards and if adaptive management is needed. A schedule for monitoring and reporting monitoring results to the DE must be included.
10. **Long-term management plan.** A description of how the mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.
11. **Adaptive management plan.** A management strategy to address unforeseen changes in site conditions or other components of the mitigation project, including the party or parties responsible for implementing adaptive management measures.
12. **Financial assurances.** A description of financial assurances that will be provided and how they are

sufficient to ensure a high level of confidence that the mitigation project will be successfully completed, in accordance with its performance standards.