

CHECKLIST FOR STREAM MITIGATION PLANS

DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

WATER RESOURCES DIVISION

www.Michigan.gov/LakesandStreams

In accordance with the administrative rules for Part 301, Inland Lakes and Streams, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, and upon approval by the Department of Environment, Great Lakes, and Energy (EGLE), a mitigation plan may be submitted by the permit applicant when stream mitigation is necessary to offset resource losses resulting from a proposed project. The following items must be submitted in the stream mitigation plan:

Section I. Objectives

A description of the objectives of stream mitigation, including:

- The linear feet of channel to be restored, created, enhanced, or preserved by stream order and flow type (i.e., perennial, intermittent, or ephemeral)
- The stream order, flow type, hydrology, and riparian area of the streams to be impacted.
- Using the Michigan Stream Quantification Tool (MiSQT), or a comparable functional assessment methodology approved by EGLE, show how stream functions impacted or lost due to the proposed project will be replaced at the stream mitigation site (functional lift).

Section II. Site Selection

A description of the factors considered during the site selection process, including:

- How the site selected for mitigation exhibits stream functions that can be improved (assessment of the mitigation site).
- A map showing the location of the mitigation site in relationship to the impact site – include information on the HUC 8 and 10 watersheds.
- A map showing the location of the mitigation site in relation to surrounding roads and other landmarks.
- Catchment assessment form in the MiSQT

Section III. Site Protection Instrument

A description of the legal arrangements and instrument that will be used to ensure the long-term protection of the compensatory mitigation project site, which shall include the stream channel and associated riparian buffer area.

- Information on current site ownership and any other easements.
- The conservation easement, drain agreement, and/or any other provisions for the long-term protection of the site. For stream mitigation performed on designated county drains, the applicant will be required to secure a drain agreement from the local agency with jurisdiction over the county drain (typically the county drain commissioner) in addition to a conservation easement from the landowner.

Section IV. Baseline Information

A description, resulting from an on-site functional assessment (MiSQT), of the existing physical and ecological characteristics of the stream channel(s) at both the impact site and the mitigation site. The MiSQT assessment should include the following stream functional parameters and metrics, as applicable. The MiSQT workbook should be submitted in Excel format and supporting documentation/field data should be included for each field value entered in the MiSQT.

- Reach Runoff measured by a land use change coefficient and concentrated flow points.
- Floodplain Connectivity measured by Bank Height Ratio and Entrenchment Ratio.
- Bedform Diversity measured by Pool Max Depth Ratio, Pool to Pool Spacing Ratio, Percent Riffle, and/or Aggradation Ratio.
- Riparian Vegetation measured by buffer width and either average DBH, tree density, and native shrub/sapling density, or herbaceous cover.
- Lateral Migration measured by dominant Bank Erosion Hazard Index/Near Bank Stress scores, percent streambank erosion, and percent streambank armoring.
- Large Woody Debris measured by a Large Woody Debris Index score.
- Physicochemical measurements including July mean temperature, E. coli, total phosphorus, and/or dissolved oxygen concentrations.
- Biological parameters including macroinvertebrates and/or fish as measured by the Procedure 51 or Procedure 22 indices.

Include maps of the impact and mitigation sites showing all waterbodies and wetlands, land use, topography, soils, hydrology, vegetation types and buffer widths, survey reaches, concentrated flow points, drainage area(s), channel characteristics including dimensions, slope, and sinuosity, and any other relevant site characteristics.

Section V. Determination of Credits

An explanation of how the compensatory stream mitigation project will provide the required compensation for unavoidable impacts to aquatic resources resulting from the permitted activity. The MiSQT, or other methods approved by EGLE, should be used to demonstrate that functions have been replaced.

Section VI. Mitigation Work Plan

Detailed written specifications and work descriptions for the compensatory mitigation project.

A Basis of Design report:

- A description of the design approach, stream hydrology, discharge estimates, geomorphic assessment including stability analyses, bankfull identification and verification, table of design criteria and description of methods used to develop design criteria, reasons for in-stream structures, and all other assumptions and calculations to support the basis of design.

Site Development and Stream Channel Design plans:

- Existing and proposed conditions of the mitigation site including topographic information (at 1ft contour intervals), structures, roads, trails, property lines and easements, directional arrows, scale, riparian buffer, vegetation establishment areas, and conservation easement boundaries.
- Existing and proposed channel alignment with center-line stationing. Existing and proposed channel profile and cross-sections showing bankfull and flood prone elevations, as well as proposed bank height ratio, entrenchment ratio, and width to depth ratio.
- Typical plan view, cross-section, and profile drawings for proposed riffles, pools, and each type of in-stream structure or wood installation including construction tolerances.
- All specifications for channel materials including calculations for rock sizing. Any erosion control blanket should consist of natural fiber and be free of plastic.
- A vegetative establishment plan which includes a plan view, methods, species list with scientific and common names, and source of any plant or seed stock

Construction Methods and Schedule:

- A schedule for completion of the mitigation site (e.g., initiation, introduction of hydrology, planting, completion).
- Site preparation, soil erosion/sedimentation control methods, construction methods and sequencing, and construction oversight.

Section VII. Maintenance Plan

A description and schedule of maintenance requirements, during the permitting and monitoring timeframe, to ensure the continued viability of the stream functions in the mitigated area once initial construction is completed.

- Identify methods to be used to prevent and control the establishment of invasive plant species, prevent over-grazing, remove trash, etc.

Section VIII. Performance Standards

A description of the standards that will be used to determine whether the compensatory stream mitigation project is achieving its objectives. Criteria by which the mitigation stream will be evaluated to determine if the stream mitigation requirements have been met should be consistent with the MiSQT and functional credits claimed for the mitigation. The following standards will be included in most projects:

- Reach Runoff: land use change coefficient and concentrated flow points
- Floodplain Connectivity: Bank Height Ratio and Entrenchment Ratio
- Bedform Diversity: Pool Max Depth Ratio, Pool to Pool Spacing Ratio, and Percent Riffle.
- Riparian Buffer: buffer width and measures of tree size and density, shrub density, and herbaceous cover
- Bank Migration/Lateral Stability: Bank Erosion Hazard Index and Near Bank Stress scores, percent streambank erosion, and percent stream bank armoring
- Large Woody Debris: LWD Index
- Physicochemical and Biology (only included if mitigation credit is being proposed for these parameters or if requested by EGLE)

Section IX. Monitoring Requirements

A description of parameters to be monitored to determine if the compensatory mitigation project is on track to meet performance standards and if adaptive management is needed.

- The MiSQT functional assessment, or other method approved by EGLE, should be used to demonstrate the change in stream functions over the monitoring period. The MiSQT Excel workbook should be included in monitoring reporting.
- A schedule for monitoring and reporting on monitoring results should be included. Monitoring should include an assessment of the as-built condition soon after construction. Year 1 of monitoring begins the year after completion of planting and seeding. Monitoring reports should cover the period of January 1 through December 31 and be submitted to EGLE prior to January 31 of the following year.
- All performance standards should have a method for monitoring.

Section X. Long-term Management Plan

A description of how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource.

Section XI. Adaptive Management Plan

A description of how expected or unforeseen changes in site conditions or other components of the compensatory stream mitigation project that adversely affect compensatory mitigation success will be identified and addressed.

- Assessment of the problem, probable causes, upstream and/or downstream impacts, and predicted trajectory (i.e., will the problem continue to worsen without assistance or will it trend toward increased stability)
- Development of corrective measures including a schedule for implementation and EGLE approval

Section XII. 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 compensatory mitigation project will be successfully completed in accordance with the performance standards.

- Standard amount for financial assurance is \$250 per linear foot of mitigation stream channel. Amount of financial assurance may increase with project complexity or timing. The financial assurance shall be held during the time frame of the permit and shall be released upon a schedule dictated by permit conditions.
- Typically, fifty percent shall be released upon substantial compliance with the performance standards after two years and two bankfull flow events occurring in separate years. The remaining fifty percent will be released upon demonstration of both channel stability and substantial compliance with the performance standards at the end of the monitoring period.