TRCA Master Environmental Servicing Plan Guideline
March 2015

Master Environmental Servicing Plans (MESPs) are generally required by municipalities to support new blocks of development, or comprehensive re-development, within a secondary plan area. TRCA is responsible for technical clearance of MESPs in accordance with its roles as a conservation authority (CA): CAs are public commenting bodies under the *Planning Act* and *Environmental Assessment Act* (and represent the Provincial interest for natural hazards – s.3.1 of the Provincial Policy Statement), service providers to municipalities as outlined in Memorandums of Understanding, resource management agencies, and regulators under the *Conservation Authorities Act*. In concert with the municipality, TRCA reviews both the terms of reference for MESPs, and MESPs themselves, to ensure that the inter-connected matters of water management, natural hazards and natural heritage are adequately addressed.

This guideline outlines the components of an MESP that are to be completed to TRCA's satisfaction prior to municipal approval. An MESP is procured by the municipality, and its Terms of Reference developed in consultation with the municipality and TRCA. The Terms of Reference should then be approved by the municipality prior to the proponent's commencement of the MESP.

Although there may be some overlap, the following study components are separate from any of the municipality's MESP requirements. They are generic and are to be refined in consultation with TRCA and the municipality for each individual MESP. Indeed, field work and data gathering may reveal that additional items to those in this list should be studied. It should also be noted that the prior completion of a Subwatershed Study for the MESP study area may not require the same level of detail outlined below in the "Phase 1" items, if these items have already been satisfactorily addressed in the subwatershed study.

In all cases, pre-consultation with the municipality and TRCA is important to clarify and confirm the MESP study components, with a view to streamlining and shortening the review process.

The following are required for TRCA's review of an MESP:

Executive Summary

- A description of why the MESP is being completed and how it relates to the broader planning process, as well as any applicable master planning or environmental assessment processes for the area;
- Key findings of the MESP, including a high-level summary of how the subject areas/disciplines of the MESP are integrated, i.e., describe how the different components of the Natural System within the study area rely on or affect one another (to be described in more detail in the latter part of Phase 1), and a list of studies to be completed at future stages in the planning process.

Planning Context, Project Timelines and Phasing

- Study Area – map of area under study in a watershed context with property boundaries of participating and non-participating landowners identified.
- Purpose – the general development concept for the subject area.
- Planning Background – summary of directions from existing legislation, policies, and designations affecting the subject area; previous approvals; planning stage and status of the proposal and approvals required; timing of phases of approval and construction.

PHASE 1 - Characterization of the Natural System

Existing Studies and Projects affecting the study area, e.g., watershed plans, subwatershed studies, ecological or hydrological monitoring programs, fish management plans, natural heritage inventories or strategies, flooding and erosion remediation projects, etc.

Baseline Monitoring Plan - Minimum period of 1 to 3 years of continuous monitoring; consult with TRCA staff for appropriate duration and locations of monitoring stations.

Monitoring locations and parameters should provide the appropriate baseline data necessary to characterize the Natural System as outlined in 1A. to 1E. below. Monitoring locations should be strategic in terms of choosing areas that may be affected by the proposed development; this will facilitate completion of more detailed analysis or modelling in Phase 2 of the MESP and in future planning stages.

1A. Surface Water

- Watershed Hydrology
  - Identify available hydrologic information (i.e. TRCA Hydrology Reports/Models)
  - In accordance with provincial and municipal requirements and TRCA's Stormwater Management Criteria document, define applicable stormwater management criteria (unit flow rates, Regional Storm control, water quality, erosion control and *water balance*) for the subject area. *For water balance, see Section 1E. of this MESP Guideline*.
  - Assess watershed, sub-watershed, catchment location and size
  - Provide location mapping for the subject lands in a watershed context
  - Confirm, and refine as required, TRCA's assumptions for hydrologic and hydraulic modeling
  - Based on results above, update TRCA's model and re-confirm stormwater management quantity control requirements.
- Flood Plain Mapping/Hydraulics
  - Review TRCA's existing flood plain mapping, and identify areas of additional mapping requirements.
  - If required (based on hydrology requirements, and review of existing flood plain mapping) complete and/or update flood plain mapping (scope of work shall be defined by TRCA).

1B. Erosion

- Fluvial Geomorphology
  - Complete a detailed Erosion Assessment, as described in TRCA's Stormwater Management Criteria document; establish the required level of stormwater management (SWM) erosion control, including release rates, and volume control requirements (as established in the water balance analysis noted below).
- Geotechnical
  - Mapping and cross-sections of steep, or long, or unstable slopes in valley corridors (see TRCA Geotechnical Guideline) that may warrant geotechnical analysis for erosion hazards, including top of slope and toe of slope erosion.

1C. Groundwater

- Hydrogeological Investigations (see Conservation Authority Guidelines for Hydrogeological Assessment Submissions, Conservation Ontario, June 2013)
  - Existing groundwater levels, flow direction and gradients
  - Aquifer extents (vertical and horizontal) and vulnerability

- Identification of major groundwater resources and groundwater users in the area
- Identification of vulnerable aquifer(s) and areas of flowing artesian conditions that could affect underground infrastructure and foundation designs (borehole depths should be aligned with anticipated depth of construction/excavation)

1D. Natural Heritage

- Natural Feature Identification
  - Identify valley and stream corridors, woodlands, wetlands, watercourses and headwater drainage features (see TRCA's Evaluation, Classification and Management of Headwater Drainage Features Guidelines, for identifying HDFs)
  - Identify aquatic habitat and management objectives from the Fisheries Management Plan or other documents that may contain aquatic management objectives for the watershed
  - Identify existing vegetation communities (ELC)
  - Conduct flora/fauna species inventory using accepted protocols and seasonal sensitivities
  - Identify species or communities of conservation concern as per the TRCA rankings
  - Identify areas that have federal and/or provincial designations such as federally designated aquatic species, provincially significant wetlands (PSWs), Areas of Natural and Scientific Interest (ANSIs), significant wildlife habitat and endangered species, etc.
  - Identify the natural heritage system for the subject lands and document sensitivities to changes in land uses. This includes the identification of the habitats that support species that have designations under the *Endangered Species Act* or the *Species At Risk Act*; and provincially significant areas under the Provincial Policy Statement (2014) such as valley lands, woodlands, wildlife habitat and wetlands (PSWs). In addition, the natural heritage system will include species and communities of concern as ranked by TRCA, as well as Locally Significant Features and Areas pursuant to applicable municipal and TRCA policies.
  - Arrange for staking of all natural features with TRCA and the municipality (and MNRF if PSWs or ANSIs).
  - Provide a survey copy of the staked lines stamped by an Ontario Land Surveyor
- Enhancement Areas/Buffering
  - Identify minimum buffers for natural features and natural hazards (flooding and erosion) required by any applicable provincial plans, municipal policies and/or TRCA policies.
  - Identify restoration/enhancement opportunities using municipal official plan mapping and policies, TRCA's Terrestrial Natural Heritage System Strategy, and the applicable watershed plan(s).

1E. Water Balance

- Identification of groundwater recharge and discharge zones, using Section 6.0 and Appendix C of the TRCA SWM Criteria document
- Identification of surface and groundwater contributions to natural features (wetlands, woodlands, watercourses and headwater drainage features) and existing hydroperiods, using Section 6.0 and Appendix D of the TRCA SWM Criteria document
- Prepare an overall water balance analysis for the study area on the basis of local surface drainage, groundwater conditions, soil, and existing land use characteristics using Appendix D of the TRCA SWM Criteria document.

- Set targets to meet the hydroperiods for specific natural features and determine the targets for meeting overall site water balance for groundwater recharge and specific contributions to maintain the hydroperiod of specific features.

Conclusions
In table/matrix form, draw conclusions from all of the information obtained in Sections 1A. to 1E. that explain how all of the elements are interconnected, by:

- providing a summary of the overall SWM criteria for quantity, quality, erosion and water balance;
- identifying the extent of natural hazards (flooding and erosion), and the extent of natural features and enhancement areas/buffers for inclusion within the Natural System (the non-developable area);
- List the criteria, targets, and protection and management requirements for Phase 2 of the MESP and the subdivision stage that will follow the MESP;
- Identify any additional studies/monitoring to be done at later planning stages.

PHASE 2 – Impact of the proposed development

Introduction

- Using the chart from Phase 1, provide a summary description of the proposal and how it will achieve the recommendations (targets, etc.) from Phase 1. This section analyzes the results and conclusions of each component section from Phase 1 and identifies or highlights the connections between them. This section should be completed by a multi-disciplinary team, exploring all interactions between the features and functions to provide an integrated summary of the results. A chart is also useful to provide overall recommendations for specific areas with respect to each of the technical disciplines.
- Provide a map that can be used to identify non-developable areas (the Natural System) and developable areas (layout of land uses and alignments of servicing, roads, and trails).

2A. Natural System Protection and Enhancement

- As per the Phase 1 report, summarize how the Natural System will be protected and enhanced from the impacts of the development, through buffering, enhancement areas and restoration plans – identify locations and general descriptions of restoration plans.

2B. Stormwater Management Servicing Plan/Low Impact Development Strategy

- As per the Phase 1 report, summarize SWM criteria and targets
- Using the appropriate model(s), carry out an assessment for the proposed development that includes a water balance and peak flow assessment in accordance with the TRCA SWM Criteria document.
- Screen potential SWM best management practices (BMPs) including conventional, low impact development (LID) and green infrastructure measures using TRCA's LID SWM Planning and Design Guide, provincial and municipal BMP documents.
- A treatment train approach using source (i.e. harvesting and reuse of rain/stormwater), conveyance (i.e. grassed swales and filter strips), and end-of-pipe facilities (i.e. stormwater management ponds, constructed wetlands), in combination with LID practices, compatible with the urban design objectives of the development, should be considered to meet the design criteria associated with water quantity, quality, erosion, and water balance (as outlined in the SWM Criteria document).
- Select a suite of SWM practices from those screened that will achieve all of the SWM criteria defined through Phase 1. The types of SWM practices selected will be dependent on local soil

types, percolation rates, and generic design conditions, all with consideration for the Natural System and the long term maintenance requirements of these BMPs.
- Assess geotechnical, and hydrogeological conditions associated with the preferred SWM strategy, including slope stability assessments for facilities adjacent to significant slopes and borehole assessments for each SWM facility.
- Using the appropriate computer models, confirm that the selected SWM plan meets the targets identified in Phase 1, as described in the TRCA SWM Criteria document.
- Provide a constructability assessment for BMPs including defining requirements and mitigation for dewatering.
- Identifiy requirements for maintenance of SWM facilities and if any access is needed within the Natural System, e.g., permanent access routes for pond and outfall maintenance

2C. Underground Servicing and Above Ground Servicing Facilities
- Identify linear alignments, pipe sizes, and maximum invert elevations
- Identify any pumping station locations
- Identify underground infrastructure valley and stream crossing requirements and mitigation
- Describe SWM for servicing (should be consistent with overall SWM plan in 2B.)
- Identify water-taking (surface or ground) requirements, including locations, mitigation, and an assessment of proximity to High Volume Recharge Areas (HVRAs), Ecologically Significant Recharge Areas (EGRAs), Significant Groundwater Recharge Areas (SGRAs) and Well Head Protection Areas (WHPAs) – see Appendix C of the SWM Criteria document for mapping of these areas.
- Identify dewatering requirements, including locations and mitigation

2D. Valley and Stream Corridor Crossings
- Identify the proposed locations and preliminary design of valley and watercourse crossings in accordance with the Transportation Infrastructure policies of The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority and TRCA's Crossings Guideline for Valley and Stream Corridors (draft, March 2015)

2E. Trails
- Identify trail locations and types of trails affecting the Natural System, especially where proposed to traverse watercourses or other components of the Natural System (e.g., buffers and enhancement areas).
- Identify linear alignments, crossing locations, trail widths, elevations and surfaces.
- Identify relationship to any applicable municipal or TRCA trails master plans.

2F. Preliminary Grading Plans
- Provide a plan of existing and proposed grades
- Demonstrate how municipal standards for grading, servicing and drainage can be met while respecting the limits of the Natural System; for example, no grading in buffers or enhancement areas.

2G. Use of TRCA-owned lands

- TRCA-owned or managed lands – if any of the subject lands are owned or managed by TRCA, and those lands are proposed to be used (temporarily or permanently) to facilitate development (e.g., infrastructure), an archaeological assessment and other requirements of TRCA's Property Services section (e.g., permission to enter, easements) may be required. Consult TRCA staff for details.

2H. Implementation Strategy

- Prepare a Comprehensive Fill Management and Site Development Phasing Strategy that has the effect of ensuring that terrestrial and aquatic systems in the subwatershed(s) shall not be negatively impacted due to uncoordinated site stripping between the various landowners. The Strategy shall consider the volume of soil disturbance within the MESP Study Area at any given time, and the effects of wind, precipitation and other environmental or human factors on the exposed soils, and provide for an implementable phasing of development to avoid negative impacts. Address TRCA and municipal regulation/by-law requirements including topsoil stripping, stockpiling, grading within and between neighbourhoods, temporary drainage and SWM, haulage routes and any fill removal off site.
- Provide a scope of work for a comprehensive erosion and sediment control strategy that defines ESC principles and methodologies to be used during construction for each phase of the development (stabilize between phases) and identify TRCA and municipal ESC criteria; demonstrate consistency with the Greater Golden Horseshoe Conservation Authorities' Erosion and Sediment Control Guideline for Urban Construction (December 2006)
- Demonstrate that the interim strategy for SWM will protect the hydroperiods of natural features during construction (i.e., after grading has commenced, but prior to the installation of mitigation measures).
- Demonstrate that topsoil management is consistent with TRCA's Preserving and Restoring Healthy Soil: Best Practices for Urban Construction (June 2012)

2I. Monitoring Plan

- Provide a post-construction environmental monitoring plan that ensures mitigation is implemented correctly and that the mitigation measures proposed are effective in maintaining and enhancing the Natural System; the plan should include recommendations for maintaining a monitoring database so that monitoring results can be tracked, lessons can be learned from effective and ineffective mitigation techniques, and actions taken to improve mitigation in the course of development.
- The costs and responsibilities for the monitoring should also be outlined, including a plan to address identified impacts and deficiencies, by proposing other mitigation measures, as per an adaptive management plan.

2J. Future Study Requirements

- Provide a summary that describes and confirms that the MESP fulfills all of the study requirements for the MESP stage.
- Provide a list of all study requirements to be fulfilled at future stages of the development (e.g.s, at draft plan of subdivision stage, at detailed design/permit stage).

Other Elements of Sustainable Communities

Complementary to the TRCA interests of natural heritage, natural hazards and water management, TRCA supports its municipal partners in encouraging development that reduces the amount of greenhouse gas emissions, adapts for the potential impacts of climate change, and other land use strategies and BMPs for building sustainable communities. Therefore, an MESP may have elements that demonstrate how the proposal for the subject lands will use:

- Green technologies for the buildings and infrastructure in the development, such as,
    - water conservation measures
    - energy conservation measures
    - waste diversion and composting strategy
- And how the proposal for the subject lands will,
    - Enhance the interface between development and the Natural System (Urban Design/Ecological Design)
    - Preserve and celebrate cultural heritage
    - Promote active transportation
    - Promote near-urban agriculture
    - Promote environmental education to residents and/or tenants

Digital Review of MESP Submissions

TRCA is moving towards digital review of files. To facilitate this review in a timely and efficient manner, MESP submissions should follow the stipulations below:

- In addition to providing one hard copy of the main document, it should also be provided digitally, formatted and bookmarked so that reviewers can easily move between the various sections.
- Where files are larger than 10MB, do not email as attachments; send by “DropBox” or other acceptable data transfer method.
- Plans with a lot of detail or that cover a large area (e.g., conceptual grading plans) should be provided in large scale hard copy.
- Appendices, including borehole logs, should also be bookmarked as part of the document. If they are not searchable then hard copies should be provided.
- A GIS-based “portable mapping file” that contains all the various data layers referenced in the MESP should be provided; this should allow reviewers to turn various layers on or off as needed to facilitate their review. (It is TRCA’s experience that this information is also a valuable tool to assist in the review of the more detailed subdivision plans, etc. that will follow in the process, so the time spent in developing this tool will be beneficial throughout the planning process and will improve the comprehensiveness, efficiency of the review and streamline the time for review).

Note: Although some weblinks are provided herein, most of the TRCA documents referred to in this guideline can be found on the “Developers and Consultants Information” page of TRCA’s website: http://www.trca.on.ca/planning-services-permits/developers-and-consultants-information; for further information, please contact TRCA staff.