

Terms of Reference: Hydrogeological Study

Effective Date: December 1, 2025

1.0. Purpose

The purpose of this Terms of Reference (ToR) is to outline the requirements for Hydrogeological Studies to support development applications in the Town of Innisfil. The studies are to assess the impact of proposed developments on groundwater quality, quantity, movement, and to ensure a safe and sustainable water supply and environmental protection.

Hydrogeological Studies are intended to demonstrate that proposed developments will not adversely affect existing wells, surface water features, groundwater dependent ecosystems, and that post-development conditions maintain natural recharge and discharge functions.

2.0. Applicability

A Hydrogeological Study is required for;

- Developments relying on private wells or septic systems
- Developments near sensitive groundwater features (e.g., aquifers, recharge areas, wetlands)
- Applications involving potential contaminants (e.g., fuel storage, stormwater infiltration)
- Any proposal where groundwater interference or depletion is a concern
- Developments with basement or floor slabs in close proximity to the high groundwater levels
- As requested by the Town, the Lake Simcoe Region Conservation Authority (LSRCA), Nottawasaga Conservation Authority (NVCA), or Ministry of the Environment, Conservation and Parks (MECP).

This requirement applies to the following development applications;

- Zoning By-law Amendments
- Official Plan Amendments
- Plan of Subdivision
- Plan of Condominium
- CPPS By-Law
- Site Plan Control Applications
- As determined necessary by the Town's Planning and Development Engineering Services.

3.0. Study Scope and Content

The Hydrogeological Study shall conform to the latest Town of Innisfil Engineering Design Standards and Specifications. The study must include the following sections:

1. Introduction and Objectives
 - a. Scope of work, study area boundaries, qualifications of the professional.
2. Description of Proposed Development
 - a. Type of development, servicing strategy, anticipated water use/consumption, potential dewatering or infiltration features.
3. Regional and Local Hydrogeological Context
 - a. Geological and hydrostratigraphic setting, aquifer and aquitard conditions, recharge/discharge areas, groundwater dependency, existing well network.
4. Field Investigations (monitoring wells, slug tests, water sampling, etc.)
 - a. Installation of monitoring wells or piezometers with continuous loggers to record groundwater level fluctuations (day/week/month) as required by the Town.
 - b. Groundwater sampling for parameters including those set out by the Provincial Water Quality Objectives (PWQOs) (for private wells, dewatering discharge, recharge/infiltration areas).
 - c. Conduct slug tests, or constant-rate pumping tests, and determine hydraulic conductivity, transmissivity and flow direction.
5. Groundwater Flow Direction and Gradient
 - a. Mapping of groundwater elevations, flow paths, contour maps, and zone of influence.
6. Water Budget Analysis
 - a. Estimate recharge, discharge, evapotranspiration, pre- and post-development water balance, dewatering/infiltration impacts.
7. Assessment of Potential Impacts on Groundwater Quality and Quantity
 - a. Evaluate drawdown impacts on existing wells, change in groundwater levels, effect on baseflow to wetlands/streams, and contaminant transport risk.
8. Septic System Suitability (if applicable)
 - a. Soil conditions, depth to water, percolation, nitrate plume modelling, separation distances.
9. Mitigation and Monitoring Plans
 - a. Measures to protect groundwater quantity and quality (buffers, cut-off walls, recharge enhancement, groundwater pumping management).
10. Summary, Conclusions, and Recommendations
 - a. Clear conclusions, risk evaluation, professional opinion on hydrogeological feasibility, and long-term performance.

If any of the above sections are not relevant to an application, a brief explanation under the section stating why it is not applicable must be provided.

4.0. Study Methodology and Standards

The Hydrogeological Study shall be prepared in accordance with the latest version of the following guidelines and standards:

- Ministry of the Environment, Conservation and Parks (MECP) guidelines
- Source Water Protection policies (where applicable)
- Ontario Geological Survey data references
- Standards of practice for Qualified Hydrogeologists or Engineers
- LSRCA Hydrogeological Assessment Checklist.
- Town of Innisfil Engineering Design Standards and Specifications.
- Ontario Provincial Standards and Specifications.

5.0. Submission Requirements

The Hydrogeological Study must be signed and sealed by a qualified hydrogeologist or engineer licensed in the Province of Ontario. The submission package shall include:

- Digital copy of the report
- Include borehole logs, groundwater elevation data, water level contour maps, and well records
- Attach laboratory analysis results, raw data sheets, and calibration records as appendices.

6.0. Consultation

Pre-consultation with Town staff and agencies (e.g., LSRCA, NVCA, MECP) is strongly recommended for developments within wellhead protection or recharge areas to confirm the appropriate study area, scope, and data collection parameters.

7.0. Validity and Updates

Hydrogeological studies are valid for up to eighteen (18) months from the date of publication unless significant changes occur onsite, nearby groundwater conditions change, or further development works have commenced.

Field data (monitoring well levels and quality) should be reassessed, and supplementary studies may be required if site conditions, monitoring results, or regulations change during this validity period.

The Town reserves the right to ask for additional/updated scope during the review process, if necessary.