# Watershed Development Ordinance

**Effective October 13, 2015**

Lake County Stormwater
Management Commission

# LAKE COUNTY
# WATERSHED DEVELOPMENT ORDINANCE

OF

LAKE COUNTY, ILLINOIS

ORIGINAL EFFECTIVE DATE
October 18, 1992

Approved as Amended
By the
Lake County Board

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# Article 1: Authority and Purpose

## §100 Introduction

This Ordinance is one part of the adopted Lake County Comprehensive Stormwater Management Plan. It sets forth the minimum requirements for the *stormwater management* aspects of *development* in Lake County. The Lake County *Stormwater Management Commission* is the corporate enforcement authority for the Ordinance. Illinois Compiled Statutes Chapter 55, Act 5, Section 5-1062 [55 ILCS 5/5-1062] states, "The purpose of this Section is to allow management and *mitigation* of the effects of urbanization on stormwater drainage… by consolidating the existing stormwater management framework into a united, countywide structure…" The Lake County Comprehensive Stormwater Management Plan, adopted by Ordinance on June 11, 1990 states, "… that the regulations be uniformly and consistently enforced throughout the County by all agencies." While local conditions may sometimes require extraordinary regulatory measures, the Lake County Stormwater Management Commission (SMC) has determined that uniform and consistent enforcement will be enhanced by municipalities adopting the standards of the Watershed Development Ordinance. In those instances where the requirements of this Ordinance are not stipulated in a municipal ordinance or do not meet the minimum requirements herein, this Ordinance shall prevail. It is recognized that a *community* has an individual right to enact standards beyond the minimum standards presented in this Ordinance. The SMC has developed a *Technical Reference Manual* which is a recommended guide for users of this Watershed Development Ordinance (WDO).

## §101 Authority

This Ordinance is enacted pursuant to the police powers granted to Lake County by 55 ILCS 5/5-1062 (County) by 65 ILCS 5/1-2-1, 11-12-12, 11-30-8, 11-30-2, 11-31-2, and 615 ILCS 5/5 & 18g. The administration and enforcement of this Ordinance shall be performed by (a) Certified Communities, within their respective jurisdictions and (b) the *Stormwater Management Commission* and its agents or employees in all other areas of Lake County.

## §102 Purpose

The purpose of this Ordinance is to establish reasonable rules and regulations for *development* in order to:

**102.01** Meet the requirements of the Rivers, Lakes and Streams Act, [615 ILCS 5/18g] effective November 18, 1987.

**102.02** Prevent additional harm due to periodic flooding, including loss of life and property and threats and inconveniences to public health, safety, and welfare.

**102.03** Assure that *development* does not increase *flood* and drainage hazards to others, or create unstable conditions susceptible to *erosion*.

**102.04** Create no new financial burden on the taxpayer for flood control projects, repairs to *flood* damaged public facilities and utilities, and for flood rescue and relief operations.

**102.05** Protect, conserve, and promote the orderly development of land and water resources.

**102.06** Protect *buildings* and improvements to buildings from *flood damage* to the greatest extent possible.

**102.07** Conserve the *natural* hydrologic, hydraulic, water quality, and other beneficial functions of *flood-prone areas* and *Regulatory Floodplains*.

**102.08** Prevent additional disruption of the economy and governmental services due to stormwater and *flood* drainage.

**102.09** Maintain eligibility for the County and its municipalities in the National Flood Insurance Program by equaling or exceeding its requirements and thus make federally subsidized flood insurance available at reduced rates. Comply with the rules and regulations of the National Flood Insurance Program codified as 44 CFR 59-79, as amended.

**102.10** Conserve the *natural* hydrologic, hydraulic, water quality, and other beneficial functions of *wetlands* by having, at a minimum, no net loss of wetlands in Lake County, and further these beneficial functions of wetlands by having an objective of a 'net gain' of wetland function as specified in the Wetland Restoration and Preservation Plan component of the Lake County Comprehensive Stormwater Management Plan.

## §103 Effective Date

The effective date of this Ordinance shall be October 18, 1992.

Approved as amended by the Lake County Board, July 12, 1994

Approved as amended by the Lake County Board, August 10, 1999

Approved as amended by the Lake County Board, October 10, 2000

Approved as amended by the Lake County Board, August 14, 2001

Approved as amended by the Lake County Board, November 8, 2005

Approved as amended by the Lake County Board, January 10, 2006

Approved as amended by the Lake County Board, October 10, 2006

Approved as amended by the Lake County Board, November 18, 2008

Approved as amended by the Lake County Board, July 10, 2012

Approved as amended by the Lake County Board, June 11, 2013

Approved as amended by the Lake County Board, October 13, 2015

# Article 2: Administration and Enforcement Responsibilities

## §200 Ordinance Enforcement

**200.01** In *Certified Communities*, the appropriate development regulations officer shall be the *Enforcement Officer* for the Ordinance. In all other areas of Lake County, the *SMC Chief Engineer* shall be the Enforcement Officer. One of the primary duties of the Enforcement Officer shall be to review all watershed development applications and issue permits for those projects that are in compliance with the provisions of this Ordinance. The Enforcement Officer shall be responsible for the administration and enforcement of the Ordinance.

**200.02** Included as part of this Ordinance as Appendix E: Enforcement Officer Duties is a delineation of requirements and duties required of and accepted by a *community* and its designated Enforcement Officer. Certain requirements or duties specified by *FEMA* and *IDNR/OWR* in Appendix E: Enforcement Officer Duties relate only to the intergovernmental relationship between a community and FEMA or IDNR/OWR for the purposes of that community obtaining or maintaining eligibility for the National Flood Insurance Program (NFIP) and delegation of state permit authority.

**200.03** Enforcement Officers in Certified Communities have the responsibility to report a Designated Erosion Control Inspector's repeated or recurring non-compliance with Article 6: Soil Erosion and Sediment Control Requirements and Article 11: Inspections and Access in this Ordinance to the SMC Chief Engineer. The *SMC Chief Engineer* has the authority and responsibility to suspend a Designated Erosion Control Inspector's listing status for repeated or recurring non-compliance. A notification of suspension from listing shall be issued to the *Designated Erosion Control Inspector* and copied to the *applicant* a minimum of 30 days prior to suspension from listing. Revocation of listing status shall be the responsibility of the SMC per Commission-adopted procedure.

**200.04** The SMC shall be responsible for the review, enforcement, and issuance of all *Public Road Development* Permits.

## §201 Community Certification

A municipality or the County may be certified by SMC to enforce the provisions of this Ordinance. Upon certification, the *community's* designated *Enforcement Officer* shall enforce all provisions of this Ordinance within the community's jurisdiction. The criteria and process for certification follow:

### 201.01 Criteria

A. The *community* is participating in the regular phase of the National Flood Insurance Program.

B. The *community* has adopted and is enforcing the provisions of this Ordinance.

C. The *community* forwards appropriate portions of the *Regulatory Floodway* Development applications to SMC for transmittal to *IDNR/OWR* or its designee for concurrent review and approval.

D. The *community* maintains records and provides SMC with certain portions of these records as described in Appendix E: Enforcement Officer Duties, Section L.

E. The *community* will require all engineering information and plans prepared by a *Registered Professional Engineer* to be reviewed under the supervision of a Registered Professional Engineer under the employ or contract of the community for conformance with this Ordinance prior to permit issuance.

**201.02 Process**

A. *Communities* desiring certification may submit a letter of intent to petition for Certification.

B. A petition for Standard Certification or for Isolated Wetland Certification shall be submitted to the SMC indicating how the *community* meets the criteria for certification. A copy of the community's adopted ordinance shall be included with the petition.

C. Within 60 days of receipt of the petition and in conjunction with a scheduled SMC meeting, the staff recommendation shall be presented.

D. The SMC shall approve the petition as submitted, shall approve the petition with conditions, or shall deny the petition. A notice of the SMC action shall be submitted to the petitioning *community*.

E. *Certified Communities* shall petition for recertification every five (5) years. This petition shall include SMC-required documentation for the previous certification period.

F. Within the five (5) year certification period, the SMC Director shall periodically review the *community's* Ordinance enforcement records and performance and make remedial recommendations to the community, if necessary. Review findings will be used in the assessment of petitions for recertification from Certified Communities.

G. The SMC may rescind or place conditions on a *Certified Community's* certification status, after a public hearing, if any of the following circumstances has been documented:

1. Permits are recurringly issued not in compliance with the Watershed Development Ordinance;
2. Permit or Watershed Development Ordinance requirements are recurringly not enforced on permitted development;
3. Regulated development that has been brought through the multi-step Community Notification Procedure [due process] before Commission deliberation.

When any of the above circumstances are documented and presented by SMC Staff to the SMC, the SMC shall determine whether to hold a public hearing regarding the Certified Community's certification status. If a public hearing is to be held, a minimum 30-day notice to the Community is required. The public hearing shall be held in conjunction with a regularly scheduled SMC meeting. After close of the public hearing, the SMC shall have the authority to make a decision on any potential modifications to the *community's* certification status.

H. The SMC shall rescind a *community's* certification for the following reasons:

1. The community is no longer a participant in the National Flood Insurance Program.
2. The community adopts a Watershed Development Ordinance or amends its ordinance so that its ordinance in less restrictive than the SMC Watershed Development Ordinance.

I. If the *community* issues a *Regulatory Floodway* development permit not in accordance with §703 Regulatory Floodway Performance Standards SMC shall rescind the community's authority to administer the *IDNR/OWR* Regulatory Floodway permit program for *Appropriate Uses*.

J. Fee-in-lieu-of detention ordinances and procedures used by Certified Communities shall be reviewed and approved by the SMC as part of the regular certification process.

K. Certified Communities shall have a designated Enforcement Officer. To be qualified to act as an *Enforcement Officer*, the person shall pass the Lake County Enforcement Officer's Exam. If a community Enforcement Officer vacates that position, the community shall designate an Interim Enforcement Officer within thirty (30) days. Final designation of a qualified Enforcement Officer shall occur within six (6) months in order for the community to remain certified.

L. *Communities* with Isolated Wetland Certification shall have a designated *Certified Wetland Specialist* (CWS) either as an employee or contracted to administer *wetland* related provisions as specified in the Ordinance, under direction of the Enforcement Officer. SMC will administer Ordinance-specified wetland provisions for communities without isolated Wetland Certification.

If a community Certified Wetland Specialist vacates that position, the community shall designate a CWS within sixty (60) days, or may utilize SMC CWS Staff capabilities on an interim basis prior to final designation. Final designation of a CWS shall occur within six (6) months in order for the community to remain Isolated Waters of Lake County-certified.

# Article 3: General Provisions

## §300 Regulated Development

The performance standards, application requirements, and other provisions of this Ordinance apply to regulated development, as determined by the Enforcement Officer.

No person, firm, corporation, or governmental agency shall commence any *development* regulated by this Ordinance on any lot or parcel of land without first obtaining a *Watershed Development Permit* from the *Stormwater Management Commission* or, if applicable, the *Certified Community*. A permit shall be issued if the proposed development meets the requirements of this Ordinance or its Certified Community equivalent. A Watershed Development Permit is required for any development, including finalization of a plat, replat, Planned Unit Development (PUD), or Manufactured Home Park site plan, that:

**300.01** Is located in a *Regulatory Floodplain*; or

**300.02** Is located in a *flood-prone area* with one hundred (100) acres of tributary *drainage area* or more; or

**300.03** Is located in a *depressional storage area* with a storage volume of 0.75 acre-foot or more for the *base flood*; or

**300.04** Creates a *wetland impact* within an area defined as Waters of the U.S. or *Isolated Waters of Lake County*; or

**300.05** Modifies the *flood-prone area* of a *channel* where the tributary *drainage area* is twenty (20) or more acres; or

**300.06** Includes the total land area of an *ownership parcel* that results in:

A. More than one (1) acre of new *impervious surface* area; or

B. More than three (3) acres of *hydrologically disturbed* area, unless the total new *impervious surface* area is less than one-half (0.5) acre; or

C. An *impervious surface* area ratio of fifty percent (50%) or greater, unless the total new impervious surface area is less than one-half (0.5) acre.

The term “new” in this article refers to *impervious surface* area created after the original effective date of this Ordinance (10/18/92). *Redevelopment* of previously developed sites shall maintain existing storage volume and shall not increase the rate of runoff from the site. The *applicant* shall provide supporting data and calculations to the satisfaction of the *Enforcement Officer* to ensure the site design either provides a *watershed benefit* or meets the requirements of 502.03. New development on partially developed sites shall meet the release rate criteria in 502.01 for the new development, if the new development exceeds the thresholds in 300.06A, or 300.06B, or 300.06C; or

**300.07** Any *public road development* meeting both of the following criteria:

A. One and one-half (1.5) acres or more of new impervious surface; and

B. One and one-half (1.5) acres or more of new *impervious surface* per mile, for linear or nonlinear projects; or

**300.08** Any *development* that hydrologically disturbs 5,000 square feet or more. This development activity shall at a minimum meet the soil *erosion* and sediment control performance standards of §600 Performance Standards, with associated application requirements. *Public road developments* are required to meet the soil erosion and sediment control standards only for those projects which require permits according to 300.01, 300.02, 300.03, 300.04, 300.05, and 300.07; or

**300.09** Any activity to a building in a Special Flood Hazard Area (SFHA) as described in FEMA Publication 480 National Flood Insurance Program Flood Management Requirements.

## §301 Contiguous Property and Development Phasing

In order to preclude inappropriate phasing of *developments* to circumvent the intent of this Ordinance, when a proposed development activity will occur on a lot or parcel of land that has contiguous lots or parcels of lands owned in whole, or in part, by the same property owner at the time of subdivision subsequent to October 18, 1992, then the criteria as defined in this section will be applied to the total land area compiled from aggregate *ownership parcels*. If this aggregate ownership parcel area is greater than the minimum area requirements defined in §300 Regulated Development, then a *Watershed Development Permit* will be required.

## §302 Exempted Development

All *development* shall meet the minimum state, federal, and local regulations. No development is exempt from the floodplain, floodway, *wetland*, and soil *erosion* and sediment control provisions of this Ordinance.

An exemption request under 302.01, or 302.02, or 302.03 shall be submitted in writing by the applicant to the *Enforcement Officer* for an exemption from specific performance standards of this Ordinance. The applicant's exemption request shall itemize each Ordinance provision that is requested for exemption. After review and verification by the *Enforcement Officer* that 302.01, or 302.02, or 302.03 are met, the specific Ordinance provision exemptions may be granted.

**302.01** Annexation agreements, final plats, site development permits or current building permits approved prior to October 18, 1992 if the *stormwater management systems* are installed, functioning, and in compliance with all applicable stormwater regulations then in effect.

**302.02** Annexation agreements, final plats, Planned Unit Developments, site development permits, or current building permits approved between October 18, 1992 and July 10, 2012 if the approved plans and designs are in conformance with the pre-July 10, 2012 Ordinance provisions. That portion of any annexation agreement, final plat, Planned Unit Development, site development permit, or current building permit which is amended after the effective date of this Ordinance and which affects the *stormwater management system* is not exempt from the provisions of this Ordinance.

**302.03** Re-subdivision of commercial or industrial subdivisions identified under 302.01, provided that the *stormwater management systems* are installed and functioning and there is no increase in *impervious surface* area permitted. Re-subdivision of

commercial or industrial subdivisions identified under 302.02, provided there is no increase in impervious surface area beyond that which was originally approved.

## §303 Development Classification

All activities requiring a *Watershed Development Permit* shall be classified as a minor, major, or *public road development*. The definition for each classification follows:

**303.01** Minor Development

A minor *development* is defined as any development that:

A. Is not located in a *Regulatory Floodplain*, or is located in a Regulatory Floodplain outside of the Regulatory Floodway, with no compensatory storage requirement; and

B. Does not create a *wetland impact* to *Waters of the United States* or *Isolated Waters of Lake County* exceeding the isolated wetland impact mitigation thresholds in 1007.01; and

C. Does not modify a *channel* where the tributary *drainage area* is greater than one hundred (100) acres, with no compensatory storage requirement; and

D. Does not require detention per 502.01.

**303.02** Public Road Development

Any *development* activity which takes place in a public right-of-way or part thereof that is administered and funded, in whole or in part, by a public agency under its respective roadway jurisdiction. Rehabilitative maintenance and in-kind replacement are considered to be a *public road development* if located in a Regulatory Floodplain. A public road development located within a Regulatory Floodway and which has been approved by the Illinois Department of Transportation Division of Highways (IDOT/DOH), Bureau of Local Roads and Streets is exempt from the hydraulic analysis requirements of this Ordinance. Individual recreation trail systems being constructed that are not part of another development project and linear railroad development projects shall be considered public road developments with respect to the requirements of this Ordinance.

**303.03** Major Development

A major *development* is defined as all other development.

## §304 Conditional Approval

Conditional Approval for a *development* may be granted by the *Enforcement Officer* prior to the issuance of a Watershed Development Permit. The Conditional Approval will be based on conformance with applicable performance standards and submittal requirements of this Ordinance. A letter will be sent to the *applicant* stating the results of the review and the conditions placed on any approvals.

## §305 Earth Change Approval

If all applicable performance standards and application requirements of this Ordinance have been met, except for obtaining all the required local, state, and federal approvals, a request for the commencement of grading activities may be

made for a development site prior to the issuance of a *Watershed Development Permit*. The proposed grading activity may commence with written approval from the *Enforcement Officer* of the Earth Change Approval plan that delineates the activities specifically allowed including appropriate soil erosion and sediment control measures. The written approval will state the conditions and limitations of the proposed grading activities. No *development* activity may occur in areas for which state and federal permits are required, except for IEPA sewer and water extension permits. Earth Change Approvals may not be granted for any development within a *Regulatory Floodplain*, except for excavations outside of the Regulatory Floodway and which do not require an IDNR/OWR permit.

## §306 Countywide and General Permits

Under its authority and jurisdiction, the *SMC Chief Engineer* may, by issuance of a Countywide or General Permit, grant approval for specific types of *development*, which comply with all applicable -Ordinance standards and purpose (§102 Purpose). The specific types of development eligible for a Countywide or General Permit (e.g., Countywide Permit #1 and General Permit #2) may be authorized only after discussion at the Technical Advisory Committee, a minimum thirty (30) day public notice, and approval by the SMC in conjunction with a regularly scheduled SMC meeting.

## §307 Permit Fees

A schedule of fees in accordance with the provisions of this Ordinance shall be established by separate resolution of the SMC. A separate fee schedule shall be developed and implemented by Certified Communities.

## §308 Application Review Times

Permit applications shall be reviewed within thirty (30) days of receipt. Amended permit applications shall be reviewed within sixty (60) days of receipt. The *Enforcement Officer* shall approve, deny, or provide remedial recommendations within sixty (60) days. If no action has been taken by the Enforcement Officer within ninety (90) days after receipt of an application, or within a longer time period if requested in writing by the *applicant*, the application shall be deemed denied.

## §309 Permit Extensions and Terminations

Among the causes for terminating a permit during its term or for denying a permit extension include, but are not limited to, the following:

**309.01** Noncompliance with any condition of the permit; or

**309.02** The permittee's failure to disclose fully all relevant facts in the application process or the permittee's misrepresentation of any relevant facts at any time; or

**309.03** If the authorized work is not commenced within three (3) years after issuance of the permit, or if the authorized work is suspended or abandoned for a period of twelve (12) months after the time of commencing the work, unless an extension has been granted in writing by the *Enforcement Officer*. The extension should be requested of the Enforcement Officer in writing no sooner than ninety (90) days prior to the termination of the permit; or

**309.04** A permit that includes a structure located within the Regulatory Floodplain, or will be located within the Regulatory Floodplain, shall be terminated without the possibility

of an extension, if the start of construction is not commenced within 180 days of the permit issuance date unless the structure is compliant with the following:

A. Any modification to National Flood Insurance Program regulations after permit issuance; or

B. Any modification to a FEMA FIRM or FIS after permit issuance.

For the purposes of this subsection, “start of construction” means the commencement of any repair, reconstruction, rehabilitation, addition, or improvement of a structure; or the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure.

# Article 4: Application Requirements

## §400 Minor Developments

The following application requirements shall be submitted when applicable to the *development* as determined by the *Enforcement Officer*:

**400.01** A completed *Watershed Development Permit* application signed by the *applicant* or applicant's agent, and when required, a Professional Engineer and *Certified Wetland Specialist*.

**400.02** A general description of the existing and proposed *stormwater management system* including all discharge points, collection, conveyance, and storage facilities.

**400.03** A grading plan showing proposed and existing contours.

**400.04** A site drainage plan which depicts drainage features, *overland flow paths*, *stormwater management system* components, *flood-prone areas*, *Regulatory Floodplains*, *wetland* boundaries, *buffer* areas, existing or proposed septic systems and wells. A capacity analysis of the above stormwater system components may be required by the *Enforcement Officer*.

**400.05** An area drainage plan locating the proposed *development* in the *watershed*.

**400.06** A description and depiction of measures to be taken to control *erosion* (soil erosion and sediment control plan).

**400.07** A description of the anticipated dates of initiation and completion of activity.

**400.08** Provide an exhibit(s) for review which displays all *deed or plat restrictions* of record or to be recorded for the *stormwater management system*.

**400.09** The federal, state, and local permit requirements of 401.13 [NRI] and 401.14 [NOI] are required when applicable to the *development* site, and 401.09 [maintenance plan] and 401.10 [PE seal] shall be required when requested by the *Enforcement Officer*.

**400.10** A *wetland* submittal if required under Article 10: Wetland Requirements of this Ordinance.

**400.11** Performance Guarantees: As specified in Appendix E: Enforcement Officer Duties, Section E.

**400.12** For permits required only in accordance with 300.09, documentation shall be submitted towards the determination of a *substantial improvement*. Other submittal requirements may be waived.

## §401 Major Developments

The following application requirements shall be submitted when applicable to the development as determined by the Enforcement Officer.

In addition to the requirements for minor *developments*, major development applications require the following information:

**401.01** Name and legal address of the *applicant*, and common address of the location where the *development* will take place, mailing address of the property owner, and the signature of the applicant or the applicant's agent.

**401.02** A topographic map of the existing conditions of the *development* site showing the location of all roads, all drainageways, the boundaries of predominate soil types, the boundaries of predominate vegetation, and the location of any drainage easements, detention or retention basins, including their inflow and outflow structures, if any. The map shall also include the location, size, and flowline elevations of all existing storm or combined sewers and other utility lines within the site. The map shall be prepared using a 2-foot or less contour interval and shall be prepared at an appropriate scale for the type of project and shall include specifications and dimensions of any proposed *channel modifications*, location and orientation of cross-sections, if any, north arrow, and a graphic or numerical scale. All elevations shall be referenced to North American Vertical Datum of 1988 (NAVD 88), which supersedes the NGVD29 datum used prior to September 18, 2013.

**401.03** Include cross-section views for the *stormwater management system* showing existing and proposed conditions including principal dimensions of the work, and existing and proposed elevations, normal water and calculated *base flood elevations*, and overland flow depth and path. The elevations of *lowest floor* or *lowest adjacent grade* for *structures* shall be included on the *development* plan as applicable. Refer to 506.03, §706 Building Protection Requirements, and Article 9: Flood Table Land Requirements for elevation requirements of structures within or adjacent to flood-prone areas.

**401.04** A vicinity map shall be included along with the *Parcel Identification Numbers* (PINs) of all parcels comprising the proposed *development*.

**401.05** A report describing the hydrologic and hydraulic analysis performed for the project. The report shall include the name of *stream* or body of water affected, a statement of purpose of proposed activity, and a detailed determination of the runoff for the project site under existing and developed conditions. This includes documentation of the design volumes and rates of the proposed runoff for each portion of the *watershed* tributary to the *stormwater management system* and receiving *channel* and high water elevations. Runoff calculations shall include all discharges entering the site from upstream areas.

**401.06** A section in the hydrologic and hydraulic analysis report describing how the runoff volume reduction requirements (as described in §503 Runoff Volume Reduction (RVR)) are incorporated into the development site plan. The section shall include the rationale for not selecting approaches with higher preference. The section shall also provide supporting calculations for meeting the runoff volume reduction requirements.

**401.07** For *detention facilities*, a section in the hydrologic and hydraulic analysis report that includes a plot or tabulation of storage volumes and water surface areas with corresponding water surface elevations, stage-discharge or outlet rating curves, and design hydrographs of inflow and outflow for the 2-year, 24-hour and the 100-year, 24-hour storm events under existing and developed conditions.

**401.08** A soil *erosion* and sediment control plan showing all measures appropriate for the *development*, as approved by the *Enforcement Officer*, to meet the objectives of this Ordinance throughout all phases of construction and permanently after completion of development of the site, including:

A. Location and description, including standard details, of all sediment control measures and design specifics of sediment basins and traps, including outlet details. The drainage area tributary to each sediment control measure shall be delineated on the soil *erosion* and sediment control plan.

B. Location and description of all soil stabilization and *erosion* control measures, including seeding mixtures and rates, types of sod, method of seedbed preparation, expected seeding dates, type and rate of lime and fertilizer application, kind and quantity of mulching for both temporary and permanent vegetative control measures, and types of non-vegetative stabilization measures.

C. Location and description of all runoff control measures, including diversions, waterways, and outlets.

D. Location and description of methods to prevent tracking of sediment off-site, including construction entrance details, as appropriate.

E. Description of dust and traffic control measures.

F. Locations of stockpiles and description of stabilization methods.

G. Description of off-site fill or borrow volumes, locations, and methods of stabilization.

H. Provisions for maintenance of control measures, including type and frequency of maintenance, easements, and estimates of the cost of maintenance.

I. Identification (name, address, and telephone) of the person(s) or entity which will have legal responsibility for maintenance of *erosion* control structures and measures during *development* and after development is completed.

J. A written narrative description of the proposed phasing (construction sequencing) of *development* of the site, including stripping and clearing, rough grading and construction, and final grading and landscaping. Phasing should identify the expected date on which clearing will begin, the estimated duration of exposure of cleared areas, and the sequence of installation of temporary sediment control measures (including perimeter controls), clearing and grading, installation of temporary soil stabilization measures, installation of storm drainage, paving streets and parking areas, final grading and the establishment of permanent vegetative cover, and the removal of temporary measures. It shall be the responsibility of the *applicant* to notify the *Enforcement Officer* of any significant changes which occur in the site development schedule after the initial soil *erosion* and sediment control plan has been approved.

**401.09** A maintenance plan for the ongoing maintenance of all *stormwater management system* components, including *wetlands*, is required prior to plan approval. The plan shall be referenced in the recorded deed or plat restriction document associated with the stormwater management system. The plan shall include:

A. Maintenance tasks and the type and frequency of maintenance of all components of the stormwater management system, including existing and replaced *drain tiles* within the ownership parcel which are part of the stormwater management system.

B. The party responsible for performing the maintenance tasks.

C. A description of all permanent public or private access deed or plat restricted areas for all *stormwater management system* components for the *development*.

D. A description of dedicated sources of funding for the required maintenance.

E. Measures to prohibit the dumping, depositing, dropping, throwing, discarding, or leaving of litter and construction material debris and all other *illicit discharges* into the *stormwater management system* and measures to be in continued compliance with IEPA NPDES Permit No. ILR40.

**401.10** The Application form, development plans, and stormwater reports shall meet the requirements of this Ordinance and shall be signed and sealed by a *Registered Professional Engineer*.

**401.11** Public trail and park facility projects which do not involve the placement of structures or fill can be submitted without the certification or seal of a *Registered Professional Engineer*.

**401.12** A description of the anticipated dates of initiation and completion of activity.

**401.13** A copy of the Natural Resources Inventory (NRI) shall be submitted by the *applicant* to the *Enforcement Officer* for *development* that is required to obtain a NRI performed by the McHenry-Lake County Soil and Water Conservation District pursuant to state statute [70 ILCS 405/22.02a].

**401.14** For *development* sites requiring a National Pollutant Discharge Elimination System (NPDES) permit, the *applicant* shall submit a Notice of Intent (NOI) to the IEPA to comply with the NPDES Permit. The approved soil *erosion* and sediment control plan created pursuant to the requirements of this Ordinance shall fulfill the plan requirements in the NPDES permit.

**401.15** If the soil mapping submitted for the *development* indicates the presence of the soils listed in this subsection, then the *applicant* shall provide site-specific soil mapping performed by a certified soil classifier for the development. No *buildings* shall be constructed on these soils unless appropriate building methods, such as pilings, caissons, or removal and replacement of unsuitable soils, as approved by the *Enforcement Officer*, are used to provide and protect a suitable building foundation.

Soils classified as a *hydric soil* (USDA/NRCS Soil Classification) in its very poorly drained condition or the following three soil classification in any condition:

A. Houghton Muck (W103)

B. Houghton Peat (W97)

C. Peotone Silty Clay Loam (W330)

Development that is exempted from this requirement is any development activity not resulting in the construction of a building.

**401.16** A copy of the consultation application to the Illinois Department of Natural Resources shall be submitted by the *applicant* to the *Enforcement Officer* for *development* that is required to comply with the consultation process of the Illinois Endangered Species Protection Act [520 ILCS 10/11] and the Illinois Natural Areas Preservation Act [525 ILCS 30/17].

**401.17** Subsurface Drainage (Drain Tiles)

The *applicant* shall submit a subsurface drainage inventory. The inventory shall include locations of existing farm and storm drainage tiles by means of slit trenching and other appropriate methods performed by a qualified subsurface drainage consultant. All existing drain tile lines damaged during the investigation shall be repaired to their previous working status.

A. The *applicant* shall provide a topographical map of the *development* site showing:

1. Location of and depth of each slit trench and identified to correspond with the tile investigation report and surveyed points where the tile was field staked at approximately 50-foot intervals; and
2. Location of each drain tile with a flow direction arrow, tile size, and any connection to adjoining properties; and
3. A summary of the tile investigation report showing trench identification number, tile size, material and quality, percentage of the tile filled with water, percentage of restrictions caused by silting, depth of ground cover, and working status; and
4. Name, address, and phone number of person or firm conducting tile location investigation.

B. Information collected during the Subsurface Drainage Inventory shall be used as part of the design and construction of a *stormwater management system* that meets the requirements of this Ordinance.

**401.18** A *wetland* submittal if required under Article 10: Wetland Requirements of this Ordinance.

**401.19** A copy of the building plans and cost estimate in accordance with FEMA NFIP standards shall be submitted for modifications to existing structures in the Regulatory Floodplain.

## §402 Public Road Developments

The following application requirements shall be submitted when applicable to the development as determined by the Enforcement Officer:

**402.01** A copy of any applicable *IDNR/OWR* permit application.

**402.02** A copy of any applicable U.S. Army Corps of Engineers permit application.

**402.03** A copy of the proposed stormwater management system, including the location and size of all existing and proposed drainage improvements including plan, section, and profile views of storm sewers, field tiles, culverts, *channels*, and detention areas.

**402.04** A copy of all calculations supporting the *stormwater management system*. Materials should be consistent with the submittal requirements of 401.05 and the engineering requirements of Article 5: General Performance Standards.

**402.05** A soil *erosion* and sediment control plan consistent with §600 Performance Standards and §601 Designated Erosion Control Inspector Program Standards.

**402.06** A wetland determination report and mitigation plan consistent with Article 10: Wetland Requirements, if applicable.

## §403 IDNR/OWR Dam Safety Permit

The following application requirements shall be submitted when applicable to the development, as determined by the Enforcement Officer:

**403.01** The *applicant* shall obtain and provide a copy of an IDNR/OWR Dam Safety Permit or a letter stating that a Dam Safety Permit is not required if the *development* includes a *dam* before the applicant requests or obtains a *Watershed Development Permit*. Reference Appendix G: IDNR/OWR Dam Safety Permitting Guidelines.

## §404 As-Built Drawings

**404.01** *As-built drawings*, signed and sealed by a Professional Engineer, shall be required for all major developments, public road developments, and other types of development as determined by the Enforcement Officer (such as those developments that affect stormwater runoff rates or volume, impact wetlands or wetland buffers, or are adjacent to floodplains).

**404.02** *As-built drawings* and supporting information shall clearly show all as-built conditions, including, but not limited to:

A. Topographic spot elevations and contours for overland flow paths, detention ponds, storage facilities, and building pads.

B. Detention pond restrictor size, invert elevation, emergency overflow size, and elevation.

C. Verification of required native vegetation planted (seed tags, invoices).

D. Storm sewer sizes, inverts.

E. *Drain tile* information provided from the Subsurface Drainage Inventory, or identified during construction as follows: location, connection, size, material, and inverts for those drain tiles that are part of the stormwater management system.

F. Other information required under this Ordinance.

G. Applicable calculations or other information verifying conformance with the permitted plan set.

H. Lowest floor and low opening elevations of structures. Low opening sizes where vents are required.

I. Benchmark information.

# Article 5: General Performance Standards

The following performance standards apply to *development* requiring a permit.

## §500 Platting, Approvals, and Development Process

**500.01** The requirements and performance standards of this Ordinance shall be considered for all *development* in site planning and appropriately addressed in the drainage plan component of subdivisions, annexation agreements, preliminary plats, final plats, re-plats, *manufactured home* parks, and Planned Unit Developments (PUD).

**500.02** In addressing §503 Runoff Volume Reduction (RVR), streets, blocks, lots, deed or plat restricted areas, parks, and other public grounds shall be located in such a manner as to preserve and utilize *natural* streams, *wetlands*, *flood-prone areas*, and best management practices and undisturbed native soil/plant areas utilized to meet the runoff volume reduction requirements.

**500.03** Subdivisions, annexation agreements, plats, re-plats, manufactured home parks, and PUDs shall show the *base flood elevation* (BFE) and *Regulatory Floodway* limits. The plats, re-plats, manufactured home parks, PUDs, or engineering plans and studies shall include a signed statement by a *Registered Professional Engineer* that accounts for changes in the drainage of surface waters in accordance with the Plat Act [765 ILCS 205/2].

**500.04** All plats and subdivisions which border on or include public bodies of water as defined by *IDNR/OWR* and listed in Appendix F: Public Bodies of Water in Lake County of this Ordinance shall be submitted by the *applicant* to IDNR/OWR for review and approval.

**500.05** A *community's* planning commission or corporate authority shall not approve any preliminary PUD or Plat of Subdivision located inside or outside its corporate limits unless such PUD or Plat is, at a minimum, subject to meeting the performance standards of the Lake County Watershed Development Ordinance.

**500.06** A *community's* planning commission or corporate authority shall not approve any final PUD or Plat of Subdivision located inside or outside its corporate limits unless such PUD or Plat, at a minimum, meets the performance standards of the Lake County Watershed Development Ordinance.

**500.07** Pursuant to state law, a property owner of a parcel being subdivided adjacent to a state or county road right-of-way shall notify the proper highway authority in writing of the proposed subdivision, and request that the proper highway authority provide, at the cost of the highway authority or otherwise provided by law, the amount of additional capacity in any stormwater *detention facility* to be constructed in the subdivision for the future availability of the highway authority for meeting stormwater detention requirements of any future public construction on the highway.

**500.08** All *stormwater management systems* within the ownership parcel shall be located and described within a *deed or plat restriction*. Stormwater management systems that service a single parcel of property may be excused from this requirement upon approval of the *Enforcement Officer*.

**500.09** Modifications to a *deed or plat restriction* for the *stormwater management system* shall be approved by the *Enforcement Officer*.

**500.10** Soil *erosion* and sediment control measures and *stormwater management systems* shall be functional before general construction begins. Where *development* of a site is to proceed in phases, the soil erosion and sediment control measures and the stormwater management systems needed for each phase shall be functional before the construction of that phase begins.

**500.11** Stormwater management systems shall be functional before building permits are issued for residential and non-residential *developments*.

## §501 Runoff Calculations

**501.01** For tributary *drainage areas* one hundred (100) acres or greater, and for the determination of detention and depressional storage requirements, an SMC-approved hydrograph-producing runoff calculation method shall be used. Appendix K: Detention Volume Versus Percent Impervious of this Ordinance may also be used, when appropriate and upon approval of the *Enforcement Officer*, for determination of detention storage volumes.

**501.02** The Rational Method may be used to calculate discharges for areas of less than one hundred (100) acres. The Rational Method shall not be used to determine detention or depressional storage requirements.

**501.03** Rainfall data as presented in Appendix I: Rainfall Depth Duration Frequency Tables for Lake County of this Ordinance shall be used for rainfall volume, storm distribution, return frequency, and event duration.

**501.04** Runoff calculations for all off-site *drainage areas* may be based on anticipated future land use conditions or existing land use conditions. Anticipated future land use conditions will be based on future land use and existing storage facilities. Future *detention facilities* may be used for anticipated future land use conditions if approved by the *SMC Chief Engineer* or for tributary drainage areas less than 100 acres in a *Certified Community*, the *Enforcement Officer*. Existing land use conditions will be based on existing land use and existing storage facilities. For each frequency storm event, runoff calculations will be based on the critical duration, for all durations presented in Appendix I: Rainfall Depth Duration Frequency Tables for Lake County.

**501.05** Existing depressional storage volume shall be maintained, and the volume of detention storage provided to meet the requirements of this Ordinance shall be in addition to the existing storage.

**501.06** For determination of soil runoff characteristics, areas of the *development* that are *hydrologically disturbed* and compacted shall be changed to that soil types' highest runoff potential/soil group classification. Soil groups that are not hydrologically disturbed will retain their current runoff characteristics. Areas that are deed or plat restricted for native planting areas may be determined to have lower runoff characteristics, and may be taken into account when meeting the runoff volume reduction requirements of this Ordinance (503.02).

## §502 Release Rates and Discharges

**502.01** Unless otherwise specified in Appendix J: Watershed Specific Release Rates, an SMC-adopted *basin plan* or *floodplain study*, the detention volume required shall be calculated using a rating curve based on maximum release rates of 0.04 cubic feet per second per acre for the 2-year, 24-hour storm event and 0.15 cubic feet

per second per acre for the 100-year, 24-hour storm event. The release rate requirement shall apply to the *hydrologically disturbed* area of the *ownership parcel* unless the *Enforcement Officer* determines that specific locations of the *ownership parcel* have unique circumstances such that the release rate shall apply to a broader or smaller area. The release rate requirements shall only apply to *developments* listed in 300.06 and 300.07.

**502.02** Watershed specific release rates are tabulated in Appendix J: Watershed Specific Release Rates of this Ordinance.

**502.03** All concentrated stormwater discharges must be conveyed into a *maintainable outlet* with *adequate downstream stormwater capacity* (as defined in Appendix A: Definitions) and will not result in increased *flood* and drainage hazard.

**502.04** The design of *stormwater management systems* shall not result in the inter-basin transfer of drainage, unless no reasonable alternative exists. The *Enforcement Officer* may also allow inter-basin transfer if the transfer relieves a known drainage hazard and there is *adequate downstream stormwater capacity*.

**502.05** The combined release from the *detention facility* outlet and the outlet designed to meet *wetland* hydrology requirements of §1006 Wetland Hydrology for Isolated Waters of Lake County shall not exceed either the 2- or 100-year allowable release rates, respectively. The wetland hydrology requirement or minimum outlet restrictor size may take precedence over the allowable release rate, provided there is adequate downstream capacity as determined by the *Enforcement Officer*.

**502.06** The *applicant* shall prohibit *illicit discharges* generated during the *development* process from entering into the *stormwater management system*. Discharges of stormwater from a development site shall be in conformance with the Soil Erosion and Sediment Control practices contained in Article 6: Soil Erosion and Sediment Control Requirements of this Ordinance.

**502.07** The performance standards of this Ordinance shall apply to all *public road developments*. The release rate performance standard of §502 Release Rates and Discharges shall apply only to additional *impervious surface* areas or in the case of new road construction, the *hydrologically disturbed* areas. This release rate requirement shall be used unless *watershed* specific release rates have been adopted or it is determined by the *Enforcement Officer* that other site conditions, including analysis of adequate downstream capacity, warrant further analysis and modification from this standard. Detention requirements shall be applied only to those projects described in 300.07.

## §503 Runoff Volume Reduction (RVR)

**503.01** An *applicant* shall choose strategies that minimize stormwater runoff volumes and address water quality impairments. The site development plan shall incorporate stormwater infiltration, evapotranspiration, reuse, or other methods into the project. The applicant shall use appropriate *green infrastructure* techniques and best management practices to reduce runoff volume according to the following hierarchy, in order of preference, in preparing a stormwater management plan:

A. Preservation and enhancement of the stormwater management benefits of the *natural* resource features of the development site (e.g., areas of Hydrologic Soil

Groups A and B, floodplains, Waters of the United States, *Isolated Waters of Lake County*, channels, drainageways, prairies, savannas, and woodlands);

B. Minimization or disconnection of impervious surfaces;

C. Enhancement of the infiltration and storage characteristics of the development site using appropriate best management practices;

D. The use of open *channels* with native vegetation to convey stormwater runoff;

E. Structural measures that provide water quality and volume reduction;

F. Structural measures that provide only volume reduction or other rainwater harvesting practices;

G. Measures that provide water quality and quantity control;

H. Measures that provide only quantity control.

**503.02** Runoff Volume Reduction (RVR) Quantitative Standard

The minimum RVR quantitative standard shall be the volume achieved utilizing applicable RVR Credits, as determined by the applicant and approved by the Enforcement Officer, based on the *maximum extent practicable*, for the following development. The term "new" for the RVR Quantitative Standard refers to impervious surface area created after April 1, 2009.

Minor and Major Development that result in at least one (1) acre hydrologic disturbance and more than one-half (0.5) acre of new impervious surface area;

Redevelopment of previously developed sites that result in at least one (1) acre hydrologic disturbance;

Public Road Development that meet or exceed the thresholds in 300.07.

A. RVR Implementation Criteria

1. Runoff volume reduction quantity shall be implemented with appropriate methods, as approved by the Enforcement Officer, which may include the following: Best management practices; *green infrastructure*; detention facilities; and preservation or enhancement of natural streams, wetlands, and areas with deed restricted native vegetation.

2. Best management practices, and the portion of the detention facility designed to meet this provision, shall be designed to dewater the RVR quantity in no greater than 96 hours. The applicant shall provide infiltration rate information for each RVR practice. The use of an underdrain system may be incorporated into the design in order to achieve the required draw down time. Underdrain systems shall be designed to dewater the RVR quantity in not less than 48 hours.

B. RVR Credits

The following credits may be used alone or in combination to meet the RVR quantity requirement:

1. Detention Facility Credit – Up to 50% of the RVR quantity may be provided within the portion of the detention facilities that have been designed to meet this standard. The volume provided to meet this provision shall be below the elevation of the primary outlet for the RVR portion of the facility.
2. Native Vegetation Cover Credit – Up to 100% of the reduced 2-year, 24-hour runoff volume achieved with native vegetation in deed or plat restricted areas (e.g., compensatory storage and buffer areas) as described in Soil Runoff Characteristics (501.06) and Streams and Channels (506.02).
3. Isolated Wetland Hydrology Credit – A maximum of 100% of the existing 2-year, 24-hour runoff volume to a preserved IWLC if the Wetland Hydrology (§1002 Wetland Hydrology for Isolated Waters of Lake County) and Water Quality Treatment (§504 Water Quality Treatment) requirements are met.
4. Water Quality Treatment Credit – Up to 100% of the volume utilized to meet the Water Quality Treatment Volume (§504 Water Quality Treatment).
5. Off-Site RVR Credit – RVR practices may be provided on off-site, localized properties that are within the same basin. Deed or plat restrictions shall be obtained and recorded on off-site properties to assure perpetual operation and maintenance of RVR facilities.
6. Best Management Practice and Green Infrastructure Credits – Up to 100% of the volume within the practices designed to meet this standard.

## §504 Water Quality Treatment

Water quality treatment standards can be achieved by combining the runoff volume reduction requirements in §503 Runoff Volume Reduction (RVR), the Stormwater Quality Runoff Standards in §602 Stormwater Quality Runoff Standards, and the following requirements:

**504.01** The water quality treatment requirements in 504.02, 504.03, and 504.04 apply to developments that result in at least one-half (0.5) acre of new impervious surface area, where “new” is defined in 300.06 of this Ordinance. The volume of runoff kept on-site to meet the runoff volume reduction requirements of this Ordinance (503.02) may be deducted from the required water quality treatment volume.

**504.02** Prior to discharging to *Waters of the United States*, *Isolated Waters of Lake County*, or adjoining property, the *development* shall divert and detain at least the first 0.01 inch of runoff for every 1% of *impervious surface* for the development with a minimum volume equal to 0.2 inch of runoff (e.g., 20% or less impervious = 0.2-inch, 50% impervious = 0.5-inch, 90% impervious = 0.9-inch); or provide an equivalent level of treatment of runoff as approved by the *Enforcement Officer* and consistent with the best management practices guidance contained in the *Technical Reference Manual*.

**504.03** A *buffer* shall be established between design normal and high water levels around *stormwater management* facilities constructed for water quality treatment to

enhance treatment effectiveness. The buffer area planting plan shall use the Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois, NRCS, et al., (as amended) as a minimum standard.

**504.04** Hydrocarbon (e.g., oil and grease) removal technology shall be required using a volume of one-half (0.5) inch of runoff for the new *impervious surface* tributary area to each treatment device and meeting a minimum 70% removal rate for *development* classified as follows:

A. Vehicle fueling and servicing facilities;

B. Parking lots with more than twenty-five (25) new stalls.

## §505 Buffer Areas

**505.01** *Buffer* areas shall be required for all areas defined as either *Waters of the United States* or *Isolated Waters of Lake County*. Buffer areas are divided into two types, linear buffers and water body buffers.

Waters of the United States is a defined term (Appendix A: Definitions) in this Ordinance and refers to areas that are under the jurisdictional authority and regulated by the United States Army Corps of Engineers. Isolated Waters of Lake County are under the jurisdictional authority of this Ordinance and is a defined term in Appendix A: Definitions.

A. Linear *buffers* shall be designated along both sides of all *channels* meeting the definition of *Waters of the United States* or *Isolated Waters of Lake County*. The buffer width shall be determined as follows:

1. When the *channel* has a *watershed* greater than twenty (20) acres but less than one (1) square mile, the minimum *buffer* shall be fifty (50) feet on each side of the channel.

2. When the *channel* has a *watershed* greater than one (1) square mile, the minimum *buffer* shall be thirty (30) feet on each side of the channel.

3. Linear high-quality aquatic resources and streams with an Index of Biotic Integrity (IBI) greater than forty (40) shall have a minimum *buffer* width of one hundred (100) feet on each side of the *channel*. (Initial IBI based on IEPA Illinois Water Quality Report, biannual. A site-specific IBI assessment may override this report.)

B. Water body *buffers* shall encompass all non-linear bodies of water meeting the definition of either *Waters of the United States* or *Isolated Waters of Lake County*. The buffer width shall be determined as follows:

1. For all water bodies or *wetlands* with a total surface area greater than one-third (1/3) acre but less than one (1) acre, a minimum *buffer* width of thirty (30) feet shall be established.

2. For all water bodies or *wetlands* with a total surface area greater than or equal to one (1) acre but less than two and one-half (2.5) acres, a minimum *buffer* width of forty (40) feet shall be established.

3. For all water bodies or *wetlands* with a total surface area greater than or equal to two and one-half (2.5) acres, a minimum *buffer* width of fifty (50) feet shall be established.

**505.02** Non-linear high-quality aquatic resources shall have a minimum *buffer* width of one hundred (100) feet.

**505.03** In areas where state or federal threatened and endangered species are present or for an Illinois Natural Area Inventory Site, *buffer* widths may be modified upon approval of the *Enforcement Officer*. Any modification requires approval by the Enforcement Officer following consultation with the Illinois Department of Natural Resources or United States Fish and Wildlife Service.

**505.04** *Buffer* areas for water bodies meeting the definition of *Waters of the United States* or *Isolated Waters of Lake County* shall extend from the *ordinary high water mark*. Buffer areas for *wetlands* shall extend from the edge of the delineated wetland. A property may contain a buffer area that originates from Waters of the United States or Isolated Waters of Lake County on another property.

**505.05** Features of the *stormwater management system* approved by SMC or *Certified Community* may be within the *buffer* area of a *development*.

**505.06** Access through *buffer* areas shall be provided, when necessary, for maintenance purposes.

**505.07** All roadside drainage ditches, existing excavated *detention facilities* (as of the amended date of this Ordinance, August 10, 1999), borrow pits, quarries, and improvements to existing *public road developments* or alignments are exempt from *buffer* requirements.

**505.08** Stormwater discharges that enter a *buffer* shall have appropriate energy dissipation measures to prevent *erosion* and scour.

**505.09** All *buffer* areas shall be maintained free from development including disturbance of the soil, dumping or filling, erection of structures, and placement of *impervious surfaces* except as follows:

A. A *buffer* area may be used for passive recreation (e.g., bird watching, walking, jogging, bicycling, horseback riding, and picnicking) and it may contain pedestrian, bicycle, or equestrian trails.

B. Structures and *impervious surfaces* (including trails, paths) may occupy a maximum of twenty percent (20%) of the *buffer* surface area provided the runoff from such facilities is diverted away from the *Waters of the United States* or *Isolated Waters of Lake County* or such runoff is directed to enter the buffer area as unconcentrated flow.

C. Utility maintenance, construction of stormwater facilities, and maintenance of stormwater facilities shall be allowed.

D. Boat docks, boathouses, and piers shall be allowed and the provisions of 505.09B shall apply.

E. *Buffer* areas *hydrologically disturbed* by allowing construction or as part of a revegetation plan shall be revegetated using the Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois, NRCS, et al., (as amended) as a minimum standard.

**505.10** A minimum of a one-foot temporary construction buffer from the limits of the *Waters of the United States* or *Isolated Waters of Lake County* shall be required unless the adjacent *wetland* is considered impacted or enhanced. The one-foot temporary

construction buffer shall be marked by construction fencing (IDOT Standard) and installed prior to the start of all other construction activities. All other construction activities, including soil *erosion* and sediment control features, shall take place on the non-wetland side of the construction fencing.

**505.11** Buffer Averaging

The *buffer* width for a *development* site may be varied to a minimum of one-half (0.5) of the buffer width required, upon approval of the *Enforcement Officer*, provided that the total buffer area required is achieved adjacent to the *Waters of the United States* or *Isolated Waters of Lake County* being buffered. The consultation process of the IDNR or U.S. Fish & Wildlife Service may override the ability to average buffer areas upon approval of the Enforcement Officer.

**505.12** Preservation of *buffer* areas shall be provided by *deed or plat restrictions*.

**505.13** The *buffer* area of a *development* site may be subtracted from the water quality volume required.

## §506 Stormwater Conveyance Systems

**506.01** Storm Sewers and Swales

A. The 10-year *design storm* shall be used as a minimum for the design of storm sewers, *swales,* and appurtenances. Storm sewers shall have a minimum diameter of twelve (12) inches with the exception that storm sewers servicing a single parcel may be excused from this requirement upon approval of the *Enforcement Officer*. Storm sewer design analysis shall be calculated under full flow conditions, unless prior approval from the Enforcement Officer is received for an alternate flow condition (e.g., pressure flow).

B. *Development* shall not connect to sanitary sewers as an outflow for the *stormwater management system*.

C. For agricultural *drain tiles* (tiles) the following provisions shall apply:

1. Field tile systems disturbed during the process of *development* shall be reconnected by those responsible for their disturbance unless the approved drainage plan includes provisions for these.

2. Observation structures, or similar maintenance and inspection access structures, shall be installed within the development at suitable points of ingress or egress.

3. The *applicant* shall notify adjoining downstream property owners in writing of any proposed stormwater facility outlet location and design. The development design shall utilize, where practical and approved by the *Enforcement Officer*, outflow locations that have an existing tile leaving the development site. A subsurface connection to the tile shall be constructed as a low flow outlet. A surface outlet shall be designed for the development site outflows based on the assumption the downstream tile will cease to function.

4. Drain tiles within the disturbed portions of the ownership parcel shall be replaced or intercepted and connected into the proposed stormwater management system or a bypass. The system or bypass shall be of an equivalent size.

5. Drain tiles located within an ownership parcel may be removed or disabled provided that a *maintainable outlet* exists or is installed to prevent flood damages to off-site properties.
6. If the development stormwater management system depends on existing drain tiles for stormwater conveyance or water surface elevation control, a *maintainable outlet* is required.
7. The locations for existing drain tiles within the ownership parcel shall be defined using the Subsurface Drainage Inventory. Recorded deed or plat restrictions shall be provided for all existing and replaced drain tiles within the ownership parcel which are part of the stormwater management system. Drain tiles that service a single parcel of property may be excused from this requirement upon approval of the Enforcement Officer.
8. The maintenance plan per 401.09 shall include the type and frequency of maintenance for all existing and replaced drain tiles within the ownership parcel which are part of the stormwater management system.

D. All storm sewers shall be located in a public road right-of-way or maintenance easement of sufficient size to maintain or re-construct the sewer.

E. All on-site stormwater conveyance systems shall be designed and constructed to withstand the expected velocity of flow from all events up to the *base flood* without *erosion*. Stabilization adequate to prevent erosion shall be provided at the inlets and outlets for all pipes, transitions, and paved *channels*.

F. Swales being used as part of the *stormwater management system* for a *development* shall be located within a deed or plat restricted area of sufficient size to maintain or reconstruct the *swale*.

G. Surface outflows onto adjoining properties shall be designed to release as sheet flow using level spreader trenches unless alternative designs are approved by the *Enforcement Officer*.

**506.02** Streams and Channels

The following items are general performance standards for streams and *channels* and do not excuse *development* from meeting all other requirements of this Ordinance.

A. *Natural* streams and *channels* are to be conserved.

B. Removal of streamside (riparian) vegetation shall be limited to one side of the *channel*.

C. Clearing of *channel* vegetation shall be limited to that which is essential for construction of the channel.

D. If a *stream* or *channel* meeting the definition of *Waters of the United States* or *Isolated Waters of Lake County* is modified, a stream or channel *mitigation* plan shall be submitted for review and approval to the *Enforcement Officer*. The plan shall show how the physical characteristics of the modified channel shall meet the existing channel length, cross-section, slope, sinuosity, and carrying capacity of the original channel. The plan shall also re-establish vegetation within the *channel modification* using the Native Plant Guide for Streams and

Stormwater Facilities in Northeastern Illinois, NRCS, et al., (as amended) as a minimum standard for the re-vegetation plan.

E. All disturbed areas associated with a *channel modification* shall be seeded or otherwise stabilized immediately according to 600.04.

F. If *channels* are modified, an approved and effective means to reduce *sedimentation* and degradation of downstream water quality must be installed before excavation begins and must be maintained throughout the construction period.

G. New or relocated *channels* shall be built in the dry and all items of construction, including vegetation, shall be completed prior to diversion of water into the new channel.

H. Streams and *channels* shall be expected to withstand all events up to the *base flood* without increased *erosion*. The use of armoring of banks using bulkheads, rip-rap, and other materials shall be avoided. Armoring shall only be used where erosion cannot be prevented in any other way such as use of vegetation or gradual slopes. Such armoring shall have minimal impact on other properties and the existing land configuration.

I. A minimum maintenance easement of twelve (12) feet from top of bank is required along one side of all *channels* draining twenty (20) or more acres. All drainage easements shall be accessible to vehicular equipment; however, linear accessibility for vehicular equipment is not required.

J. Construction vehicles shall cross streams by the means of existing bridges or culverts. Where an existing crossing is not available, a temporary crossing shall be constructed in which:

1. The approach roads will be one-half (0.5) foot or less above *natural* grade.
2. The crossing will allow stream flow to pass without backing up the water above the stream bank vegetation line or above any drainage tile or outfall.
3. The top of the roadway fill in the *channel* will be at least two (2) feet below the top of the lowest bank. Any fill in the channel shall be non-erosive material, such as rip-rap or gravel.
4. All disturbed *stream* banks will be seeded or otherwise stabilized as soon as possible in accordance with 600.04 upon installation and again upon removal of construction crossings.
5. The access road and temporary crossings will be removed within one (1) year after installation, unless an extension of time is granted by the *Enforcement Officer*.

**506.03** Overland Flow Paths

The following items are general performance standards for *overland flow paths* and do not excuse *development* from meeting all other requirements of this Ordinance.

A. All areas of *development* must be provided with an *overland flow path* that will pass the *base flood* flow without *damage* to structures or property. If the upstream *drainage area* is less than twenty (20) acres, the storm sewer pipe

and inlet systems sized for the base flood can be constructed in lieu of providing an overland flow path.

B. The flow rate for a *base flood* shall be used to establish *overland flow path* limits, and it shall include all on-site and off-site tributary areas in accordance with §501 Runoff Calculations.

C. The *overland flow path* shall be protected from any activity, such as fencing, landscaping, or storage shed placement, which could impair its function. This protection shall be established through a *deed or plat restriction*.

D. For *overland flow paths* with less than twenty (20) acres tributary *drainage area*, all structures in parcels containing or adjoining to an overland flow path or other high water level designation shall have a *lowest adjacent grade* a minimum of one-half (0.5) foot above the design high water elevation.

E. For *overland flow paths* with greater than or equal to twenty (20) acres tributary *drainage area* but less than one hundred (100) acres, all structures in parcels containing or adjoining to an overland flow path or other high water level designation shall have a *lowest adjacent grade* a minimum of one (1) foot above the design high water elevation.

## §507 Stormwater Facilities

**507.01** All stormwater facilities, when determined applicable by the *Enforcement Officer*, shall be provided with:

A. An *emergency overflow* structure capable of passing the *critical duration base flood* inflow rate without damages to downstream structures or property.

B. The top of the impounding structure shall be a minimum of one (1) foot above the design high water level within the emergency overflow structure based on 507.01A.

C. A minimum 8-foot wide safety shelf with a maximum depth of three (3) feet below normal water level sloped back towards the shoreline.

D. Features for maintenance and emergency ingress and egress capability.

**507.02** All parcels within the established flood table land's elevation criteria of a detention facility design high water level shall be protected from flooding as follows:

A. For detention facilities with less than one hundred (100) acres of tributary area, all structures in parcels containing or adjoining the facility shall have a lowest adjacent grade a minimum of one (1) foot above the design high water elevation within the emergency overflow structure.

B. For detention facilities with greater than or equal to one hundred (100) acres of tributary area, all structures in parcels containing or adjoining the facility shall meet the requirements of §705 Public Health Protection Standards, 706.01A, 706.02A, 706.03, and 706.04 of this Ordinance at an elevation two (2) feet above the design high water elevation within the emergency overflow structure. New residential structures may have the lowest floor below this elevation if structurally dry flood-proofed to at least two (2) feet above the design highwater elevation within the emergency overflow structure.

**507.03** Single pipe outlets shall have a minimum inside diameter of twelve (12) inches. If design release rates call for smaller outlet, a design that minimizes the possibility of clogging shall be used. Minimum outlet restrictor size shall be four (4) inches in diameter provided there is adequate downstream capacity. Detention volume and corresponding high water level required for a *development* shall be determined by using the appropriate release rates specified in §502 Release Rates and Discharges, regardless of a minimum outlet restrictor size.

**507.04** Stormwater infiltration, retention, and *detention facilities* required to meet a *development's* discharge requirements shall be designed to *by-pass* off-site tributary flow from streams and *channels* unless approved by the *Enforcement Officer*.

**507.05** Any *development* involving the construction, modification, or removal of a *dam* as defined in Appendix A: Definitions per 17 Ill Adm. Code Part 3702 (Rules for Construction of Dams) shall obtain an IDNR/OWR Dam Safety Permit or a letter stating no permit is required prior to the start of such activity. Reference Appendix G: IDNR/OWR Dam Safety Permitting Guidelines.

**507.06** Stormwater retention and *detention facilities* shall not be constructed in a *Regulatory Floodplain* unless approved by the *Enforcement Officer*. If a retention or detention facility is constructed in a Regulatory Floodplain, the *development* must meet the requirements of Article 7: Regulatory Floodplain and Floodway Requirements, of this Ordinance.

**507.07** The placement of a detention basin in a floodplain area shall require *compensatory storage* per §704 Compensatory Storage Performance Standards. The volume of detention storage required to meet the standards of this Ordinance shall be in addition to the floodplain compensatory storage required for the *development*.

**507.08** Impounding berms or walls for stormwater retention and *detention facilities* shall be designed and constructed to withstand all expected forces, including, but not limited to, *erosion*, pressure, and uplift. The *applicant* shall submit material and compaction design specifications for earthen impoundments and provide as-built information verifying that the constructed condition meets the design requirements. Impounding berms or walls shall be represented on the design plans and signed and sealed by a *Registered Professional Engineer or Structural Engineer.*

## §508 On-Stream Detention

**508.01** All *on-stream detention* shall provide a *Detention Volume Safety Factor* as follows:

A. The Detention Volume Safety Factor applies to the volume of *on-stream detention* necessary to meet this Ordinance's site requirements.

B. The Detention Volume Safety Factor is equal to one (1) plus 0.05 times the ratio of off-site tributary *drainage area* to on-site tributary drainage area.

C. The maximum Detention Volume Safety Factor shall be 1.5.

**508.02** No *on-stream detention* shall be allowed with an off-site to on-site tributary *drainage area* ratio greater than 10:1 except for *development* providing a *watershed benefit*.

**508.03** *On-stream detention* shall not be permissible if the tributary *drainage area* is greater than 640 acres except for detention that provides a *watershed benefit*.

**508.04** The release rate shall be 0.04 cubic feet per second per acre of the total tributary *drainage area* (on-site and off-site) at the elevation created by impoundment of the on-site 2-year storm volume plus the *Detention Volume Safety Factor*, and 0.15 cubic feet per second per acre of the total tributary drainage area (on-site and off-site) at the elevation created by impoundment of the on-site 100-year storm volume plus the Detention Volume Safety Factor and the required *compensatory storage*. The release rate and on-site detention volume shall be calculated using the 24-hour storm event. This release rate calculation shall be used unless other site conditions warrant further analysis and modification from this standard or unless *watershed* specific release rates have been adopted.

**508.05** *On-stream detention* shall provide water quality treatment. One of the following two methods shall be used:

A. A *wet detention facility* with a minimum permanent pool volume equal to the calculated sediment volume accumulated over a one-year period for the entire upstream *watershed* and an average normal water depth of at least four (4) feet. The facility shall also have a live storage volume that, at a minimum, equals the water quality treatment standards of §504 Water Quality Treatment of this Ordinance for the *development* site.

B. A separate off-line sediment basin with a volume meeting the water quality treatment standards of §504 Water Quality Treatment of this Ordinance for the tributary *drainage area* to the sediment basin.

**508.06** Impoundment of the *stream* as part of *on-stream detention* shall be designed to allow the migration and movement of present or potentially present indigenous species, which require access to upstream areas as part of their life cycle. The impoundment shall not cause or contribute to the degradation of water quality or stream aquatic habitat.

**508.07** *Compensatory storage* requirements shall be satisfied and shall be in addition to detention volume requirements.

**508.08** No *on-stream detention* shall be allowed in areas designated as a high-quality aquatic resource.

## §509 Fee-In-Lieu of On-Site Stormwater Storage

**509.01** The SMC may require, as part of an adopted *basin plan* or *floodplain study*, the payment of a *fee-in-lieu of on-site stormwater storage* to fulfill all or part of the on-site stormwater storage requirement for a *development*. The adoption of a floodplain study or basin plan is per Appendix E: Enforcement Officer Duties, Section D of this Ordinance.

**509.02** The following fee-in-lieu of on-site stormwater storage procedures apply to communities with adopted procedures for requiring and collecting fee-in-lieu of revenues for stormwater storage requirements in this Ordinance:

A. The *Enforcement Officer* may require, or the *applicant* may submit, a written request for the payment of a *fee-in-lieu of on-site stormwater storage* to fulfill all or part of the on-site detention requirement below the detention threshold minimum limit set by this Ordinance in 300.06 and 300.07 and for *compensatory storage* requirements for streambank and shoreline restoration fills of less than two hundred (200) cubic yards. A request for fee-in-lieu of on-

site stormwater storage shall be either rejected or approved within forty-five (45) days of the written request unless additional engineering studies are required.

B. Approval of a request for *fee-in-lieu of on-site stormwater storage* on a *development* site below the detention threshold in 300.06 and 300.07 of this Ordinance and for *compensatory storage* requirements for streambank and shoreline restoration fills of less than two hundred (200) cubic yards shall be determined by the *Enforcement Officer*.

C. *Fee-in-lieu of on-site stormwater storage* shall be the lesser of:

1. The fee computed for each acre-foot or cubic yard or part thereof of stormwater storage approved in accordance with the procedures and schedules as approved by the SMC for Non-Certified Communities or the community elected board of officials in a *Certified Community*; or

2. The estimated construction cost as approved by the SMC for Non-Certified Communities or the community elected board of officials in a Certified Community of the *applicant's* proposed and approved on-site stormwater storage, including land costs.

D. A fund will be maintained by the *Certified Community* or the SMC for Non-Certified Communities for each of the four major Lake County *watersheds* for the purpose of identifying and controlling all revenues and expenditures resulting from fee-in-lieu of on-site stormwater storage approvals. All *fee-in-lieu of on-site stormwater storage* revenues received from each *watershed* shall be deposited in these funds for use within that watershed. A Certified Community may opt to allow SMC to administer fee-in-lieu-of revenues and expenditures through execution of an Intergovernmental Agreement specifying that arrangement.

E. The following requirements must be met before a *fee-in-lieu of on-site stormwater storage* will be approved:

1. The downstream *stormwater management system* has "*adequate downstream stormwater capacity*" (see Appendix A: Definitions); and

2. The SMC for Non-Certified Communities or the community elected board of officials in a *Certified Community* has an adopted fee-in-lieu of on-site stormwater storage program.

F. *Fee-in-lieu of on-site stormwater storage* revenues may be used to plan, design, or construct an upgrade to existing or future *stormwater management systems* if the upgrade is consistent with a *basin plan*, *floodplain study*, or stormwater system improvement that has been approved by the SMC for Non-Certified Communities or the community elected board of officials in a *Certified Community*.

**509.03** The fee-in-lieu of on-site stormwater storage option shall be authorized for all *public road developments* on existing alignments provided the downstream drainage system has adequate stormwater capacity and that it will not result in negative impacts to the drainage system.

# Article 6: Soil Erosion and Sediment Control Requirements

## §600 Performance Standards

Soil *erosion* and sediment control related measures are required to be constructed and maintained for any land disturbance activity permitted under Article 3: General Provisions. The following requirements shall be met:

**600.01** Soil disturbance shall be conducted in such a manner as to minimize *erosion*. Areas of the *development* site that are not to be graded shall be protected from construction traffic or other disturbance until final seeding is performed. Soil stabilization measures shall consider the time of year, site conditions, and the use of temporary or permanent measures.

**600.02** Properties and *channels* adjoining *development* sites shall be protected from *erosion* and *sedimentation*. At points where concentrated flow leaves a development site, energy dissipation devices shall be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity of flow from the structure to the watercourse so that the *natural* physical and biological characteristics and functions are maintained and protected.

**600.03** Sediment control measures shall be constructed prior to the commencement of hydrologic disturbance of upland areas.

**600.04** Disturbed areas shall be stabilized with temporary or permanent measures within seven (7) calendar days following the end of active hydrologic disturbance, or redisturbance, consistent with the following criteria or using an appropriate measure as approved by the *Enforcement Officer*:

A. Appropriate temporary or permanent stabilization measures shall include seeding, mulching, sodding, and/or non-vegetative measures.

B. Disturbance to areas or embankments having slopes equal to or steeper than 3H:1V shall be minimized; disturbed slopes shall be stabilized with staked-in-place sod, appropriately specified mat or blanket, or other appropriate measure(s) in combination with seeding.

C. *Erosion* control blanket shall be required on all interior detention basin side slopes between normal water level and high water level.

D. The seven (7) calendar day stabilization requirement may be precluded by snow cover or where land disturbing activities will resume within fourteen (14) calendar days from when the active hydrologic disturbance ceased, provided that the disturbed portion of the development site has appropriate soil *erosion* and sediment controls.

**600.05** Land disturbance activities in streams shall be avoided, where possible. If disturbance activities are unavoidable, the following requirements shall be met:

A. Where *stream* construction crossings are necessary, temporary crossings shall be constructed of non-erosive material.

B. The time and area of disturbance of a *stream* shall be kept to a minimum. The stream, including bed and banks, shall be restabilized within 48 hours after *channel* disturbance is completed or interrupted.

**600.06** Soil *erosion* and sediment control measures shall be appropriate with regard to the amount of tributary *drainage area* as follows:

A. Disturbed areas draining greater than 5,000 $ft^2$ but less than one (1) acre shall, at a minimum, be protected by a filter barrier (including filter fences, which at a minimum, meet the applicable sections of the AASHTO Standard Specification 288-00, or equivalent control measures) to control all off-site runoff. Vegetated filter strips, with a minimum width of twenty-five (25) feet, in the direction of flow, may be used as an alternative only where runoff in sheet flow is expected.

B. Disturbed areas draining more than one (1) but fewer than five (5) acres shall, at a minimum, be protected by a sediment trap or equivalent control measure at a point downslope of the disturbed area.

C. Disturbed areas draining more than five (5) acres shall, at a minimum, be protected by a sediment basin with a perforated filtered riser pipe or equivalent control measure at a point downslope of the disturbed area.

D. Sediment basins shall have both a permanent pool (dead storage) and additional volume (live storage) with each volume equal to the runoff amount of a 2-year, 24-hour event over the on-site *hydrologically disturbed* tributary *drainage area* to the sediment basin. Two-year storm runoff volumes versus site runoff curve numbers are shown in Appendix K: Detention Volume Versus Percent Impervious of this Ordinance. The available sediment volume below normal water level, in addition to the dead storage volume, shall be sized to store the estimated sediment load generated from the site over the duration of the construction period. For construction periods exceeding one (1) year, the 1-year sediment load and a sediment removal schedule may be submitted.

If the detention basin for the proposed *development* condition of the site is used for sediment basin, the above volume requirements will be explicitly met. Until the site is finally stabilized, the basin permanent pool of water shall meet the above volume requirements and have a filtered perforated riser protecting the outflow pipe.

**600.07** All storm sewers that are or will be functioning during construction shall be protected by an appropriate sediment control measure.

**600.08** If dewatering services are used, adjoining properties and discharge locations shall be protected from *erosion* and sedimentation. Discharges shall be routed through an approved anionic polymer dewatering system, or a similar measure, as approved by the Enforcement Officer. The Enforcement Officer, or approved representative, must be present at the commencement of dewatering activities.

**600.09** All temporary soil *erosion* and sediment control measures shall be removed within thirty (30) days after final site stabilization is achieved or after the temporary measures are no longer needed. Trapped sediment and other disturbed soil areas shall be permanently stabilized.

**600.10** A stabilized mat of crushed stone meeting IDOT gradation CA-1 underlain with filter fabric and in accordance with the Illinois Urban Manual, or other measure(s) as approved by the Enforcement Officer, shall be located at any point where traffic will be entering or leaving a development site to or from a public right-of-way, street, alley, or parking area. Pollutants from equipment and vehicle washing, wheel

wash water, and other wash waters shall be treated in a sediment basin or other appropriate measure(s) designed to minimize the discharge of pollutants, as approved by the Enforcement Officer. Any sediment or soil reaching an improved public right-of-way, street, alley, or parking area shall be removed by scraping or street cleaning as accumulations warrant and transported to a controlled sediment disposal area. The *Enforcement Officer* may require additional stabilized construction entrance methods.

**600.11** Earthen embankments shall be constructed with side slopes no steeper than 3H:1V. Steeper slopes may be constructed with appropriate stabilization as approved by the *Enforcement Officer*.

**600.12** Stormwater conveyance *channels*, including ditches, *swales*, and diversions, and the outlet of all channels and pipes shall be designed and constructed to withstand the expected flow velocity from the 10-year frequency storm without *erosion*. All constructed or modified channels shall be stabilized within 48 hours.

**600.13** Temporary diversions shall be constructed as necessary to direct all runoff from *hydrologically disturbed* areas to the appropriate sediment trap or basin.

**600.14** Soil stockpiles shall not be located in a *flood-prone area* or a designated *buffer* protecting *Waters of the United States* or *Isolated Waters of Lake County*. Soil stockpiles are defined as having greater than 100 $yd^3$ of soil and will remain in place for more than seven (7) days. Soil stockpile locations shall be shown on the soil *erosion* and sediment control plan and shall have the appropriate measures to prevent erosion of the stockpile.

**600.15** Handbooks

Standards and specifications contained in the *Illinois Urban Manual*, as amended, and the planning procedures sections of the Illinois Procedures and Standards for Urban Soil Erosion and Sedimentation Control, as amended, are referenced in this Ordinance as guidance for presenting soil *erosion* and sediment control plan specifications and delineating procedures and methods of operation under site *development* for soil erosion and sediment control. In the event of conflict between provisions of said manuals and this Ordinance, this Ordinance shall govern.

**600.16** The *applicant* shall provide adequate receptacles for the deposition of all construction material debris generated during the *development* process. The applicant shall not cause or permit the dumping, depositing, dropping, throwing, discarding, or leaving of construction material debris upon or into any development site, *channel*, Waters of the U.S., or *Isolated Waters of Lake County*. The applicant shall maintain the development site free of construction material debris.

**600.17** The applicant shall minimize the discharge of pollutants from the exposure of building materials, building products, landscape materials (e.g., fertilizers, pesticides, herbicides), detergents, sanitary waste, and other on-site materials to precipitation and stormwater runoff.

**600.18** If the installed soil erosion and sediment controls do not minimize sediment leaving the development site, additional measures such as anionic polymers or filtration systems may be required by the Enforcement Officer.

**600.19** If stripping, clearing, grading, or landscaping are to be done in phases, the permittee shall plan for appropriate erosion control measures to be in place after each stage listed in §1101 Inspections.

## §601 Designated Erosion Control Inspector Program Standards

**601.01** A *Designated Erosion Control Inspector* (DECI), hired or employed by the *applicant*, shall be required for *development* in 601.01A and 601.01B, and may be required by the Enforcement Officer for 601.01C:

A. Exceeds ten (10) acres of hydrologic disturbance; or

B. Exceeds one (1) acre of hydrologic disturbance and has a *Regulatory Floodplain*, *Isolated Waters of Lake County*, or *Waters of the United States* on-site or on a downstream adjoining property; or

C. Is less than or equal to one (1) acre of hydrologic disturbance and has a Regulatory Floodplain, Isolated Waters of Lake County, or Waters of the United States on-site or on a downstream adjoining property.

**601.02** Article 11: Inspections and Access of this Ordinance contains inspection requirements for *development* meeting the threshold for program inclusion in 601.01 and *Designated Erosion Control Inspector* requirements.

**601.03** The *applicant* shall submit the name of the *Designated Erosion Control Inspector* to the *Enforcement Officer* at or before the pre-construction meeting or commencement of hydrologic disturbance for the *development*.

## §602 Stormwater Quality Runoff Standards

The following standards shall be considered by *communities* with a separate adopted "Stormwater Quality Runoff Ordinance." The *Enforcement Officer* may set turbidity or total suspended solids limits for *development* sites that discharge to *Waters of the United States*, *Isolated Waters of Lake County*, or their *buffers* or that are in close proximity to the above, as determined by the Enforcement Officer. These standards shall apply to development site construction up to the point of permanent site stabilization as determined by the Enforcement Officer.

**602.01** Turbidity or total suspended solids limits shall apply only to *development* requiring both a Storm Water Pollution Prevention Plan as part of their General NPDES Permit No. ILR10 and a detention *pond* or similar stormwater storage system in order to use that stormwater facility for additional treatment measures needed to meet the standards in §602 Stormwater Quality Runoff Standards.

**602.02** If a singular storm event exceeds the 100-year design storm storage volume of the *development* site *stormwater management system*, water quality readings taken during that event will not be considered a violation of this Ordinance.

**602.03** As applicable to the *development* site described in 602.01, one of the following limits shall apply to each discharge location:

A. For development sites adjacent to lakes with total suspended solids background levels established in Appendix D: Total Suspended Solids Background Levels for Lake County Water Bodies of this Ordinance, the discharge limit standard shall be no more than 120% of the maximum values.

B. A maximum Nephelometric Turbidity Unit reading of fifty (50) NTU may be used.

C. The Enforcement Officer may determine an individual NTU limit for discharge from the development based on site-specific discharge sampling.

D. Upon approval of the Enforcement Officer, the applicant may determine an individual site limit based on site-specific discharge sampling.

**602.04** The developer should conduct site runoff sampling during storm events exceeding one-half (0.5) inch of rainfall and include the results in the weekly inspection reports required by the Storm Water Pollution Prevention Plan described in 602.01.

**602.05** Exceptions to these limits shall be allowed for dredging or *development* activities within a Waters of the United States or Isolated Waters of Lake County. In these cases specific permit conditions may be set with regard to time allowed for the activity to be completed and additional *erosion* control measures to be implemented.

# Article 7: Regulatory Floodplain and Floodway Requirements

## §700 Location of Regulatory Floodplain, Base Flood Elevation, and Regulatory Floodway

**700.01** The *Regulatory Floodplain* is delineated within a *development* by projecting the base flood elevation (BFE) onto the site topography.

**700.02** The BFE shall be as delineated by the 100-year flood profiles, as indicated on the floodplain studies noted in 700.02A through 700.02D:

A. SMC *Floodplain* Studies, adopted by the SMC for regulatory use after receiving an Independent Technical Review and a 60-day public technical review and comment period. Approved SMC floodplain studies, maps, and profiles shall be posted on the SMC website. SMC floodplain studies, including maps and profiles, shall be effective where:

1. The elevations exceed the current effective Flood Insurance Study (FIS) maps and profiles, provided that the study has been submitted to IDNR or *FEMA* for approval; or

2. The *base flood elevations* had not previously been determined in the current effective FIS and are not within areas under the jurisdiction of the *IDNR/OWR*.

B. Should no SMC approved *Regulatory Floodplain* profile exist for the site, the *FEMA* Flood Insurance Study and profiles, as listed in Appendix C: FEMA Flood Insurance Study Maps and Profiles.

C. In the case of *FEMA* delineated “AH Zones” the elevation noted on the map shall be the BFE. In the case of FEMA delineated “AO Zones” the BFE shall be the depth number shown on the map added to the highest adjacent grade, or at least two (2) feet above the highest adjacent grade if no depth number is provided.

D. When no *base flood elevation* exists, the BFE shall be determined by a *Registered Professional Engineer* using an appropriate model or technique as approved by the SMC or *IDNR/OWR*. For *riverine* *flood-prone areas* with greater than one hundred (100) acres of tributary *drainage area*, non-riverine *flood-prone areas* with greater than twenty (20) acres of tributary drainage area, and all mapped *Special Flood Hazard Areas* regardless of drainage area, the BFE determination shall be submitted to SMC for approval prior to issuance of a *Watershed Development Permit*. The BFE determination for non-riverine depressional floodplains with less than twenty (20) acres of tributary drainage area shall be reviewed and approved by the *Enforcement Officer*. BFE determinations shall be based on the *critical duration* event.

1. Where a *channel* has a tributary *drainage area* of 640 acres or more, the analyses in 700.02D shall be submitted to SMC for approval by *IDNR/OWR*.

2. For a *non-riverine Regulatory Floodplain*, the historic flood of record (as determined by the *Enforcement Officer* according to 700.02D) plus three (3) feet may be used for the BFE instead of performing a detailed hydrologic and hydraulic study.

**700.03** The location of the *Regulatory Floodway* shall be as delineated on the maps referenced in Appendix C: FEMA Flood Insurance Study Maps and Profiles. Where interpretation is needed to determine the exact location of the *Regulatory Floodway* boundary, *IDNR/OWR* should be contacted.

**700.04** Nothing contained herein shall prohibit the application of these regulations to land that can be demonstrated by engineering survey to lie within any *Regulatory Floodplain*. Conversely, any lands (except for those located in a *Regulatory Floodway*) that can be demonstrated by a topographic survey certified by a *Registered Professional Engineer* or Registered Land Surveyor to lie beyond the Regulatory Floodplain, and show to the satisfaction of the *Enforcement Officer*, to have been higher than the BFE as of the date of the first floodplain map denoting the site to be in a *Special Flood Hazard Area* and as of the date of the current effective map, shall not be considered to be located in the Special Flood Hazard Area.

In the case of a site located in the Regulatory Floodway that is higher than the BFE, it is subject to the regulations of this section until such time as a Letter of Map Revision is received from the *IDNR/OWR* and *FEMA*.

## §701 Application Requirements

**701.01** Development in the Regulatory Floodplain

If the *development* is located in a *Regulatory Floodplain*, the *applicant* shall provide the following additional information:

A. Site location of the property, drawn to scale on the Regulatory Floodplain map.

B. A plan view of the project showing:

1. The *Regulatory Floodway* limit, *Regulatory Floodplain* limit, and for work in public bodies of water as defined by *IDNR/OWR*, the navigation *channels*.

2. Cross-section views of the project for the impacted reach showing existing and proposed conditions including principal dimensions of the work as shown in plan view, existing and proposed elevations, normal water elevation, 10-year frequency flood elevation, 100-year frequency flood elevation, and graphic or numerical scales (horizontal and vertical).

3. A copy of the *Regulatory Floodway* map with the project site delineated and marked to reflect any proposed change in the Regulatory Floodway location.

C. A listing of all local, state, and federal permits or approval letters that may be required for this type of *development*. The *applicant* shall obtain and provide copies of any and all required federal, state, and local permits for development in the *Regulatory Floodplain* before the applicant requests or obtains a *Watershed Development Permit*. Reference Appendix H: Partial List of Permits Required (When Applicable) for Development in Lake County for a partial list of permits that may be applicable.

D. Engineering calculations and supporting data showing that the proposed work will meet the performance standards of this Ordinance.

E. All changes in grade resulting from any proposed excavation or filling; and existing and proposed *Regulatory Floodplain* and *Regulatory Floodway* limits;

the location and dimension of all *buildings* and additions to buildings; and the elevation of the *lowest floor* (including *basement*) of all proposed buildings subject to the requirements of this Ordinance.

F. *Elevation certificate* of the *lowest floor* elevation (including *basements* and attached garages) or the elevation to which a non-residential *building* has been flood-proofed using a flood-proofing certificate for all buildings in the *Regulatory Floodplain*.

**701.02** Development in the Regulatory Floodplain Without Regulatory Floodway

The applicant, through SMC, shall obtain approval from *IDNR/OWR* for *development* with a tributary *drainage area* of 640 acres or more located within the *Regulatory Floodplain* without a delineated *Regulatory Floodway*. The development shall not singularly or cumulatively result in an obstruction of *flood* flows or potential flood damages outside the development due to increased flood heights, velocities, or loss of floodplain storage. The applicant shall meet the requirements of Article 7: Regulatory Floodplain and Floodway Requirements of this Ordinance according to the following criteria:

A. Submit to SMC an engineering study performed by a *Registered Professional Engineer* which will determine a floodway which meets the definition of a *Regulatory Floodway* and show that the proposed *development* will meet the requirements of Article 7: Regulatory Floodplain and Floodway Requirements of this Ordinance; or

B. Submit to SMC an engineering study performed by a *Registered Professional Engineer* which will determine a *base flood elevation* and demonstrate that the proposed *development* will maintain the existing conditions conveyance, will not increase flood velocities, will not increase flood profiles, and will compensate for all lost flood storage at a ratio of 1.2:1 in a manner that is hydraulically equivalent; or

C. Submit to SMC an engineering study performed by a *Registered Professional Engineer* which will demonstrate that for a range of flood elevations (which would conservatively exceed the expected 100-year flood elevation) that the proposed *development* will maintain the existing conditions conveyance, will not increase flood velocities, will not increase flood profiles, and will compensate for all lost flood storage at a ratio of 1.2:1 in a manner that is hydraulically equivalent.

**701.03** The *applicant* shall obtain and provide copies of any and all required federal, state, and local permits for *development* in the *Regulatory Floodplain* before the applicant requests or obtains a *Watershed Development Permit*. Reference Appendix H: Partial List of Permits Required (When Applicable) for Development in Lake County for a partial list of permits that may be applicable.

**701.04** The *applicant* shall submit the data required to SMC and *FEMA* for proposed revisions to the *base flood elevation* of a *Regulatory Floodplain* study or relocation of a *Regulatory Floodway* boundary. The applicant shall also submit this data to IDNR/OWR when the tributary area is greater than one square mile.

**701.05** The *applicant* shall provide, when applicable to the *development*: an affidavit or documentation to prove where the development was above the *base flood*

*elevation* (BFE) prior to the effective date of the first *Regulatory Floodplain* map; certification that the ground elevation existed prior to the effective date of the first Regulatory Floodplain map.

## §702 Regulatory Floodplain Performance Standards

The performance standards of this section apply to *Regulatory Floodplain development* except when superseded by more stringent requirements in §701 Application Requirements, §703 Regulatory Floodway Performance Standards, §704 Compensatory Storage Performance Standards, §705 Public Health Protection Standards, §706 Building Protection Requirements, and §707 Bridge, Culvert Crossing, and Roadway Approach Performance Standards.

**702.01** Modification and disturbance of *natural riverine Regulatory Floodplains* shall be avoided to protect existing hydrologic and environmental functions. Such disturbances shall be minimized and all negative impacts mitigated as described in a *mitigation* plan.

**702.02** No *development* shall be allowed in the *Regulatory Floodplain* that shall singularly or cumulatively create a damaging or potentially damaging increase in *flood* heights or velocity or threat to public health, safety, and welfare or impair the *natural* hydrologic functions of the Regulatory Floodplain or *channel*.

**702.03** For projects involving *channel modification*, fill, *stream* maintenance, or levees, the flood carrying capacity of the *Regulatory Floodplain* shall be maintained.

**702.04** If the proposed *development* would result in a change in the mapped *Regulatory Floodplain* or BFE on a site, the *applicant* shall submit sufficient data to *FEMA* and SMC to obtain a *Letter of Map Revision* (LOMR). Proposed changes to Regulatory Floodplain and *Regulatory Floodway* delineation and BFE shall be submitted to SMC (see Appendix E: Enforcement Officer Duties). *IDNR/OWR* concurrence is required for changes to the BFE and floodway delineation.

**702.05** If the *development* is located in a public body of water, as defined by *IDNR/OWR*, a permit must also be received from IDNR/OWR.

**702.06** Any work involving construction or modification or removal of a *dam* or an on-stream structure to impound water shall obtain an IDNR/OWR Dam Safety Permit or letter indicating a permit is not required prior to the start of *development* activity. Reference Appendix G: IDNR/OWR Dam Safety Permitting Guidelines.

**702.07** For *public flood control projects*, the permitting requirements of Article 7: Regulatory Floodplain and Floodway Requirements will be considered met if the *applicant* can demonstrate to *IDNR/OWR*, or SMC in areas outside of IDNR/OWR jurisdiction, through hydraulic and hydrologic calculation, that the proposed project will not singularly or cumulatively result in increased *flood* heights outside the project right-of-way or easements for all flood events up to and including the *base flood* event.

## §703 Regulatory Floodway Performance Standards

The only *development* in a *Regulatory Floodway* which will be allowed are *Appropriate Uses* which will not cause an increase in *flood* heights for all flood events up to and including the *base flood*. Only those Appropriate Uses listed in 703.01 and in 17 Ill. Adm. Code Part 3708 will be allowed in the Regulatory

Floodway. Appropriate Uses do not include the construction or placement of any new structures, fill, *building* additions, buildings on stilts, piles, piers, or columns, fencing (including landscaping or planting designed to act as a fence), and storage of materials except as specifically defined in 703.01 as an Appropriate Use. If the development is proposed for the Regulatory Floodway portion of the *Regulatory Floodplain,* the following standards apply in addition to the previously stated standards for the Regulatory Floodplain:

**703.01** Only the construction, modification, repair, or replacement of the following *Appropriate Uses* will be allowed in the *Regulatory Floodway*:

A. Public flood *control projects* and private improvements relating to the control of drainage, flooding of existing *buildings*, *erosion*, water quality, or habitat for fish and wildlife.

B. Structures or facilities relating to functionally water dependent uses such as facilities and improvements relating to recreational boating and as modifications or additions to existing wastewater treatment facilities.

C. Storm and sanitary sewer outfalls.

D. Underground and overhead utilities sufficiently flood-proofed.

E. Recreational facilities such as playing fields and trail systems including any related fencing (at least 50% open when viewed from any one direction) built parallel to the direction of *flood* flows, and including open air pavilions.

F. Detached garages, storage sheds, or other non-habitable structures without toilet facilities, accessory to existing *buildings* that will not block *flood* flows nor reduce *Regulatory Floodway* storage.

G. Bridges, culverts and associated roadways, sidewalks, and railways necessary for crossing over the *Regulatory Floodway* or for providing access to other *Appropriate Uses* in the Regulatory Floodway and any modification thereto.

H. Parking Lots

1. Parking lots (where the existing depth of flooding for the *base flood* event is less than one (1) foot) and aircraft parking aprons both built at or below ground elevation and any modifications thereto.

2. The depth of flooding can be greater than one (1) foot for parking lots used for short term outdoor recreational use facilities where the *applicant* agrees to restrict access during overbank flooding events and agrees to accept liability for all *damage* caused by vehicular access during all overbank flooding events.

I. *Regulatory Floodway* re-grading, without fill, to create a positive non-erosive slope toward a *channel*.

J. *Flood-proofing* activities to protect previously existing lawful structures including the construction of water-tight window wells, elevating structures, or the construction of flood walls around residential, commercial, or industrial principal structures where the outside toe of the floodwall shall be no more than ten (10) feet away from the exterior wall of the existing *structure*, and which are not considered to be *substantial improvements* to the structure.

K. The replacement, *reconstruction*, or repair of a damaged *building*, provided that the outside dimensions of the building are not increased and that the activity is not a substantial improvement. An activity that is a substantial improvement shall conform to 706.01B for residential structures or 706.02B for non-residential structures.

L. Modifications to an existing *building*, which are not *substantial improvements*, that would not increase the enclosed floor area of the building below the *base flood elevation*, and which will not block *flood* flows, including, but not limited to, fireplaces, bay windows, decks, patios, and second story additions. No enclosed floor areas may be built on stilts.

M. *Substantial improvements*, provided that the outside dimensions of the building are not increased; the building shall conform to 706.01B for residential structures or 706.02B for non-residential structures.

**703.02** Additions to the list of *Appropriate Uses* in 703.01 are not allowed.

**703.03** All *Appropriate Uses* shall require a permit from the SMC or *Certified Community* and must be in accordance with all applicable provisions of this Ordinance.

**703.04** Construction of an *Appropriate Use* will be considered permissible provided that the proposed project meets the following engineering and *mitigation* criteria and those of §700 Location of Regulatory Floodplain, Base Flood Elevation, and Regulatory Floodway, 701.03 Regulatory Floodplain Performance Standards, §704 Compensatory Storage Performance Standards, §705 Public Health Protection Standards, and §706 Building Protection Requirements and is so stated in writing with supporting plans, calculations, and data prepared by a *Registered Professional Engineer*:

A. All effective *Regulatory Floodway* conveyance lost due to the development of *Appropriate Uses*, other than bridge or culvert crossings or on-stream structures or dams, shall be replaced for all *flood* events up to and including the *base flood*. In calculating effective Regulatory Floodway conveyance, the following factors shall be taken into consideration:

1. *Regulatory Floodway* conveyance,

   $K = (1.486/n)\ AR^{2/3}$

   where “n” is Manning’s roughness coefficient, “A” is the effective area of the cross-section, and “R” is the ratio of the area to the wetted perimeter.

2. The same Manning’s n-value shall be used for both existing and proposed conditions unless a recorded maintenance agreement with a federal, state, or local unit of government can ensure the proposed conditions will be maintained or the land cover is changing from a vegetative to a non-vegetative land cover.

B. Transition sections shall be provided and used in calculations of effective *Regulatory Floodway* conveyance, in the design of excavations in the Regulatory Floodway, between cross-sections with rapid expansions and contractions, and when meeting the Regulatory Floodway delineation on

adjoining properties. The following expansion and contraction ratios shall be used:

1. Water will expand no faster than at a rate of one foot horizontal for every four feet of the flooded *stream's* length.
2. Water will contract no faster than at a rate of one foot horizontal for every one foot of the flooded *stream's* length.
3. Water will not expand or contract faster than one foot vertical for every ten feet of the flooded *stream*'s length.
4. All cross-sections used in the calculations shall be located perpendicular to *flood* flows.
5. In the design of excavations in the *Regulatory Floodway*, *erosion*/scour protection shall be provided on land upstream and downstream of proposed *transition sections*.

C. The development of all *Appropriate Uses* shall not result in an increase in the average *channel* or *Regulatory Floodway* velocities or stage, for all *flood* events up to and including the *base flood* event. However, in the case of bridges or culverts or on-stream structures built for the purpose of backing up water in the *stream* during normal or flood flows, velocities may be increased at the structure site if scour, *erosion*, and *sedimentation* will be avoided by the use of rip-rap or other design measures.

D. In the case of on-stream structures built for the purpose of backing up water, an increase in upstream stage when compared to existing conditions for all *flood* events up to and including the *base flood* event shall be contained within recorded easements. A permit or letter indicating a permit is not required must be obtained from *IDNR/OWR*, Dam Safety Section for a Dam Safety Permit or waiver for any structure built for the purpose of backing up water in the *stream* during normal or flood flow.

E. General criteria for analysis of *flood* elevations

1. The *flood* profiles, flows, and *Regulatory Floodway* data in the Regulatory Floodway study, referenced in §700 Location of Regulatory Floodplain, Base Flood Elevation, and Regulatory Floodway, must be used for analysis of the base conditions. If the study data appears to be in error or conditions have changed, *IDNR/OWR* shall be contacted for approval and concurrence on the appropriate base conditions data to use.
2. If the BFE at the site of the proposed *development* is affected by backwater from a downstream receiving *stream* with a larger *drainage area*, the proposed development shall be shown to meet the requirements of this section for the base elevations of the *Regulatory Floodway* conditions and conditions with the receiving stream at normal water elevations. Additional receiving stream elevations may be considered for design if appropriate and approved by SMC or *IDNR/OWR*.
3. If the *applicant* is informed by *IDNR/OWR*, local governments, or a private owner that a downstream or upstream restrictive bridge or culvert is

scheduled to be removed, reconstructed, modified, or a regional *flood* control project is scheduled to be built, removed, constructed, or modified within the next five (5) years, the proposed *development* shall be analyzed and shown to meet the requirements of this section for both the existing conditions and the expected flood profile conditions when the bridge, culvert, or flood control project is built.

F. If the *Appropriate Use* will result in a change in the *Regulatory Floodway* location or a change in the BFE, the *applicant* shall submit to SMC the information required to be issued a *Conditional Letter of Map Revision* (CLOMR) from *IDNR/OWR* and *FEMA*. A public notice inviting public comment on the proposed change in the BFE or location in the Regulatory Floodway will be issued by IDNR/OWR or its designee before a CLOMR is issued. The application will not be considered complete until the CLOMR is received. No filling, grading, dredging, or excavating shall take place until a Conditional Approval is issued by the *Enforcement Officer*. The construction or placement of *structures* within the currently effective floodway boundary shall not take place until a final *Letter of Map Revision* (LOMR) is issued by IDNR/OWR and *FEMA,* which revises the floodway boundary.

**703.05** For those circumstances listed in 703.05A through 703.05E and located in a *Regulatory Floodway*, the following information shall be submitted to *IDNR/OWR* or SMC:

A. Analysis of the flood profile due to a proposed bridge, culvert crossings, and roadway approaches.

B. An engineer's determination that an existing bridge or culvert crossing or approach road is not a source of *flood damage* and the analysis indicating the proposed flood profile.

C. Alternative *transition sections* and hydraulically equivalent storage.

D. *IDNR/OWR* will retain permit authority for any IDNR/OWR projects, dams, etc., all other state, federal, or SMC projects.

E. SMC will issue permits to local units of government for *Regulatory Floodway* development.

## §704 Compensatory Storage Performance Standards

*Compensatory storage* is required for all storage lost or displaced in a *Regulatory Floodplain* due to *development*.

**704.01** *Hydraulically equivalent compensatory storage* requirements for development activity in a *riverine Regulatory Floodplain* shall be at least equal to 1.2 times the volume of Regulatory Floodplain storage lost or displaced. Such compensation areas shall be designed to drain freely and openly to the *channel* and located opposite or adjacent to fill areas. A *deed or plat restriction* is required to prohibit any modification to the compensation area.

**704.02** *Hydraulically equivalent compensatory storage* requirements for development activity in a *non-riverine Regulatory Floodplain* shall be at least equal to 1.0 times the volume of *Regulatory Floodplain* storage lost or displaced. Compensation areas

shall be designed to access the required volume. A deed or plat restriction is required to prohibit any modification to the compensation area. Upon approval of the Enforcement Officer, hydraulic equivalency for non-riverine compensatory storage may be altered, provided that the storage is replaced at or below the existing elevation at which storage is lost or displaced but not below the proposed normal water level.

**704.03** Hydraulically equivalent compensatory storage requirements for development activity in a non-riverine Regulatory Floodplain, that is located partially on-site, with more than 10% of the BFE surface area located on-site, shall be at least equal to 1.2 times the volume of Regulatory Floodplain storage lost or displaced. Such compensation areas shall be designed to access the required volume. A deed or plat restriction is required to prohibit any modification to the compensation area. Upon approval of the Enforcement Officer, hydraulic equivalency for non-riverine compensatory storage may be altered, provided that the storage is replaced at or below the existing elevation at which storage is lost or displaced but not below the proposed normal water level.

**704.04** Upon approval of the *Enforcement Officer*, shorelines or streambanks that have experienced *erosion* may be restored to their condition as of the current effective date of the FIRM in that *community* without the need to provide *compensatory storage* or pay a fee-in-lieu of for the fill used to restore the eroded area according to the following criteria:

A. The restoration fill shall meet existing grades and within *riverine* areas the current effective *Regulatory Floodplain* BFE shall not be increased and the *Regulatory Floodway* conveyance shall be maintained.

B. The amount of eroded property being restored shall be documented and submitted by the *applicant* as part of the permit process. Proper documentation shall be either field survey information or photo documentation of the *erosion* that has occurred for the property being restored.

C. For rivers, *lakes*, and streams where no floodway has been designated, no documentation of past shoreline *erosion* is required if the *applicant* does not exceed one (1) cubic yard of fill per lineal foot for a maximum of two hundred (200) feet. In this case, the placing of the fill shall not significantly alter the alignment of the shoreline with adjoining properties as determined by the *Enforcement Officer*. Non-documentable fills are a one-time allowance on a per property basis and all fills exceeding two hundred (200) cubic yards shall be regulated as specified in §509 Fee-In-Lieu of On-Site Stormwater Storage and §704 Compensatory Storage Performance Standards of this Ordinance.

**704.05** Top dressing is the placement of not more than four (4) inches of topsoil within the *Regulatory Floodplain* for the purposes of stabilizing an existing *erosion* control problem or establishing vegetative cover. Top dressing shall be allowed by permit on a per-parcel, one-time only allowance, and not damage or alter adjoining property drainage patterns. Upon approval of the *Enforcement Officer*, floodplain *compensatory storage* shall not be required. Top dressing fill shall comply with the Soil Erosion and Sediment Control standards and Wetlands provisions of this Ordinance (Article 6: Soil Erosion and Sediment Control Requirements and Article

10: Wetland Requirements). This provision shall not be applicable to the design process for new *development*.

**704.06** Top dressing is the placement of not more than four (4) inches of topsoil within the *Regulatory Floodplain*. For the purposes of restoring pre-subsidence grade to an area that primarily experiences subsidence due to a documented flood event, top dressing shall be allowed by permit on a per-parcel basis and not damage or alter adjoining property drainage patterns. Upon approval of the *Enforcement Officer*, floodplain *compensatory storage* shall not be required. Top dressing fill shall comply with the Soil Erosion and Sediment Control standards and Wetlands provisions of this Ordinance (Article 6: Soil Erosion and Sediment Control Requirements and Article 10: Wetland Requirements). This provision shall not be applicable to the design process for new development. A one-time allowance of this provision shall be in accordance with 704.06A through 704.06C and repeat allowances shall be in accordance with 704.06A through 704.06D:

A. The restoration fill shall meet pre-subsidence elevations, and within riverine areas, the pre-subsidence effective *Regulatory Floodplain* and *Regulatory Floodway* conveyance shall be maintained.

B. The property being considered for top dressing shall be documented and submitted by the applicant as part of the permit process. Proper documentation shall be either topographic information or photographic documentation of the flooding and subsidence that has occurred on the property.

C. Upon completion of top dressing, the applicant shall provide topographic or photographic documentation of completed work.

D. Repeat top dressing applications are limited to documented flood events with topographic or photographic evidence of subsidence.

**704.07** Impervious surface rehabilitative maintenance is the placement of not more than four (4) inches of pavement or any other impervious material within the Regulatory Floodplain. For the purposes of restoring pre-subsidence grades to an area that has experienced subsidence, rehabilitative maintenance of such areas shall be allowed by permit on a per-project basis and not damage or alter adjoining property drainage patterns. Upon approval of the Enforcement Officer, floodplain compensatory storage shall not be required. Rehabilitative maintenance fill shall comply with the Soil Erosion and Sediment Control standards and Wetlands provisions of this Ordinance (Article 6: Soil Erosion and Sediment Control Requirements and Article 10: Wetland Requirements). This provision shall not be applicable to the design process for new development. A one-time allowance of this provision shall be in accordance with 704.07A through 704.07C and repeat allowances shall be in accordance with 704.07A through 704.07D:

A. The restoration fill shall meet pre-subsidence elevations, and within riverine areas, the pre-subsidence effective Regulatory Floodplain and Regulatory Floodway conveyance shall be maintained.

B. The project being considered for rehabilitative maintenance shall be documented and submitted by the applicant as part of the permit process.

Proper documentation shall be either topographic information or photographic documentation of the subsidence that has occurred on the project.

C. Upon completion of rehabilitative maintenance, the applicant shall provide topographic or photographic documentation of completed work.

D. Repeat rehabilitative maintenance applications are limited to documented topographic or photographic evidence of subsidence.

## §705 Public Health Protection Standards

**705.01** For property within the *Regulatory Floodplain* no chemicals, explosives, buoyant materials, animal waste, fertilizers, flammable liquids, pollutants, or other hazardous or toxic materials shall be placed or stored below the *Flood Protection Elevation*.

**705.02** New and replacement water supply systems, wells, and sanitary sewer lines may be permitted providing all manholes or other above-ground openings located below the FPE are watertight.

**705.03** On-site waste disposal systems shall be designed to avoid inundation by the *base flood*.

## §706 Building Protection Requirements

**706.01** Building protection requirements for residential structures shall follow applicable FEMA regulations and include the following:

A. The *lowest floor*, including *basements,* of all new residential structures, including additions, shall be elevated up to at least the *Flood Protection Elevation* (FPE). The floor of an attached garage for a new *structure* must be elevated up to at least one-half (0.5) foot above the *base flood elevation* (BFE).

1. If placed on compacted fill, the top of the fill for a residential *structure* shall be above the FPE. The top of fill for an attached garage shall be one-half (0.5) foot above the BFE. The fill pad shall be placed at the appropriate elevation and designed to extend a minimum of ten (10) feet out from the building's designed footprint unless the *building* is certified by a Registered Structural Engineer to be protected from damages due to hydrostatic pressures. Additionally, the fill pad shall meet 95% of Standard Proctor Density in order to be demonstrated not to settle below the FPE for the residential structure and not below one-half (0.5) foot above the BFE for an attached garage, and to be adequately protected against *erosion*, scour, and differential settlement. Foundation excavations shall not extend more than five (5) feet beyond the foundation footprint. Backfill for the over excavated area does not need to meet the compaction requirements.

2. If elevated by means of walls, pilings, or other foundation, the building's supporting structure must be permanently open to *flood* waters and not subject to *damage* by hydrostatic pressures of the *base flood*. The bottom of the permanent openings shall be no more than one (1) foot above the *lowest adjacent grade*. The total net area shall be provided below the BFE, and consist of a minimum of two (2) openings for each enclosed area with each opening of an enclosed area on a different exterior wall. The

openings must have a total net area of not less than one (1) square inch for every one (1) square foot of enclosed area subject to flooding below the BFE. Any louvers, screens, or other opening covers must not block or impede the automatic flow of flood waters into and out of the enclosed area. The foundation and supporting members shall be anchored and aligned in relation to flood flows and adjoining structures so as to minimize exposure to known hydrodynamic forces such as current, waves, ice, and floating debris. All areas below the FPE shall be constructed with materials resistant to flood damage. The *lowest floor* (including *basement*) for the residential structure and all electrical, heating, ventilation, plumbing, air conditioning equipment, and utility meters shall be located at or above the FPE. Waterproofed service facilities, including, but not limited to, water and sewer pipes, electrical and telephone lines, and submersible pumps**,** may be located below the FPE. No area less than one (1) foot above the BFE shall be used for storage of items or materials.

B. The *lowest floor*, including *basements*, of an existing residential *structure* with a *substantial improvement* shall be elevated to at least one (1) foot above the BFE.

1. If placed on compacted fill, the top of the fill for a substantially improved residential structure shall be at least one (1) foot above the BFE. The fill pad shall be placed at the appropriate elevation and designed to extend a minimum of ten (10) feet out from the building's designed footprint unless the building is certified by a Registered Structural Engineer to be protected from damages due to hydrostatic pressures. Additionally, the fill pad shall meet 95% of Standard Proctor Density in order to be demonstrated not to settle below one (1) foot above the BFE for the substantially improved residential structure, and to be adequately protected against erosion, scour, and differential settlement. Foundation excavations shall not extend more than five (5) feet beyond the foundation footprint. Backfill for the over excavated area does not need to meet the compaction requirements.

2. If elevated by means of walls, pilings, or other foundation, the building's supporting structure must be permanently open to flood waters and not subject to damage by hydrostatic pressures of the base flood. The bottom of the permanent openings shall be no more than one (1) foot above the lowest adjacent grade. The total net area shall be provided below the BFE, and consist of a minimum of two (2) openings for each enclosed area with each opening of an enclosed area on a different exterior wall. The openings must have a total net area of not less than one (1) square inch for every one (1) square foot of enclosed area subject to flooding below the BFE. Any louvers, screens, or other opening covers must not block or impede the automatic flow of flood waters into and out of the enclosed area. The foundation and supporting members shall be anchored and aligned in relation to flood flows and adjoining structures so as to minimize exposure to known hydrodynamic forces such as current, waves, ice, and floating debris. All areas lower than one (1) foot above the BFE shall be constructed with materials resistant to flood damage. The lowest floor (including basement) for the substantially improved residential structure

and all electrical, heating, ventilation, plumbing, air conditioning equipment, and utility meters shall be elevated to at least one (1) foot above the BFE. Waterproofed service facilities, including, but not limited to, water and sewer pipes, electrical and telephone lines, and submersible pumps, may be located below the BFE-plus-one-foot elevation.

**706.02** Building protection requirements for non-residential structures shall follow applicable FEMA regulations and include the following:

A. The *lowest floor*, including *basements,* of all new non-residential *buildings***,** including additions, shall be elevated at least to the FPE or be structurally dry flood-proofed to at least the FPE. A non-residential building may be structurally dry flood-proofed (in lieu of elevation) provided that a *Registered Professional Engineer*, Registered Structural Engineer, or Licensed Architect shall certify that the building has been structurally dry flood-proofed up to the FPE and the *structure* and attendant utility facilities are watertight and capable of resisting the effects of the *base flood*. The building design shall take into account *flood* velocities, duration, rate of rise, hydrostatic and hydrodynamic forces, the effects of buoyancy, and impacts from debris or ice. Flood-proofing measures shall be operable without human intervention and without an outside source of electricity. (Levees, berms, floodwalls, and similar works are not considered *flood-proofing* for the purpose of this subsection.)

1. If a non-residential structure is not dry flood-proofed and is placed on compacted fill, the top of the fill shall be above the FPE. The fill pad shall be placed at the appropriate elevation and designed to extend a minimum of ten (10) feet out from the building's designed footprint unless the building is certified by a Registered Structural Engineer to be protected from damages due to hydrostatic pressures. Additionally, the fill pad shall meet 95% of Standard Proctor Density in order to be demonstrated not to settle below the FPE and to be adequately protected against erosion, scour, and differential settlement. Foundation excavations shall not extend more than five (5) feet beyond the foundation footprint. Backfill for the over excavated area does not need to meet the compaction requirements.

2. If a non-residential structure is not dry flood-proofed and is elevated by means of walls, pilings, or other foundation, the building's supporting structure must be permanently open to flood waters and not subject to damage by hydrostatic pressures of the base flood. The bottom of the permanent openings shall be no more than one (1) foot above the lowest adjacent grade. The total net area shall be provided below the BFE, and consist of a minimum of two (2) openings for each enclosed area with each opening of an enclosed area on a different exterior wall. The openings must have a total net area of not less than one (1) square inch for every one (1) square foot of enclosed area subject to flooding below the BFE. Any louvers, screens, or other opening covers must not block or impede the automatic flow of flood waters into and out of the enclosed area. The foundation and supporting members shall be anchored and aligned in relation to flood flows and adjoining structures so as to minimize exposure to known hydrodynamic forces such as current, waves, ice, and floating

debris. All areas below the FPE shall be constructed with materials resistant to flood damage. The lowest floor (including basement) for the non-residential structure and all electrical, heating, ventilation, plumbing, air conditioning equipment, and utility meters shall be located at or above the FPE. Waterproofed service facilities, including, but not limited to, water and sewer pipes, electrical and telephone lines, and submersible pumps, may be located below the FPE. No area less than one (1) foot above the BFE shall be used for storage of items or materials.

B. The lowest floor, including basements, of all substantially improved non-residential buildings and attendant utility facilities shall be elevated or structurally dry flood-proofed to a minimum of one (1) foot above the BFE. A substantially improved non-residential building may be structurally dry flood-proofed (in lieu of elevation) provided that a Registered Professional Engineer, Registered Structural Engineer, or Licensed Architect shall certify that the building has been structurally dry flood-proofed up to a minimum of one (1) foot above the BFE and the structure and attendant utility facilities are watertight and capable of resisting the effects of the base flood. The building design shall take into account flood velocities, duration, rate of rise, hydrostatic and hydrodynamic forces, the effects of buoyancy, and impacts from debris or ice. Flood-proofing measures shall be operable without human intervention and without an outside source of electricity. (Levees, berms, floodwalls, and similar works are not considered flood-proofing for the purpose of this subsection.)

1. If a substantially improved non-residential structure is not dry flood-proofed and is placed on compacted fill, the top of the fill for a non-residential structure substantial improvement shall be at least one (1) foot above the BFE. The fill pad shall be placed at the appropriate elevation and designed to extend a minimum of ten (10) feet out from the building's designed footprint unless the building is certified by a Registered Structural Engineer to be protected from damages due to hydrostatic pressures. Additionally, the fill pad shall meet 95% of Standard Proctor Density in order to be demonstrated not to settle below one (1) foot above the BFE for the non-residential structure, and to be adequately protected against erosion, scour, and differential settlement. Foundation excavations shall not extend more than five (5) feet beyond the foundation footprint. Backfill for the over excavated area does not need to meet the compaction requirements.

2. If a substantially improved non-residential structure is not dry flood-proofed and is elevated by means of walls, pilings, or other foundation, the building's supporting structure must be permanently open to flood waters and not subject to damage by hydrostatic pressures of the base flood. The bottom of the permanent openings shall be no more than one (1) foot above the lowest adjacent grade. The total net area shall be provided below the BFE, and consist of a minimum of two (2) openings for each enclosed area with each opening of an enclosed area on a different exterior wall. The openings must have a total net area of not less than one (1) square inch for every one (1) square foot of enclosed area subject to flooding below the BFE. Any louvers, screens, or other opening covers must not block or impede the automatic flow of flood waters into and out of

the enclosed area. The foundation and supporting members shall be anchored and aligned in relation to flood flows and adjoining structures so as to minimize exposure to known hydrodynamic forces such as current, waves, ice, and floating debris. All areas lower than one (1) foot above the BFE shall be constructed with materials resistant to flood damage. The lowest floor (including basement) for the substantially improved non-residential structure and all electrical, heating, ventilation, plumbing, air conditioning equipment, and utility meters shall be elevated to at least one (1) foot above the BFE. Waterproofed service facilities, including, but not limited to, water and sewer pipes, electrical and telephone lines, and submersible pumps, may be located below the BFE-plus-one-foot elevation.

**706.03** Manufactured homes and recreational vehicles to be installed on-site for more than 180 days shall be elevated to or above the FPE and shall be anchored to resist flotation, collapse, or lateral movement by being tied down in accordance with the Rules and Regulations for the Illinois Mobile Home Tie-Down Act issued pursuant to 77 Ill. Adm. Code Part 870. The requirements in 706.01A shall apply to this section.

**706.04** Tool sheds, detached garages, and attached garages which are not *substantial improvements* on an existing single-family platted lot may be constructed with the *lowest floor* below the FPE in accordance with the following:

A. The *building* shall not be used for human habitation.

B. All areas below the BFE shall be constructed with waterproof material. Structures located in a *Regulatory Floodway* shall be constructed and placed on a development site so as not to block the flow of flood waters and shall also meet the *Appropriate Use* criteria of §703 Regulatory Floodway Performance Standards. In addition, all other requirements of this Ordinance must be met.

C. The *structure* shall be anchored to prevent flotation.

D. Service facilities such as electrical and heating equipment shall be elevated or flood-proofed to the FPE.

E. The *building* shall be used only for the storage of vehicles or tools and may not contain other rooms, workshops, greenhouses, or similar uses.

F. If a residence is elevated appropriately, then the area below the residence can be used as a garage, as long as the garage conforms to 706.04A through 706.04E and includes permanent flow through openings as described in 706.01A.2.

G. The *building* shall be valued at less than $17,250 (2011 costs) and be no greater than 576 square feet in floor size.

**706.05** A non-conforming *structure* damaged by any origin may be restored unless the activity meets the definition of substantial improvement, in which case it shall conform to the provisions of 706.01B for residential structures or 706.02B for non-residential structures.

**706.06** If *flood-proofing* construction is required beyond the outside dimensions of an existing habitable, residential or commercial *building*, the outside perimeter of the flood-proofing construction shall be placed no further than ten (10) feet from the outside of the building. Compensation of lost storage and conveyance will not be required for flood-proofing activities.

## §707 Bridge, Culvert Crossing, and Roadway Approach Performance Standards

**707.01** A proposed new structure shall not result in an increase of upstream flood stages greater than one-tenth (0.1) foot when compared to the existing conditions for all *flood* events up to and including the *base flood* event unless contained within the *channel* banks, or recorded easements. The evaluation must be submitted to the SMC for review and concurrence before a permit is issued.

**707.02** If the proposed *development* will increase upstream flood stages greater than one-tenth (0.1) foot, the *applicant* must contact *IDNR/OWR,* Dam Safety Section for a Dam Safety Permit or waiver.

**707.03** Lost *Regulatory Floodway* and Regulatory Floodplain storage must be compensated for per the *Regulatory Floodplain* performance standards of this Ordinance except that artificially created storage that is lost or displaced due to a reduction in upstream head loss caused by a bridge, culvert, storm sewer, or constructed embankment shall not be required to be replaced, provided no *flood damage* will be incurred downstream.

**707.04** Velocity increases must be mitigated per the *Regulatory Floodway* performance section of this Ordinance except that in the case of bridges or culverts or on-*stream* structures built for the purpose of backing up water in the stream during normal or *flood* flows, velocities may be increased at the structure site if scour, *erosion*, and *sedimentation* will be avoided by the use of appropriate measures.

**707.05** For modifications or replacement of existing structures, the existing structure must first be evaluated in accordance with 17 Ill. Adm. Code Part 3708 to determine if the existing structure is a source of *flood damage*. If the structure is a source of flood damage, the *applicant's* engineer must evaluate the feasibility of redesigning the structure to reduce the existing backwater, taking into consideration the effects of flood damage to upstream and downstream properties. Modifications or replacement structures shall not increase flood stages compared to the existing or regulatory condition, whichever is greater, for all flood events up to and including the *base flood* event. The evaluation must be submitted to *IDNR/OWR*, or its designee, for review and concurrence before a permit is issued.

**707.06** If the crossing is proposed over a public body of water, an *IDNR/OWR* permit must be obtained.

**707.07** The hydraulic analysis for the backwater caused by the bridge showing the existing condition and proposed regulatory profile must be submitted to *IDNR/OWR* for concurrence that a *Conditional Letter of Map Revision* (CLOMR) is not required.

# Article 8: Flood-Prone Area Requirements

The performance standards of this section apply to *development* located in *flood-prone areas* with *drainage areas* less than 640 acres or in *depressional storage areas*, as specified.

## §800 Flood-carrying Capacity

The flood-carrying capacity shall be maintained for *channels* with *flood-prone areas* draining a tributary area of twenty (20) acres or more (§506 Stormwater Conveyance Systems).

## §801 Flood-prone Area Conveyance, Velocities, Flood Profiles, and Flood Storage

For development within a *flood-prone area* where the tributary *drainage area* is one hundred (100) acres or more, the *applicant* shall meet the requirements of Article 9: Flood Table Land Requirements of this Ordinance according to the following criteria:

**801.01** Submit to SMC an engineering study performed by a *Registered Professional Engineer* which will determine a floodway which meets the definition of a *Regulatory Floodway* and show that the proposed *development* will meet the requirements of Article 7: Regulatory Floodplain and Floodway Requirements of this Ordinance; or

**801.02** Submit to SMC an engineering study performed by a *Registered Professional Engineer* which will determine a *base flood elevation* and demonstrate that the proposed *development* will maintain the existing conditions conveyance, will not increase *flood* velocities, will not increase flood profiles, and will provide hydraulically equivalent compensatory storage at a ratio of 1.2:1. Such compensation areas shall be designed to drain freely and openly to the channel and located opposite or adjacent to fill areas; or

**801.03** Submit to SMC an engineering study performed by a *Registered Professional Engineer* which will demonstrate that for a range of flood elevations (which would conservatively exceed the expected 100-year flood elevation) that the proposed *development* will maintain the existing conditions conveyance, will not increase *flood* velocities, will not increase flood profiles, and will provide hydraulically equivalent compensatory storage at a ratio of 1.2:1. Such compensation areas shall be designed to drain freely and openly to the channel and located opposite or adjacent to fill areas.

# Article 9: Flood Table Land Requirements

The following flood table land requirements apply to new construction only and not to additions or *substantial improvements* to structures within flood table lands built before August 10, 1999.

## §900 Public Health Protection Standards

**900.01** No chemicals, explosives, buoyant materials, animal waste, fertilizers, flammable liquids, pollutants, or other hazardous or toxic materials shall be placed or stored below the *Flood Protection Elevation* (FPE).

**900.02** New and replacement water supply systems, wells, and sanitary sewer lines may be permitted providing all manholes or other above-ground openings located below the FPE are watertight.

**900.03** On-site waste disposal systems shall be designed to avoid inundation by the base flood.

## §901 Building Protection Requirements

**901.01** The lowest floor, including basements, of all new residential structures, including additions, shall be elevated or structurally dry flood-proofed up to at least the Flood Protection Elevation (FPE). The floor of an attached garage for a new structure must be elevated up to at least one-half (0.5) foot above the base flood elevation (BFE). If structurally dry flood-proofed, a Licensed Professional Engineer, Licensed Structural Engineer, or Licensed Architect shall certify that the building has been structurally dry flood-proofed up to the FPE and the structure and attendant utility facilities are watertight and capable of resisting the effects of the base flood. The building design shall take into account flood velocities, duration, rate of rise, hydrostatic and hydrodynamic forces, the effects of buoyancy, and impacts from debris or ice. Flood-proofing measures shall be operable without human intervention and without an outside source of electricity. (Levees, berms, floodwalls, and similar works are not considered flood-proofing for the purpose of this subsection.)

A. If the residential structure is not dry flood-proofed and is placed on compacted fill, the top of the fill for a residential structure shall be above the FPE. The top of fill for an attached garage shall be one-half (0.5) foot above the BFE. The fill pad shall be placed at the appropriate elevation and designed to extend a minimum of ten (10) feet out from the building's designed footprint unless the building is certified by a Registered Structural Engineer to be protected from damages due to hydrostatic pressures. Additionally, the fill pad shall meet 95% of Standard Proctor Density in order to be demonstrated not to settle below the FPE for the residential structure and not below one-half (0.5) foot above the BFE for an attached garage, and to be adequately protected against erosion, scour, and differential settlement. Foundation excavations shall not extend more than five (5) feet beyond the foundation footprint. Backfill for the over excavated area does not need to meet the compaction requirements.

B. If the residential structure is not dry flood-proofed and is elevated by means of walls, pilings, or other foundation, the building's supporting structure must be permanently open to flood waters and not subject to damage by hydrostatic pressures of the base flood. The bottom of the permanent openings shall be

no more than one (1) foot above the lowest adjacent grade. The total net area shall be provided below the FPE, and consist of a minimum of two (2) openings for each enclosed area with each opening of an enclosed area on a different exterior wall. The openings must have a total net area of not less than one (1) square inch for every one (1) square foot of enclosed area subject to flooding below the FPE. Any louvers, screens, or other opening covers must not block or impede the automatic flow of flood waters into and out of the enclosed area. The foundation and supporting members shall be anchored and aligned in relation to flood flows and adjoining structures so as to minimize exposure to known hydrodynamic forces such as current, waves, ice, and floating debris. All areas below the FPE shall be constructed with materials resistant to flood damage. The lowest floor (including basement) for the residential structure and all electrical, heating, ventilation, plumbing, air conditioning equipment, and utility meters shall be located at or above the FPE. Waterproofed service facilities, including, but not limited to, water and sewer pipes, electrical and telephone lines, and submersible pumps, may be located below the FPE. No area less than one (1) foot above the BFE shall be used for storage of items or materials.

**901.02** The lowest floor, including basements, of all new non-residential buildings, including additions, shall be elevated at least to the FPE or be structurally dry flood-proofed to at least the FPE. A non-residential building may be structurally dry flood-proofed (in lieu of elevation) provided that a Licensed Professional Engineer, Licensed Structural Engineer, or Licensed Architect shall certify that the building has been structurally dry flood-proofed up to the FPE and the structure and attendant utility facilities are watertight and capable of resisting the effects of the base flood. The building design shall take into account flood velocities, duration, rate of rise, hydrostatic and hydrodynamic forces, the effects of buoyancy, and impacts from debris or ice. Flood-proofing measures shall be operable without human intervention and without an outside source of electricity. (Levees, berms, floodwalls, and similar works are not considered flood-proofing for the purposes of this subsection.)

A. If a non-residential structure is not dry flood-proofed and is placed on compacted fill, the top of the fill shall be above the FPE. The fill pad shall be placed at the appropriate elevation and designed to extend a minimum of ten (10) feet out from the building's designed footprint unless the building is certified by a Licensed Structural Engineer to be protected from damages due to hydrostatic pressures. Additionally, the fill pad shall meet 95% of Standard Proctor Density in order to be demonstrated not to settle below the FPE and to be adequately protected against erosion, scour, and differential settlement. Foundation excavations shall not extend more than five (5) feet beyond the foundation footprint. Backfill for the over excavated area does not need to meet the compaction requirements.

B. If a non-residential structure is not dry flood-proofed and is elevated by means of walls, pilings, or other foundation, the building's supporting structure must be permanently open to flood waters and not subject to damage by hydrostatic pressures of the base flood. The bottom of the permanent openings shall be no more than one (1) foot above the lowest adjacent grade. The total net area shall be provided below the FPE, and consist of a minimum of two (2) openings

for each enclosed area with each opening of an enclosed area on a different exterior wall. The openings must have a total net area of not less than one (1) square inch for every one (1) square foot of enclosed area subject to flooding below the FPE. Any louvers, screens, or other opening covers must not block or impede the automatic flow of flood waters into and out of the enclosed area. The foundation and supporting members shall be anchored and aligned in relation to flood flows and adjoining structures so as to minimize exposure to known hydrodynamic forces such as current, waves, ice, and floating debris. All areas below the FPE shall be constructed with materials resistant to flood damage. The lowest floor (including basement) for the non-residential structure and all electrical, heating, ventilation, plumbing, air conditioning equipment, and utility meters shall be located at or above the FPE. Waterproofed service facilities, including, but not limited to, water and sewer pipes, electrical and telephone lines, and submersible pumps, may be located below the FPE. No area less than one (1) foot above the BFE shall be used for storage of items or materials.

**901.03** Manufactured homes and recreational vehicles to be installed on-site for more than 180 days shall be elevated to or above the FPE and shall be anchored to resist flotation, collapse, or lateral movement by being tied down in accordance with the Rules and Regulations for the Illinois Mobile Home Tie-Down Act issued pursuant to 77 Ill. Adm. Code Part 870.

**901.04** Accessory structures and attached garages may be constructed with the lowest floor below the FPE in accordance with the following:

A. The building shall not be used for human habitation.

B. The structure shall be anchored to prevent flotation.

C. Service facilities such as electrical and heating equipment shall be elevated or flood-proofed to the FPE.

# Article 10: Wetland Requirements

The performance standards of this section apply when Waters of the United States or Isolated Waters of Lake County are located wholly or partially within the development site.

## §1000 Wetland Delineation

**1000.01** The *applicant* shall identify the boundaries, extent, function, and quality of all *wetland* areas on the *development* site, and prepare a Wetland Determination Report. The presence and extent of wetland areas shall be determined by, or under the supervision of, a *Certified Wetland Specialist* using an on-site wetland procedure within three (3) years of the initial permit application date in accordance with the methodology contained in the 1987 U.S Army Corps of Engineers wetland delineation manual (as amended, including applicable supplements) or as otherwise noted in 1000.02.

**1000.02 Wetland Determination Report**

The following are minimum requirements for the Wetland Determination Report:

A. A plan showing the location of *wetlands* within the *development* site and the approximate boundaries of off-site wetlands per 1000.02F. The wetland boundary within the development site shall be flagged in the field and surveyed;

B. An aerial photograph delineating the *wetland* and the *development* boundary;

C. A copy of the following maps (most recent) delineating the *development* boundary:

   1. U.S.G.S. quadrangle map
   2. Lake County Wetland Inventory map
   3. *FEMA* floodplain map
   4. Lake County soil survey
   5. Hydrologic Atlas

D. U.S. Army Corps of Engineers data sheets (March 1992 or most recent version) with color photographs provided for representative upland and *wetland* data points;

E. A written description of the *wetland*(s) that includes a Floristic Quality Assessment as determined by methodology contained in Swink, F. and G. Wilhelm's Plants of the Chicago Region (1994, 4th Edition, Indianapolis: Indiana Academy of Science). Floristic quality assessments shall generally be conducted between May 15 and October 1, which approximates the growing season. Non-growing season assessments may require additional sampling during the growing season to satisfy this requirement;

F. The approximate location, extent, and relative quality of off-site *wetlands* on properties within the maximum *buffer* requirements adjoining the *development* shall be identified by using the first of the following documents or procedures pertaining at the time of development:

1. Site-specific delineation according to the 1987 Federal *wetland* delineation manual (as amended, including applicable supplements). If such delineation is not available, use 1000.02F.2.
2. *Wetlands* identified in Lake County Wetland Inventory maps (most current LCWI map).

G. A *farmed wetland* determination for *development* sites in accordance with the current U.S. Natural Resources Conservation Service methodology. The farmed wetland boundaries shall be shown on the plan and aerial photograph in 1000.02A and 1000.02B.

## §1001 Jurisdictional Determination

The *applicant* shall provide a valid, written jurisdictional determination (JD) from the U.S. Army Corps of Engineers or a Corps-approved agency, as to which wetlands on the *development* site are *Isolated Waters of Lake County* or *Waters of the United States*. A copy of the jurisdictional determination shall be included with the wetland submittal.

## §1002 Isolated Waters of Lake County Exclusions

Excluded areas are as specified in Appendix A: Definitions of *Isolated Waters of Lake County*.

## §1003 Letter of No Impact

**1003.01** For development containing Waters of the United States or Isolated Waters of Lake County, but with no proposed impacts, the following information is required for a Letter of No Impact (LONI):

A. A cover letter describing the proposed activity;

B. Development plan(s) as specified in 1005.01D;

C. A wetland hydrology analysis meeting the requirements of §1006 Wetland Hydrology for Isolated Waters of Lake County where there is a proposed modification of tributary drainage area or surface runoff volume to Isolated Waters of Lake County;

D. A letter from the U.S. Army Corps of Engineers stating that the proposed development will not impact Waters of the United States, if required by SMC or the Isolated Wetland Certified Community.

## §1004 Waters of the United States Impacts

**1004.01** The following information is required:

A. Wetland delineation and *wetland* determination report as specified in §1000 Wetland Delineation of this Ordinance.

B. A U.S. Army Corps of Engineers permit for the proposed *development* or a letter from the Corps stating that the proposed development does not require Corps authorization.

C. *Buffer* area requirements as specified in §505 Buffer Areas of this Ordinance.

D. All *wetland impacts* occurring in Lake County that exceed the *mitigation* threshold of the Corps regulatory program shall be mitigated for in Lake County at the mitigation ratio specified by the Corps for that *development* impact.

## §1005 Isolated Waters of Lake County Impacts

**1005.01** The following information is required:

A. A cover letter signed by a *Certified Wetland Specialist* that provides a clear project purpose and need statement, a description of the proposed activity, area (in acres) of *wetland impact*, and a statement on the category to be used as follows:

1. Category I: *Wetland impacts* less than or equal to one (1) acre and does not impact *high-quality aquatic resources*;
2. Category II: *Wetland impacts* greater than one (1) acre and less than two (2) acres and does not impact *high-quality aquatic resources*;
3. Category III: *Wetland impacts* greater than or equal to two (2) acres or impacts *high-quality aquatic resources*; and
4. Category IV: *Wetland impacts* for the restoration, creation, and enhancement of *wetlands* provided that there are net gains in aquatic resource function. Category IV activities include shoreline and streambank *erosion* restoration described in 704.04.

B. A completed *Watershed Development Permit* Application form signed by a *Certified Wetland Specialist*.

C. A delineation of the *wetlands* consistent with the requirements provided in §1000 Wetland Delineation of this Ordinance.

D. Development site plan(s) meeting the requirements of Article 4: Application Requirements of this Ordinance showing the boundaries of all existing wetlands or water bodies on the ownership parcel, including the development site and the areas of proposed wetland impacts.

E. A statement on the occurrence of any *high-quality aquatic resources* on or adjoining the *development*.

F. A wetland hydrology assessment per §1006 Wetland Hydrology for Isolated Waters of Lake County, as applicable.

G. Documentation that the *development* is in compliance with the Illinois Department of Natural Resources' Endangered Species Consultation Program and the Illinois Natural Areas Preservation Act [520 ILCS 10/11] and [525 ILCS 30/17].

H. For *developments* involving State of Illinois funding or pass-through funding, documentation that the development is in compliance with the Interagency Wetland Policy Act of 1989 [20 ILCS 830] as administered by the Illinois Department of Natural Resources.

I. Documentation that the *development* is in compliance with the U.S. Fish and Wildlife Service's consultation program under the Endangered Species Act.

J. A *mitigation* plan meeting the requirements of §1007 Mitigation for Isolated Waters of Lake County of this Ordinance.

K. A copy of the Natural Resources Information Report (NRI) for *development* that is required to obtain a NRI performed by the McHenry-Lake County Soil and Water Conservation District pursuant to state statute [70 ILCS 405/22.02a].

L. A narrative of the alternative measures taken to avoid, minimize, or mitigate for *wetland impacts* to *Isolated Waters of Lake County* (Category II requirement only, see 1005.01A.2).

M. Category III Wetland Impacts (1005.01A.3)

1. A narrative of the measures taken, in sequence, to avoid and minimize *wetland impacts* to *Isolated Waters of Lake County* before *mitigation* is considered.

2. Upon concurrence of the *Enforcement Officer* and the SMC or the Isolated Waters of Lake County-Certified Community's *Certified Wetland Specialist* that a *Watershed Development Permit* application meets all other *wetland* submittal requirements of this Ordinance, the SMC or the Isolated Waters of Lake County-Certified Community's Certified Wetland Specialist shall issue a Technical Notification to USACE, IDNR, IEPA, USFWS, and the SMC requesting comments with respect to the proposed *wetland impacts* within fifteen (15) working days. The SMC or the Isolated Waters of Lake County-Certified Community's Certified Wetland Specialist shall receive the comments and copies of the comments shall be forwarded to the *applicant* for response. Full consideration of the comments and applicant's response shall be evaluated by the SMC or the Isolated Waters of Lake County-Certified Community's Certified Wetland Specialist for compliance with 102.10 prior to approval of wetland provisions and permit issuance.

3. The SMC shall review and issue Category III (1005.01A.3) wetland authorizations for *development* sites occurring in more than one local unit of government jurisdiction.

N. Category IV Wetland Impacts (1005.01A.4)

1. A narrative on the benefits to the aquatic environment of the proposed *development*.

2. Shoreline and streambank *erosion* restoration that meet the requirements contained in 704.04 are exempt from the submittal requirements contained in this section.

3. *Isolated Waters of Lake County* that are used for detention and not for *mitigation* credit per §1008 Detention in Isolated Waters of Lake County shall be exempt from the submittal requirements of 1005.01J.

## §1006 Wetland Hydrology for Isolated Waters of Lake County

The following hydrology requirement applies to *Isolated Waters of Lake County* located wholly or partially within the ownership parcel, including the *development* site. The runoff volume reduction requirements (503.02) may be modified to satisfy the wetland hydrology requirement for the portion of the development site tributary to the wetland.

**1006.01** The *development* design shall maintain between 80% and 150% of the existing condition, 2-year, 24-hour storm event runoff volume from the on-site tributary drainage area to the preserved *Isolated Waters of Lake County*. The following minimum information shall be submitted to address this provision:

A. An exhibit illustrating the existing condition and with-project tributary drainage areas; and

B. Existing condition and with-project runoff volume calculations (including land use and soil type documentation); and

C. Existing condition and with-project runoff volume determination. For proposed *development* that will change the size of an *Isolated Waters of Lake County*, the proposed to existing conditions runoff volume ratio shall be adjusted according to the change in *wetland* size, to determine if the hydrology threshold has been met; and

D. The *development* shall include a design for the *stormwater management system* that maintains or replicates the existing hydrologic condition of the *wetland*, unless changes are proposed to enhance the wetland function.

**1006.02** A *wetland impact* to *Isolated Waters of Lake County* shall be assumed and the *mitigation* requirements of §1007 Mitigation for Isolated Waters of Lake County of this Ordinance shall apply if the *development* does not meet provisions of 1006.01. The hydrologic wetland impact shall be in addition to other wetland impacts to Isolated Waters of Lake County (e.g., filling, excavation, drainage, etc.). The amount of wetland impact shall be determined as follows:

A. For *Isolated Waters of Lake County* wholly on-site: The total area of the impacted Isolated Waters of Lake County not meeting the provisions of 1006.01; and

B. For *Isolated Waters of Lake County* located partially on-site: The ratio of on-site tributary *drainage area* to total tributary drainage area multiplied by the with-project area of the impacted Isolated Waters of Lake County.

## §1007 Mitigation for Isolated Waters of Lake County

**1007.01** *Mitigation* is required within Lake County for:

A. *Wetland impacts* greater than or equal to one-tenth (0.10) acre of *Isolated Waters of Lake County* including those that are *high-quality aquatic resources* (HQAR).

B. For single-lot, single-family residences, provided the activity is a single and complete project: *Wetland impacts* greater than one-quarter (0.25) acre of *Isolated Waters of Lake County* or one-tenth (0.10) acre of *Isolated Waters of Lake County* that are *high-quality aquatic resources*.

**1007.02** *Mitigation* shall provide for the replacement of the *wetland* environment lost to development at the following proportional rates (i.e., creation acreage to *wetland impact* acreage):

A. For *wetland impacts* to areas that are not *high-quality aquatic resources* under Categories I, II, and III (1005.01A.1, 1005.01A.2, and 1005.01A.3, respectively), a minimum of 1.5:1 *mitigation* ratio shall be required or a minimum 1:1 mitigation ratio for fully certified wetland mitigation bank credits.

B. A minimum of 3:1 for *wetland impacts* that are *high-quality aquatic resources*.

C. A minimum of 6:1 for *wetland impacts* that are high quality *forested wetlands* as defined in Appendix L: High-Quality Aquatic Resources.

D. For *wetland impacts* to *open waters* that are not *high-quality aquatic resources* under Categories I, II, and III (1005.01A.1, 1005.01A.2, and 1005.01A.3, respectively), a minimum of 1:1 mitigation ratio shall be required.

**1007.03** Mitigation Hierarchy for Isolated Waters of Lake County

A. Size Requirements

1. If the required *mitigation* acreage is less than one and one-half (1.5) acres, mitigation requirements shall follow the mitigation hierarchy in 1007.03B.2 through 1007.03B.4. If on-site mitigation increases an existing on-site *wetland* size to greater than or equal to one and one-half (1.5) acres, the *applicant* may use the mitigation hierarchy in 1007.03B.1.

2. If the required *mitigation* acreage is one and one-half (1.5) acres or greater, mitigation requirements shall follow the mitigation hierarchy in 1007.03B.1 through 1007.03B.4.

B. Hierarchy

All *mitigation* shall occur in Lake County. Mitigation shall use the following hierarchy. Allowance to the next lower step is permitted only when justified through sequencing specified in 1005.01L and 1005.01M or when the higher step is not available or as specified in 1007.03B.4:

1. On-site *wetland* *mitigation* meeting the requirements of the project mitigation document.

2. In the same *watershed* as *wetland impact*: A U.S. Army Corps of Engineers Approved Wetland Mitigation Bank; or a SMC Approved Wetland Mitigation Bank; or off-site *wetland* *mitigation* meeting the requirements of the project mitigation document.

3. Outside of the *watershed* (at double the required *mitigation* acreage): A U.S. Army Corps of Engineers Approved Wetland Mitigation Bank; or a SMC Approved Wetland Mitigation Bank; or off-site *wetland* mitigation meeting the requirements of the project mitigation document.

4. *SMC Wetland Restoration Fund*. This *mitigation* option may only be used for *wetland impacts* where there are no available mitigation credits within the *watershed* and the corresponding fees and mitigation ratios shall be charged at the 'in-watershed' rate.

**1007.04** Mitigated *Isolated Waters of Lake County* shall be designed to duplicate or improve the hydrologic and biologic features of the original *wetland impact* area.

**1007.05** A Project Mitigation Document (PMD) shall be submitted for all *mitigation* projects in conformance with Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts of this Ordinance. Appendix N contains requirements for performance standards, monitoring, and completion standards.

**1007.06** *Creation* of *wetlands* for the *mitigation* of *wetland impacts* shall not take place within *detention facilities*. Enhancement of *farmed wetlands* meeting the size criterion in

1007.03A of this Ordinance may be used for up to 80% of the mitigation requirement.

**1007.07** *Enhancement* of existing non-farmed *wetlands* may be credited at up to 25% of the enhanced wetland acreage completed, provided that the *wetland impact* acreage created is at a minimum 1:1 ratio and the *mitigation* hierarchy in 1007.03 is followed.

**1007.08** A five-year *wetland mitigation* surety for 110% of *mitigation* cost shall be submitted prior to obtaining a permit. The mitigation surety shall include the costs for construction, monitoring, and management activities during the 5-year performance period.

**1007.09** A *wetland mitigation* management and monitoring plan indicating the legally responsible parties for long-term operation and maintenance and dedicated funding sources shall be submitted.

**1007.10** *Mitigation* areas shall have the same *buffer* area requirements and mitigation credit for established buffer areas as described in Appendix M: SMC-Approved Wetland Mitigation Banking Requirements for SMC approved *wetland* mitigation banks.

**1007.11** The developer shall provide annual monitoring reports on the status of the constructed *mitigation* measures. The developer shall undertake all necessary remedial action to bring the area into compliance with the *wetland* mitigation plan.

**1007.12** *Wetland impacts* occurring prior to issuance of a WDO Permit shall presume the *wetland* disturbed was a *high-quality aquatic resource* requiring *mitigation* at a minimum rate of 3:1, except 6:1 for *wetland impacts* that are *forested wetlands* as defined in Appendix L: High-Quality Aquatic Resources.

**1007.13** *Mitigation* areas shall be protected by a *deed or plat restriction* for that purpose.

## §1008 Detention in Isolated Waters of Lake County

**1008.01** Detention shall only be allowed in the following *Isolated Waters of Lake County* and may not be considered a *wetland impact*, subject to provisions of 1008.02 and 1008.03:

A. *Farmed wetlands*.

B. Non-farmed wetlands that are not high-quality aquatic resources when the existing vegetated wetland acreage (not including open water area) is either:

1. Covered by a minimum of 85% of one (1) or more of the following species:

a. Reed canary grass (*Phalaris arundinacea*)

b. Purple loosestrife (*Lythrum salicaria*)

c. Common reed (*Phragmites australis*)

d. Buckthorn (*Rhamnus* spp.)

2. Has an FQI of seven (7) or less.

C. *Isolated Waters of Lake County* comprised of open water that are not *high-quality aquatic resources* (HQARs).

D. Non-farmed wetlands not meeting 1008.01B that are not high-quality aquatic resources and wholly located within a deed or plat restriction may be utilized for

detention greater than the required 2-year, 24-hour volume. The outlet design shall maintain or replicate the existing hydrologic condition of the wetland, unless changes are proposed to enhance the wetland function. Excavation or grading shall be considered an impact under the appropriate impact Category I, II, or III (1005.01A.1, 1005.01A.2, or 1005.01A.3, respectively).

**1008.02** The following shall apply when using *Isolated Waters of Lake County* for detention and not for *wetland* enhancement *mitigation* credit:

A. The *applicant* shall use a "wetland detention basin" design as provided in the *Technical Reference Manual (TRM)*, and shall re-establish vegetation within the detention basin using the Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois, NRCS, et al., (as amended) as a minimum standard for the re-vegetation plan.

B. Reduction of wetland area within the existing delineated wetland boundary from existing to proposed conditions shall be reviewed as an impact under the appropriate impact Category I, II, or III (1005.01A.1, 1005.01A.2, or 1005.01A.3, respectively).

C. Excavation of existing wetland as part of the proposed wetland detention basin design shall be reviewed under Category IV (1005.01A.4) meeting the criteria of 1008.01A, 1008.01B, and 1008.01C.

D. The wetland hydrology thresholds of §1006 Wetland Hydrology for Isolated Waters of Lake County shall apply for Isolated Waters of Lake County meeting the criteria of 1008.01A and 1008.01D.

E. The requirements for water quality treatment of §504 Water Quality Treatment shall apply upstream of the Isolated Waters of Lake County.

F. The *maintainable outlet* requirements of 502.03 shall apply.

**1008.03** The following shall apply when using Isolated Waters of Lake County for detention and for wetland enhancement mitigation credit:

A. Isolated Waters of Lake County meeting the criteria of 1008.01 may be used for wetland enhancement mitigation credit.

B. Wetland enhancement within the proposed detention basin shall be reviewed under Category IV (1005.01A.4) requirements, and the performance standards listed in Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts, Section H: PERFORMANCE STANDARDS, shall apply.

C. Reduction of wetland area within the existing delineated wetland boundary from existing to proposed conditions shall be reviewed as an impact under the appropriate impact Category I, II, or III (1005.01A.1, 1005.01A.2, or 1005.01A.3, respectively).

D. The mitigation requirements of §1007 Mitigation for Isolated Waters of Lake County shall apply.

E. The wetland hydrology thresholds of §1006 Wetland Hydrology for Isolated Waters of Lake County shall apply.

F. The requirements for water quality treatment of §504 Water Quality Treatment shall apply upstream of the Isolated Waters of Lake County.

# Article 11: Inspections and Access

## §1100 Access Authority

Representatives of the SMC and of any federal, state, and local unit of government are authorized to enter upon any land or water to *inspect* *development* activity and to verify the existing conditions of a development site that is currently under permit review.

## §1101 Inspections

**1101.01** The *Enforcement Officer* may *inspect* site *development* at any stage in the construction process. For major developments, the Enforcement Officer shall conduct site inspections, at a minimum, at the end of the construction stages 1101.02A and 1101.02G. Construction plans approved by the Enforcement Officer shall be maintained at the development site during progress of the work.

**1101.02** The *Designated Erosion Control Inspector* (DECI) shall conduct inspections and document as described below, at a minimum, at the intervals in 1101.02A and 1101.02F, for those developments that require a Designated Erosion Control Inspector, until permanent stabilization and Enforcement Officer approval of appropriate as-built documentation and drawings.

A. Upon completion of installation of sediment and runoff control measures (including perimeter controls and diversions), prior to proceeding with any other earth disturbance or grading.

B. After stripping and clearing.

C. After rough grading.

D. After final grading.

E. After seeding and landscaping deadlines.

F. After every seven (7) calendar days or storm event with greater than one-half (0.5) inch of rainfall or *liquid equivalent precipitation*.

G. After final stabilization and landscaping, prior to removal of sediment and erosion controls.

H. After removal of erosion and sediment controls.

**1101.03** Designated Erosion Control Inspector inspections may be performed at a reduced frequency, at the discretion of the Enforcement Officer, for projects with a valid Watershed Development Permit, that are permanently stabilized, have submitted a Notice of Termination to IEPA, and are entering a prolonged period of inactivity. Designated Erosion Control Inspector inspections shall only be required after storm events with greater than one-half (0.5) inch of rainfall or *liquid equivalent precipitation*.

**1101.04** If a *wetland* *mitigation* area is constructed as part of the *Watershed Development Permit*, the SMC or Isolated Waters of Lake County-Certified Community's *Certified Wetland Specialist* shall, at a minimum, perform the following inspections:

A. After final grading and before seeding or plant installation.

B. After seeding and plant installation.

C. Annual inspections during the 5-year monitoring and maintenance period.

## §1102 Additional Protective Measures

**1102.01** If at any stage of the grading of any *development* site the *Enforcement Officer* determines that the nature of the site is such that further work authorized by an existing permit is likely to imperil any property, public way, *stream*, *lake*, wetland, or drainage structure, the Enforcement Officer may require, as a condition of allowing the work to be done, that such reasonable additional protective measures be taken as is considered advisable to avoid the likelihood of such peril. Additional protective measures may include, but shall not be limited to, a more level exposed slope, construction of additional drainage facilities, berms, terracing, compaction, or cribbing, installation of plant materials for *erosion* control, and recommendations of a licensed soils engineer and/or engineering geologist which may be made requirements for further work.

**1102.02** Where the *Enforcement Officer* determines that storm *damage* may result or has resulted because the grading on any *development* site is not complete, work may be stopped and the permittee required to install temporary structures or take such other measures as may be required to protect adjoining property or the public safety. On large developments or where unusual site conditions prevail, the Enforcement Officer may require that the operations be conducted in specific stages so as to ensure completion of protective measures or devices prior to the advent of seasonal rains.

## §1103 Designated Erosion Control Inspector Responsibilities

The *Designated Erosion Control Inspector* (DECI) shall *inspect* the *development* site as specified in 1101.02 and 1101.03 and, at a minimum, perform the following:

**1103.01** Keep a copy of the *Enforcement Officer*-approved soil erosion and sediment control plans at the *development* site at all times.

**1103.02** Keep a written log of all inspections that shall contain, at a minimum, conditions of the soil erosion and sediment control measures and any corrective actions that need to be taken. The Designated Erosion Control Inspector log shall be kept at the *development* site at all times and shall be made available for inspection upon request of the *Enforcement Officer*.

**1103.03** Notify the *Enforcement Officer* within 24 hours when the *development* site is determined to be not in compliance with this Ordinance or the approved soil erosion and sediment control plans and the proposed corrective measures to be taken.

**1103.04** Recommend to the *applicant* additional soil erosion and sediment control prevention measures, if necessary, to reduce sediment leaving a *development*.

**1103.05** For *development* requiring conformance with §602 Stormwater Quality Runoff Standards, the Designated Erosion Control Inspector is responsible for site runoff sampling and reporting requirements.

# Article 12: Penalties and Legal Actions for Non-Compliance

## §1200 Stop Work Order

Whenever an *Enforcement Officer* finds a violation of this Ordinance, or of any permit or order issued pursuant thereto, within their respective jurisdiction, the Enforcement Officer may issue a stop work order on *development* activity on the subject property or on the portion of the activity in direct violation of the Ordinance. In every case, the Enforcement Officer shall issue an order that: (1) describes the violation; (2) specifies the time period for remediation; and (3) requires compliance with this Ordinance prior to the completion of the activity in violation.

## §1201 Fines

Failure to comply with any of the requirements of this Ordinance shall constitute a violation. Any violation thereof shall be subject to a fine of not more than one thousand ($1000.00) dollars for each violation. Each day the violation continues shall be considered a separate offense.

## §1202 Legal Actions

**1202.01** The SMC or *Certified Community* may also take any other legal action necessary to prevent or remedy any violation including appropriate equitable or injunctive relief and, if applicable, an assessment to the violator for the removal, correction, or termination of any adverse effects upon any property resulting from any unauthorized activity for which legal action under this section may have been brought.

**1202.02** SMC or the *Certified Community* may record a notice of violation on the title to the property at the Lake County Recorder of Deeds Office.

**1202.03** The *Enforcement Officer* shall inform the owner that any such violation is considered a willful act to increase *flood* damages and, therefore, may cause coverage by a Standard Flood Insurance Policy to be suspended.

**1202.04** The SMC may enforce violations of this Ordinance in accordance with the Lake County Administrative Adjudication Ordinance.

# Article 13: Variances

## §1300 Administration

The *Enforcement Officer,* upon application, after hearing, and subject to the process and standards that follow, may grant variances to the provisions of this Ordinance as will not cause detriment to the public good, safety, or welfare nor be contrary to the spirit, purpose, and intent of this Ordinance where, by reason of unique and exceptional physical circumstances or condition of a particular property, the literal enforcement of the provisions of this Ordinance would result in an unreasonable hardship.

**1300.01** In *communities* that have received both Standard and Isolated Wetland Certifications, the community's *Enforcement Officer* shall administer the variance provisions.

**1300.02** In *communities* that have received only Standard Certification, the community's *Enforcement Officer* shall administer the variance provisions except for the Wetland provisions (Article 10: Wetland Requirements), which will be administered by the *SMC Chief Engineer*.

**1300.03** For *development* requiring a *Watershed Development Permit* from the SMC, the *SMC Chief Engineer* shall administer the variance provisions.

**1300.04** A public notice will be issued inviting public comment on proposed variances for major *developments*. In a *Certified Community,* a copy of the public notice shall be sent to the *SMC Chief Engineer* a minimum of thirty (30) days before the ruling to allow for SMC comment on the variance being issued. For variances under the administration of the SMC, the SMC shall send a copy of the public notice to the community a minimum of thirty (30) days before the ruling to allow for community comment

**1300.05** Written findings shall be made public for variances and shall be on file with the SMC.

## §1301 Variance Criteria

**1301.01** Variances shall be granted only upon:

A. Showing of good and sufficient cause; and

B. A determination that the variance is the minimum necessary to afford relief, considering the *flood* hazard and water quality; and

C. A finding that failure to grant the variance would result in exceptional hardship to the *applicant*; and

D. A finding that the granting of a variance would not result in increased *flood* heights, additional threats to public safety, or extraordinary public expense, nor create nuisances, cause fraud, or victimization of the public, nor conflict with existing local laws or ordinances and that all *buildings* will be protected by methods that minimize flood *damage* below the *base flood elevation*; and

E. A finding that the *development* activity cannot be located outside the *Regulatory Floodplain*; and

F. A determination that the activity is not in a *Regulatory Floodway*. No variances shall be granted to any *development* located in a Regulatory Floodway. No variance shall be granted pertaining to 701.02 Development in the Regulatory

Floodplain Without Regulatory Floodway, §703 Regulatory Floodway Performance Standards, and §707 Bridge, Culvert Crossing, and Roadway Approach Performance Standards; and

G. The *applicant's* circumstances are unique and do not represent a general problem; and

H. The granting of the variance will not alter the essential character of the area involved including existing *stream* uses.

## §1302 Conditions and Special Considerations

**1302.01** Upon consideration of the factors noted in §1301 Variance Criteria and the intent of the Ordinance, the *Enforcement Officer* may attach such conditions to the granting of a variance deemed necessary to further the purposes and objectives herein.

**1302.02** Variances requested in connection with restoration of a historic site or *building* listed on the National Register of Historical Places or documented as worthy of preservation by the Illinois Historic Preservation Agency may be granted using criteria more permissive than the requirements contained in Article 13: Variances.

**1302.03** The *Enforcement Officer* shall notify an *applicant* in writing that a variance from the requirements of §706 Building Protection Requirements that would lessen the degree of protection to a *building* will result in increased premium rates for flood insurance up to amounts as high as $25 for $100 of insurance coverage, increase the risks to life and property, and require that the applicant will acknowledge in a signed exception to title the assumption of the risks and liability and will pay upon approval of the variance a recording fee above and beyond the usual permit review fee.

**1302.04** In a *Regulatory Floodplain* without a *Regulatory Floodway* where the tributary *drainage area* is 640 acres or more, a variance may not be granted that will result in a loss of the Regulatory Floodplain storage of greater than 10% of the existing Regulatory Floodplain storage on the site.

**1302.05** Variances requested in connection with the *redevelopment* of previously developed sites, that will further the public policy goals of downtown redevelopment and neighborhood revitalization, may be granted a variance provided the variance would not result in an increase in the pre-redevelopment runoff rate or volume and there will exist *adequate downstream stormwater capacity*. No variance shall be granted pertaining to Article 7: Regulatory Floodplain and Floodway Requirements.

**1302.06** Due to the unique nature of *public road developments* occurring in a narrow right-of-way instead of an expansive tract of land, variances requested in connection with public road developments that will further the public policy of minimizing the condemnation of private or public property may be granted using criteria more permissive than the requirements of §1301 Variance Criteria to the minimum extent necessary to achieve the minimal amount of condemnation. No variances shall be granted pertaining to 701.02 Development in the Regulatory Floodplain Without Regulatory Floodway, §703 Regulatory Floodway Performance Standards, and §707 Bridge, Culvert Crossing, and Roadway Approach Performance Standards.

# Article 14: Appeals

## §1400 Appeal Process

**1400.01** Any permit *applicant* aggrieved by the denial or conditions of a *Watershed Development Permit*, Earth Change Approval, Conditional Approval, or Variance by a *Certified Community's* *Enforcement Officer* may request review thereof by the Certified Community's board of elected officials or the appropriate body within thirty (30) days of the disputed act or actions.

**1400.02** Any permit *applicant* aggrieved by a permit decision, the denial or conditions of a *Watershed Development Permit*, Earth Change Approval, Conditional Approval, or Variance by the *SMC Chief Engineer* may request review thereof by the SMC Director within thirty (30) days of the disputed act or actions.

**1400.03** Any permit *applicant* aggrieved by a permit decision, the denial or conditions of a *Watershed Development Permit*, Earth Change Approval, Conditional Approval, or Variance by the SMC Director may appeal it to the SMC by written notice filed with the SMC Director within thirty (30) days of the disputed act or actions.

# Article 15: Disclaimer of Liability

It is recognized that although the degree of flood protection required by this Ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations, on occasions greater floods can and will occur, and *flood* heights may be increased by man-made or *natural* causes. These provisions do not imply that land outside the flood-plain areas or that uses permitted within such areas will be free from flooding or flood damages. These provisions shall not create liability on the part of the *Stormwater Management Commission* nor any *Certified Community* nor any officer or employee thereof for any claims, damages, or liabilities that result from reliance on this Ordinance or any administrative decision lawfully made thereunder.

# Article 16: Separability

The provisions of this Ordinance shall be deemed separable and the invalidity of any portion of this Ordinance shall not affect the validity of the remainder.

# Article 17: Abrogation and Greater Restrictions

This Ordinance is not intended to repeal, abrogate, or impair any existing deed or plat restrictions. Where this Ordinance and other ordinance *deed or plat restrictions* conflict or overlap, whichever imposes the more stringent restrictions shall prevail. This Ordinance is intended to repeal the original Ordinance or resolution which was adopted to meet the National Flood Insurance Program regulations, but is not intended to repeal the resolution which the *community* passed in order to establish initial eligibility for the program.

# Appendix A: Definitions

adequate downstream stormwater capacity: A *stormwater management system* shall be considered to have adequate downstream stormwater capacity if the system can be shown to store or convey up to and including the 100-year stormwater runoff without increasing *damage* to adjoining properties or to a point downstream known to the *Enforcement Officer* to be a restriction causing significant backwater.

agricultural practices: These practices include: normal farming, silviculture, and ranching activities such as gardening, plowing, seeding, cultivating, harvesting for the production of food, fiber, forest products, nursery stock, and livestock; maintenance of agricultural drain tiles, irrigation and drainage ditches; maintenance of farm roads and other access areas for farm vehicles and equipment use.

applicant: Any person, firm, or governmental agency who owns property or the duly appointed representative that wishes to develop that property and one who executes the necessary forms to procure permit to carry out such *development* from the SMC or Certified Community.

Appropriate Use: Only uses of the *Regulatory Floodway* that are permissible and will be considered for permit issuance. The only uses that will be allowed are as specified in §703 Regulatory Floodway Performance Standards.

as-built drawings: See *record drawings*.

base flood: The *flood* having a one percent (1%) probability of being equaled or exceeded in any given year. The base flood is also known as the 100-year frequency flood event. Application of the *base flood elevation* at any location is as defined in §700 Location of Regulatory Floodplain, Base Flood Elevation, and Regulatory Floodway of this Ordinance.

base flood elevation(BFE): The elevation delineating the level of flooding resulting from the 100-year flood frequency storm event.

basement: Any area of a building having its floor subgrade (below grade level) on all sides.

basin: Sub-*watershed* areas within Lake County that include the Fox River mainstem (including the Chain O' Lakes), Flint Creek, Tower Lake Drain, Slocum Drain, Mutton Creek, Squaw Creek, Fish Lake Drain, Sequoit Creek, the Des Plaines River mainstem, South Mill Creek, North Mill Creek, Newport Drainage Ditch, Bull Creek, Indian Creek, Aptakisic Creek, Buffalo Creek, Skokie River, Middle Fork-North Branch Chicago River, West Fork-North Branch Chicago River, Kellogg Creek, Dead River, Waukegan River, Pettibone Creek, and Lake Michigan Bluff/Ravines.

basin plan: A study and evaluation of an individual drainage basin's stormwater management and flood control needs.

building: A *structure* that is principally above ground and is enclosed by walls and a roof. The term includes a gas or liquid storage tank, a *manufactured home*, mobile home, or a prefabricated building. This term also includes recreational vehicles and travel trailers to be installed on a site for more than 180 days.

buffer: An area of predominantly vegetated land to be left open, adjacent to drainageways, *wetlands*, *lakes*, ponds, or other surface waters for the purpose of eliminating or minimizing adverse impacts to such areas.

by-pass: To route tributary *drainage area* runoff around and not through a stormwater control structure.

Certified Community: A community which has petitioned the SMC and has been found by the SMC to be capable of enforcing an ordinance (or ordinances) which contain stormwater and *Regulatory Floodplain* management rules and regulations which are consistent with, or at least as stringent as these of, this Lake County Watershed Development Ordinance.

Certified Wetland Specialist: Person meeting the minimum requirements of A., B., C., and D., as follows:

A. Provide a one (1) page statement of qualifications in the areas noted below. The signed statement will be considered as evidence of qualifications.

B. Pass the Certified Wetland Specialist Exam.

C. Completion of a SMC-approved *wetland* delineation course and meet the requirements of one (1) of the following:

   1. Registered Professional Wetland Scientist (PWS) from the Society of Wetland Scientists; or

   2. Minimum of a Bachelor's Degree in an Earth Science or Biologic Science and at least one (1) of the following: Three (3) years (cumulative) full-time experience in the Upper Midwest Region on *wetland*-related projects; or the completion of one hundred (100) wetland delineations in the Upper Midwest; or a minimum of three hundred (300) hours spent in field review of wetlands in the Upper Midwest; or

   3. Six (6) years (cumulative) full-time experience in the Upper Midwest Region on wetland-related projects.

D. Recertification as a Certified Wetland Specialist shall be required every three (3) years through the SMC. A minimum of twenty-four (24) work-related professional development hours including SMC mandatory training for this type of certification shall be obtained within the three-year period in order to qualify for recertification. Documentation shall be self-monitoring and shall be provided to SMC upon application of certification or recertification.

channel: Any river, *stream*, creek, brook, branch, *natural* or artificial depression, ponded area, *lake*, flowage, slough, ditch, conduit, culvert, gully, ravine, *swale*, wash, or natural or man-made drainageway, in or into which surface or groundwater flows, either perennially or intermittently.

channel modification: Alteration of a channel by changing the physical dimensions or materials of its bed or banks. Channel modification includes damming, rip-rapping or other armoring, widening, deepening, straightening, relocating, and lining and significant removal of bottom or woody vegetation of the channel. Channel modification does not include the clearing of dead or dying vegetation, debris, or trash from the channel.

community: Any municipality, as defined in state statute [65 ILCS 5/1-1-2], or the unincorporated county within Lake County acting as a unit of local government.

compensatory storage: A volume of storage created to offset the loss or displacement of flood storage capacity due to a development activity.

conditional approval Regulatory Floodway map change: Pre-construction approval by the *IDNR/OWR* and the Federal Emergency Management Agency of a proposed change to the

*Regulatory Floodway* map and/or BFE. This pre-construction approval, pursuant to this Part, gives assurance to the property owner that once an *Appropriate Use* is constructed according to permitted plans, the Regulatory Floodway map and/or BFE can be changed, as previously agreed, upon review and acceptance of as-built plans.

Conditional Letter of Map Revision (CLOMR): A letter which indicated that the Federal Emergency Management Agency will revise *base flood elevations*, flood insurance rate zones, flood boundaries, or *Regulatory Floodway* and/or BFE as shown on an effective Flood Hazard Boundary Map or *Flood Insurance Rate Map*, once the as-built plans are submitted and approved.

control structure: A structure designed to control the rate of flow that passes through the structure, given a specific upstream and downstream water surface elevation.

critical duration: The design storm duration for a given frequency storm which produces the greatest peak flow, volume, or stage by analyzing all durations presented in Appendix I: Rainfall Depth Duration Frequency Tables for Lake County.

dam: All obstructions, wall embankments, or barriers, together with their abutments and appurtenant works, if any, constructed for the purpose of storing or diverting water or creating a pool. Underground water storage tanks are not included.

damage: A measurable rise in *flood* heights on property currently subject to flooding, flooding of property currently not subject to flooding unless it is contained within the streambanks or a deed or plat restricted area, or increases in velocity to the point where the rate of land lost to *erosion* and scour is significantly increased.

deed or plat restriction: Permanent easements, covenants, deed restricted open spaces, outlots, reserved plat areas, and conservation easements dedicated to meet the requirements of this Ordinance, or public road rights-of-way that contain any part of the *stormwater management system* of a *development*.

depressional storage areas: Non-riverine depressions where stormwater collects.

design storm: A selected storm event, described in terms of the probability of occurring once within a given number of years, for which stormwater or *flood* control improvements are designed and built.

Designated Erosion Control Inspector: A person responsible for, at a minimum, verifying compliance and on-going maintenance of the approved soil erosion and sediment control plan measures of a *development* and who is recommended to meet the minimum qualification requirements of A., B., C., and D., as follows:

A. Provide a one (1) page statement of qualifications in the areas noted below and a request to be included on the SMC Designated Erosion Control Inspector qualified listing. The signed statement will be considered as evidence of qualifications.

B. Pass the *Designated Erosion Control Inspector Exam* that is administered by the SMC.

C. Complete a SMC-approved soil erosion and sediment control course and meet the requirements of one (1) of the following:

   1. Have an official designation as a Certified Professional in Erosion and Sediment Control (CPESC) or Certified Erosion, Sediment and Stormwater Inspector (CESSWI); or

2. Two (2) years cumulative experience in the Upper Midwest Region on soil erosion and sediment control inspections.

D. The listing of Designated Erosion Control Inspectors shall be officially updated every three (3) years by the SMC. A minimum of twenty-four (24) work-related professional development hours including SMC mandatory training for this designation shall be obtained within the three-year period in order to qualify for re-listing. Documentation shall be self-monitoring and shall be provided to SMC upon application for listing.

Designated Erosion Control Inspector Exam: An exam that is formally adopted and administered by the Lake County *Stormwater Management Commission* to establish minimum qualifications for an individual to be listed as a *Designated Erosion Control Inspector* by the SMC.

detention facility: A man-made structure for the temporary storage of stormwater runoff with controlled release during or immediately following a storm.

Detention Volume Safety Factor: A multiplication factor applied to a *development's* detention volume when the *detention facility* is constructed on-stream.

development: Completion of a final plat, replat, or man-made change to private or public real estate including:

A. Construction, *reconstruction*, repair, or placement of a building or any addition to a building;

B. Installation of a *manufactured home* on a site, preparation of a site for a manufactured home, or the placement of a recreational vehicle on a site for more than 180 days;

C. Drilling, mining, installation of utilities, construction of roads, bridges, or similar projects;

D. Clearing of land as an adjunct of construction;

E. Construction or erection of levees, walls, fences, *dams*, or culverts; *channel modification*; filling, dredging, grading, excavating, paving, or other alterations of the ground surface; storage of materials; deposit of solid or liquid waste;

F. Any other activity that might change the direction, height, volume, or velocity of *flood* or surface water, including the drainage of *wetlands* and removal of vegetation to the extent such that the wetland would no longer meet the criteria of supporting *hydrophytic vegetation* as defined in this Ordinance except that which would be considered appropriate for management purposes.

Development does not include maintenance of existing buildings and facilities such as resurfacing of roadways when the road elevation is not increased, or gardening, plowing, and similar agriculture practices that do not involve filling, grading, or construction of levees. Nor does development include agriculture practices outside of the *Regulatory Floodplain* involving filling or grading as part of a Natural Resources Conservation Service designed and approved conservation project (i.e., terraces, grass waterways). Additionally, development does not include fence installation, pole placement, drilling, or other minor auxiliary construction activity which does not affect stormwater runoff rates or volumes as long as the development activity is not located in a Regulatory Floodplain, wetland, or channel.

dominant: For the purpose of this Ordinance, a dominant plant species is one that comprises greater than 50% of the vegetative layer. The vegetative layer is defined as a subunit of a plant community in which all component species exhibit the same growth form (e.g., trees, saplings, shrubs, herbs).

drain tile: A conduit, such as corrugated plastic tubing, clay tile, or pipe, installed beneath the ground surface to collect and/or convey drainage water.

drainage area: The land area above a given point that contributes stormwater to that point.

dry detention facility: A dry detention facility is a *detention facility* designed to drain completely after temporary storage of stormwater flows and to normally be dry over the majority of its bottom area.

elevation certificate: A form published by the Federal Emergency Management Agency that is used to certify the elevation to which a building has been constructed.

emergency overflow: The structure in a *stormwater management system* designed to protect the system in the event of a malfunction of the primary flow structure or a storm event greater than the system design. The emergency overflow capacity initiates at the facility design high water level or *base flood elevation*.

Enforcement Officer: A person meeting the requirements of 201.02K and designated as follows:

A. Within *communities* that have received Standard Certification, the Enforcement Officer shall be a person designated in writing by the community for the purpose of permitting *development*, and administering and enforcing all of the provisions of this Ordinance except as noted in Article 13: Variances.

B. Within *communities* that have not received Standard Certification, the Enforcement Officer shall be the *SMC Chief Engineer*.

C. Recertification as an Enforcement Officer shall be required every three (3) years through the SMC. A minimum of twenty-four (24) work-related professional development hours including SMC mandatory training for this type of certification shall be obtained within the three-year period in order to qualify for recertification. Documentation shall be self-monitoring and shall be provided to SMC upon application of certification or recertification.

erosion: The process whereby soil is removed by precipitation, flowing water, wave action, or wind.

farmed wetland: *Wetlands* that are farmed currently, or have been farmed within five (5) years previous to the permit application date, as defined in 7 CFR Part 12 (61 FR 47025).

fee-in-lieu of on-site stormwater storage: A fee assessed to a permit *applicant* used to contribute to the cost of a basin plan or *floodplain study* components; or other stormwater system improvements, “in-lieu-of” constructing on-site detention or for *compensatory storage* requirements for streambank and shoreline restoration fills of less than two hundred (200) cubic yards.

FEMA: Federal Emergency Management Agency and its regulations codified as 44 CFR 59-79 effective as of October 1, 1986.

flood: A general and temporary condition of partial or complete inundation of normally dry land areas from overflow of inland or tidal waves, or the unusual and rapid accumulation of runoff of surface waters from any source.

flood frequency: A period of years, based on a statistical analysis, during which a *flood* of a stated magnitude may be expected to be equaled or exceeded.

Flood Insurance Rate Maps (FIRM): A map prepared by the Federal Emergency Management Agency or HUD that depicts the *Special Flood Hazard Area* (SFHA) within a *community*. This map includes insurance rate zones and *Regulatory Floodplains* and may or may not depict *Regulatory Floodways*.

floodplain (regulatory): See *Regulatory Floodplain*.

floodplain management: An overall program of corrective and preventive measures for avoiding or reducing future *flood damage*.

floodplain study: A study, formally adopted by the SMC, excluding *base flood* determinations performed for a specific *development* site, that examines, analyzes, evaluates, or determines the hydraulic and hydrologic characteristics of *flood* hazards for a *basin* or partial basin area. To be used as a regulatory instrument the study shall, at a minimum, meet the *FEMA* criteria specified in Guidelines and Specifications for Flood Hazard Mapping Partners, most current version.

flood-prone area: Any area inundated by the *base flood*.

Flood Protection Elevation (FPE): The elevation of the *base flood elevation* plus two (2) feet of *freeboard*.

flood-proofing: Any combination of structural and non-structural additions, changes, or adjustments to structures or property which reduce or eliminate *flood damage* to real estate or improved real property, water and sanitary facilities, structures, and their contents.

flood-proofing certificate: A form published by the Federal Emergency Management Agency that is used to certify that a building has been designed and constructed to be structurally dry flood-proofed to the *Flood Protection Elevation*.

flood table land: The land area immediately adjacent to *flood-prone areas* with greater than one hundred (100) acres of tributary *drainage area*, the elevation of which is greater than the *base flood elevation* by two (2) feet or less.

floodway (regulatory): See *Regulatory Floodway*.

forested wetland: A *wetland* area with thirty percent (30%) or greater areal coverage of trees. Trees refer to woody plants that are greater than three (3) inches in diameter at breast height (DBH) and with a height of greater than twenty (20) feet.

freeboard: An increment of height added to the *base flood elevation* to provide a factor of safety for uncertainties in calculations, unknown local conditions, wave actions, and unpredictable effects such as those caused by ice or debris jams.

functional assessment: An assessment of a *wetland's* flood storage, water quality, and other beneficial functions.

green infrastructure: Any stormwater management technique or practice that reduces runoff volume through preserving, restoring, utilizing, or enhancing the processes of infiltration, evapotranspiration, and reuse. Approaches may include green roofs, naturalized detention facilities, trees and tree boxes, rain gardens, vegetated swales, wetlands, infiltration planters, porous and permeable pavements, porous piping systems, dry wells, vegetated median strips, reforestation/revegetation, rain barrels and cisterns, and protection and enhancement of riparian buffers and floodplains.

high-quality aquatic resources (HQAR): *Waters of the United States* or *Isolated Waters of Lake County* that are determined to be critical due to their uniqueness, scarcity, function, and/or value as defined in Appendix L: High-Quality Aquatic Resources of this Ordinance.

historic structure: A "Historic Structure" is any *structure* that is:

A. Listed individually in the National Register of Historic Places or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;

B. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;

C. Individually listed on the State inventory of historic places by the Illinois Historic Preservation Agency; or

D. Individually listed on a local inventory of historic places that has been certified by the Illinois Historic Preservation Agency.

hydraulically equivalent compensatory storage: *Compensatory storage* placed between the proposed normal water elevation and the proposed 100-year flood elevation. All storage lost or displaced below the existing 10-year flood elevation is replaced below the proposed 10-year flood elevation. All storage lost or displaced above the existing 10-year flood elevation is replaced above the proposed 10-year flood elevation. The additional compensatory storage required beyond a 1:1 ratio may be placed at any elevation between normal water level and the base flood elevation.

hydrologic and hydraulic calculations: Engineering analysis which determines expected *flood* flows and flood elevations based on land characteristics and rainfall events.

hydric soil: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.

hydrologically disturbed: An area where the land surface has been cleared, grubbed, compacted, or otherwise modified to alter stormwater runoff, volumes, rates, flow direction, or inundation duration.

hydrophytic vegetation: Plant life growing in water, soil, or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

IDNR/OWR: Illinois Department of Natural Resources, Office of Water Resources, previously known as IDOT/DWR.

illicit discharge: Any discharge or dumping of material into the *stormwater management system* or a flood-prone area that is not composed entirely of stormwater, except for discharges allowed under NPDES Permit No. ILR40 Part I.B.2.

Illinois Urban Manual: The Natural Resources Conservation Service Illinois Urban Manual. A technical manual designed for urban ecosystem protection and enhancement. This manual contains design guidance for a *development* site to meet the Watershed Development Ordinance performance standards for soil *erosion* and sediment control.

impervious surface: Any hard-surfaced, man-made area that does not readily absorb or retain water, including, but not limited to, building roofs, parking and driveway areas, graveled areas, sidewalks, and paved recreation areas.

in-kind replacement (culvert): An in-kind culvert replacement has an equivalent cross-sectional area, shape, roughness coefficient, and inlet and outlet elevations; or the replacement may be shown to have an equivalent hydraulic capacity using appropriate engineering calculations.

inspect: To visit, to review plans, or to oversee a site visit or plan review per generally accepted engineering practices.

Isolated Waters of Lake County: All waters such as *lakes*, ponds, streams (including intermittent streams), *farmed wetlands*, and wetlands that are not under U.S. Army Corps of Engineers jurisdiction. The limits of the Isolated Waters of Lake County extend to the *ordinary high water mark* or the delineated *wetland* boundary.

A. The following are excluded from Isolated Waters of Lake County, as determined by the Enforcement Officer
    1. Excavations and impoundments that have received a permit from the appropriate jurisdictional authority.
    2. Excavations and impoundments permitted by right, prior to being a regulated activity, within 40% or more non-hydric soils. Areas designated as 'water' as depicted on the Soil Survey of Lake County, SCS, 1970 are determined as either hydric or non-hydric soils by connecting adjoining soil boundaries to create complete polygons of the depicted soil type.
    3. Wetlands created incidental to construction grading on development sites.
    4. *Roadside ditches*.
B. The following shall not be considered as meeting the exclusion criteria in Section A. of this definition:
    1. All areas meeting the definition of *high-quality aquatic resources.*
    2. Wetland *mitigation* areas created to meet the requirements of this Ordinance or Section 404 of the Clean Water Act.
    3. Wetland areas created or restored using public funds.

lake: A *natural* or artificial body of water encompassing an area of two (2) or more acres which retains water throughout the year.

Letter of Map Amendment (LOMA): Official determination by *FEMA* that a specific *structure* is not in a *Special Flood Hazard Area*; amends the effective Flood Hazard Boundary Map (FHBM) or *Flood Insurance Rate Map* (FIRM).

Letter of Map Revision (LOMR): Letter issued by *FEMA* or *IDNR/OWR* that revises *base flood elevations*, flood insurance rate zones, flood boundaries, or *Regulatory Floodways* as shown on an effective FHBM or FIRM.

Letter of No Impact (LONI): Written confirmation from SMC or Isolated Wetland Certified Community that no wetland impacts will occur from a proposed development, based on a review of plans or other applicable information provided by the applicant as specified in this Ordinance.

liquid equivalent precipitation: The amount of precipitation, including any frozen precipitation in its melted state (e.g., snow, sleet, freezing rain). With varying densities of frozen precipitation, the liquid equivalent precipitation indicates the actual amount of water that falls in a storm event, regardless of the type of precipitation.

low opening elevation: The elevation at which water could enter a *structure* through any non-watertight opening such as a doorway threshold, a window sill, or a *basement* window well.

lowest adjacent grade: The lowest finished grade adjacent to a *structure*, not including the bottom of window wells.

lowest floor: Lowest floor of the lowest enclosed area, including *basement*. An unfinished or flood resistant enclosure, usable solely for parking of vehicles, or building access in an area other than a basement area is not considered a building's lowest floor, provided that the requirements of 706.01B.2 are met.

maintainable outlet: A stormwater conveyance system (such as a storm sewer or overland flow path) that provides positive drainage to a *natural* watercourse or *stormwater management system*. The natural watercourse or stormwater management system shall have *adequate downstream stormwater capacity*. Stormwater management systems shall be within a recorded drainage easement or right-of-way.

manufactured home: A *structure*, transportable in one or more sections, which is built on a permanent chassis and is designated for use with or without a permanent foundation when connected to the required utilities. The term manufactured homes also include park trailers, recreational vehicles, and other similar vehicles installed on-site for more than 180 consecutive days.

manufactured home park or subdivision: A parcel (or contiguous parcels) of land divided into two (2) or more *manufactured home* lots for rent or sale.

maximum extent practicable (MEP): For the purposes of this Ordinance, the maximum extent practicable (MEP) is defined as the highest level of runoff volume reduction (RVR) that is achievable for the development as determined by the applicant and approved by the Enforcement Officer (see Appendix O: Runoff Volume Reduction for runoff volume reduction quantities). The MEP RVR quantitative standard for the development shall not be required to exceed the minimum performance standards identified in 503.02. For public road developments, the MEP shall not necessitate the need to acquire right-of-way or deed and plat restricted areas outside of the right-of-way.

In making the determination that the RVR quantitative standard for the development is the MEP, the following objectives should be considered, when applicable, including, but not limited to:

A. Prevention or reduction of existing, adjacent flood-related problems.

B. Examination of adequate downstream capacity from the development.

C. Preservation of existing wetland hydrology.

D. Protection of adjacent streams from degradation due to increased volumes and prolonged bankfull flows.

E. Minimization of off-site water quality impacts.

F. Enhancement of aquifer recharge on-site.

G. Evaluation of geographic features of the site (e.g., topography, soil structure, natural resources).

H. Utilization of best available and feasible technology.

I. Maximization of the performance of the design.

J. Provide for sustainability through maintenance and management of the installed practices.

mitigation: Measures taken to eliminate or minimize *damage* from *development* activities, such as construction in *wetlands* or *Regulatory Floodplain* filling, by replacement of the resource.

NAVD 88: North American Vertical Datum of 1988. Sepersedes NGVD29, effective September 18, 2013.

NGVD: National Geodetic Vertical Datum of 1929. Superseded by NAVD 88, effective September 18, 2013.

natural: When used in reference to streams and channels means those streams and channels formed by the existing surface topography of the earth prior to changes made by man. A modified *stream* and channel which has regained natural characteristics over time as it meanders and reestablishes vegetation may be considered natural.

non-riverine Regulatory Floodplain: *Regulatory Floodplains* not associated with streams, creeks, or rivers, such as isolated *depressional storage areas* or *lakes*.

on-stream detention: Any *detention facility* that has off-site tributary *drainage area*.

open waters: Permanently inundated *Isolated Waters of Lake County* that are greater than three (3) feet in depth below the normal water level or normal pool elevation.

ordinary high water mark: The point on the bank or shore at which the presence and movement of surface waters are continuous so as to leave a distinctive mark, such as by *erosion*, destruction, or prevention of terrestrial vegetation, predominance of aquatic vegetation, or other such recognized characteristics.

overland flow path: An area of land which conveys stormwater for all events up to and including the *base flood* event. The overland flow path can be estimated using readily available topographic information and shall take into account all on-site and off-site tributary areas in accordance with 501.04.

ownership parcel: Any legally described parcel of land. This includes contiguous lots or parcels of land, owned in whole, or in part, by the same property owner.

Parcel Identification Number (PIN): Permanent index number used to identify properties for tax assessment.

pond: A *natural* or artificial body of water of less than two (2) acres which retains water year round.

public body of water: All open public rivers, streams, and *lakes* specifically designated by *IDNR/OWR* in Appendix F: Public Bodies of Water in Lake County of this Ordinance that are capable of being navigated by water craft, in whole or in part, for commercial uses and purposes, or which in their *natural* condition were capable of being improved and made navigable, or that are connected with or discharged their waters into navigable lakes or rivers within, or upon, the borders of the State of Illinois, together with all bayous, sloughs, backwaters, lakes that are open to the main channel or body of water and directly accessible thereto.

public flood control project: A *flood* control project within a deed or plat restricted area, which will be operated and maintained by a public agency to reduce flood damages to existing *buildings* or structures. A land stewardship not-for-profit corporation, or similar entity, may also own, operate, or maintain a public flood control project. In this circumstance, there shall also be an executed agreement with a public agency to take over ownership, operation, or maintenance if the corporation dissolves or fails to meet the operation and maintenance requirements for the project area. The project shall include a hydrologic and hydraulic study of the existing and proposed conditions of the *watershed* area affected by the project. Nothing in this definition shall preclude the design, engineering, construction, or financing, in whole or in part, of a flood control project by persons or parties who are not public agencies.

public road development: Any *development* activities which take place in a public right-of-way or part thereof that is administered and funded, in whole or in part, by a public agency under its respective roadway jurisdiction. *Rehabilitative maintenance* and in-kind replacement are considered to be a public road development if located in a *Regulatory Floodplain*. A public road development located within a *Regulatory Floodway* and which has been approved by the Illinois Department of Transportation, Division of Highways (IDOT/DOH), Bureau of Local Roads and Streets is exempt from the hydraulic analysis requirements of this Ordinance. Individual recreation trail systems being constructed that are not part of another development project and linear railroad development projects shall be considered public road developments with respect to the requirements of this Ordinance.

reconstruction: The act of rebuilding a *structure*.

record drawings: Construction drawings revised to show significant changes made during the construction process, usually based on marked-up prints, drawings, and other data furnished by the contractor to the *Enforcement Officer*.

Registered Professional Engineer: An engineer registered in the State of Illinois, under the Professional Engineer Practice Act of 1989, [225 ILCS 325/1-49].

Regulatory Floodplain: Regulatory Floodplains may be either *riverine* or *non-riverine* depressional areas. Floodplain boundaries shall be delineated by projecting the *base flood elevation* onto the best available topography and by superimposing the Special Flood Hazard Area onto the base map. A *flood-prone area* is a Regulatory Floodplain if it meets any of the following descriptions:

A. Any riverine area inundated by the *base flood* where there is at least 640 acres of tributary *drainage area*.

B. Any non-riverine area with a storage volume of 0.75 acre-foot or more when inundated by the *base flood*.

C. Any area indicated as a *Special Flood Hazard Area* on the *FEMA Flood Insurance Rate Map* or Letter of Map Revision.

Regulatory Floodway: The channel, including on-stream *lakes*, and that portion of the *Regulatory Floodplain* adjacent to a *stream* or channel as designated by the Illinois Department of Natural Resources, Office of Water Resources, which is needed to store and convey the existing and anticipated future 100-year frequency flood discharge with no more than a 0.1 foot increase in stage due to the loss of flood conveyance or storage, and no more than a 10% increase in velocities. The location of the Regulatory Floodway shall be as delineated on the maps listed in Appendix C: FEMA Flood Insurance Study Maps and Profiles. Where interpretation is needed to determine the exact location of the Regulatory Floodway boundary, the *IDNR/OWR* should be contacted for the interpretation.

rehabilitative maintenance (roadway): Rehabilitative maintenance is repair or maintenance that does not increase the traffic lanes and does not involve changes to the roadway elevation.

repair, remodeling, or maintenance: Activities which do not result in any increases in the outside dimensions of a building or any changes to the dimensions of a *structure*.

repetitive loss: *Flood*-related damages sustained by a *structure* on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds twenty-five percent (25%) of the market value of the structure before the damage occurred.

retention facilities: A facility designed to completely retain a specified amount of stormwater runoff without release except by means of evaporation, infiltration, or pumping.

riverine: Relating to, formed by, or resembling a *stream* (including creeks and rivers).

roadside ditches: Drainage ditches within twenty-five (25) feet from the edge of the outside travel lane.

sedimentation: The process that deposits soils, debris, and other materials either on other ground surfaces or in bodies of water or watercourses.

SMC-approved wetland bank: A *wetland mitigation* bank approved by the SMC that conforms with Appendix M: SMC-Approved Wetland Mitigation Banking Requirements of this Ordinance.

SMC Chief Engineer: A *Registered Professional Engineer* representing the Lake County Stormwater Management Commission as the *Enforcement Officer* of the Watershed Development Ordinance.

SMC Wetland Restoration Fund: A fund that is administered and implemented for *wetland impact mitigation* that is approved and adopted by the SMC.

Special Flood Hazard Area (SFHA): Any area subject to inundation by the *base flood* from a river, creek, *stream*, or any other identified channel or ponding and shown on the *Regulatory Floodplain* map as listed in Appendix B: SMC Regulatory Floodplain Maps and Profiles and Appendix C: FEMA Flood Insurance Study Maps and Profiles.

stormwater management: A set of actions taken to control stormwater runoff with the objectives of providing controlled surface drainage, *flood* control, and pollutant reduction in runoff.

Stormwater Management Commission (SMC): The Lake County Stormwater Management Commission established and existing under state statute [55 ILCS 5/5-1062] for the purposes of developing, revising, and implementing a countywide *stormwater management* plan.

stormwater management system: The collection of *natural* features and man-made facilities which define the *stormwater management* for a *development*.

stream: A course of running water flowing in a channel (includes creeks and rivers).

structure: The results of a man-made change to the land constructed on or below the ground, including the construction, *reconstruction,* or placement of a building or any addition to a building; installing a *manufactured home* on a site; preparing a site for a manufactured home; or installing a recreational vehicle on a site for more than 180 days.

substantial damage: Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50% of the market value of the structure before the damage occurred.

substantial improvement: Any repair, *reconstruction*, rehabilitation, addition, or improvement of a *structure* which increases the total building floor area by more than 75% of the structure's first floor area or the cost of which equals or exceeds 50% of the market value of the current structure before the start of construction. This term includes structures which have incurred a *repetitive loss* or substantial damage, regardless of the actual repair work performed. For the purposes of this definition, "start of construction" is considered to occur when the first qualifying improvement, as described in FEMA Publication 480 National Flood Insurance Program Flood Management Requirements, commences or when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. This term includes all cumulative improvements within the last ten (10) years. The term does not, however, include either:

A. Any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions; or

B. Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

swale: A vegetated channel, ditch, or low-lying or depressional tract of land that is periodically inundated by conveying stormwater from one point to another.

Technical Reference Manual (TRM): The Lake County *Stormwater Management Commission* Technical Reference Manual. This manual contains design guidance for a *development* site to meet the Watershed Development Ordinance performance standards.

transition section: Reaches of the *stream* or *Regulatory Floodway* where water flows from a narrow cross-section to a wide cross-section or vice-versa.

water dependent: Structures or facilities relating to the use of, or requiring access to, the water or shoreline. Examples of water dependent uses include, but are not limited to, pumping facilities, wastewater treatment facilities, facilities and improvements related to recreation boating or commercial shipping.

watershed: The land area above a given point on a channel that contributes stormwater to that point. In Lake County, the four major watersheds are officially defined as: the Lake Michigan Watershed, the North Branch of the Chicago River Watershed, the Des Plaines River Watershed, and the Fox River Watershed.

watershed benefit: A decrease in *flood* damages to structures upstream or downstream of the *development* site created by installation of the *stormwater management system*. The benefit must be beyond the benefit provided by meeting the minimum Watershed Development Ordinance standards and TRM guidance.

Watershed Development Permit: A permit established by this Ordinance and issued, through the SMC or Certified Communities, prior to the approval of a building permit signifying conformance with provisions of this Ordinance.

Waters of the United States: For the purpose of this Ordinance, the term Waters of the United States refers to those water bodies and *wetland* areas that are under the U.S. Army Corps of Engineers jurisdiction.

wet detention facility: A wet detention facility is designed to maintain a permanent pool of water after the temporary storage of stormwater runoff.

wetland: A wetland is a specific type of *natural* or man-made drainageway as follows: Wetlands are land that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, under normal conditions, a prevalence of vegetation adapted for life in saturated soil conditions (known as *hydrophytic vegetation*). A wetland is identified based upon the three attributes: 1) hydrology, 2) soils, and 3) vegetation as mandated by the current Federal wetland determination methodology.

wetland impact: *Isolated Waters of Lake County* or Waters of the U.S. that are *hydrologically disturbed* or otherwise adversely affected by flooding, filling, excavation, or drainage which results from implementation of a *development* activity.

# Appendix B: SMC Regulatory Floodplain Maps and Profiles

| Community | Waterway | Map Type | Map Date | Description |
|---|---|---|---|---|

# Appendix C: FEMA Flood Insurance Study Maps and Profiles

| COMMUNITY NAME | COMMUNITY MEMBER | DATE OF CURRENT EFFECTIVE MAP (OR MAP INDEX) | LAKE COUNTY DFIRM PANEL NUMBERS | EFFECTIVE FIS STUDY DATE |
|---|---|---|---|---|
| ANTIOCH | 170358# | September 18, 2013 | 17097C0010 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0026 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0027 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0028 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0029 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0032 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0034 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0035 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0055 K | February 17, 2016 |
| BANNOCKBURN | 170359# | September 18, 2013 | 17097C0259 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0267 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0278 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0286 K | February 17, 2016 |
| BARRINGTON HILLS | 170058# | September 18, 2013 | 17097C0215 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0216 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0217 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0219 K | February 17, 2016 |
| BARRINGTON | 170057# | September 18, 2013 | 17097C0216 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0217 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0219 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0236 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0238 K | February 17, 2016 |
| BEACH PARK | 171022# | September 18, 2013 | 17097C0059 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0067 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0069 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0078 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0086 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0087 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0088 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0089 K | February 17, 2016 |
| BUFFALO GROVE | 170068# | September 18, 2013 | 17097C0253 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0254 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0261 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0262 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0263 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0264 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0266 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0270 K | February 17, 2016 |
| DEERFIELD | 170361# | September 18, 2013 | 17097C0267 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0270 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0278 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0286 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0287 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0288 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0289 K | February 17, 2016 |

| COMMUNITY NAME | COMMUNITY MEMBER | DATE OF CURRENT EFFECTIVE MAP (OR MAP INDEX) | LAKE COUNTY DFIRM PANEL NUMBERS | EFFECTIVE FIS STUDY DATE |
|---|---|---|---|---|
| DEER PARK | 171028# | September 18, 2013 | 17097C0217 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0236 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0237 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0238 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0241 K | February 17, 2016 |
| FOX LAKE | 170362# | September 18, 2013 | 17097C0004 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0010 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0012 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0014 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0019 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0020 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0106 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0107 L | February 17, 2016 |
| FOX RIVER GROVE | 170477# | September 18, 2013 | 10797C0205 K | February 17, 2016 |
| GRAYSLAKE | 170363# | September 18, 2013 | 17097C0043 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0044 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0129 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0131 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0132 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0133 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0134 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0137 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0141 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0142 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0151 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0153 K | February 17, 2016 |
| GREEN OAKS | 170364# | September 18, 2013 | 17097C0158 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0159 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0166 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0167 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0168 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0169 K | February 17, 2016 |
| GURNEE | 170365# | September 18, 2013 | 17097C0044 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0063 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0064 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0068 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0069 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0132 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0151 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0152 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0153 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0154 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0156 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0157 K | February 17, 2016 |
| HAINESVILLE | 171005# | February 17, 2016 | 17097C0127 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0129 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0131 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0133 L | February 17, 2016 |
| HAWTHORN WOODS | 170366# | February 17, 2016 | 17097C0139 L | February 17, 2016 |

| COMMUNITY NAME | COMMUNITY MEMBER | DATE OF CURRENT EFFECTIVE MAP (OR MAP INDEX) | LAKE COUNTY DFIRM PANEL NUMBERS | EFFECTIVE FIS STUDY DATE |
|---|---|---|---|---|
| HAWTHORN WOODS | 170366# | February 17, 2016 | 17097C0143 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0226 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0227 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0228 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0229 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0231 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0232 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0233 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0234 K | February 17, 2016 |
| HIGHLAND PARK | 170367# | September 18, 2013 | 17097C0277 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0278 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0279 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0283 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0285 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0286 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0287 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0289 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0291 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0293 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0295 K | February 17, 2016 |
| HIGHWOOD | 171033# | September 18, 2013 | 17097C0279 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0283 K | February 17, 2016 |
| INDIAN CREEK | 170369# | September 18, 2013 | 17097C0251 K | February 17, 2016 |
| ISLAND LAKE | 170370# | September 18, 2013 | 17097C0112 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0114 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0116 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0118 K | February 17, 2016 |
| KILDEER | 170371# | September 18, 2013 | 17097C0233 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0234 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0237 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0241 K | February 17, 2016 |
| LAKE BARRINGTON | 170372# | September 18, 2013 | 17097C0118 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0205 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0206 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0207 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0208 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0209 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0215 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0216 K | February 17, 2016 |
| LAKE BLUFF | 170373# | September 18, 2013 | 17097C0167 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0169 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0186 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0188 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0190 K | February 17, 2016 |
| LAKE COUNTY UNINCORPORATED AREAS | 170357# | DFIRM PANEL NUMBERS LISTED SEPARATELY AT END OF APPENDIX | | |
| LAKE FOREST | 170374# | September 18, 2013 | 17097C0169 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0188 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0190 K | February 17, 2016 |

| COMMUNITY NAME | COMMUNITY MEMBER | DATE OF CURRENT EFFECTIVE MAP (OR MAP INDEX) | LAKE COUNTY DFIRM PANEL NUMBERS | EFFECTIVE FIS STUDY DATE |
|---|---|---|---|---|
| LAKE FOREST | 170374# | September 18, 2013 | 17097C0257 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0259 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0276 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0277 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0278 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0279 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0285 K | February 17, 2016 |
| LAKE VILLA | 170375# | September 18, 2013 | 17097C0028 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0029 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0035 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0036 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0037 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0038 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0039 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0041 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0043 K | February 17, 2016 |
| LAKE ZURICH | 170376# | February 17, 2016 | 17097C0227 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0228 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0229 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0233 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0236 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0237 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0241 K | February 17, 2016 |
| LAKEMOOR | 170915# | September 18, 2013 | 17097C0102 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0104 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0106 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0108 K | February 17, 2016 |
| LIBERTYVILLE | 170377# | September 18, 2013 | 17097C0134 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0142 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0161 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0162 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0163 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0164 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0166 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0168 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0252 K | February 17, 2016 |
| LINCOLNSHIRE | 170378# | September 18, 2013 | 17097C0254 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0257 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0258 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0259 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0262 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0266 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0267 K | February 17, 2016 |
| LINDENHURST | 170379# | September 18, 2013 | 17097C0035 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0041 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0042 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0044 K | February 17, 2016 |
| LONG GROVE | 170380# | September 18, 2013 | 17097C0144 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0231 K | February 17, 2016 |

| COMMUNITY NAME | COMMUNITY MEMBER | DATE OF CURRENT EFFECTIVE MAP (OR MAP INDEX) | LAKE COUNTY DFIRM PANEL NUMBERS | EFFECTIVE FIS STUDY DATE |
|---|---|---|---|---|
| LONG GROVE | 170380# | September 18, 2013 | 17097C0232 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0233 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0234 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0241 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0242 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0251 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0253 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0254 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0261 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0263 K | February 17, 2016 |
| METTAWA | 170381# | September 18, 2013 | 17097C0164 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0168 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0169 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0252 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0256 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0257 K | February 17, 2016 |
| MUNDELEIN | 170382# | February 17, 2016 | 17097C0139 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0141 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0142 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0143 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0144 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0161 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0163 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0164 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0232 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0251 K | February 17, 2016 |
| NORTH BARRINGTON | 170383# | September 18, 2013 | 17097C0207 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0208 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0209 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0217 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0226 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0228 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0236 K | February 17, 2016 |
| NORTH CHICAGO | 170384# | September 18, 2013 | 17097C0159 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0167 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0180 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0186 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0190 K | February 17, 2016 |
| OLD MILL CREEK | 170385# | September 18, 2013 | 17097C0034 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0042 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0044 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0055 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0061 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0062 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0063 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0064 K | February 17, 2016 |
| PARK CITY | 170386# | September 18, 2013 | 17097C0156 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0157 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0159 K | February 17, 2016 |

| COMMUNITY NAME | COMMUNITY MEMBER | DATE OF CURRENT EFFECTIVE MAP (OR MAP INDEX) | LAKE COUNTY DFIRM PANEL NUMBERS | EFFECTIVE FIS STUDY DATE |
|---|---|---|---|---|
| PORT BARRINGTON | 170478# | September 18, 2013 | 17097C0114 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0118 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0205 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0206 K | February 17, 2016 |
| RIVERWOODS | 170387# | September 18, 2013 | 17097C0259 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0266 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0267 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0270 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0286 K | February 17, 2016 |
| ROUND LAKE BEACH | 170389# | September 18, 2013 | 17097C0038 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0039 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0043 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0126 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0127 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0131 L | February 17, 2016 |
| ROUND LAKE HEIGHTS | 170390# | September 18, 2013 | 17097C0038 K | February 17, 2016 |
| ROUND LAKE PARK | 170391# | February 17, 2016 | 17097C0127 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0129 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0133 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0137 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0141 L | February 17, 2016 |
| ROUND LAKE | 170388# | February 17, 2016 | 17097C0107 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0109 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0126 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0127 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0128 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0129 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0136 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0137 L | February 17, 2016 |
| THIRD LAKE | 170392# | September 18, 2013 | 17097C0043 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0044 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0132 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0151 K | February 17, 2016 |
| TOWER LAKES | 170393# | September 18, 2013 | 17097C0206 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0207 K | February 17, 2016 |
| VERNON HILLS | 170394# | September 18, 2013 | 17097C0163 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0164 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0251 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0252 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0253 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0254 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0256 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0258 K | February 17, 2016 |
| VOLO | 171042# | September 18, 2013 | 17097C0106 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0107 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0108 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0109 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0116 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0117 L | February 17, 2016 |

| COMMUNITY NAME | COMMUNITY MEMBER | DATE OF CURRENT EFFECTIVE MAP (OR MAP INDEX) | LAKE COUNTY DFIRM PANEL NUMBERS | EFFECTIVE FIS STUDY DATE |
|---|---|---|---|---|
| WADSWORTH | 170395# | September 18, 2013 | 17097C0055 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0056 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0057 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0058 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0059 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0062 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0064 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0066 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0067 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0068 K | February 17, 2016 |
| WAUCONDA | 170396# | September 18, 2013 | 17097C0116 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0117 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0118 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0119 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0136 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0138 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0206 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0207 K | February 17, 2016 |
| WAUKEGAN | 170397# | September 18, 2013 | 17097C0066 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0067 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0068 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0069 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0086 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0087 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0088 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0089 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0095 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0154 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0156 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0157 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0158 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0159 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0166 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0177 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0180 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0185 K | February 17, 2016 |
| WHEELING | 170173# | September 18, 2013 | 17097C0264 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0270 K | February 17, 2016 |
| WINTHROP HARBOR | 170398# | September 18, 2013 | 17097C0076 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0077 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0078 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0079 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0081 K | February 17, 2016 |
| ZION | 170399# | September 18, 2013 | 17097C0057 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0059 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0076 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0077 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0078 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0079 K | February 17, 2016 |

| COMMUNITY NAME | COMMUNITY MEMBER | DATE OF CURRENT EFFECTIVE MAP (OR MAP INDEX) | LAKE COUNTY DFIRM PANEL NUMBERS | EFFECTIVE FIS STUDY DATE |
|---|---|---|---|---|
| ZION | 170399# | September 18, 2013 | 17097C0081 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0085 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0086 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0087 K | February 17, 2016 |
| LAKE COUNTY UNINCORPORATED AREAS | 170357# | September 18, 2013 | 17097C0004 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0010 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0012 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0014 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0019 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0020 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0026 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0027 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0028 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0029 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0032 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0034 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0035 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0036 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0037 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0038 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0039 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0041 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0042 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0043 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0044 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0055 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0056 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0057 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0058 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0059 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0061 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0062 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0063 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0064 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0066 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0067 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0068 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0069 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0076 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0077 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0078 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0079 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0081 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0085 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0086 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0087 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0088 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0089 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0095 K | February 17, 2016 |

| COMMUNITY NAME | COMMUNITY MEMBER | DATE OF CURRENT EFFECTIVE MAP (OR MAP INDEX) | LAKE COUNTY DFIRM PANEL NUMBERS | EFFECTIVE FIS STUDY DATE |
|---|---|---|---|---|
| LAKE COUNTY UNINCORPORATED AREAS | 170357# | September 18, 2013 | 17097C0102 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0104 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0106 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0107 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0108 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0109 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0112 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0114 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0116 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0117 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0118 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0119 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0126 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0127 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0128 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0129 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0131 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0132 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0133 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0134 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0136 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0137 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0138 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0139 L | February 17, 2016 |
| | | February 17, 2016 | 17097C0141 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0142 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0143 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0144 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0151 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0152 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0153 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0154 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0156 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0157 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0158 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0159 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0161 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0162 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0163 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0164 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0166 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0167 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0168 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0169 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0177 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0180 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0185 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0186 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0188 K | February 17, 2016 |

| COMMUNITY NAME | COMMUNITY MEMBER | DATE OF CURRENT EFFECTIVE MAP (OR MAP INDEX) | LAKE COUNTY DFIRM PANEL NUMBERS | EFFECTIVE FIS STUDY DATE |
|---|---|---|---|---|
| LAKE COUNTY UNINCORPORATED AREAS | 170357# | September 18, 2013 | 17097C0190 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0205 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0206 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0207 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0208 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0209 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0215 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0216 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0217 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0226 K | February 17, 2016 |
| | | February 17, 2016 | 17097C0227 L | February 17, 2016 |
| | | September 18, 2013 | 17097C0228 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0229 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0231 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0232 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0233 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0234 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0236 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0237 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0241 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0242 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0251 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0252 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0253 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0254 K | February 17, 2016 |
| | | September 18, 2013 | 17097C0256 K | February 17, 2016 |

# Appendix D: Total Suspended Solids Background Levels for Lake County Water Bodies

**Lake County, Illinois Lakes Total Suspended Solids Concentrations (TSS in mg/L)**

**All data collected by the Lake County Health Department Lakes Management Unit (2000-2004)**

**All samples collected at a lake depth less than or equal to 3 feet**

| | SAMPLE | AVERAGE | MINIMUM | MAXIMUM |
|---|---|---|---|---|
| LAKE NAME | YEAR | TSS mg/L | TSS mg/L | TSS mg/L |
| ADID 127 | 2004 | 74.8 | 31.8 | 111.0 |
| ADID 182 | 2004 | 111.0 | 111.0 | 111.0 |
| ADID 203 | 2004 | 4.1 | 1.1 | 8.7 |
| Albert Lake (Site 1 and Site 2) | 2001 | 62.9 | 20.4 | 124.0 |
| Ames Pit | 2000 | 3.3 | 1.3 | 4.8 |
| Antioch Lake | 2001 | 15.2 | 8.0 | 21.0 |
| Bangs Lake | 2002 | 3.4 | 1.3 | 5.4 |
| Big Bear Lake | 2002 | 14.1 | 9.3 | 18.0 |
| Bishop Lake | 2004 | 14.3 | 2.6 | 30.7 |
| Bittersweet Golf Course #13 | 2004 | 17.0 | 5.4 | 24.0 |
| Bluff Lake | 2002 | 10.2 | 5.0 | 18.0 |
| Bresen Lake | 2000 | 11.2 | 4.9 | 16.0 |
| Broberg Marsh | 2000 | 9.6 | 5.4 | 11.0 |
| Buffalo Creek Reservoir | 2001 | 34.7 | 21.0 | 58.6 |
| Butler Lake | 2001 | 2.1 | 1.9 | 2.5 |
| Cedar Lake | 2003 | 2.2 | 1.0 | 4.0 |
| Channel Lake (Site 1 and Site 3) | 2002 | 6.0 | <1.0 | 9.0 |
| College Trail Lake | 2004 | 12.4 | 9.3 | 16.3 |
| Columbus Park Lake | 2000 | 19.0 | 7.9 | 26.0 |
| Countryside Glen Lake | 2004 | 6.7 | 4.3 | 7.9 |
| Countryside Lake | 2000 | 9.9 | 1.4 | 22.0 |
| Cranberry Lake | 2000 | 1.2 | 0.6 | 2.0 |
| Crooked Lake | 2001 | 13.7 | 9.4 | 17.0 |
| Cross Lake | 2003 | 2.2 | 1.3 | 3.3 |
| Davis Lake | 2000 | 2.1 | 1.0 | 3.2 |
| Deep Lake | 2003 | 2.4 | <1.0 | 3.3 |
| Deer Lake | 2000 | 2.5 | 0.9 | 6.6 |
| Deer Lake Meadow Lake | 2004 | 23.2 | 16.0 | 35.0 |
| Diamond Lake | 2002 | 5.9 | 4.1 | 9.5 |
| Dog Bone Lake | 2004 | 39.4 | 26.2 | 66.0 |
| Dog Pond | 2001 | 1.4 | <1.0 | 1.7 |
| Druce Lake | 2001 | 2.2 | 1.6 | 3.6 |
| Drummond Lake | 2002 | 52.1 | 27.0 | 93.1 |
| Duck Lake | 2001 | 20.6 | 6.1 | 31.0 |
| Dugdale Lake | 2003 | 2.2 | 1.2 | 4.0 |
| Dunns Lake | 2002 | 27.5 | 16.0 | 40.4 |
| Eagle Lake (Site 1 and Site 2) | 2002 | 11.5 | <1.0 | 22.0 |

| | SAMPLE | AVERAGE | MINIMUM | MAXIMUM |
|---|---|---|---|---|
| LAKE NAME | YEAR | TSS mg/L | TSS mg/L | TSS mg/L |
| East Loon Lake | 2003 | 4.1 | 3.1 | 5.6 |
| East Meadow Lake | 2004 | 11.4 | 9.2 | 17.0 |
| Echo Lake | 2000 | 9.7 | 6.0 | 18.0 |
| Fairfield Marsh | 2003 | 81.6 | 19.0 | 165.0 |
| Fischer Lake | 2001 | 15.4 | 8.9 | 19.6 |
| Fish Lake | 2002 | 11.3 | 3.1 | 19.0 |
| Flint Lake (Site 1 and Site 2) | 2003 | 31.8 | 10.0 | 69.6 |
| Forest Lake | 2000, 03, 04 | 14.3 | 5.0 | 27.7 |
| Fourth Lake | 2000 | 1.8 | 0.6 | 3.0 |
| Fox Lake (Site 1 and Site 3) | 2002 | 30.8 | 21.0 | 43.0 |
| Gages Lake | 2003 | 7.0 | 4.2 | 11.0 |
| Grand Avenue Marsh | 2004 | 13.2 | 7.8 | 22.0 |
| Grandwood Park Lake (Site 1 and Site 2) | 2000 | 13.2 | 5.0 | 27.0 |
| Grass Lake (Site 1 and Site 2) | 2002 | 43.1 | 27.0 | 73.0 |
| Grassy Lake | 2000 | 27.1 | 16.0 | 43.2 |
| Gray's Lake | 2002 | 2.9 | <1.0 | 3.5 |
| Half Day Pit | 2003 | 21.3 | 14.0 | 26.0 |
| Harvey Lake | 2000 | 19.8 | 14.0 | 28.0 |
| Hastings Lake | 2001 | 7.6 | 6.0 | 12.0 |
| Hendrick Lake | 2000, 04 | 3.4 | 2.0 | 5.4 |
| Heron Pond | 2004 | 1.8 | 1.5 | 2.3 |
| Hidden Lake | 2002 | 74.0 | 52.0 | 106.0 |
| Highland Lake | 2001 | 3.3 | 2.4 | 4.9 |
| Honey Lake | 2001 | 1.8 | 1.1 | 2.5 |
| Hook Lake | 2004 | 5.1 | 2.9 | 8.5 |
| Independence Grove Lake | 2000 | 3.5 | 2.5 | 4.2 |
| International Mine and Chemical Lake | 2003 | 4.4 | 1.8 | 8.1 |
| Island Lake | 2003 | 14.9 | 5.7 | 29.4 |
| Lake Barrington | 2001 | 9.6 | 0.2 | 18.0 |
| Lake Carina | 2001 | 3.4 | 2.2 | 4.7 |
| Lake Catherine (Site 1 and Site 3) | 2002 | 6.0 | <1.0 | 16.0 |
| Lake Charles | 2000 | 16.3 | 9.0 | 27.2 |
| Lake Christa | 2004 | 8.2 | 2.2 | 18.0 |
| Lake Eleanor (Site 1 and Site 2) | 2001 | 32.4 | 12.0 | 54.0 |
| Lake Fairfield | 2000 | 5.1 | 2.0 | 8.8 |
| Lake Fairview | 2000 | 4.9 | 1.6 | 8.4 |
| Lake Farmington | 2004 | 21.2 | 11.0 | 34.0 |
| Lake Forest Pond | 2003 | 54.1 | 17.7 | 73.8 |
| Lake Holloway | 2002 | 14.6 | 1.6 | 31.0 |
| Lake Kathyrn | 2004 | 2.1 | 1.1 | 3.9 |
| Lake Lakeland Estates | 2000 | 8.2 | 1.4 | 14.0 |
| Lake Leo | 2001 | 2.3 | 1.0 | 4.8 |

| | SAMPLE | AVERAGE | MINIMUM | MAXIMUM |
|---|---|---|---|---|
| LAKE NAME | YEAR | TSS mg/L | TSS mg/L | TSS mg/L |
| Lake Linden | 2002 | 2.3 | 1.1 | 3.7 |
| Lake Louise (Site 1 and Site 2) | 2003 | 22.6 | 8.8 | 49.1 |
| Lake Marie (Site 1 and Site 3) | 2002 | 15.1 | 7.0 | 20.0 |
| Lake Matthews | 2002 | 21.2 | 9.9 | 31.0 |
| Lake Miltmore | 2003 | 4.7 | 2.4 | 6.4 |
| Lake Minear | 2002 | 1.6 | 1.1 | 2.2 |
| Lake Naomi | 2001 | 5.0 | 2.9 | 7.1 |
| Lake Napa Suwe (Site 1 and Site 2) | 2002 | 51.9 | 25.0 | 122.0 |
| Lake of the Hollow | 2000 | 1.8 | 1.2 | 2.4 |
| Lake Tranquility (Site 1 and Site 2) | 2002 | 10.8 | 1.2 | 24.0 |
| Lake Zurich | 2002 | 4.9 | 2.7 | 7.5 |
| Lakewood Marsh | 2004 | 4.3 | 1.6 | 8.5 |
| Lambs Farm Lake | 2003 | 5.1 | 2.9 | 9.4 |
| Leisure Lake | 2000 | 11.5 | 3.5 | 17.0 |
| Liberty Lake | 2001 | 8.3 | 6.0 | 11.0 |
| Little Bear Lake | 2002 | 8.3 | 3.7 | 11.0 |
| Little Silver Lake | 2003 | 1.8 | 1.3 | 2.5 |
| Loch Lomond Lake | 2004 | 13.2 | 4.3 | 21.8 |
| Lochanora Lake | 2004 | 2.8 | <1.0 | 4.4 |
| Long Lake | 2001 | 9.7 | 6.3 | 11.9 |
| Longview Meadow Lake | 2004 | 25.1 | 20.2 | 31.6 |
| Lucky Lake | 2001 | 8.1 | 4.3 | 15.5 |
| Lucy Lake | 2004 | 12.4 | 7.6 | 18.0 |
| Mary Lee Lake | 2004 | 3.5 | 2.3 | 5.4 |
| McDonald Lake 1 | 2003 | 13.7 | 3.3 | 29.3 |
| McDonald Lake 2 | 2003 | 70.1 | 58.8 | 84.0 |
| McGreal Lake | 2002 | 3.9 | 1.2 | 6.3 |
| Nielsen Pond | 2001 | 4.0 | 1.9 | 8.2 |
| Nippersink Lake (Site 1 and Site 2) | 2002 | 40.1 | 25.0 | 59.0 |
| North Churchill Lake | 2003 | 77.2 | 54.5 | 134.0 |
| North Tower Lake | 2001 | 2.8 | 0.7 | 6.1 |
| Oak Hills Lake | 2004 | 64.1 | 42.0 | 88.3 |
| Old Oak Lake | 2003 | 3.6 | 2.7 | 3.9 |
| Old School Lake | 2003 | 1.7 | 1.0 | 2.8 |
| Owens Lake | 2000 | 11.0 | 2.0 | 31.0 |
| Patski Pond (Site 1 and Site 2) | 2004 | 46.3 | 13.9 | 98.5 |
| Peterson Pond | 2001 | 3.8 | 1.7 | 8.5 |
| Petite Lake | 2002 | 12.8 | 9.0 | 15.0 |
| Pistakee Lake (Site 1 and Site 3) | 2002 | 33.9 | 10.0 | 57.0 |
| Pond-a-Rudy | 2001 | 26.0 | 1.1 | 50.2 |
| Potomac Lake | 2000 | 3.9 | 1.0 | 6.4 |
| Pulaski Pond | 2003 | 1.9 | 1.1 | 3.2 |

| LAKE NAME | SAMPLE YEAR | AVERAGE TSS mg/L | MINIMUM TSS mg/L | MAXIMUM TSS mg/L |
|---|---|---|---|---|
| Rasmussen Lake | 2001 | 22.8 | 9.6 | 54.9 |
| Redhead Lake | 2002 | 36.8 | 18.0 | 68.0 |
| Redwing Marsh | 2003 | 28.2 | 11.0 | 50.0 |
| Redwing Slough (Site 1 and Site 2) | 2000 | 4.4 | 0.5 | 7.3 |
| Rivershire Pond 2 | 2004 | 14.9 | 8.5 | 21.6 |
| Round Lake | 2003 | 3.5 | 2.6 | 4.5 |
| Round Lake Marsh North | 2004 | 20.2 | <1.0 | 54.3 |
| Salem Lake | 2000 | 16.5 | 3.4 | 28.0 |
| Sand Lake | 2004 | 3.3 | 1.7 | 5.2 |
| Sand Pond | 2000 | 1.6 | 0.6 | 2.8 |
| Schreiber Lake | 2003 | 3.1 | <1.0 | 4.5 |
| Seven Acre Lake | 2003 | 6.3 | 3.4 | 12.0 |
| Slocum Lake | 2001 | 39.2 | 24.6 | 48.0 |
| Slough Lake | 2000 | 33.8 | 16.0 | 61.0 |
| South Churchill Lake | 2003 | 43.6 | 29.0 | 51.7 |
| Spring Lake | 2002 | 12.8 | 8.0 | 18.0 |
| St. Mary's Lake | 2002 | 11.8 | 8.5 | 15.7 |
| Sterling Lake | 2003 | 3.0 | 2.3 | 3.7 |
| Stockholm Lake | 2004 | 10.6 | 2.2 | 29.5 |
| Stone Quarry Lake | 2004 | 3.5 | 1.7 | 6.8 |
| Sullivan Lake | 2002 | 5.2 | 2.9 | 9.7 |
| Summerhill Estates Lake | 2004 | 6.1 | 2.7 | 10.0 |
| Sun Lake | 2001 | 2.4 | 1.3 | 4.3 |
| Sylvan Lake | 2001 | 15.1 | 6.6 | 27.7 |
| Taylor Lake | 2003 | 8.4 | 5.9 | 12.0 |
| Third Lake | 2000 | 7.9 | 2.2 | 13.0 |
| Timber Lake | 2001 | 4.1 | 2.1 | 9.9 |
| Timber Lake S | 2000 | 15.0 | 5.7 | 27.6 |
| Tower Lake | 2001 | 15.0 | 5.6 | 26.2 |
| Turner Lake | 2002 | 6.0 | 3.0 | 8.7 |
| Valley Lake | 2000 | 12.2 | 5.7 | 17.0 |
| Waterford Lake | 2000 | 2.7 | 1.0 | 5.8 |
| Werhane Lake | 2001 | 13.7 | 7.0 | 20.9 |
| West Loon Lake | 2003 | 1.8 | 1.3 | 2.5 |
| West Meadow Lake | 2004 | 17.7 | 8.9 | 31.7 |
| White Lake | 2000 | 3.6 | 1.9 | 7.8 |
| Willow Lake | 2003 | 19.4 | 13.4 | 27.8 |
| Windward Lake | 2001 | 1.2 | <0.1 | 1.3 |
| Woodland Lake | 2004 | 21.2 | 17.0 | 25.0 |
| Wooster Lake | 2003 | 3.4 | 1.3 | 6.9 |

**Total Lake County Lakes Sampled** **161**

# Appendix E: Enforcement Officer Duties

This Appendix, as a part of this duly adopted Ordinance, delineates requirements or duties required of and accepted by a *community* and its designated *Enforcement Officer*. Certain requirements or duties specified by *FEMA* or *IDNR/OWR* are for the purposes of that community obtaining or maintaining eligibility for participation in the National Flood Insurance Program and delegation of state permit authority. These certain requirements or duties relate only to the intergovernmental relationship between a community and FEMA or IDNR/OWR, and they do not and are not intended to create any third party beneficial rights in or for *applicants*, property owners, or others.

A. In Certified Communities, the appropriate development regulations officer shall be the *Enforcement Officer* for this Ordinance. In all other areas of Lake County, the *SMC Chief Engineer* shall be this Enforcement Officer. One of the primary duties of the Enforcement Officer shall be to review all Watershed Development Applications and issue permits for those projects that are in compliance with the provisions of the Ordinance. The Enforcement Officer shall be responsible for the administration and enforcement of this Ordinance. If the Enforcement Officer is contracted by a *Certified Community*, then the contract scope shall be comprehensive enough to cover all specified duties herein or the duties shall be shared with a Co-Enforcement Officer who is an Employee of the Certified Community.

B. The *Enforcement Officer* shall determine for each *development* if it is in a *Special Flood Hazard Area* (SFHA) using the criteria specified in §700 Location of Regulatory Floodplain, Base Flood Elevation, and Regulatory Floodway of this Ordinance. If a site is in a SFHA, a determination is required as to whether it is in a *Regulatory Floodway*, or a *Regulatory Floodplain* on which a detailed study has not been conducted, or a *flood-prone area* with a tributary *drainage area* equal to or greater than 640 acres, greater than 100 acres, or greater than 20 acres.

C. The *Enforcement Officer* shall ensure that an *IDNR/OWR* Dam Safety Permit is obtained or a letter stating that no Dam Safety Permit is required if the *development* includes a *dam* before the issuance of a *Watershed Development Permit*. Reference Appendix G: IDNR/OWR Dam Safety Permitting Guidelines.

D. Adopted *basin plans* and floodplain studies may be the basis for more specific regulations. These additional or more specific regulations will apply only in the specific study area of the basin plan or *floodplain study* and supersede those of this Ordinance only upon amendment to the Watershed Development Ordinance and formal adoption of the basin plan or floodplain study by SMC.

E. To assure projects are built and maintained according to permitted plans, the *Enforcement Officer* shall determine applicable deed restrictions, performance guarantees, *as-built drawings*, and maintenance guarantees for projects that affect stormwater runoff characteristics, impact wetlands or buffers, or impact floodplains. If such performance guarantees or other such adequate security as the Enforcement Officer may approve is required, the amount shall be at least 110% of the estimated cost to complete construction of the *stormwater management system* and soil erosion and sediment control measures required

by the *Watershed Development Permit*, which the estimated probable cost shall be approved by the Enforcement Officer. The performance guarantee may be reduced upon verification of construction milestones or after approval of the as-built drawings and calculations. The performance guarantee shall be valid for a minimum of one (1) year beyond the date of project completion or two (2) years from the start of construction, whichever is greater. The performance guarantee shall not be reduced below ten percent (10%) of the original value until project as-built drawings are accepted. The performance guarantee may not be further reduced before the completion of a minimum two-year maintenance period.

F. A *Registered Professional Engineer* in the employ or under contract with SMC or *Certified Community* shall review any plans, calculations, or analyses submitted by a Registered Professional Engineer pursuant to the requirements of this Ordinance.

G. Proposed amendments to this Ordinance and appendices must be done in accordance with applicable state or federal law and approved by *IDNR/OWR* and *FEMA*.

H. Prior to the issuance of a *Watershed Development Permit*, and based on the reliance that the application requirements of §400 Minor Developments, §401 Major Developments, §402 Public Road Developments, §403 IDNR/OWR Dam Safety Permit,and §701 Application Requirements have been met, the *Enforcement Officer* shall further ensure that the *applicant* has obtained and provided copies of any and all required federal, state, and local permits for *development* in the *Regulatory Floodplain*. Reference Appendix H: Partial List of Permits Required (When Applicable) for Development in Lake County for a partial list of permits that may be applicable.

I. The *Enforcement Officer* shall *inspect* (as defined in Appendix A: Definitions of this Ordinance) *development* projects before, during, and upon completion of construction to ensure proper elevation of the *structure* and to ensure compliance with the provisions of this Ordinance. The Enforcement Officer may require a pre-construction meeting as a condition of issuing a permit.

J. Enforcement Officer Duties

1. *IDNR/OWR* has retained permit review and approval authority over the following:

   a. Illinois Department of Natural Resources projects, *dams*, or impoundment structures as defined in Appendix A: Definitions and that meet the 'permit required' criteria for dams in Appendix G: IDNR/OWR Dam Safety Permitting Guidelines.

   b. All other state, federal, and SMC *development* located in the *Regulatory Floodplain*.

   c. Permit issuance for development within or over Public Waters.

2. For the following types of regulatory approvals or permit authority, SMC has jurisdiction within depressional flood-prone areas with greater than 20 acres of tributary area and *riverine* flood-prone areas with greater than 100 acres

of tributary area. *IDNR/OWR* has jurisdiction within Regulatory Floodways or Floodplains with greater than 640 acres (one square mile) of tributary area.

a. *Base flood elevation* determinations where none now exist.

b. Any changes in the base flood elevation.

c. Changes to the Regulatory Floodway boundaries.

d. Determination that the development is a *public flood control project*.

3. SMC has regulatory approval or permit authority for the following types of *development*:

a. Non-certified community development.

b. *Public road development.*

c. Determination that an existing bridge or culvert crossing proposed to be modified is not a source of flood damage and the analysis indicating the proposed flood profile, per §707 Bridge, Culvert Crossing, and Roadway Approach Performance Standards.

d. Alternative transition sections and hydraulically equivalent compensatory storage as indicated in 703.04.

e. Lake County Forest Preserve District development.

f. Community and local unit of government development in the *Regulatory Floodplain*.

g. Other development as specified within intergovernmental agreements with the SMC.

K. The *Enforcement Officer* shall submit the data required to SMC, *IDNR/OWR*, and the Federal Emergency Management Agency (*FEMA*) for proposed revisions to the *base flood elevation* of a *Regulatory Floodplain* study or a relocation of a *Regulatory Floodway* boundary.

The *Enforcement Officer* shall submit reports as required for the National Flood Insurance Program.

L. The adopted Lake County Comprehensive Stormwater Management Plan states the SMC should “maintain a repository of stormwater management data for the county”. Toward that end, the *Enforcement Officer* shall:

1. Maintain records of every *Watershed Development Permit* application, permit, variance, hydrologic and hydraulic data, and enforcement action and shall allow periodic inspections of the records by SMC, *FEMA*, or *IDNR/OWR* personnel.

2. Maintain an *elevation certificate* and flood-proofing certificate file, to certify the elevation of the *lowest floor* (including *basement*) of a residential or non-residential building or the elevation to which a non-residential *building* has been flood-proofed, for buildings constructed in the *Regulatory Floodplain*.

3. Maintain for public inspection and provide copies upon request of: *base flood* data and maps, variance documentation, Conditional Letters of Map Revision, Letters of Map Revision, Letters of Map Amendment, elevation and *flood-proofing certificate*, other *Watershed Development Permit* related materials, elevation and flood-proofing *record drawings* for *buildings* requiring *flood-proofing* or constructed subject to the elevation criteria provisions of this Ordinance, and record drawings of the *stormwater management system* required by this Ordinance for each *development*.
4. Copy to the SMC, at agreed-upon intervals, but no later than a 5-year period, specified portions of the *Watershed Development Permit* records.

M. The *Enforcement Officer* shall notify adjacent upstream and downstream communities, the SMC, and *IDNR/OWR* in writing thirty (30) days prior to the issuance of a permit for the alteration or relocation of a *channel* in a *Regulatory Floodplain*.

# Appendix F: Public Bodies of Water in Lake County

The following public bodies of water were navigable in their *natural* condition or were improved for navigation and opened to public use. The entire length and surface area in Illinois, including all backwater *lakes* and sloughs open to the main *channel* or body of water at normal flows or stages, are open to the public.

1) Lake Michigan

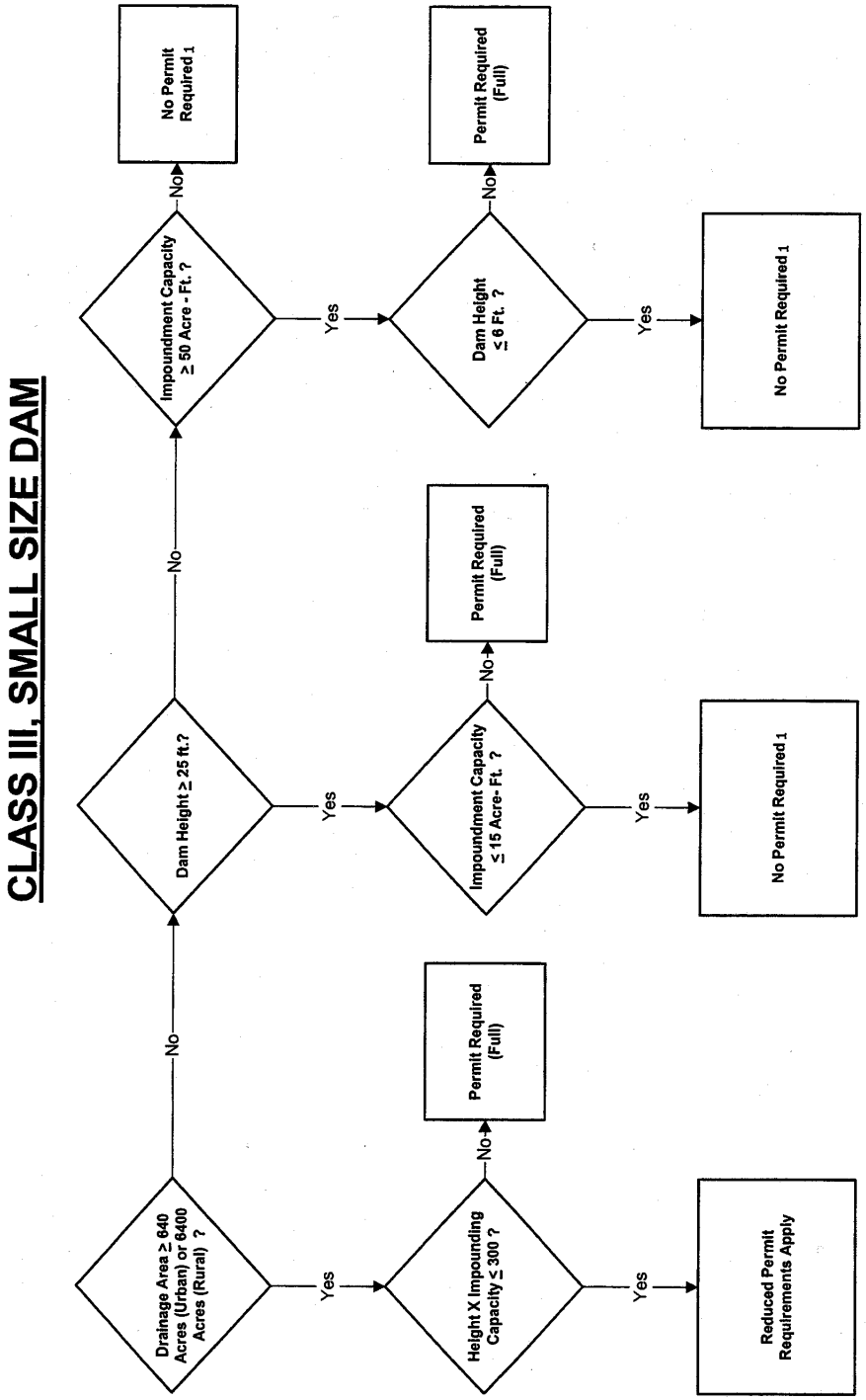
2) Fox River (Illinois River Basin)

3) Fox Chain-O-Lakes (Lake and McHenry Counties): Bluff Lake, Lake Catherine, Channel Lake, Fox Lake, Grass Lake, Lake Marie, Nippersink Lake, Dunns Lake, Pistakee Lake, Lake Jerilyn, Lac Louette, Redhead Lake

The following public bodies of water are navigable waters that were dedicated to public use. This list is incomplete. It is believed there are numerous channels and slips in subdivisions on the margins of public bodies of water which have been dedicated by plat. Additional channels and slips have been dedicated by common law.

1) Petite Lake, Spring Lake, and connecting channels between Bluff Lake and Fox Lake in Lake County

# Appendix G: IDNR/OWR Dam Safety Permitting Guidelines




## REDUCED PERMIT REQUIREMENTS

a) a completed "Application for Permit form,
b) construction plans and documents that are sealed, signed and dated by an engineer or qualified personnel
c) information describing the downstream floodplain for a distance of two miles,
d) calculations for the reservoir's 100-year flood pool elevation,
e) proof of flooding rights (fee simple ownership or flood easement) of all lands within the reservoir's flood pool.
f) right of access authorization for the State to inspect the dam site and immediate vicinity before, during and after construction for the life of the dam and its appurtenances, and
g) agreement to submit record ("as-built") plans and specifications upon completion of the project.

1 Unless known potential exists for downstream for flood related structural damage which would result from dam failure.

# Appendix H: Partial List of Permits Required (When Applicable) for Development in Lake County

United States Army Corps of Engineers

Illinois Department of Natural Resources, Office of Water Resources

Illinois Department of Natural Resources, Department of Natural Heritage

Illinois Department of Transportation, Division of Highways, District 1

Illinois Environmental Protection Agency

McHenry-Lake County Soil and Water Conservation District

Lake County Health Department

Lake County Division of Transportation

Community / County Building Permits

Illinois Historical Preservation Agency

United States Fish and Wildlife Service

Fox Waterway Agency

# Appendix I: Rainfall Depth Duration Frequency Tables for Lake County

**Rainfall Depth-Duration Frequency Tables for Lake County**
**Rainfall is in inches**

| Duration | 1 year | 2 year | 5 year | 10 year | 25 year | 50 year | 100 year | *Mult. factor |
|---|---|---|---|---|---|---|---|---|
| 5 min | 0.28 | 0.34 | 0.41 | 0.47 | 0.57 | 0.66 | 0.78 | 0.12 |
| 10 min | 0.49 | 0.59 | 0.71 | 0.81 | 1.00 | 1.16 | 1.37 | 0.21 |
| 15 min | 0.63 | 0.76 | 0.92 | 1.05 | 1.28 | 1.49 | 1.76 | 0.27 |
| 30 min | 0.87 | 1.04 | 1.26 | 1.44 | 1.76 | 2.04 | 2.41 | 0.37 |
| 1 hour | 1.10 | 1.32 | 1.60 | 1.82 | 2.23 | 2.59 | 3.06 | 0.47 |
| 2 hour | 1.36 | 1.62 | 1.97 | 2.25 | 2.76 | 3.19 | 3.77 | 0.58 |
| 3 hour | 1.50 | 1.79 | 2.18 | 2.48 | 3.04 | 3.52 | 4.16 | 0.64 |
| 6 hour | 1.76 | 2.10 | 2.55 | 2.91 | 3.56 | 4.13 | 4.88 | 0.75 |
| 12 hour | 2.04 | 2.44 | 2.96 | 3.38 | 4.13 | 4.79 | 5.66 | 0.87 |
| 18 hour | 2.21 | 2.63 | 3.20 | 3.65 | 4.47 | 5.17 | 6.11 | 0.94 |
| 24 hour | 2.35 | 2.80 | 3.40 | 3.88 | 4.75 | 5.50 | 6.50 | 1.00 |
| 48 hour | 2.54 | 3.02 | 3.67 | 4.19 | 5.13 | 5.94 | 7.02 | 1.08 |
| 72 hour | 2.73 | 3.25 | 3.94 | 4.50 | 5.51 | 6.38 | 7.54 | 1.16 |
| ***120 hour*** | ***3.08*** | ***3.67*** | ***4.45*** | ***5.08*** | ***6.22*** | ***7.21*** | ***8.52*** | ***1.31*** |
| ***240 hour*** | ***3.45*** | ***4.12*** | ***5.00*** | ***5.70*** | ***6.98*** | ***8.09*** | ***9.56*** | ***1.47*** |

*References:* *Bulletin 70, Illinois State Water Survey Champaign, 1989*

*Multiplication Factor - Average ratios of X-hour/24-hour rainfall for Illinois, 1989 Bulletin 70.

**HUFF RAINFALL DISTRIBUTIONS**

The Huff quartiles represent the typical rainfall distribution for 4 different storm duration ranges. The First quartile applies to storms less than or equal to 6 hours long. Second is for storms greater than 6 hours and less than or equal to 12 while the third Huff quartile is for storms greater than 12 hours and less than or equal to 24 hours. Fourth quartile storms apply to storm durations greater than 24 hours.

**HUFF QUARTILE DISTRIBUTIONS**

| CUMUL. | AREA < 10 SM | | | | AREA > 10 & AREA < 50 | | | | AREA > 50 & AREA < 400 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STORM | HUFF QUARTILE | | | | HUFF QUARTILE | | | | HUFF QUARTILE | | | |
| PERCENT | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 4th |
| 05 | 16 | 03 | 03 | 02 | 12 | 03 | 02 | 02 | 08 | 02 | 02 | 02 |
| 10 | 33 | 08 | 06 | 05 | 25 | 06 | 05 | 04 | 17 | 04 | 04 | 03 |
| 15 | 43 | 12 | 09 | 08 | 38 | 10 | 08 | 07 | 34 | 08 | 07 | 05 |
| 20 | 52 | 16 | 12 | 10 | 51 | 14 | 12 | 09 | 50 | 12 | 10 | 07 |
| 25 | 60 | 22 | 15 | 13 | 62 | 21 | 14 | 11 | 63 | 21 | 12 | 09 |
| 30 | 66 | 29 | 19 | 16 | 69 | 30 | 17 | 13 | 71 | 31 | 14 | 10 |
| 35 | 71 | 39 | 23 | 19 | 74 | 40 | 20 | 15 | 76 | 42 | 16 | 12 |
| 40 | 75 | 51 | 27 | 22 | 78 | 52 | 23 | 18 | 80 | 53 | 19 | 14 |
| 45 | 79 | 62 | 32 | 25 | 81 | 63 | 27 | 21 | 83 | 64 | 22 | 16 |
| 50 | 82 | 70 | 38 | 28 | 84 | 72 | 33 | 24 | 86 | 73 | 29 | 19 |
| 55 | 84 | 76 | 45 | 32 | 86 | 78 | 42 | 27 | 88 | 80 | 39 | 21 |
| 60 | 86 | 81 | 57 | 35 | 88 | 83 | 55 | 30 | 90 | 86 | 54 | 25 |
| 65 | 88 | 85 | 70 | 39 | 90 | 87 | 69 | 34 | 92 | 89 | 68 | 29 |
| 70 | 90 | 88 | 79 | 45 | 92 | 90 | 79 | 40 | 93 | 92 | 79 | 35 |
| 75 | 92 | 91 | 85 | 51 | 94 | 92 | 86 | 47 | 95 | 94 | 87 | 43 |
| 80 | 94 | 93 | 89 | 59 | 95 | 94 | 91 | 57 | 96 | 96 | 92 | 54 |
| 85 | 96 | 95 | 92 | 72 | 96 | 96 | 94 | 74 | 97 | 97 | 95 | 75 |
| 90 | 97 | 97 | 95 | 84 | 97 | 97 | 96 | 88 | 98 | 98 | 97 | 92 |
| 95 | 98 | 98 | 97 | 92 | 98 | 98 | 98 | 95 | 99 | 99 | 99 | 97 |

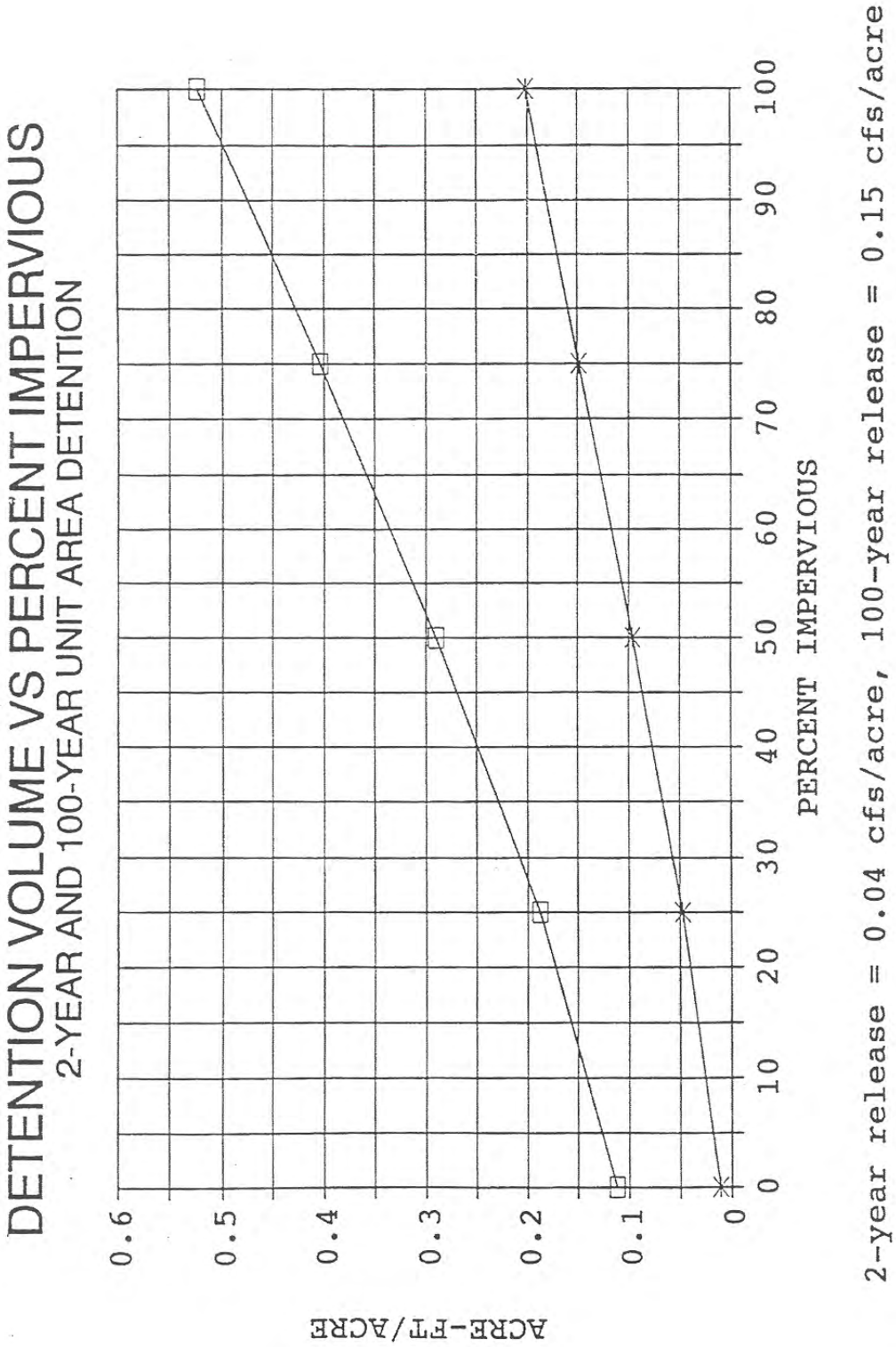
*References:* *Floyd A. Huff and James R. Angel, 1989 "Frequency Distributions and Hydroclimatic Characteristics of Heavy Rainstorms in Illinois', Illinois State Water Survey, Bulletin 70.*

# Appendix J: Watershed Specific Release Rates

| WATERSHED | Release Rates (cfs/acre) | | |
|---|---|---|---|
| MAJOR TRIBUTARIES | 100 Year | 2 Year | |
| MINOR TRIBUTARIES | Storm Event | Storm Event | Comments [1/] |
| **FOX RIVER** | | | |
| Fox River Mainstem | 0.150 | 0.040 | WDO Maximum Allowable |
| Flint Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Honey Lake Drain | 0.150 | 0.040 | WDO Maximum Allowable |
| Mutton Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Sequoit Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Slocum Lake Drain | 0.150 | 0.040 | WDO Maximum Allowable |
| Bang's Lake Drain | 0.150 | 0.040 | WDO Maximum Allowable |
| Squaw Creek Mainstem | 0.090 | 0.020 | Watershed Average Rate Based on 8/1/96 SMC adoption of the 11/3/82 FIS flow rate analysis. |
| Fish Lake Drain | 0.090 | 0.020 | Watershed Average Rate Based on 8/1/96 SMC adoption of the 11/3/82 FIS flow rate analysis. |
| Round Lake Drain | 0.090 | 0.020 | Watershed Average Rate Based on 8/1/96 SMC adoption of the 11/3/82 FIS flow rate analysis. |
| Eagle Creek | 0.090 | 0.020 | Watershed Average Rate Based on 8/1/96 SMC adoption of the 11/3/82 FIS flow rate analysis. |
| Tower Lake Drain | 0.150 | 0.040 | WDO Maximum Allowable |
| **DES PLAINES RIVER** | | | |
| Des Plaines River Mainstem | 0.150 | 0.040 | WDO Maximum Allowable |
| Aptakisic Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Buffalo Creek Mainstem | 0.150 | 0.040 | WDO Maximum Allowable |
| Tributary B to Buffalo Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Bull Creek Mainstem | 0.150 | 0.040 | WDO Maximum Allowable |
| Bull Creek Tributary | 0.150 | 0.040 | WDO Maximum Allowable |
| Gurnee Tributary | 0.150 | 0.040 | WDO Maximum Allowable |
| Indian Creek Mainstem | 0.150 | 0.040 | WDO Maximum Allowable |
| South Branch Indian Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| West Branch Indian Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Forest Lake Drain | 0.150 | 0.040 | WDO Maximum Allowable |
| Seavey Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Diamond Lake Drain | 0.150 | 0.040 | WDO Maximum Allowable |
| Mill Creek Mainstem | 0.150 | 0.040 | WDO Maximum Allowable |
| North Mill Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Hastings Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Newport Drainage Ditch | 0.150 | 0.040 | WDO Maximum Allowable |
| Suburban Country Club Tributary | 0.150 | 0.040 | WDO Maximum Allowable |
| **LAKE MICHIGAN** | | | |
| Bluff/Ravine | 0.150 | 0.040 | WDO Maximum Allowable |
| Dead River | 0.150 | 0.040 | WDO Maximum Allowable |
| Bull Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Kellogg Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Pettibone Creek | 0.150 | 0.040 | WDO Maximum Allowable |
| Waukegan River | 0.150 | 0.040 | WDO Maximum Allowable |
| **NORTH BRANCH CHICAGO RIVER** | | | |
| Middle Fork | 0.150 | 0.040 | WDO Maximum Allowable |
| Skokie River | 0.150 | 0.040 | WDO Maximum Allowable |
| West Fork | 0.150 | 0.040 | WDO Maximum Allowable |

**1/ Individual Communities within these watershed boundaries may have more restrictive release rates.**

# Appendix K: Detention Volume Versus Percent Impervious




Reference: Northeastern Illinois Planning Commission, Investigation of Hydrologic Methods for Urban Development in Northeastern Illinois

# Appendix L: High-Quality Aquatic Resources

The following are descriptions of *high-quality aquatic resources*:

A. Advanced Identification (ADID) sites: Aquatic sites that have been determined to provide Biological Values by the U.S. Army Corps of Engineers, Chicago District and U.S. Environmental Protection Agency (U.S. Environmental Protection Agency. 1992. Advanced Identification (ADID) Study, Lake County, Illinois. Chicago, Illinois) or latest ADID study.

B. Bog: A low nutrient peatland, usually in a glacial depression, that is acidic in the surface stratum and often dominated at least in part by the genus *Sphagnum*.

C. Ephemeral pool: A seasonally inundated depression within a *forested wetland* or upland community, usually located on a moraine, glacial outwash plain, or in an area shallow to bedrock; also known locally as a "vernal pool." These areas may not be permanently vegetated.

D. Fen: A peatland, herbaceous (including calcareous floating mats) or wooded, with calcareous groundwater flow.

E. High Quality Forested wetland: A *forested wetland* *dominated* by native woody vegetation by at least one of the following species or genera: *Carya* spp., *Cephalanthus occidentalis*, *Cornus alternifolia*, *Fraxinus nigra*, *Juglans cinerea*, and *Quercus* spp.

F. Sedge meadow: A *wetland* *dominated* by at least one of the following genera: *Carex* (except *Carex blanda, Carex grisea*, and *Carex vulpinodea*), *Calamagrostis*, *Cladium*, *Deschampsia*, *Rhynchospora*, *Scleria*, or *Eriophorum*.

G. Seep: A *wetland*, herbaceous or wooded, with saturated soil or inundation resulting from the diffuse flow of groundwater to the surface stratum.

H. Streams shown on the most recent USGS quadrangle map as a perennial (solid blue line) or intermittent (dashed blue line) that are not determined to be a Waters of the U.S. If a site specific Index of Biological Integrity (IBI) assessment is lower than 35, this *stream* reach shall not be considered a *high-quality aquatic resource*.

I. Streamside marsh: An *Isolated Waters of Lake County* *wetland* that is within a 10-year *riverine* floodplain and dominated by herbaceous species.

J. Wet prairie: A *wetland* *dominated* by native graminoid species with a diverse indigenous forb component that is seasonally saturated and/or temporarily inundated.

K. *Wetlands* supporting Federal or Illinois endangered or threatened species: For current state-listed species, reference Illinois Endangered Species Protection Board's "Checklist of Endangered and Threatened Animals and Plants of Illinois" and/or contact the Illinois Department of Natural Resources. For Federally-listed species, reference the U.S. Fish and Wildlife Service's "Endangered and Threatened Wildlife and Plants" list (latest edition) and/or contact the U.S. Fish and Wildlife Service.

L. *Wetlands* with a Floristic Quality Index of 20 or greater or a mean C-value of 3.5 or greater: Reference Plants of the Chicago Region (F. Swink and G. Wilhelm, 4th Edition, Indianapolis: Indiana Academy of Science, 1994).

M. *Wetlands* that are within a designated Illinois Natural Areas Inventory Site (INAI).

# Appendix M: SMC-Approved Wetland Mitigation Banking Requirements

A. PURPOSE

This appendix includes the criteria for establishing, owning, and operating *wetland* *mitigation* banks. It further sets out the criteria for authorizing *applicants* (e.g., individuals, corporations, units of government) to withdraw credits from a mitigation bank to offset unavoidable *wetland impacts* that would result from the applicant's proposed activity.

B. GOALS

Mitigation banks are a form of regional *mitigation*, which encourage the development of large-scale *wetland* complexes that can be professionally managed and maintained in perpetuity for the benefit of the general public. The consolidation of multiple small mitigation projects allows for economies of scale in planning, implementation, and maintenance, and can produce wetlands of greater value because of their size and a high level of commitment to long-term management. The expected benefits include water quality management, wildlife habitat restoration and creation, flood control, conservation of biological diversity, education, recreation, and aesthetics. Further, this action will reduce administrative costs and delays in issuing permits for proposed activities that qualify for use of a mitigation bank.

Mitigation banking is intended to be a means of creating or restoring wetlands and generating bank credits in advance of the filling of wetlands for specific projects. As an interim measure, and as a way to encourage the initial development and implementation of banks, the sale of bank credits and the issuance of permits prior to the generation of bank credits at the bank site shall be allowed under conditions described elsewhere in this document.

C. DEFINITIONS

1. Creation: Conversion of a non-wetland site into a *wetland* site by excavation, diking and flooding, or conversion of a deepwater site by filling.

2. Credit Certification: A formal determination by the SMC that *mitigation* bank credits have been generated. Certified credits result from fully meeting all certification standards (see Appendix M: SMC-Approved Wetland Mitigation Banking Requirements, Section O: CREDIT CERTIFICATION). Conditionally certified credits are those credits that are based on reasonable progress towards becoming certified credits. Uncertified credits are those credits that are based on full approval of the bank charter, and initial construction of the bank, including demonstration of *wetland* hydrology and planting. A maximum of 30% of the total potential credits may be sold upon approval of bank charter alone. An additional 20% of the total credits may be sold upon the demonstration of wetland hydrology. Upon completion of the approved planting plan, an additional 20% of the total credits may be sold. Using this formula, 70% of the total credits available from the bank may be sold as uncertified credits.

3. Designated Service Area: The designated service area of an SMC-approved *mitigation* bank is Lake County.

4. Enhancement: Altering the physical characteristics of an existing *wetland* such that it permanently improves one or more specific wetland functions and values. Because impacts associated with individual projects that propose to use bank credits will, in virtually all cases, be permanent, only enhancement that results in permanent improvement of a wetland's functions and values will generate credits.

5. Growing Season: The period between May 1 and October 10. This growing season definition is for the purposes of Appendix M alone, and is used to establish performance periods for determining compliance with revegetation standards. It does not establish the growing season for purposes of *wetland* delineation.

6. Ledger: Document to be used in the accounting of credits and debits. The ledger will be maintained by the bank sponsor and reviewed by the SMC.

7. Management: Actions taken within *mitigation* bank *wetlands* to establish and maintain desired habitat conditions. Representative management actions include water level manipulations, herbiciding, mechanical plant removal, and prescribed burning.

8. Mitigation Bank: A system of accounting for *wetland* loss and compensation, which can include one or more wetland *mitigation* sites. The minimum acreage requirements in this Ordinance shall apply to each site.

9. Mitigation Bank Charter: A written document which contains specifications pertaining to establishment, operation, and maintenance of a *wetland mitigation* bank, codification of the goals, objectives, procedures of the bank, and incorporating the relevant terms and conditions of this Ordinance. Principal types of banking charters are a legally binding agreement or a *Watershed Development Permit*.

10. Mitigation Bank Credits: The unit of measure of bank credit will be acres by *wetland* type.

11. Mitigation Bank Site: The geographic location of created, restored, and enhanced *wetlands*, which serve as the physical resource used to generate bank credits.

12. Monitoring: A specific program of data collection which documents the physical, chemical, and biological characteristics of the *mitigation* bank *wetlands*, for the purpose of determining compliance with performance standards contained in the mitigation bank charter.

13. Phased Mitigation Bank: The construction of a *mitigation* bank in discrete steps, as authorized or agreed to in advance by the SMC. The bank prospectus must clearly describe each phase of the bank, and list the order in which the phases would be constructed.

14. Prospectus: A preliminary plan for a *wetland mitigation* bank prepared by a prospective sponsor and submitted for consideration to SMC.

15. Restoration: Re-establishing *wetland* conditions in areas that were wetland in historical times, but which have been modified such that they are now

considered non-wetland. Restoration converts previous wetland sites back to functional wetlands.

16. Site Development Plan: A plan for each bank site that identifies all actions that will be undertaken to generate bank credits. Representative elements of the site development plan include plans for site grading, revegetation, *erosion* control, structures, management, and monitoring.

17. Sponsor: The legally responsible individual or entity, proposing establishment of a *wetland mitigation* bank.

18. Wetland Mitigation: Replacement of *wetlands*, and wetlands functions and values, for the purposes of compensating for *wetland impacts*. The replacement of the wetland functions and values is generally accomplished through wetland restoration, creation, and enhancement.

D. RESERVED

E. CONSIDERATIONS IN ESTABLISHMENT AND USE OF MITIGATION BANKS

Charters of *mitigation* banks, mitigation sites, and associated *wetland* credits shall be subject to approval by the SMC. Every mitigation bank shall have as its primary purpose the creation, restoration, enhancement, and long-term protection and maintenance of wetland resources. All existing property rights remain in effect.

In all cases of a proposed bank, the SMC will issue a public notice describing the project. The public comment period for submittal of relevant comments on the bank prospectus will be a minimum of thirty (30) days. The *Watershed Development Permit* that is needed in order to construct, restore, or enhance *wetlands* on the bank site will follow normal permit processing procedures.

Operation and maintenance procedures approved by the SMC shall be employed to maintain the wetland resources in the bank in as high a qualitative state as is technically practicable. Management of the mitigation bank shall be based on a monitoring plan approved by the SMC. Monitoring shall include, but shall not necessarily be limited to, monitoring of the water, soil, and plants comprising the wetland assets of the bank. The bank sponsor shall strive to manage the assets to provide multiple wetland benefits such as water quality management, flood control, biological conservation, and educational and recreational opportunities. In general, mitigation banks should be planned and designed such that little or no management or maintenance other than prescribed burning is necessary once the plant communities are established.

F. GENERAL GUIDELINES

Using normal review procedures prescribed by this Ordinance, the SMC will conduct project evaluations and will determine the level of *mitigation* required, and whether a project is eligible to use a mitigation bank.

1. Ideally, *mitigation* banks should be a way of restoring and creating *wetlands* in advance of *development* projects that result in wetland losses. However, to promote the establishment of mitigation banks, this Ordinance provides for limited, incremental sales of uncertified credits, and for the issuance of *Watershed Development Permits* based on uncertified credits according to

the guidelines found in Appendix M: SMC-Approved Wetland Mitigation Banking Requirements, Section P: MITIGATION BANK CREDIT SALES. This provision is considered necessary to increase the economic viability of mitigation banks. Because the development plan for any given bank site may require the sale of a minimum number of credits before wetlands may be restored or constructed, it is recognized that a temporary deficit of wetlands may result. To address this possibility, the SMC will require a higher mitigation ratio for the use of uncertified and conditionally certified credit, and for funds to be maintained in an appropriate financial security to ensure construction of the bank's wetlands. This Ordinance also limits the number of credits that can be sold prior to construction, and prior to conditional certification. It also establishes a maximum amount of time that may elapse before pre-construction credit sales are converted to conditionally certified or fully certified credits.

2. Emphasis will be on the replacement of *wetland* acreage and type. Therefore, the preferred method of generating wetland bank credits will be the restoration of former wetlands or the creation of new wetlands, which will result in a net gain in wetland acreage on the bank site. Permanent wetland enhancement as a means of generating bank credits can be performed as specified in Appendix M: SMC-Approved Wetland Mitigation Banking Requirements, Section N: ESTABLISHING MITIGATION BANK CREDITS. Appropriate functional value assessment methodologies and credit ratios will be determined for each site by the SMC.

3. Mitigation banks generally shall be held to a higher standard of performance than conventional *wetland* *mitigation* sites. These standards are detailed in Appendix M: SMC-Approved Wetland Mitigation Banking Requirements, Section S: PERFORMANCE STANDARDS.

4. Permit applications for *wetland impacts* to *high-quality aquatic resources* generally will not be considered for *mitigation* banking, until the *applicant* has shown compliance with the avoidance and minimization requirements of this Ordinance.

5. The *mitigation* bank, once established, must be dedicated to maintaining the *wetland* functions and values to the exclusion of other conflicting uses, as determined by the SMC.

G. SITE SELECTION CRITERIA

The bank site will be reviewed with respect to the following site selection criteria. Failure to meet any of these criteria may be, depending on circumstances, grounds for rejection of a bank site. The site shall:

1. Be owned and/or under the full control of the bank.

2. Contain a majority of drained or hydrologically modified *hydric soils*, recognizing that restoration of former *wetlands* is a preferred form of *mitigation*.

3. Have no *high-quality aquatic resources* that would be adversely affected by the construction or restoration work.

4. Contain adequate perimeter upland areas to buffer the *wetlands* from potentially incompatible land uses on adjoining parcels and meet the *buffer* requirements of this Ordinance.
5. Be so situated that adequate hydrology can be ensured (e.g., be located on a *floodplain* or possess a high groundwater table).
6. Be proximate or adjacent to public land holdings so as to create contiguous, large-scale habitat areas.
7. Be part of an adopted or accepted open space plan, *watershed* plan, conservancy district, protected riparian corridor, or other local or regional conservation land use plan. This criterion has been established in order to help implement local and regional conservation plans, and to ensure maximum consistency and compatibility with future surrounding land uses.
8. Contain no known hazardous waste, which must be confirmed by an environmental assessment conducted by a qualified person or firm.
9. Have a minimum size of ten (10) acres or five (5) acres if within the Lake Michigan Watershed.

H. BANK OWNERSHIP

A *mitigation* bank may be either publicly or privately owned. The bank may be incorporated as for-profit or not-for-profit. If the bank is incorporated, it must be incorporated in the State of Illinois. Publicly owned refers to ownership of the bank site by any federal, state, regional, or local unit of government.

All land, including associated uplands, which are part of the mitigation bank shall be protected in perpetuity from future *development* by an appropriate *deed or plat restriction*. This deed or plat restriction must be recorded with the Lake County Recorder of Deeds Office, attached to the abstract of title, with a certified copy of the registration provided to the SMC prior to the SMC authorizing the bank. The mitigation bank charter should also identify the entity responsible for the ownership and long-term management of the site. In addition, the bank sponsor is responsible for securing adequate funds for the operation and maintenance of the bank during its operational life, as well as for long-term management of the site. Bank sponsors are strongly encouraged to establish agreements for long-term management with public or private conservation organizations.

Transfer or sale of the mitigation bank may occur to a party willing and financially able to abide by the terms and conditions of the Mitigation Bank Charter entered into by the SMC and the bank owner. Any such transfer must be approved by the SMC.

I. INITIAL PLANNING

The individual or entity proposing to sponsor establishment of a *mitigation* bank will initially hold informal discussions with the SMC. The purpose of these discussions will be to acquaint the sponsor with the legal, regulatory, and ecological background relevant to banking and to provide procedural guidance to the prospective *applicant*.

During this discussion the prospective bank sponsor will be informed that a formal request for the establishment of a bank must be made to the SMC. The formal request will include a prospectus and a *Watershed Development Permit* application, if required. The bank sponsor and the SMC shall develop an authorizing document for the bank that shall be signed by all parties. The authorizing document should outline the responsibilities of the bank sponsor, and contain the necessary information outlined in this Ordinance governing the operation of the bank.

J. PROSPECTUS DEVELOPMENT

The purpose of the prospectus is to provide sufficient information to allow the SMC to determine if the general considerations and site evaluation criteria outlined in this Ordinance are likely to be met if the proposed bank is established. It is understood that the prospectus will become the basis of the mitigation bank charter. The prospectus should contain:

1. The bank location and size;
2. A delineation of any *wetlands* or other jurisdictional areas that may exist at the proposed bank location;
3. The type of real estate interest in bank property;
4. A legal description of the property;
5. The type of bank (i.e., single client, general use, market oriented, etc.);
6. The method of credit production (i.e., restoration, creation, enhancement), the number of proposed credits by each method, and the rationale for crediting;
7. A statement as to compliance with this document;
8. A general site plan showing the location of all existing and proposed *wetland* and upland habitats, roads, trails, structures, utilities, and any other existing or proposed site improvements;
9. An outline of management and maintenance responsibilities;
10. A preliminary construction plan and schedule of completion, preliminary planting plan, and preliminary administrative, management, monitoring, and financial plans; and
11. A charter of incorporation for the *mitigation* bank, if appropriate.

K. FINANCIAL ASSURANCES

The bank sponsor is responsible for securing sufficient funds or other financial assurances to cover contingency actions in the event of bank default or failure. In addition, the bank sponsor is responsible for securing adequate funding to monitor and maintain the bank throughout its operational life, and to make provision for long-term management through financial assurances or through agreements with land management organizations or agencies. Total funding requirements should reflect realistic cost estimates for monitoring, long-term maintenance, contingency, and remedial actions. Financial assurances may be in the form of performance bonds, irrevocable letters of credit, irrevocable

trusts, escrow accounts, casualty insurance, or other approved sureties. Such assurances may be phased out or reduced once it has been demonstrated that the bank is functionally mature and/or self-sustaining in accordance with the approved performance standards. The financial plan must demonstrate that the bank and its *wetlands* can be maintained in perpetuity whether through continual ownership or by conveyance to a public or private agency that will assume the responsibilities of the bank.

L. MITIGATION BANK APPLICATION PROCESS

The sponsor must submit a *Watershed Development Permit* application and a prospectus for the initial development of the bank. Upon receipt of these items the SMC shall begin a public interest review on the prospectus with input from government agencies and the general public. The public will be notified of all proposed banks by a public notice issued by the SMC for a 30-day comment period. Copies of all comments received during the public notice comment period will be given to the bank sponsor. Full consideration will be given to all comments received in evaluating the bank proposal. The bank sponsor and the SMC shall develop an authorizing document for the bank. The authorizing document should outline the responsibilities of the bank sponsor and contain the necessary information outlined in this Ordinance governing the operation of the bank. Additionally, the details of the bank sponsor's responsibilities shall be noted in any Watershed Development Permit in which the permittee's *mitigation* responsibilities are met through the use of the mitigation bank.

SMC shall make a site inspection of the bank area. A written response to the banking prospectus indicating the prospective bank's feasibility would then be prepared by the SMC based upon observations made during the site visit. An indication of feasibility in the letter should be interpreted as general acceptability of conceptual bank plans and either probable issuance of a Watershed Development Permit, or probable signatory approval of a Mitigation Bank Charter upon completion of detailed plans.

The formal request to the SMC for establishment of a bank shall include:

1. A *Watershed Development Permit* application to conduct the proposed work that is necessary to establish the bank;
2. A copy of the previously described prospectus; and
3. A plan that details the goals, objectives, and success criteria for creating *wetlands*, including wetland types and their respective acreages.

M. DETAILED PLANNING STAGE

This is the final planning stage leading to issuance of a *Watershed Development Permit* for authorization, implementation, and operation of a bank. The preparation of detailed plans should be closely coordinated with the SMC and other local authorities as appropriate.

Each *mitigation* bank shall have a site development plan that must be approved by the SMC. This plan shall identify and incorporate the following, to the extent practicable and appropriate:

1. Diverse aquatic and supporting landscapes (e.g., shallow open water, riparian *wetlands*, deep and shallow marshes, floodplain forests, wet meadows and prairies, upland buffers, etc.), which are interrelated, one to the other, so as to maximize wetland functions and values;
2. Diverse wildlife habitats and associated edge conditions;
3. Associated upland *buffer* areas contiguous to the *wetlands* to protect the wetlands from potential adverse effects of adjacent land uses, specifying the width and area of all such zones;
4. *Wetland* functions which will be created or enhanced by maximizing vegetative diversity and abundance, structuring specific wildlife habitats, optimizing wetland hydrology, and providing public access;
5. Species native to the area;
6. The use of native soils on the site;
7. The means for establishing the appropriate hydrology; and
8. The *mitigation* bank shall be designed to be as self-sufficient as possible and minimize maintenance.

N. ESTABLISHING MITIGATION BANK CREDITS

The units of *wetland* credit shall be acres of wetland. Mitigation bank credits shall be generated as wetlands are created, restored, or enhanced on the bank site, resulting in an increase in wetland acreage and/or quality on the bank site. Banking credits may be generated as follows: Full credit will be given for wetland *creation* from upland and for *restoration* of former wetlands. Partial credit (25% of the enhanced wetland acreage) can be given for permanent enhancement (e.g., re-establishment of hydrology) of degraded wetlands. A maximum of 30% of the total potential credits generated by the bank may consist of enhanced wetlands or enhanced uplands.

O. CREDIT CERTIFICATION

Mitigation bank credits shall be certifiable by the SMC when the bank credits conform to the criteria outlined in Appendix M: SMC-Approved Wetland Mitigation Banking Requirements, Section S: PERFORMANCE STANDARDS. Credits may be certifiable at any time, but the standards for certification shall be met no later than five (5) years from the date of planting unless otherwise specified in the bank charter and approved by the SMC. After the second full growing season following creation or restoration of *wetlands*, the SMC may conditionally certify the credits of the bank based on reasonable progress toward achieving the performance standards. Conditional certification shall be based on degree of conformance with the standards for conditional certification in Appendix M: SMC-Approved Wetland Mitigation Banking Requirements, Section S: PERFORMANCE STANDARDS, and on any interim corrective measures recommended by the SMC.

At the end of five (5) years, if any of the above conditions are not met, the authorized agent of the bank shall submit a plan to the SMC outlining corrective measures to be taken based on the ecological conditions of the site.

Management activities shall continue until the standards are met, as verified by the SMC.

Certain types of enhancement of existing wetland can be an acceptable way of generating credits if the enhancement actions are scientifically sound and result in a substantial, measurable, and permanent increase in the level of wetland function. The types of enhancement that will be acceptable include the following:

1. Restoration of *wetland* hydrology at sites that have been significantly modified through tile drainage or ditch drainage.
2. Restoration of diverse native plant communities where the original plant community has been totally destroyed, and the site is currently farmed or has revegetated with aggressive and/or exotic species such as reed canarygrass, cattails, purple loosestrife, phragmites, buckthorn, or other species. Restoration goals would include the removal of the exotic or aggressive species, and the introduction and establishment of a diverse assemblage of native species appropriate for the site considering geographic location, soils, hydrology, and other factors. Selective removal of exotic species in otherwise healthy native plant communities will normally not be considered eligible for credit.
3. Restoration of deep marsh habitat through shallow impoundment, where the purpose is to create hemimarsh conditions suitable for nesting by target *wetland* bird species of concern. This approach is appropriate at sites that have been significantly altered through partial drainage, and consist largely of dense monotypic stands of cattails or other aggressive species. It is not appropriate for sites that have existing biodiversity or habitat values that would be adversely affected by the proposed actions or where the level of benefit would be minimal.

The prospectus must specifically state which aspects of wetland function would be increased as a result of the enhancement actions, the level to which they would be increased, and the scientific basis for expecting the increase. It must also include a narrative description of how the enhancement would be accomplished, a schedule of completion, explicit performance standards, and performance milestones for enhancement actions to be carried out over an extended period of time.

Performance standards for enhancement work will be approved as part of the *Watershed Development Permit*. Actions such as the restoration of hydrology can be implemented in a very short time and can be measured through immediate water level responses. Plant community restoration is a lengthier process, requiring sustained effort over a period of time. In such cases, interim performance milestones may be established, and credits resulting from such work would be included in the final 30% increment of credit released from the bank.

Credit ratios will be determined based on specific circumstances for each bank. Restoration of a historic wetland area or creation of a wetland from an upland area would receive a credit ratio of 100%. Actions that restore a very degraded

wetland to a high degree of function, such as restoring normal hydrology to a drained wetland or restoring a high level of species diversity to a monotypic plant community, shall receive credit at a maximum ratio of 25% of the credit values awarded to restored or created wetlands.

All created, restored, or enhanced wetland areas on the mitigation bank site shall, at a minimum, meet the buffer width requirements of 505.01 of this Ordinance. All existing *high-quality aquatic resources* on the *mitigation* bank site shall, at a minimum, meet the *buffer* width requirements of 505.02 of this Ordinance.

The inclusion of upland and deepwater environments within a wetland mitigation bank may be inadvertent (i.e., due to topographic reasons and real estate considerations) or planned (i.e., to realize or enhance certain wetland functions). In the latter case, upland areas may be either naturally occurring or be artificially created and, depending on their basic purpose, may occur along the periphery of the bank or be dispersed throughout. Enhanced upland areas or enhanced wetland edges used to meet the buffer requirements of this Ordinance for the mitigation bank shall be credited at 25% of the enhanced acreage completed. Created or restored wetland edges used to meet the buffer requirements of this Ordinance for the mitigation bank shall be credited at 75% of the acreage created or restored.

Conditional certification will allow for a reduction of the posted financial security to a level sufficient to assure full certification. Corrective measures will be approved by the SMC prior to implementation. These measures should ensure that the mitigation standard is met at the end of the five-year management period from the day the planting is completed.

During construction of the mitigation wetlands, qualified personnel must make periodic inspections of the site to ensure that soil *erosion* control measures are employed and functioning properly. Inspection reports shall be submitted to the SMC on a monthly basis.

P. MITIGATION BANK CREDIT SALES

Upon authorization of the *mitigation* bank, through a *Watershed Development Permit*, the sale of *wetland* credits and the *creation* or *restoration* of wetlands and *buffers* may commence. The mitigation bank credits may be sold for mitigation purposes in accordance with the following conditions:

1. Certified credits and conditionally certified credits may be sold provided that adequate funds, as approved by the SMC, are established through an escrow account, performance bond, irrevocable letter of credit, or other financial surety for the generation of certified credits and long-term maintenance of the bank site.

2. If an approved bank has only uncertified credits, then those uncertified credits may be sold for *mitigation* purposes, provided that adequate funds, as approved by the SMC, are established through an escrow account, performance bond, irrevocable letter of credit, or other financial surety for the generation of credits and long-term maintenance of the required bank site.

3. The SMC has sole authority to determine the number of credits available for withdrawal from the *mitigation* bank.
4. All *mitigation* bank credit sales shall require prior approval by the SMC to confirm credit availability and compliance with all other applicable provisions of this Ordinance.

In every event, the mitigation bank sponsor shall establish in a performance bond, escrow account, irrevocable letter of credit, or other financial surety, adequate funds to ensure the construction, planting, and long-term monitoring, management, and maintenance of the mitigation bank *wetlands* and associated uplands. The amount of the financial surety shall be based upon the calculated per acre cost of completing the approved plan, including grading and planting of the site. Cost estimates for the construction and/or planting and maintenance for all restored, created, or enhanced wetlands in the bank must be presented. A proposed schedule of release of the financial surety following completion of specific tasks associated with the establishment of the bank must also be submitted for approval. Construction estimates shall include an estimate of the cubic yards of earth to be moved during the grading of the site, as well as an estimated cost per cubic yard for the earthwork.

The interest on all such escrow accounts may be used by the bank sponsor for monitoring, management, and maintenance purposes only. The financial sureties must be maintained until all credits have been certified and sold or the SMC has determined the mitigation bank is self-sustaining. The amount of the financial surety will be reviewed annually based on the results of the monitoring report.

For all mitigation banks, credit sales may commence upon approval of the bank's charter. A maximum of 30% of the total potential credits may be sold prior to construction, based on approval of the bank's charter and the posting of adequate financial surety. Upon acceptance by the SMC that appropriate wetland hydrology has been demonstrated throughout all proposed wetlands at the site, an additional 20% of the total credits may be sold. Upon acceptance by the SMC that the site has been planted according to the approved plan, and after wetland hydrology has been demonstrated, another 20% of the total credits may be sold. The final 30% of the total credits may be sold upon full certification.

Incremental demonstration of wetland hydrology and incremental planting of the site may also be awarded credit. For example, peizometer data from a 50-acre wetland restoration area shows that 37 acres of the planned wetland meets the wetland hydrology criterion of the 1987 Federal Wetland Delineation manual (as amended, including applicable supplements).

These 37 acres represent 74% of the proposed wetland area. By applying this 74% factor to the allowable 20% increment of credits awarded for demonstrating wetland hydrology, the allowable increment of new credits for the bank would equal 14.8% of the proposed wetland on the site (0.74 X .20 = 0.148, or 14.8%). The same method would be used for calculating credits due to incremental planting. In the event that the bank sponsor sells more than the number of credits approved by the SMC, the SMC reserves the right to deduct

the amount of the oversale from the total potential credits available from the bank. These credits will not be restored, even if future development of the bank results in the certification of additional credit sales.

No Watershed Development Permits will be granted to *applicants* proposing to use a mitigation bank unless credits are available in the bank, as specified in this Ordinance.

The initial physical and biological improvements at the bank site (including, but not limited to, grading, planting, and restoration of wetland hydrology) must be completed no later than the end of the third full growing season following the sale of the first mitigation bank credit.

The bank sponsor shall keep a ledger of all available credits, whether purchased or unpurchased, and of all credits sold or otherwise debited including individual sale prices. This ledger shall be made available to the SMC upon request. In addition, the bank sponsor must provide the SMC an updated ledger containing a list of all transactions, including sale prices at a given bank to date at the conclusion of every credit sale.

Q. MONITORING, MANAGEMENT, AND REPORTING

Monitoring shall occur for a period of five (5) years from the date of the completion of the approved planting plan. Management shall proceed on a continuing basis from the completion of planting through the end of the monitoring period. Management shall proceed as needed to reconcile current conditions with functional goals. Any required remedial measures will be based on information contained in monitoring reports and/or from SMC site inspections.

The monitoring results of the *mitigation* bank shall be provided to the SMC on an annual basis during the monitoring period. Following this, no report shall be required, but the SMC shall retain the right to *inspect* the mitigation bank as deemed appropriate. The SMC shall hold on file copies of any reports. The SMC will establish an annual compliance monitoring schedule that assures that all mitigation bank sites are inspected for compliance with the approved bank plan.

The mitigation bank sponsor shall be responsible for all monitoring, management, and reporting. However, the work may be done by bank employees, subcontractors, or public or private organizations.

The operational life of a bank shall consist of the period during which the terms and conditions of the mitigation bank charter are in effect. With the exception of arrangements for the long-term management and protection in perpetuity of the *wetlands* and/or other aquatic resources and associated uplands, the operational life of a mitigation bank terminates at the point when:

1. Wetland mitigation credits have been exhausted or banking activity is voluntarily terminated with written notice from the bank sponsor to the SMC; or
2. The SMC has determined that the debited bank is functionally mature and/or self-sustaining to the degree specified in the mitigation bank charter

and associated documents, including the performance standards outlined in this Ordinance.

R. LOSS OF BANK CHARTER

Should a bank not meet the terms of its charter, for whatever reason, the SMC shall inform the bank sponsor and shall specify a reasonable period of time in which to comply. Should any modifications to the charter be required, recommended changes shall be approved by the SMC. Continued non-performance of the bank shall result in revocation of the charter and forfeiture of financial securities.

S. PERFORMANCE STANDARDS

The following performance standards are established to ensure that *mitigation* banks create *wetlands*, which compare favorably with moderate to high quality *natural* wetlands with respect to diversity, abundance, and distribution of plant species, and also to ensure that the created wetlands exhibit the hydrologic regimes of natural wetlands. These standards will be used to measure the performance of mitigation banks unless otherwise stated in the mitigation bank charter. The bank sponsor may propose other standards if native plant restoration is not the primary goal of the mitigation bank. For example, wildlife habitat enhancement goals may require the development of alternative standards based on habitat structure such as the interspersion of open water and cattails, or the seasonal establishment of mud flats. Justification for alternative standards must be provided in the bank prospectus. The SMC retains approval authority for any performance standards proposed which are different from those contained in this Ordinance.

Species Composition: Species selected for the planting shall be native to Lake County (ref. Swink and Wilhelm, Plants of the Chicago Region, 4th Edition, 1994), and shall be appropriate for the hydrologic zone to be planted. A minimum number of native perennial species proposed for establishment must be present within each plant community to meet certification standards, as follows:

Marsh - minimum of 15 native perennial species

Sedge meadow/wet prairie - minimum of 35 native perennial species

Mesic prairie (buffer) - minimum of 25 native perennial species

In addition, at least 50% of the required minimum number of species must occur at a 10% frequency or greater.

Species Dominance: The following dominance standards are for wetland mitigation banking purposes only. Dominance shall be determined by calculating importance values, with at least two parameters, frequency and cover, used to calculate species importance. Cattails (*Typha* spp.), reed canary grass (*Phalaris arundinacea*), and non-native species shall cumulatively comprise not more than 5% of the total dominance measure for each community for which credit is granted.

The native perennial species within each wetland plant community shall represent at least 80% of the total dominance measure.

Wetland Hydrology: Wetland hydrology must be independently demonstrated within each wetland for which credit is sought from data gathered from peizometers placed throughout the bank site. Peizometer placement must be approved by the SMC prior to approval of the bank.

Conditional Certification: Credits shall be conditionally certified not sooner than the second full growing season after planting, based upon achieving the following standards:

75% of the minimum number of native perennial species required for full certification shall be present in each plant community.

The total of native perennial species within each plant community shall represent at least 15% of the total dominance measure.

# Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts

## INTRODUCTION

This Appendix contains the minimum requirements and guidelines for preparation of a Project Mitigation Document (PMD) related to the creation or enhancement of *wetlands* on a *development* site, or on an off-site property, to meet the *mitigation* provisions in §1007 Mitigation for Isolated Waters of Lake County of this Ordinance. These provisions do not apply for Category IV (1005.01A.4) impacts to *Isolated Waters of Lake County*. The PMD shall provide, at a minimum, information needed by SMC or an Isolated Wetland Certified Community (IWCC) to evaluate the appropriateness and enforceability of a proposed mitigation plan. Additional requirements may apply for impacts to *Waters of the United States*, as determined by the U.S. Army Corps of Engineers. For the purposes of Appendix N, the term *mitigation site* refers to the ownership parcel where the mitigation is to occur. *Mitigation area* refers to the location within the mitigation site where the actual mitigation will occur.

Each PMD shall include specific information in a standard format as outlined in Table 1 and described in Appendix N, Sections A-K.

**Table 1 – Standard Format for PMD**

| Section | Topic |
|---|---|
| A | Mitigation Goals |
| B | Mitigation Site Information |
| C | Mitigation Design |
| D | Deed or Plat Restriction |
| E | Construction Schedule |
| F | Financial Assurance |
| G | As-Built Plans |
| H | Performance Standards |
| I | Monitoring and Management |
| J | Reports |
| K | Compliance and Completion |

A. MITIGATION GOALS

1. Discuss how the *wetland* *mitigation* shall duplicate or improve the hydrologic and biologic features of the impacted wetlands. Describe the specific functions of the wetlands to be created or enhanced versus the functions of the wetlands to be impacted.

2. Describe the acreage and vegetative community type of wetlands and wetland *buffers* to be created or enhanced to meet the minimum mitigation ratios required in 1007.02 of this Ordinance. Mitigation acreage shall be credited on the following basis:

   a. 100% for each acre of wetland created or restored. For the purposes of Appendix N, wetland creation includes restoration of historic wetlands which have been filled, drained, or otherwise manipulated to the extent the areas no longer exhibit wetland characteristics. Open water creation shall be credited at 100% for in-kind mitigation (e.g., one (1) acre of open water created for one

(1) acre of open water impacted). No mitigation credit shall be given for open water creation to compensate for non-open water impacts.

b. 25% for each acre of non-*farmed wetland* enhanced after a minimum ratio of 1:1 for wetland creation to *wetland impact* is achieved.

c. Enhancement of farmed wetlands meeting the size criterion in 1007.03A of this Ordinance may be used for up to 80% of the total mitigation requirement (e.g., if 2.0 acres of mitigation are required, up to 1.6 acres may be credited for farmed wetland enhancement, as long as the size criterion above is met).

d. Enhanced upland areas or enhanced wetland edges used to meet the buffer requirements in §505 Buffer Areas of this Ordinance shall be credited at 25% for each acre enhanced. Created or restored wetland edges used to meet the buffer requirements of this Ordinance shall be credited at 75% for each acre created or restored. All high-quality aquatic resources existing on the mitigation site shall, at a minimum, meet the buffer requirements for high quality aquatic resources; all other existing enhanced, created, or restored wetland areas shall, at a minimum, meet the non-high-quality aquatic resource buffer requirements of this Ordinance.

B. MITIGATION SITE INFORMATION

1. Site Location

Identify the mitigation site on a general location map (USGS quadrangle map preferred), plat of survey, and major *watershed* map (e.g., Fox River Watershed).

2. Physical Description

Describe the physical characteristics of the mitigation area. Provide information to support the mitigation site selection, including, but not limited to: wetland determination report meeting the requirements in §1000 Wetland Delineation of this Ordinance, NRCS-certified wetland determination (for agricultural land), topographic map with a minimum of 2-foot contour lines, recent and historic aerial photographs, current site photographs, *drain tile* information, USGS hydrologic atlas, *FEMA* flood insurance rate map and *base flood elevations* as required by this Ordinance, and SCS soil survey map and soil unit descriptions.

3. Land Use

Describe the past and current land use(s) of the mitigation site parcel. Submit a plan at a minimum scale of 1 in.=100 ft. showing the existing land use(s) and pertinent features, such as *buildings*, roads, utility lines, drain tiles, culverts, landscaping, lot lines, etc. Include on the plan or provide a narrative of any adjacent land uses that could conflict with the mitigation proposal and any zoning restrictions. Discuss potential adverse impacts to the mitigation site, including stormwater runoff from adjacent properties or nearby *development* in the watershed. Include a copy of the current zoning map and comprehensive land plan showing proposed land use(s), roads, and trail systems.

4. Ownership

Identify the current owner(s) of the mitigation site property. If the owner is different from the permittee, provide the SMC or IWCC with a copy of an executed agreement between the owner(s) and permittee that grants permission by the owner(s) for the permittee to use the property for mitigation and specifies the responsibilities of each party for establishment of the mitigation site. Once mitigation is in place, the permittee shall notify the SMC or IWCC of any change in ownership. The new owner(s) shall provide written assurance to the issuer of the Watershed Development Permit of the transfer of the permit and intent to comply with the terms and conditions of the permit, specifically the mitigation plan.

5. Significant Biological Resources

   The permittee shall consult with the Illinois Department of Natural Resources (IDNR) and the U.S. Fish & Wildlife Service (USFWS) regarding the possible presence of threatened or endangered species or critical habitat on the mitigation site. The SMC or IWCC shall not approve the mitigation area until documentation is provided confirming the proposed mitigation area is in compliance with the IDNR's Endangered Species Consultation Program and the Illinois Natural Areas Preservation Act [520 ILCS 10/11] and [525 ILCS 30/17] and the USFWS' consultation program under the federal Endangered Species Act.

C. MITIGATION DESIGN

1. Topography

   If grading is proposed, submit a grading plan at a minimum scale of 1 in.=100 ft. showing existing and proposed grades with a minimum of 1-foot contour lines. Identify elevation and location of reference benchmarks. Include cross-sections for the mitigation wetlands with normal water level (NWL) and high water level (HWL) depicted, if applicable.

2. Hydrology

   Identify the source(s) of water for the mitigation wetlands, both surface and subsurface. Describe any water control structures to be used and identify these structures on the grading plan, with invert elevations. Control structures with adjustable inverts are recommended to facilitate management of desired water levels in the mitigation wetlands. Describe the expected hydrologic regime of the mitigation wetlands. Provide hydrologic modeling results in both summary table and hydrograph form for the 2-year and 100-year, 24-hour storm events, at a minimum, to support the expected hydrologic regime of the mitigation wetlands. Verify that the mitigation design will not adversely impact the hydrology of existing on-site or nearby wetlands.

   Discuss factors influencing the quality of stormwater runoff from on-site and off-site sources (e.g., roads, lawns, parking lots, etc.) and incorporate best management practices (BMPs) into the design to treat runoff before it discharges into the wetlands. Identify the BMPs on the grading plan.

   Stormwater detention basins shall not be used for creation of wetlands to meet the wetland mitigation requirements of this Ordinance in §1007 Mitigation for Isolated Waters of Lake County.

3. Soils

   A minimum of twelve (12) inches of suitable rooting medium shall be provided on the mitigation wetlands and wetland buffer areas. Use low ground pressure equipment to minimize soil compaction. Include information about whether topsoil will be imported from off-site.

   If the mitigation site contains a drained hydric soil, include the SCS soil map unit description and describe the drainage system (e.g., *drain tile*, ditches, channels, etc.). The drainage system shall be shown on the grading plan. Verify the hydric soil map unit by digging a 30-inch deep soil pit in a representative location of the map unit and write a detailed profile description of the soil, including horizons, soil colors using Munsell color charts, and soil texture and structure. Examine the soil profile for the presence of redoximorphic features such as iron/manganese accumulations, oxidized rhizospheres, mottles, and depleted zones. Record the type, relative abundance, location, and color of these features. Record other evidence of soil wetness such as the accumulation of partially decomposed organic matter at the soil surface.

4. Planting Plan

   Submit a plan at a minimum scale of 1 in.=100 ft. depicting the location and acreage of each wetland and wetland buffer community type to be established. This plan shall also be used as the base map to show the locations of the vegetation monitoring transects and hydrology sampling points discussed in Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts, Section I: MONITORING AND MANAGEMENT. Provide the list of plants to be established in community by common and scientific name, along with the seeding or planting rate for each species. Seed and plant stock source(s) shall originate from within 150 miles of the mitigation site to maintain local genotypes.

D. DEED OR PLAT RESTRICTION

All mitigation wetlands, as well as other preserved wetlands or waters and wetland buffers on the mitigation site, shall be protected in perpetuity by a *deed or plat restriction*. The permittee shall provide the SMC or IWCC with a draft copy of the proposed deed or plat restriction document and associated exhibit(s) showing the restricted areas for approval. Contact the SMC for example wetland and wetland buffer restrictive language.

E. CONSTRUCTION SCHEDULE

Provide a schedule with anticipated start date and duration for each phase of the mitigation site construction, including installation of soil *erosion* and sediment control measures, earthwork, and planting.

F. FINANCIAL ASSURANCE

The permittee shall provide the SMC or IWCC with a financial surety for 110% of the total estimated cost for construction, monitoring, and management of the mitigation wetlands and wetland buffers. The amount of the financial surety shall be based upon the wetland consultant's detailed cost estimate for completing the approved mitigation

plan, including earthwork, planting, and monitoring and management for a minimum of five (5) full growing seasons after planting is completed. The cost estimate shall be provided to the SMC or IWCC for approval prior to obtaining the financial surety. The financial surety may be in the form of a performance bond, irrevocable letter of credit, irrevocable trust, escrow account, casualty insurance, or other approved surety.

The financial surety shall be held by the SMC or IWCC until the mitigation site meets the performance standards in Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts, Section H: PERFORMANCE STANDARDS. Such surety may be phased out or reduced by the SMC or IWCC once it has been demonstrated that the mitigation site is functionally mature and/or self-sustaining in accordance with the performance standards in Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts, Section H: PERFORMANCE STANDARDS.

G. AS-BUILT PLANS

1. Upon the completion of earthwork, but prior to planting, the permittee shall provide an as-built topographic map to the SMC or IWCC for approval. The as-built map shall depict the constructed grades at a minimum of 2-foot contour intervals, along with spot elevations, and the invert elevations of all water control structures. The benchmark(s) used to establish the grades shall also be indicated on the plan. If the constructed grades and invert elevations are not in conformance with the approved grading and utility plan, the permittee shall be responsible for regrading or reinstalling the water control structures at the designed elevations to comply with the approved plan. If the as-built plan and site inspection are determined to be in conformance with the approved design, the SMC or IWCC shall issue a written approval of the as-built plan and planting activities may commence.

2. Upon the completion of planting activities, the permittee shall provide the SMC or IWCC with lists of the species actually planted in the mitigation wetlands and wetland buffers, including the common and scientific name of each species, the quantity of each species planted (e.g., weight of seeds/acre, number of plugged plants/acre), the source of the seeds/plants, the planting method(s) used, and the date(s) seeding or planting occurred.

H. PERFORMANCE STANDARDS

Performance standards are predetermined criteria for guiding and measuring mitigation success.

1. Performance Period

The performance period shall consist of a minimum five (5) years at which time the vegetation performance standards are met, unless the vegetation performance standards can be met earlier for two (2) consecutive growing seasons, at which time the performance period shall be considered complete. Conversely, the performance period may be required to be longer than five (5) years in order to meet the vegetation performance standards if they haven't been met after the standard five-year time frame.

2. Wetland Vegetation Performance Standards

The performance standards below apply to emergent, wet prairie, and sedge meadow communities. If other community types are proposed (e.g., aquatic, forest, etc.), the permittee shall submit proposed performance standards for each community to the SMC or IWCC for approval.

a. Floristic Quality: By the end of the performance period, a native mean coefficient of conservatism value (native mean C value) of greater than or equal to 3.5 and a native floristic quality index value (FQI) of greater than or equal to 20 shall be achieved for each wetland community. Native plant species coefficients of conservatism and the methods for calculating the native mean C value and FQI are included in Swink, Floyd and Gerould Wilhelm, Plants of the Chicago Region (Indianapolis: Indiana Academy of Science, 4th Edition, 1994).

b. Mean Wetness Coefficient: By the end of the performance period, the mean wetness coefficient (mean W) shall be less than or equal to 0 in each wetland community. Wetness coefficients are listed below, based on the National Wetland Category of each plant species designated in Reed, Porter B., National List of Plant Species that Occur in Wetlands: North Central (Region 3), U.S. Fish Wildlife. Service. Rep. 88(26.3, 1988). The mean W for each wetland community is calculated by the following equation: Sum of wetness coefficients for all species/number of species.

**Wetness Coefficients**

| *National Wetland Category* | *Wetness Coefficient* |
|---|---|
| Obligate (OBL) | -5 |
| Facultative Wetland + (FACW+) | -4 |
| Facultative Wetland (FACW) | -3 |
| Facultative Wetland - (FACW-) | -2 |
| Facultative + (FAC+) | -1 |
| Facultative (FAC) | 0 |
| Facultative - (FAC-) | 1 |
| Facultative Upland - (FACU-) | 2 |
| Facultative Upland (FACU) | 3 |
| Facultative Upland + (FACU+) | 4 |
| Upland (UPL) | 5 |

c. Vegetative Cover: By the end of the performance period, no area greater than one hundred (100) square feet within the created or enhanced wetlands shall be devoid of vegetation, as measured by percent areal coverage. Areas not meeting this standard shall be re-planted.

d. Invasive Species Dominance: By the end of the performance period, none of the three *dominant* plant species in the emergent, wet prairie, or sedge meadow communities shall be non-native or weedy species, including, but not limited to, the following species: *Typha* spp., *Phragmites australis, Poa compressa, Poa pratensis, Lythrum salicaria, Salix interior, Echinochloa crusgalli,* or *Phalaris arundinacea*. Dominance shall be based on the relative

importance value (RIV) of each species, which is calculated by the following equation:

RIVs = [RFs + RCs] / 2 x 100, where:

RIVs is the relative importance value of the individual species in the community,

RFs is the frequency of the individual species occurring in all quadrats/the total frequency of all species (adventive and native) occurring in all quadrats, and

RCs is the coverage of the individual species occurring in all quadrats/the total coverage of all species (adventive and native) occurring in all quadrats.

3. Wetland Buffer Vegetation Performance Standards

The performance standards below apply to the prairie community to achieve mitigation credit. If other community types are proposed for the wetland buffers (e.g., forest, savanna, etc.), the permittee shall submit proposed performance standards for each community to the SMC or IWCC for approval.

a. Floristic Quality: By the end of the performance period, a native mean coefficient of conservatism value (native mean C value) of greater than or equal to 2.5 and a native floristic quality index value (FQI) of greater than or equal to 15 shall be achieved for the buffer.

b. Vegetative Cover: By the end of the performance period, no area greater than one hundred (100) square feet within the created or enhanced mesic prairie buffers shall be devoid of vegetation, as measured by percent areal coverage. Areas not meeting this standard shall be re-planted.

c. Invasive Species Dominance: By the end of the performance period, none of the three dominant plant species in the mesic prairie buffer community shall be non-native or weedy species, including, but not limited to, the following species: *Cirsium arvense, Melilotus* spp., *Alliaria petiolata, Poa compressa, Poa pratensis, Ambrosia artemisiifolia,* or *Rhamnus cathartica* and *R. frangula*. Dominance shall be based on the relative importance value (RIV) of each species, which is calculated using the equation in Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts, Section H.2.d.

I. MONITORING AND MANAGEMENT

1. Monitoring

a. Monitoring Plan: The PMD shall contain a proposed five-year monitoring plan. Such plan shall include, at a minimum, a description of the sampling methodologies to be followed for evaluating hydrology in the mitigation wetlands and assessing vegetation in the mitigation wetlands and buffers, the frequency of sampling, and the report(s) to be generated.

b. Vegetation Monitoring: A sufficient number of straight-line sampling transects shall be established in the mitigation wetlands and wetland buffers to achieve a representative amount of plant frequency and coverage data. The beginning and end points of each transect shall be monumented in the field with a metal

stake. The location of each transect and the number of proposed quadrats per transect shall be accurately identified on the Planting Plan (Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts, Section C.4), which shall be included in the annual monitoring reports. Each transect shall consist of a series of sample quadrats either 0.25 or 1.0 square meter in size. Vegetation sampling shall be conducted by, or under the supervision of, a Certified Wetland Specialist twice during the growing season with at least one month between sampling dates (e.g., May/June and August/September). Vegetation sampling shall include the following, at a minimum:

1. Record the number and estimated percent areal coverage of each vascular plant species in each quadrat, including all non-native (adventive) taxa and native taxa. Use this data to perform the calculations in Appendix N, Section I.1.b.(2) through (4). Photograph each end of the transect at the time of sampling.
2. Calculate the native mean C value, FQI, and mean wetness coefficient for each quadrat.
3. Calculate the native mean C value, native FQI, and mean wetness coefficient for each transect.
4. Calculate the RIVn of total native species by the following equation:

RIVn = [RFn + RCn] / 2 x 100, where:

RIVn is the relative importance value of the total native species in the community,

RFn is the total frequency of the native species occurring in all quadrats/the total frequency of all species (adventive and native) occurring in all quadrats, and

RCn is the total coverage of the native species occurring in all quadrats/the total coverage of all species (adventive and native) occurring in all quadrats.

c. <u>Hydrology Monitoring</u>: A sufficient number of representative sample points shall be established in each mitigation wetland to assess the hydrologic conditions. The sample points shall be monumented in the field with a metal stake. The location of each sample point shall be accurately identified on the Planting Plan (Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts, Section C.4), which shall be included in the annual monitoring reports. At a minimum, hydrology monitoring shall be conducted on a bi-weekly basis during the first growing season and on a monthly basis during each succeeding growing season of the monitoring period. Hydrology sampling shall include the following, at a minimum:

1. Depth of inundation (in. or cm.) based on NAVD 88 datum, which supersedes the NGVD29 datum used prior to September 18, 2013, and
2. Soil moisture condition to a minimum depth of 12 in. (e.g., saturated, moist, dry).

2. Management

   a. Management Plan: The PMD shall contain a proposed five-year management plan. Such plan shall include a description of the anticipated management practices to be employed each year to meet the performance standards in Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts, Section H: PERFORMANCE STANDARDS, and a schedule of all proposed management practices (i.e., a calendar indicating month and year of activity). In addition, the plan shall identify the entity to assume responsibility for long-term management of the mitigation wetlands and wetland buffers after the performance period and the dedicated source of funding for long-term management. At completion of the performance period, the SMC or IWCC shall require a written agreement between the permittee and the entity identified for long-term management.

   b. Management Practices: Describe the methods and equipment to be used for each proposed management practice (e.g., prescribed burning, control of invasive plant species by herbicide application or hand removal, mow management, etc.). List all permits or certifications/licenses required for the proposed management practices (e.g., IEPA open burn permit, local fire department permits, IDOA herbicide applicators license, etc.). Personnel who perform the management activities shall have appropriate licenses and qualifications.

J. REPORTS

At a minimum, an annual report prepared by, or under the supervision of, a Certified Wetland Specialist summarizing the results of the previous year's monitoring data shall be submitted to the SMC or IWCC by January 31st of the following year. The annual reports shall contain, at a minimum:

1. A narrative summary of the vegetation and hydrology monitoring data;
2. A discussion of the progress of native vegetation establishment relative to the performance standards in Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts, Section H: PERFORMANCE STANDARDS;
3. An appendix containing the monitoring data;
4. Photographs of the sample transects and panoramic views of the mitigation wetlands and buffers;
5. A narrative summary of the management practices employed during the previous year and photographs documenting these activities;

6. Recommendations for proposed management practices to be employed during the following year(s), based on the monitoring results to date; and
7. The proposed schedule for management practices in the following year(s).

K. COMPLIANCE AND COMPLETION

1. Responsible Parties

   The permittee shall be responsible for establishment of the mitigation wetlands and wetland buffers and all associated monitoring and management activities for the performance period. The permittee shall take corrective measures as necessary to meet the performance standards in Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts, Section H: PERFORMANCE STANDARDS, within the performance period.

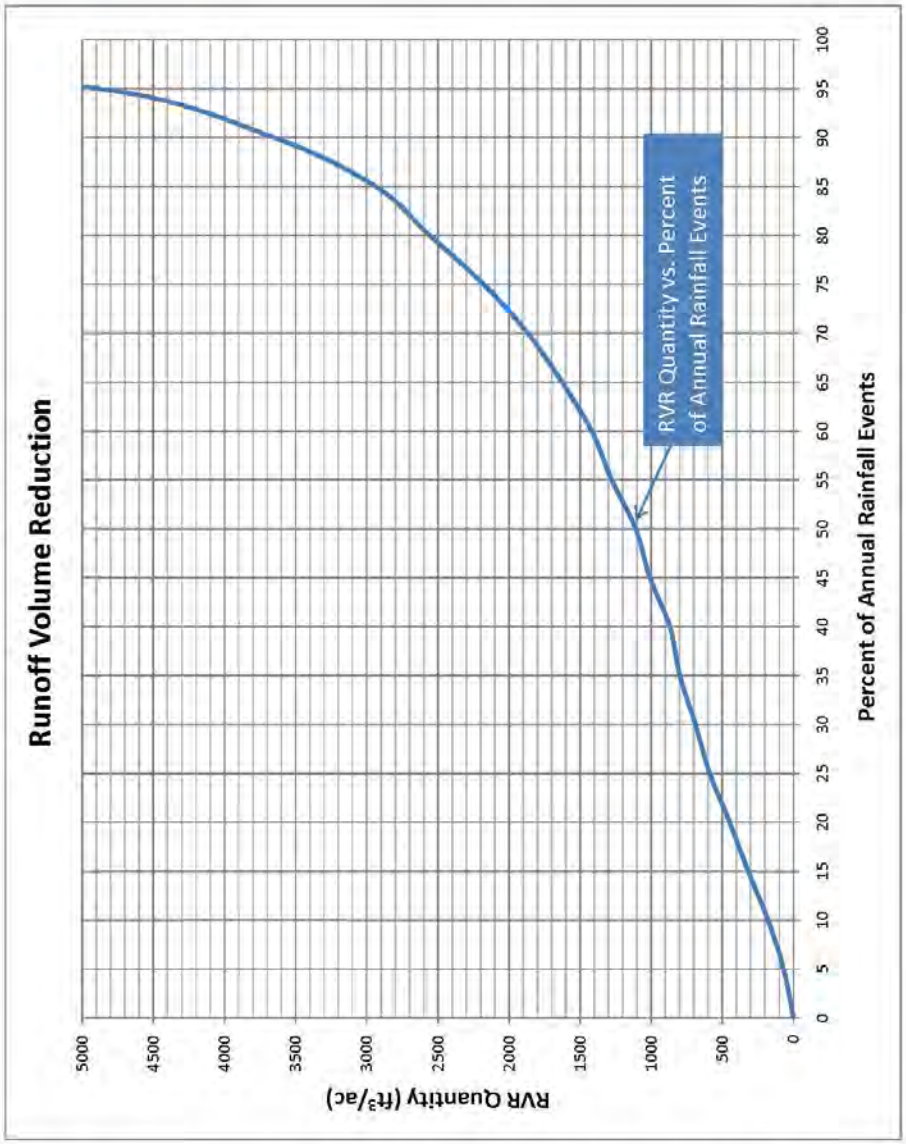
   After the performance period, the entity identified for long term management shall assume long-term management for the mitigation wetlands and wetland buffers. The permittee's responsibility for the mitigation wetlands and wetland buffers shall be released in writing by the SMC or IWCC.

2. Notification

   After the performance period, the permittee shall provide written notification to the SMC or IWCC, along with following information: 1) a scaled plan (min. 1 in. = 100 ft.) showing the delineated boundaries and actual acreages of the mitigation wetlands and wetland buffers; and 2) a summary of how the performance standards have been met for each wetland and buffer. Upon notification, the SMC or IWCC shall review the submitted information and perform a site inspection to evaluate the success of the mitigation site. If the mitigation goals and performance standards have been met, the SMC or IWCC shall notify the permittee in writing that the permittee's responsibility for the mitigation site is released. A copy of the written release shall be provided to the entity designated for long-term management of the mitigation site.

   If the SMC or IWCC determine that the mitigation goals or performance standards have not been met based on the information submitted and site inspection, the SMC or IWCC shall notify the permittee in writing of the specific shortfalls. The permittee shall be granted a specified time limit to respond to the identified shortfalls. Failure to fully respond to the identified shortfalls within the specified time limit may result in SMC or IWCC use of the mitigation surety to correct the shortfalls.

# Appendix O: Runoff Volume Reduction




| Percent of Annual Rainfall Events | 100% impervious values | |
|---|---|---|
| | Runoff Depth (in) | RVR Quantity $ft^3$/ac new impervious |
| 0 | 0 | 0 |
| 5 | 0.02 | 70 |
| 10 | 0.05 | 180 |
| 15 | 0.09 | 320 |
| 20 | 0.12 | 450 |
| 25 | 0.16 | 590 |
| 30 | 0.19 | 690 |
| 35 | 0.22 | 800 |
| 40 | 0.24 | 870 |
| 45 | 0.28 | 1010 |
| 50 | 0.30 | 1110 |
| 55 | 0.35 | 1280 |
| 60 | 0.39 | 1420 |
| 65 | 0.45 | 1630 |
| 70 | 0.51 | 1870 |
| 75 | 0.60 | 2180 |
| 80 | 0.70 | 2560 |
| 85 | 0.81 | 2940 |
| 90 | 1.01 | 3660 |
| 95 | 1.35 | 4900 |
| 99 | 2.41 | 8760 |

Runoff Depth based on Figure 3 of the Center For Watershed Protection Report.

Runoff Depth = P*R where:

P = Rainfall Depth (inches)

R=Volumetric Runoff Coefficient = 0.95 for 100% impervious cover [0.05+.009(I)], where I is 100% (impervious cover)]

RVR Quantity = Runoff Depth (in) / 12 (in/ft) * 43560 ($ft^2$/ac)