


Kane County Stormwater Ordinance Revisions



General Overview

**Qualified Review Specialists
January 22, 2020**

Topics to be Covered

- Website Changes and pdf Resources for Communities/Reviewers
 - “Triggers” chart and Technical Manual examples
 - Offsite Outfall and 48 hour calculation
 - Detention Storage Facility Changes – Flowcharts
 - BMP’s & Watershed Benefit Measures
 - Small but Significant
- 

Questions??

We will take questions at the end of the presentation if there is time before the plastic pipe meeting from 2:00-3:00.

Cards are available in the back of the room if you have specific questions about the application of a project to the revised Ordinance. Typically, those are more detailed questions that need to be addressed on a one on one basis.

General topic questions written on the cards or emailed after the meeting will be provided with responses in a memo along with the slides to all Certified Community reviewers.

Website Resources

The screenshot shows a web browser window with the URL countyofkane.org/FDER/Pages/environmentalResources/waterResources/stormwater.aspx. The page header includes the Kane County logo and the text "KANE COUNTY, ILLINOIS ESTABLISHED JANUARY 16, 1836". A navigation menu contains links for Government, A-Z Services, Business, Communities, Calendar, Maps, and Employment. The main content area features a sidebar with menu items: Environmental Resources, Water Resources, Floodplain Information, Local Drainage Improvements, Stormwater Management & Permitting (highlighted), Watershed Planning & Special Projects, Water Supply Planning, and Electronic Payments. The main content is titled "Stormwater Management & Permitting" and includes a paragraph about Kane County's role in administering the stormwater management ordinance. A list of links provides access to various documents and resources. A "Learn More About the Stormwater Ordinance Update" button is also present. The footer contains contact information, a "Using This Site" section with links to FOIA, Document Library, Ethics Advisor, and Website Policies, and an "Alerts" section with links to Emergency Alerts, Health Alerts, Traffic Alerts, and Code Red. The Windows taskbar at the bottom shows the date as 1/14/2020 and the time as 4:21 PM.

Web.Kane - Home | Pages - Environmental Resources

countyofkane.org/FDER/Pages/environmentalResources/waterResources/stormwater.aspx

KANE COUNTY, ILLINOIS
ESTABLISHED JANUARY 16, 1836

Google Custom Search

Select Language

Government | A-Z Services | Business | Communities | Calendar | Maps | Employment

Environmental Resources

Water Resources

Floodplain Information

Local Drainage Improvements

Stormwater Management & Permitting

Watershed Planning & Special Projects

Water Supply Planning

Electronic Payments

Stormwater Management & Permitting

Kane County Environmental and Water Resources is responsible for administering and enforcing the Kane County Stormwater Management Ordinance. This is done through the review and permit process for various construction activities.


- [Kane County Stormwater Management Ordinance](#)
- [When is a Stormwater Permit Required? Worksheet](#)
- [Stormwater Permit Packet](#)
- [Wetlands Impact and Mitigation Permit Worksheet and Application](#)
- [Kane County Stormwater Technical Manual - DRAFT](#)
- [Kane County Stormwater Management Plan](#)
- [Certified Communities Stormwater Contacts](#)
- [Drainage Districts in Kane County](#)
- [Exempt Projects from June 1, 2019 Revisions](#)

Learn More About the Stormwater Ordinance Update

Qualified Review Specialists (QRS)

[Qualified Engineer Review Specialist Listing \(QERS\)](#)
[Qualified Wetland Review Specialist Listing \(QWRSL\)](#)
[Appendix B: Qualified Engineer Review Specialist Statement](#)
[Appendix C: Qualified Wetland Review Specialist Statement](#)

CONTACT

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Geneva, IL 60134
630-232-3400

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USING THIS SITE

- FOIA
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ALERTS

- ADA Complaints
- Contact Us
- County Code
- Sign In
- Emergency Alerts
- Health Alerts
- Traffic Alerts
- Code Red

Type here to search

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1/14/2020

Triggers Chart

ARTICLE IV—REQUIREMENTS FOR STORMWATER MANAGEMENT

9-81 GENERAL INFORMATION

A. All **Developments** shall meet the requirements of Sections 9-81 and 9-82 and Articles III and VI of this Chapter.

B. The thresholds for requiring **Stormwater Management Measures** are summarized in Table 9-81.

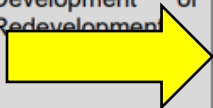
TABLE 9-81
REQUIREMENTS FOR STORMWATER MANAGEMENT MEASURES

| Development Category | New Impervious Area for Development or Net New Impervious Area for Redevelopment | Detention Storage Facility (Section) | Stormwater Mitigation / BMP (Section) | Watershed Benefit Measure ¹ (Section) | Fee-in-Lieu ³ (Section) |
|--|--|--------------------------------------|---------------------------------------|--|------------------------------------|
| Development or Redevelopment | < 5,000 sq.ft. | | X ² (9-107.C) | | A (9-85) |
| | 5,000 sq.ft. – 24,999 sq.ft. | | X (9-107.C) | | A (9-85) |
| | ≥ 25,000 sq.ft. AND < 1% Site area | X (9-84) | X (9-107.D) | O (9-108) | A (9-85) |
| | ≥ 25,000 sq.ft. AND ≥ 1% Site area | X (9-84) | X (9-107.D) | | A (9-85) |
| Linear Project (Trails/Roads) | > 1-acre in aggregate for roads and trails that are ≤ AASHTO max. width | | X ¹ (9-107.C) | O (9-108) | A (9-85) |
| | > 1-acre in aggregate for roads and trails that are > AASHTO max. width | X (9-84) | X (9-107.D) | | A (9-85) |
| Total Impervious Area > 50% Site area (for Sites < 1-acre) | | | X (9-107.C) | | A (9-85) |
| Hydrologically Disturbed Area > 3-acres | | X ⁴ (9-84) | X (9-107.D) | O (9-108) | A (9-85) |

X = Required; O = Option for required measure; A = Allowed

Triggers Chart - TRM

Table T9-81

| Development Category | New Impervious Area for Development or Net New Impervious Area for Redevelopment | Detention Storage Facility (Section) | Stormwater Mitigation / BMP (Section) | Watershed Benefit Measure ¹ (Section) | Fee-in-Lieu ³ (Section) |
|--|---|--------------------------------------|---------------------------------------|--|------------------------------------|
| Development or Redevelopment  | < 5,000 sq.ft. See Examples T9-81.A.1.a & T9-81.A.1.b | | X ² (9-107.C) | | A (9-85) |
| | 5,000 sq.ft. – 24,999 sq.ft. See Examples T9-81.A.2 & T9-81.A.2.b | | X (9-107.C) | | A (9-85) |
| | ≥ 25,000 sq.ft. AND < 1% Site area See Example T9-81.A.3 | X (9-84) | X (9-107.D) | O (9-108) | A (9-85) |
| | ≥ 25,000 sq.ft. AND ≥ 1% Site area See Examples T9-81.A.4.a & 9-81.A.4.b | X (9-84) | X (9-107.D) | | A (9-85) |
| Linear Project (Trails/Roads) | > 1-acre in aggregate for roads and trails that are ≤ AASHTO max. width See Example T9-81.A.5 | | X ¹ (9-107.C) | O (9-108) | A (9-85) |
| | > 1-acre in aggregate for roads and trails that are > AASHTO max. width See Example T9-81.A.6 | X (9-84) | X (9-107.D) | | A (9-85) |
| | Total Impervious Area > 50% Site area (for Sites < 1-acre) See Example T9-81.A.7 | | X (9-107.C) | | A (9-85) |
| | Hydrologically Disturbed Area > 3-acres See Examples T9-81.A.8 and T9-81.A.4.b | X ¹ (9-84) | X (9-107.D) | O (9-108) | A (9-85) |

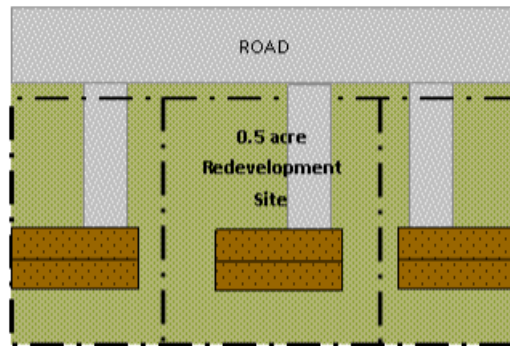
X = Required; O = Option for required measure; A = Allowed

Triggers Chart - TRM

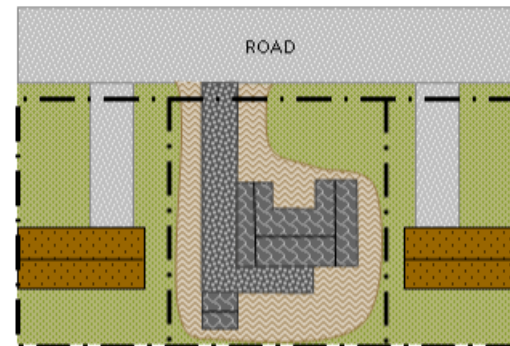
Example T9-81.A.2.b





Redevelopment of a 0.5 acre (21,780 sq. ft.) Site is proposed with a 4,000 sq. ft. house and 2,500 sq. ft. driveway, patio & detached garage with a total of 5,000 sq. ft. of Net New Impervious Area. No known drainage issues are in the immediate vicinity of the project.

Existing Site:



Proposed Site:



-  Existing Undisturbed (not a Hydrologically Disturbed Area) = 0.5 acre (21,780 sq. ft.)
-  Existing Impervious = 1,500 sq. ft.
-  Proposed Pervious (Hydrologically Disturbed Area) = 0.25 acre
-  New Impervious Area (Hydrologically Disturbed Area) = 6,500 sq. ft.
 Net New Impervious Area (Hydrologically Disturbed) =
 (New Impervious Area - Existing Impervious Area Removed)
 $6,500 - 1,500 = 5,000$ sq. ft.

Total Impervious Area = $6,500 / 21,780 = 0.30 * 100 = 30\%$ of Site area

Detention Required = No, < 25,000 sq. ft. Net New Impervious Area

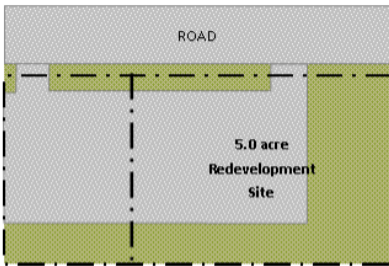
Stormwater Mitigation/BMP = Yes, 5,000 sq. ft. Net New Impervious Area

Detention Sizing - TRM

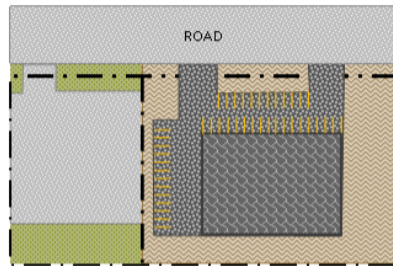
Example T9-84.D

Redevelopment of a 5 acre Site is proposed. An existing 2 acre parking lot will be removed and replaced with a new building and parking lot resulting in 1 acres of Net New impervious Area. The entire Site will be regraded and is a Hydrologically Disturbed Area.

Existing Site:



Proposed Site:



Existing Undisturbed (not a Hydrologically Disturbed Area) = 3.0 acres

Existing Impervious = 2.0 acres

Proposed Pervious (Hydrologically Disturbed Area) = 2.0 acre

Net New Impervious Area (Hydrologically Disturbed) =
(New Impervious Area - Existing Impervious Area Removed)
 $3.0 - 2.0 = 1.0$ acre

Total Impervious Area = $2 / 5 = 0.4 * 100 = 40\%$ of Site area

Detention Required = Yes, Net New Impervious Area 25,000 sq. ft.

Yes, Hydrologically Disturbed area > 3 acres

Stormwater Mitigation/BMP = Yes, Net New Impervious Area 5,000 sq. ft.

Yes, Hydrologically Disturbed Area > 3 acres

Example T9-84.D (continued)

The Developer plans to provide a Detention Storage Facility and Stormwater Mitigation BMPs in separate locations on-site. The existing on-site 1% Critical Duration Storm at the Outlet is 5.0 cfs. The Detention Storage Facility Outlet elevation is 775.0 ft. The Site topography allows for 4-ft of bounce.

Step 1: Determine Hydrologically Disturbed Area (HDA)

$$HDA = P_{HDA} + NI_{HDA}$$

$$2.0 \text{ ac} + 3.0 \text{ ac} = 5.0 \text{ ac}$$

Where:

Proposed Pervious Hydrologically Disturbed Area (P_{HDA}) = 3.0 acre

New Impervious Hydrologically Disturbed Area (NI_{HDA}) = 3.0 acre

Step 2: Determine Detention Storage Volume

$$HDA \text{ Allowable Release Rate} = HDA \times 0.10 \frac{cfs}{ac}$$

$$HDA \text{ Allowable Release Rate} = 5 \text{ ac} \times 0.10 \frac{cfs}{ac} = 0.50 \text{ cfs}$$

Using event hydrograph method (TR-20, et al) for site conditions, determine required detention storage volume and high water elevation. The restrictor size is iterated until the maximum HDA allowable Release Rate is met. For this example, it was determined that:

Restrictor Size = 3.25" Diameter or 4" minimum restrictor

Required Detention Volume = 2.4 ac-ft

High Water Elevation = 778.0

Step 3: Determine Emergency Overflow Weir Elevation

Emergency Overflow Weir Design Capacity: 5.0 cfs

$$Emergency \text{ Overflow Elevation} = HWE = 778.0 \text{ ft}$$

Step 4: Set Freeboard Elevation

$$Freeboard = HWE + 1 \text{ ft} = 779.0 \text{ ft}$$

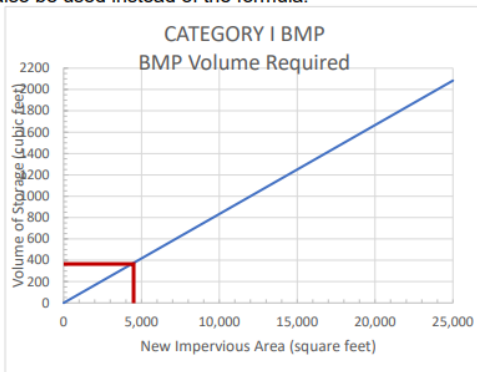
BMP Resources - TRM

Stormwater Mitigation/BMP Volume and Sizing:

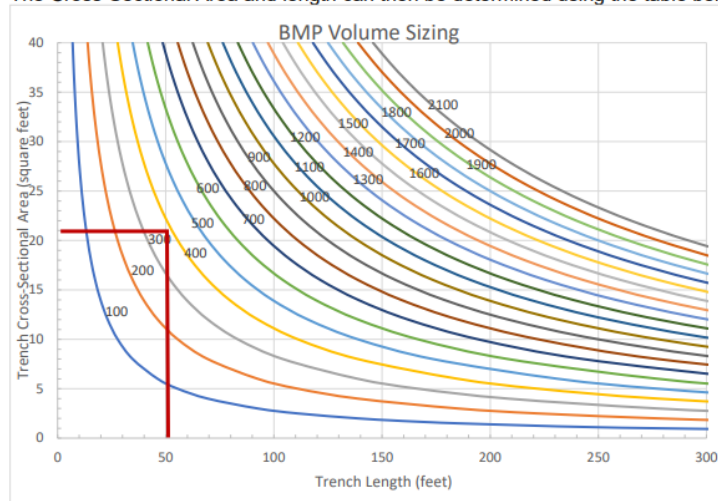
$$V_{BMP} = 1in \times NI_{HDA}$$

$$1in \times \frac{1ft}{12in} \times 4,500ft^2 = 373.5ft^3$$

The table below can also be used instead of the formula.



The Cross-Sectional Area and length can then be determined using the table below.

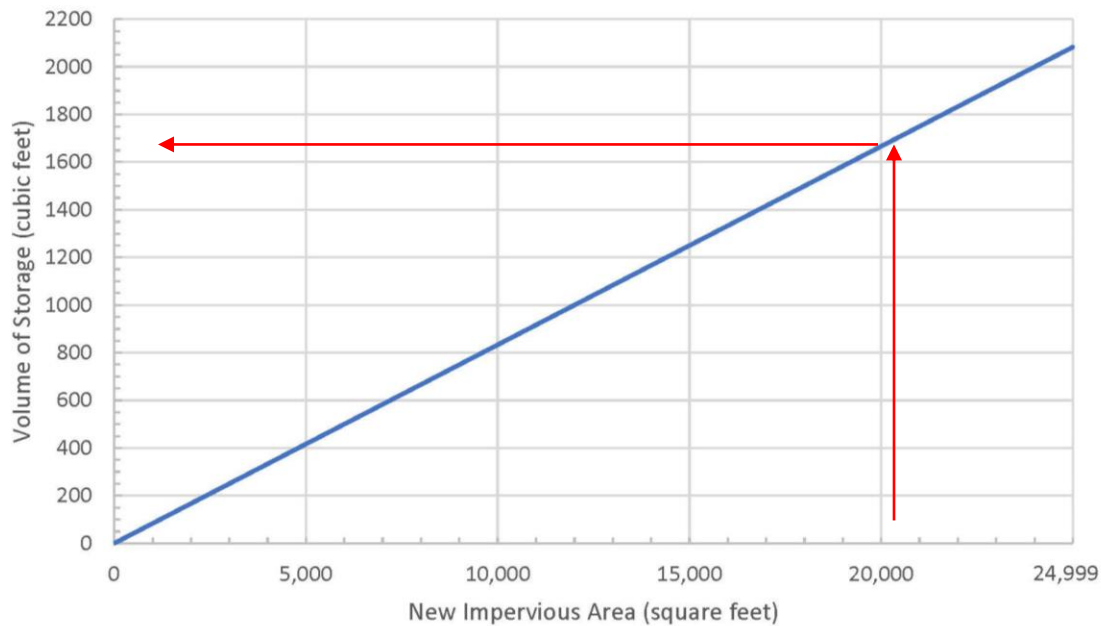


The resulting BMP size for this example is 50 feet in length with a cross sectional area of 21 feet.

- Based on 1" of rainfall over New Impervious Area (not Net New)
- Deleted "hydraulically connected"
- Category I design charts for small projects. Intent that engineer/surveyor not required
- RECARGA runs for Category II
- 2009 BMP Manual Incorporated into TRM with updates

Category I BMP Guidance

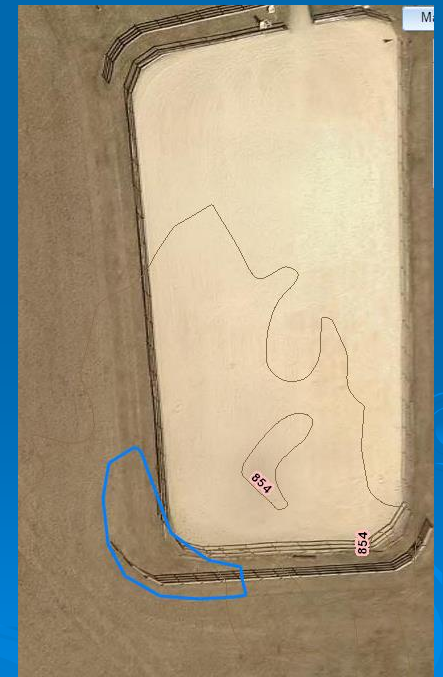
CATEGORY I BMP
BMP Volume Required



*BMP STORAGE VOLUME REQUIRED = (1" RAINFALL / 12) * (NEW IMPERVIOUS AREA IN SQUARE FEET)

1,700 CF of storage
Required for R-Arena

Construct 18" deep rain
garden

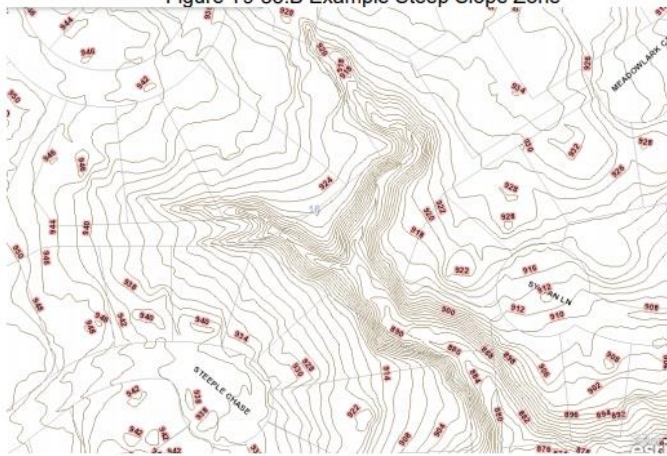


48-Hour Rule 9-83.B.1.b

Outfall into Agricultural Surface Drainage Systems and Steep Slope Zones

Extended discharge from Detention Storage Facilities of surface water drainage over cropped fields and steep ravines can create conditions that can damage agricultural crops and cause severe erosion in ravines due to extended saturation of soils. Therefore, the ordinance requires underground conveyance of surface water discharge systems within forty-eight (48) hours of the end of a storm event. Additional guidance for Steep Slopes zones is included in the Forms. In general, Steep Slope is defined as land with a slope which equals or exceeds a vertical rise of one foot for a horizontal run of three feet for a vertical height of 10 feet or more. Many of the Steep Slope zones in Kane County fall in the Ferson Creek watershed such as the example below in Campton Township:

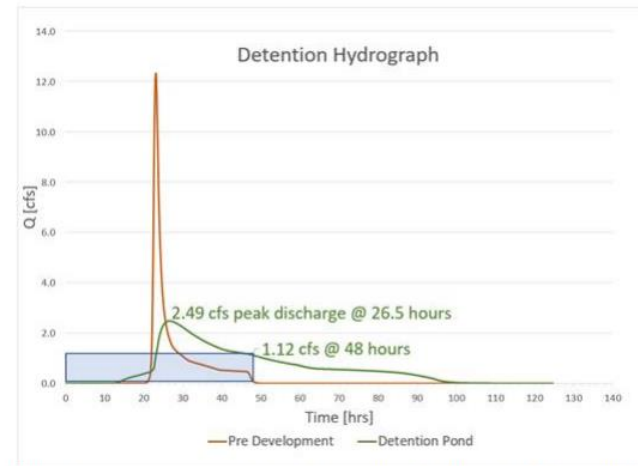
Figure T9-83.B Example Steep Slope Zone



Agricultural surface drainage systems are defined as upland cropped or grassed waterways that experience intermittent stormwater flows during storm events. These systems do not convey groundwater or agricultural subsurface drainage outfalls and are not considered to be an adequate outfall for extended releases from Detention Storage Facilities or Nuisance Flow. Below are two examples of Agricultural surface drainage systems in which the 48 hr requirement would apply:

Example T9-83.A:

A residential development is proposed on a 26.1 acre site with 100 parcels and 40% impervious Area.



Step 1: Utilize the proposed hydrograph to determine the flow at 48 hours. In the example above, the flow is 1.12 cfs.

Step 2: Determine sump pump flows at 5 gpm per first 50 Single Family Residential (SFR) structures and 3 gpm for each structure after if basements are expected to be in seasonal high groundwater table:

$$(5\text{gpm} \times 50\text{SFR}) + (3\text{gpm} \times 50\text{SFR}) = 400\text{gpm} = 0.89\text{cfs}$$

Step 3: Determine Stormwater Mitigation/BMP volume and underdrain flow per Section 9-107.D.1

$$V_{BMP} = 1\text{in} \times NI_{HDA}$$

$$1\text{in} \times \frac{1\text{ft}}{12\text{in}} \times 454,766\text{ft}^2 = 37,745\text{ft}^3$$

$$37,745\text{ft}^3 \div 259,200 = 0.146\text{cfs}$$

Where:

$$\text{New Impervious Area } (NI_{HDA}) = 26.1\text{ac} \times \frac{43,560\text{ft}^2}{1\text{ac}} = 454,766\text{ft}^2$$

Draw down time of the BMP is 3 days

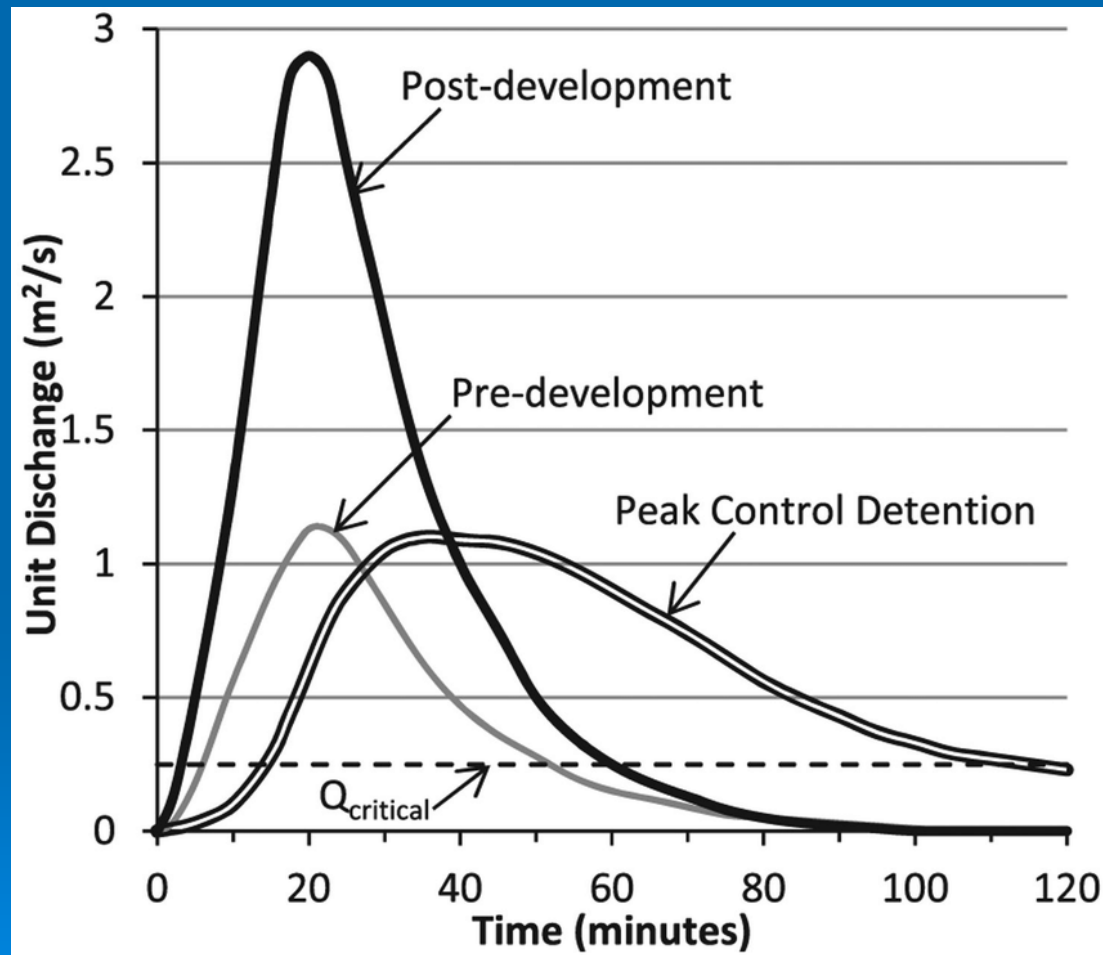
$$3\text{days} \times (86,400\text{sec}/\text{day}) = 259,200\text{sec}$$

Step 4: Sum flow rates and size pipe:

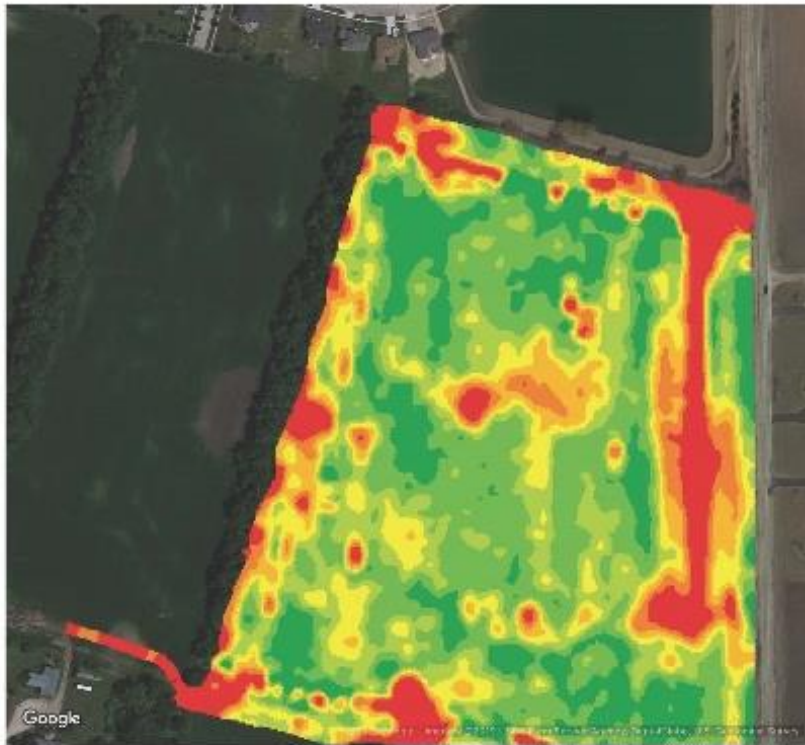
$$1.12\text{cfs} + 0.89\text{cfs} + 0.146\text{cfs} = 2.156\text{cfs}$$

Therefore, the off-site subsurface outfall should be sized for 2.16 cfs. Assuming the slope is 0.2% the required pipe size using Figure T9-83.E should be 15".

Offsite Outfall to Ag and Steep Slopes



Offsite Outfall to Ag Property



Operation Start Time

10/30/2018 03:22:12 PM

Operation End Time

11/01/2018 11:40:30 AM

Total Yield

6,737.41 bu

Average Yield

188.88 bu/ac

Average Moisture

15.37 %

Area Worked

35.67 ac

Wet Weight

379,980.84 lb

Average Wet Weight

10,652.67 lb/ac

Average Speed

4.09 mi/hr

Crop Type

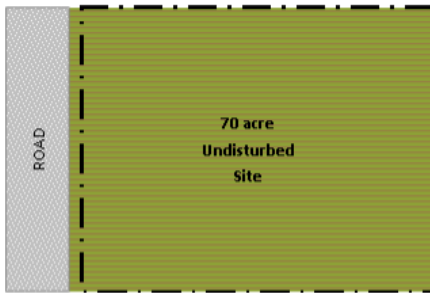
Corn

Watershed Benefit Measures

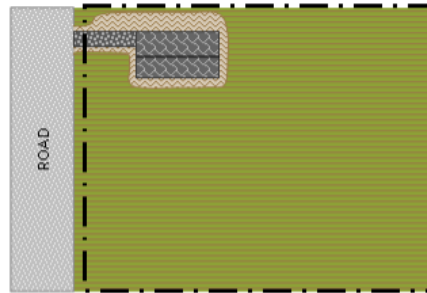
Example T9-108





Development of an undisturbed 70 acre agricultural Site with a 25,500 sq. ft. pole barn/driveway with 0.6 acre of Hydrologically Disturbed Area.

Existing Site:



Proposed Site:



-  Existing Undisturbed (not a Hydrologically Disturbed Area) = 70 acres
-  Existing Impervious = 0 sq. ft.
-  Proposed Pervious (Hydrologically Disturbed Area) = 0.25 acre (21,780 sq. ft.)
-  New Impervious Area (Hydrologically Disturbed Area) = 0.58 acre (25,500 sq. ft.)

Total Impervious Area = $0.57 / 70 = 0.008 * 100 = 0.8\%$ of Site area
 Detention Required = Yes¹, > 25,000 sq. ft. New Impervious Area but less than 1% of the Site area
 Stormwater Mitigation/BMP = Yes¹, New Impervious Area > 5,000 sq. ft. and greater than 1% of the Site area

¹A **Watershed Benefit Measure** may be provided in lieu of the required **Detention Storage Facility** and **Stormwater Mitigation/BMP** at the discretion of the **Administrator**.

Hydrologically Disturbed Area (HDA) Calculations:

$$HDA = P_{HDA} + N_{HDA}$$

$$0.25 \text{ ac} + 0.58 \text{ ac} = 0.835 \text{ ac}$$

Where:

Proposed Pervious Hydrologically Disturbed Area (P_{HDA}) = 0.25 acre
 New Impervious Hydrologically Disturbed Area (N_{HDA}) = 0.585 acre (25,500 sq. ft.)

Detention Storage Volume Calculations:

$$V_{DSF} = HDA \times V_{UAD}$$

$$0.835 \text{ ac} \times 0.45 \text{ ac-ft} = 0.375 \text{ ac-ft}$$

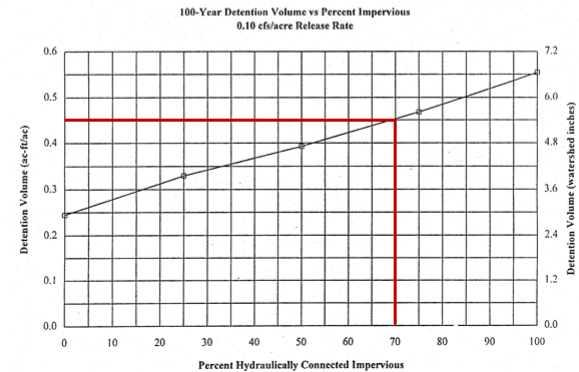
$$0.375 \text{ ac-ft} \times \frac{43,560 \text{ ft}^2}{1 \text{ ac}} = 16,367 \text{ ft}^3$$

Where:

Percent Hydraulically Connected Impervious = $\%HCI = \frac{N_{HDA}}{(P_{HDA} + N_{HDA})} \times 100$

$$\left(\frac{0.585 \text{ ac}}{(0.25 \text{ ac} + 0.585 \text{ ac})} \right) * 100 = 70\%$$

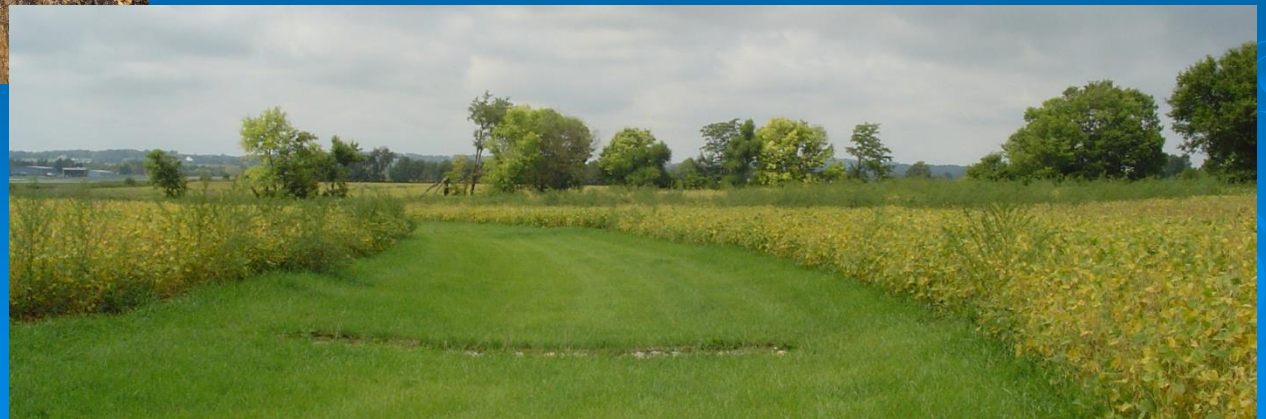
Unit Area Detention Volume (V_{UAD}) Determine using Figure below:



Watershed Benefit Measures



Watershed Benefit Measures



Small but Significant

- Certified Communities can develop general permits for straight forward activities with approval of the Director. (99-28.B)



Small but Significant

- A Permit is required for Developments that have met the detention requirement and may be constructing less than 5,000 sq ft of impervious area. (9-28.A.5)



Flow Charts

TABLE 9-84.B
POST-ORDINANCE BASIN (After to 2002)

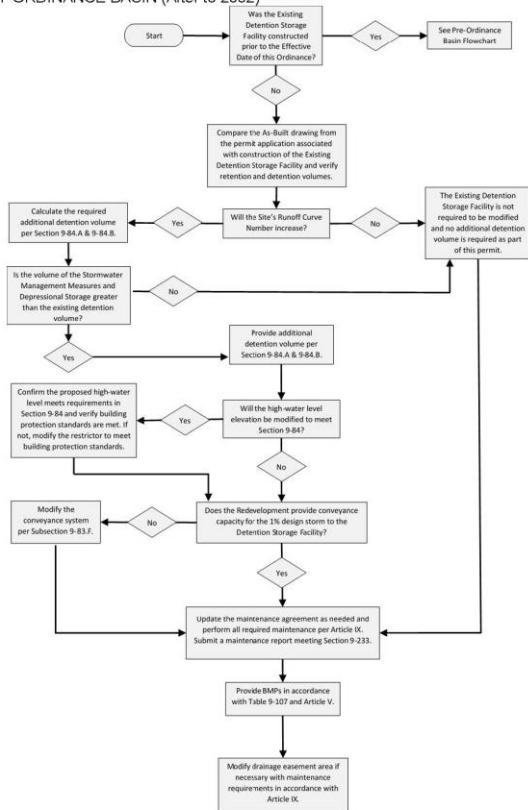
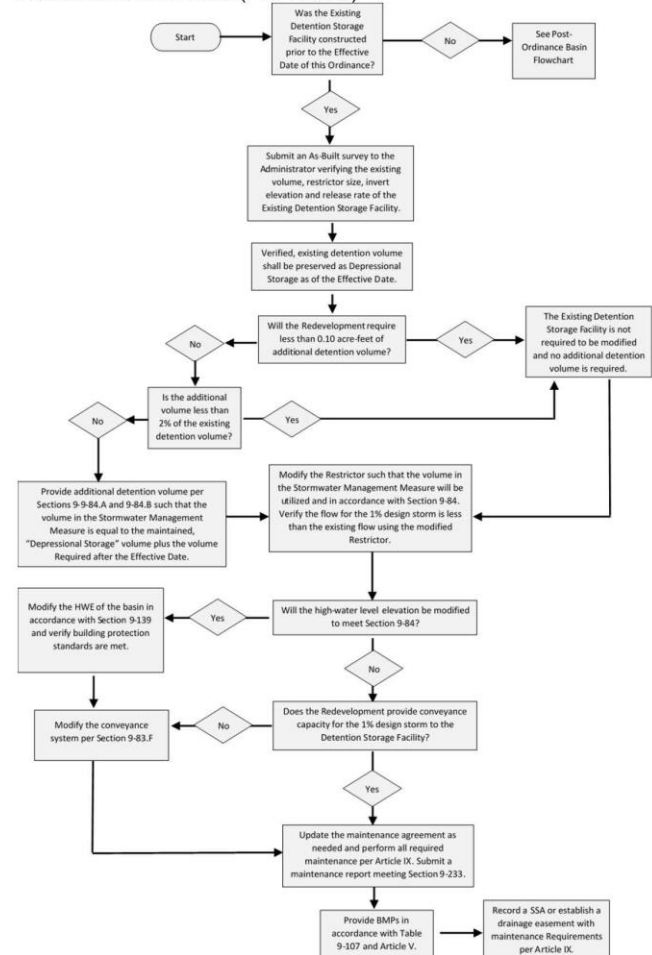
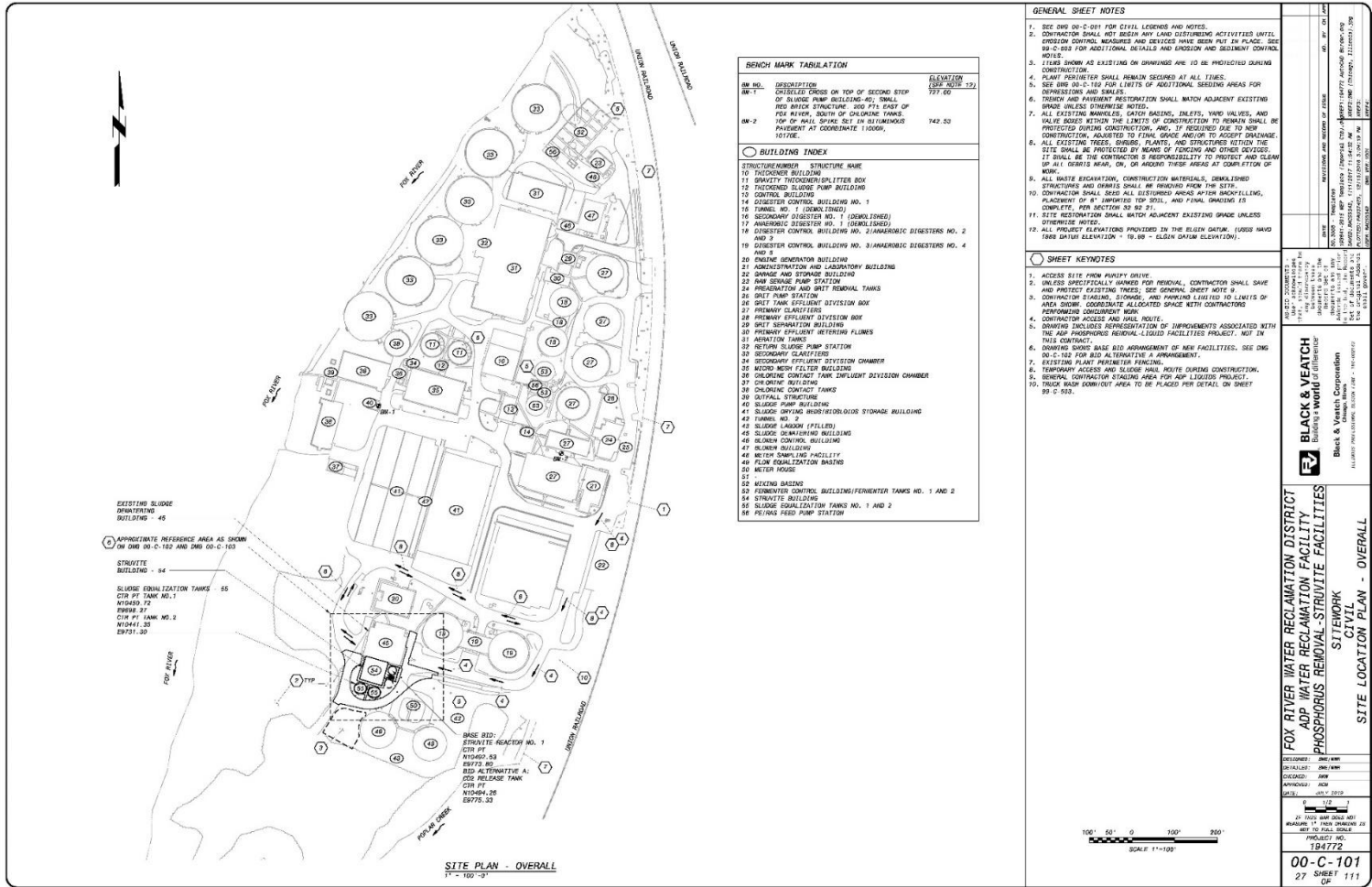


TABLE 9-84.A
PRE-ORDINANCE BASIN (Prior to 2002)



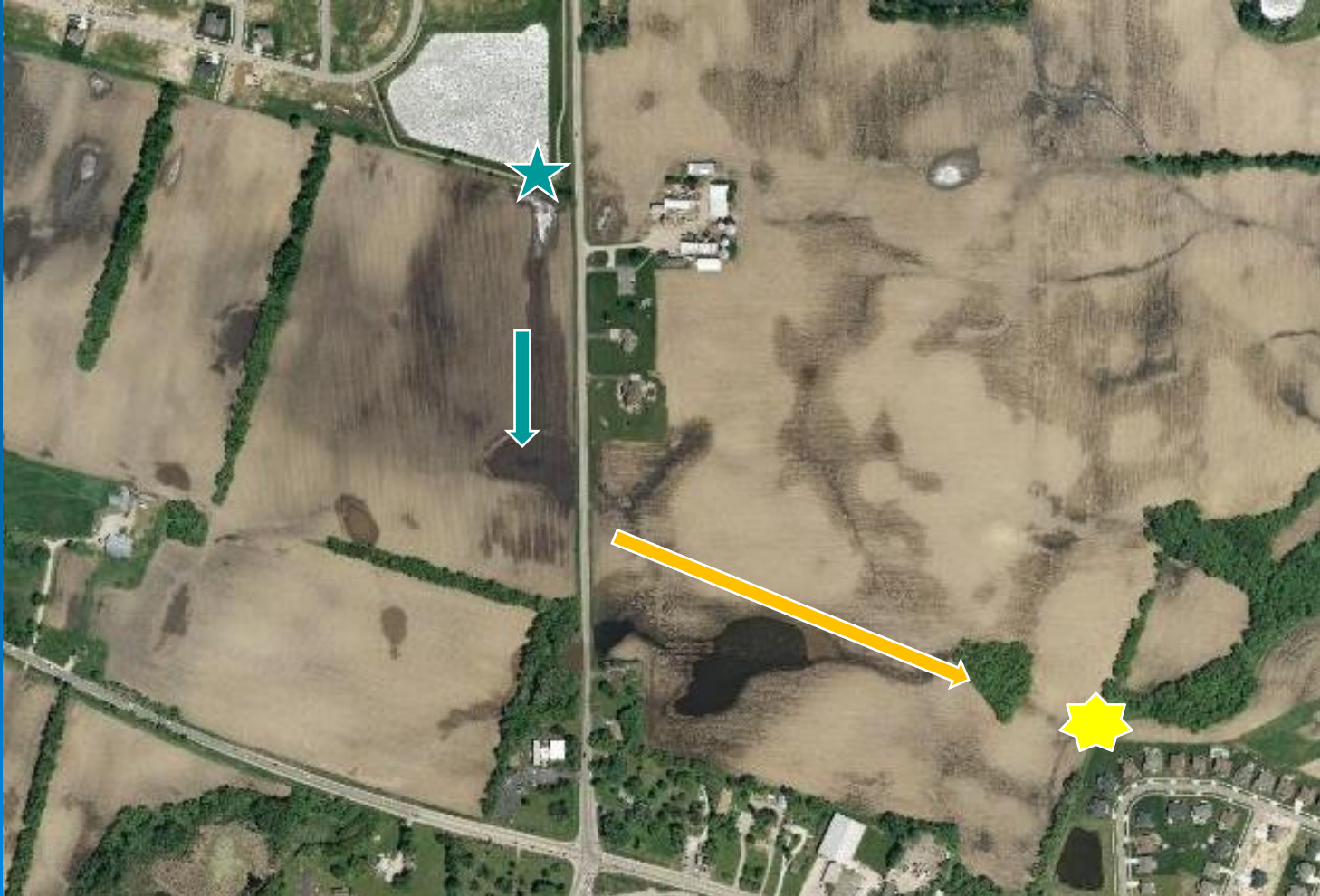
Small but Significant

- Fee-in-Lieu can be approved for both Development & Redevelopment projects. (9-28.B.4.a)



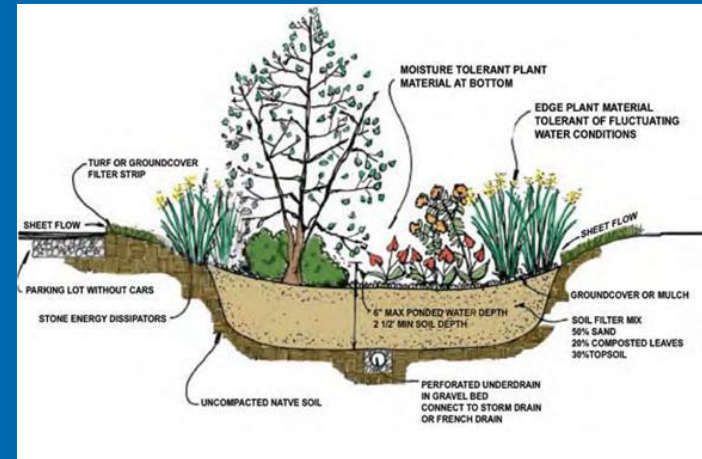
Small but Significant

Offsite Outfalls are required to be evaluated to Open Channel or downstream location id'ed by the Administrator in a storm sewer system. (9-83.B.1.a)



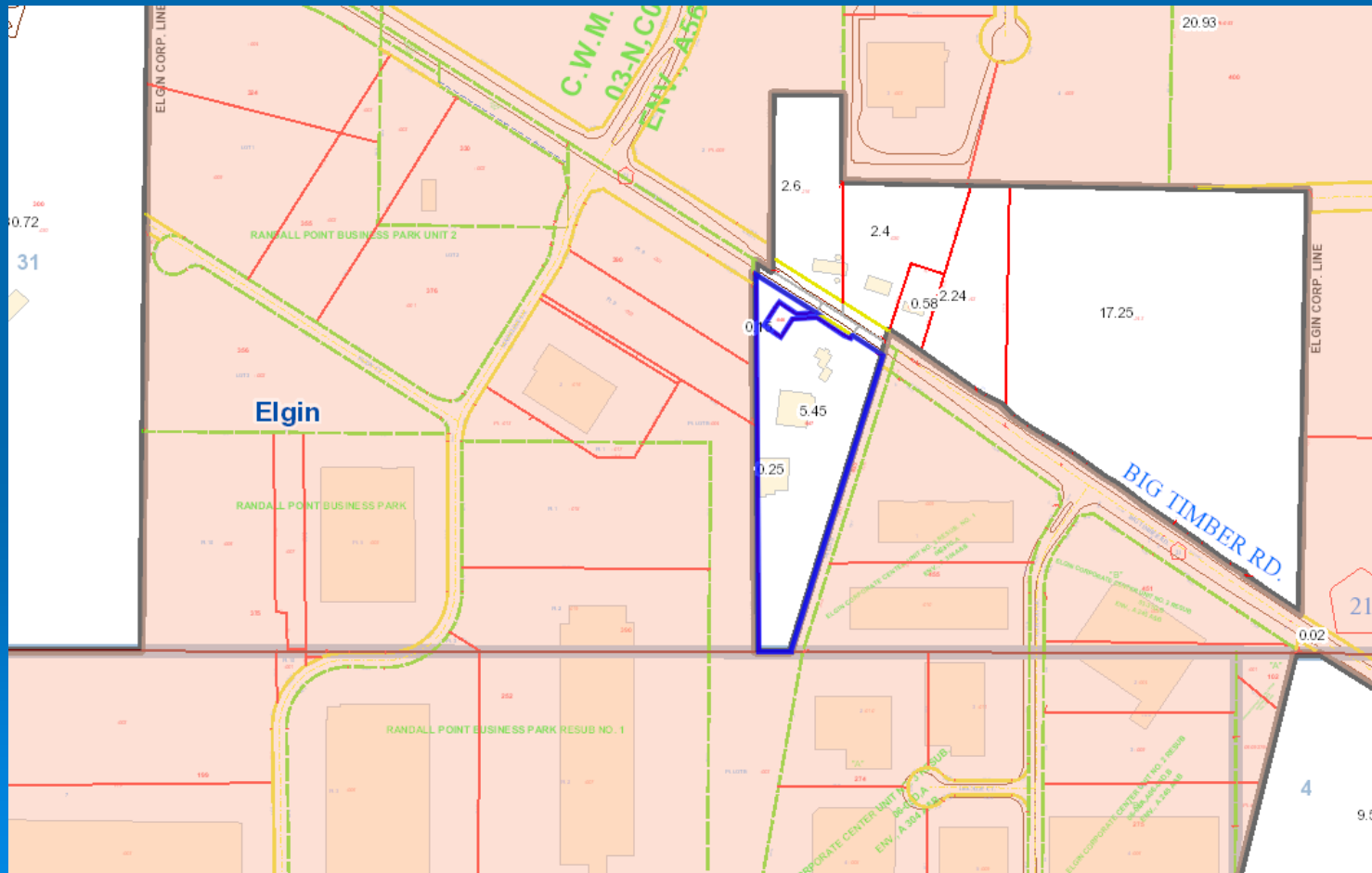
Small but Significant

- Offsite draintiles are not to be used for surface water discharges, but may be used for BMP underdrains in accordance with Reasonable Use (requirements and exceptions can be found in the referenced section. (9-83.B.1.e)



Small but Significant

- 15 Day required notification to downstream community (including unincorporated area) or drainage district before a permit can be issued. (9-83.B.1.i)



Small but Significant



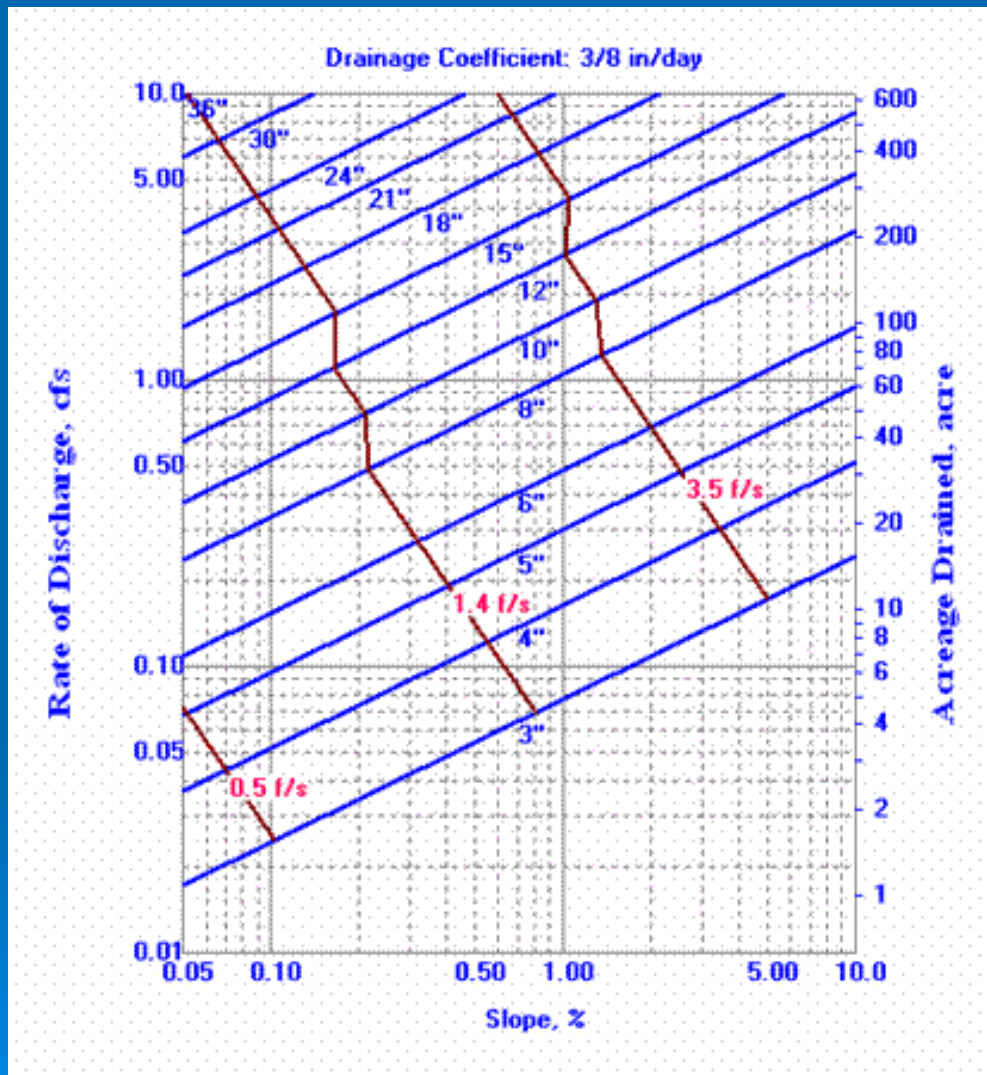
Upstream Tributary:
Must take into account
debris & natural
sedimentation, long term
maintenance and 3/8"
sizing for agricultural
drainage systems (9-
83.B.3)



Upstream Tributary



Upstream Tributary



- Surface drainage plan to handle silt and crop debris
- Surface flow must be in open space or ROW
- Surface flow must bypass stormwater system if farm debris and sediment not removed
- Connections to upstream tiles must be upsized for future pattern tile drainage

Figure 13. Design chart for plastic tubing using a drainage coefficient of 3/8 in/day.

Small but Significant DEFINITIONS

ADEQUATE DOWNSTREAM STORMWATER CAPACITY: ****NEW****

DEVELOPMENT: Now includes plat act divisions that over time would have similar impacts to a subdivision. Development does not include maintenance of Stormwater Management Measures

IMPERVIOUS AREA: ****NEW**** Specifically defines what is to be included in the calculation

NET NEW AND NEW IMPERVIOUS AREA: ****NEW**** defines both calculations

NEW WATERSHED BENEFIT: ****NEW****

PERMEABLE PAVEMENT: ****NEW****

POLLUTANTS OF CONCERN: ****NEW****

VOLUME SENSITIVE WATERSHED: ****NEW****

Comments or Questions?



Questions

- If a project is exempt from the June 1st changes, do they have to follow the revised Bulletin 70? The 2002 Ordinance specifically references the old Bulletin 70, so the development would not have to follow the revised version. Each community should, however, consider that State Climatologists, who are experts in this field, have revised Bulletin 70 as their research has determined that the rainfall amounts in the old Bulletin 70 are no longer accurate. While an exempt project may not be technically required to follow the new Bulletin 70, each Certified Community should make a determination as to whether it is in the best interest of the community, knowing that the experts have analyzed the data, to continue issuing permits for exempt projects with out of date data. The Ordinance will need to be revised when Bulletin 75 is released.
- If a property is experiencing sediment coming from a farm field, what enforcement action can be taken under the Community's MS-4 Permit? When the County receives a complaint about excessive farm debris, the complaint is forwarded to NRCS to make a determination if the field is Highly Erodible and if the proper practices are in place. If the field is not determined to fall under NRCS's program, the County will typically meet with the farmer and suggest a buffer or grassed waterway to reduce the sediment and/or debris leaving the farm. Point Source defined in the MS-4 permit excludes agriculture & agricultural stormwater runoff