Village of Inverness

Storm Water Management Program

Adopted December 14, 2010

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September 2010

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Section 1: Overview of the Storm Water Management Program

1.1 *Introduction*

This MS4 Storm Water Management Program (SWMP) has been developed by the Village of Inverness for the purpose of meeting the minimum standards required by the United States Environmental Protection Agency (USEPA) under the National Pollutant Discharge Elimination System (NPDES) Phase II program. Federal regulations through the USEPA require that all Municipal Separate Storm Sewer Systems (MS4s), in partially or fully in urbanized areas, obtain storm water permits for their discharges into receiving waters (based on the 2000 census). Regulated systems include the conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, gutters, ditches, swales and manmade channels or storm sewers.

Storm water runoff naturally contains numerous constituents. However, urbanization and urban activities (including municipal activities) typically increase concentrations to levels that may impact water quality. Pollutants associated with storm water include sediment, nutrients, bacteria and viruses, oil and grease, metals, organics, pesticides and gross pollutants. In addition to private construction sites, the following is a list of municipal activities that have the potential for generating pollutants:

Fixed Facilities Activities	**Field Program Activities**
Building Maintenance and Repair	Street Sweeping and Cleaning
Parking Lot Maintenance	Street Repair and Maintenance
Landscape Maintenance	Bridge and Structure Maintenance
Waste Handling and Disposal	Controlling Litter
Vehicle and Equipment Storage	Landscape Mowing/Trimming/Planting
Vehicle and Equipment Cleaning	Fertilizer and Pesticide Application
Material Handling and Storage	Controlling Illicit Connections
Material Loading and Unloading	Controlling Illegal Dumping
Minor Construction	Solid Waste Collection and Recycling

The SWMP describes the procedures and practices that are implemented by the Village of Inverness toward the goal of reducing the discharge of pollutants within storm water runoff in order to comply with Federal standards. Compliance with this program is intended to protect water quality, contributing to the following amenities:

- Cleaner lakes and streams
- Improved recreational opportunities and tourism
- Flood damage reduction
- Improved aesthetics and wildlife habitat
- A safer and healthier environment for the citizens

This SWMP addresses the primary program elements for all the Village of Inverness activities. This includes the manner in which the Village of Inverness reviews:

- Permits and inspection of construction activities within its limits
- The planning and design of projects performed within its limits
- Maintains its facilities and performs its day-to-day operations
- Works toward protecting the receiving streams from illicit discharges
- Provides public education and outreach
- Trains their employees in carrying out and reporting program activities
- Continually monitors and evaluates the program

1.2 *State and Federal Regulations*

Federal environmental regulations based on the 1972 Clean Water Act (CWA) require that MS4s, construction sites and industrial activities control polluted storm water runoff from entering receiving bodies of water (including navigable streams and lakes). The NPDES permit process regulates the discharge from these sources based on amendments to the CWA in 1987 and the subsequent 1990 and 1999 regulations by the U.S. Environmental Protection Agency (USEPA). In Illinois, the USEPA has delegated administration of the Federal NDPES program to the Illinois Environmental Protection Agency (IEPA). At the state level, storm water requirements are mirrored after the federal NPDES storm water requirements, requiring that storm water be treated to the maximum extent practicable. Illinois's NPDES program requires that all construction sites disturbing more than one acre, industrial sites, and all designated Municipal Separate Storm Sewer Systems (MS4s) obtain permit coverage. On December 20, 1999 the IEPA issued a general NPDES Phase II permit ILR40 for all MS4s. Under the General Permit each MS4 owner was required to submit a Notice of Intent (NOI) declaring compliance with the conditions of the permit by March 10, 2003. The original NOI describes the proposed activities and Best Management Practices (BMPs) that occurred over the original five year period toward the ultimate goal of developing a compliant SWMP. After the fifth year, the components of the SWMP should be implemented (refer to Section 4.1 for Performance Milestones). The IEPA reissued the ILR 40 permit on February 20, 2009 (effective April 1, 2009). A copy of the ILR40 permit is included in Appendix 14.

Additionally, under the General ILR10 permit (See Appendix 15) also administered by IEPA, all construction projects that disturb greater than one acre of total land area must obtain an NPDES permit from IEPA prior to the start of construction. Municipal construction projects in municipalities covered by the General ILR40 permit are automatically covered under ILR10 30 days after the IEPA receives the NOI from the municipality.

1.3 *SWMP Organization*

This SWMP identifies best management practices to be implemented in six different categories. These categories are:

- Public Education and Outreach
- Public Participation/Involvement
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Illicit Discharge Detection and Elimination
- Pollution Prevention/Good Housekeeping

Section 1: SWMP Overview - discusses the format of the document and the regulations associated with NPDES II through county, state and federal agencies.

Section 2: Plan Management - discusses the logistics of the SWMP. This includes the organization, implementation and responsible parties necessary to achieve overall compliance with the SWMP and NPDES Permit. It also identifies how the Village of Inverness coordinates with other county and state agencies and discusses the legal authority that the Village has to implement the plan components.

Section 3: SWMP - addresses storm water pollutant control measures implemented by the Village of Inverness through the six minimum control categories established by the USEPA.

Section 4: Monitoring, Program Evaluation and Reporting - describes the monitoring, evaluation and reporting procedures associated with the program. This SWMP is a guide created to protect the Village of Inverness's receiving streams from pollution and resultant degradation. This Section assists in identifying best management practices and processes.

Section 5: Appendices – includes forms, references, exhibits and bibliography.

1.4 *Watershed, Sub-Watersheds and Receiving Streams*

The Village of Inverness's storm water falls into three watersheds, the Upper Salt Creek Watershed, Flint Creek Watershed and the Poplar Creek Watershed.

Upper Salt Creek Watershed

The majority of Inverness's storm water flows into the Upper Sal Creek Watershed. The entire Village east of the Ela Road drains to the Salt Creek as well as a sizeable portion to the west of Ela Road.

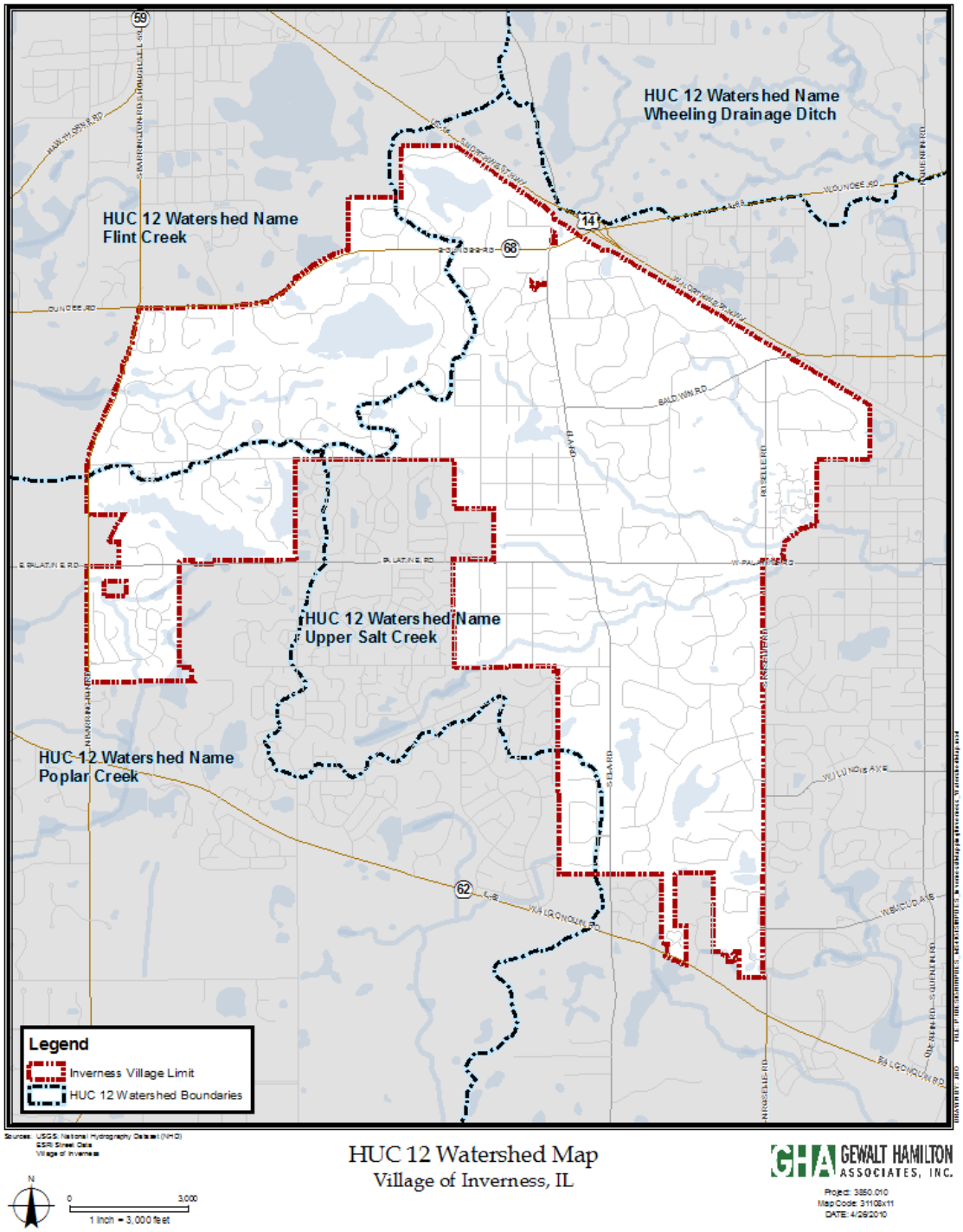
Flint Creek Watershed

The Flint Creek Watershed of Northern Illinois drains approximately 36.5 square miles (23,374 acres) of land in the Lake, Cook and McHenry Counties. The watershed is a sub-unit of the larger Upper Fox River Basin that drains large portions of Jefferson, Kenosha, Racine, Walworth, Waukesha counties in Wisconsin, McHenry, Lake, Kane, and Cook counties in Illinois.

Poplar Creek Watershed

The Poplar Creek Watershed drains approximately 39 square miles in Northern Illinois. The Poplar Creek Watershed is located to the South of Flint Creek and West of the Upper Salt Creek Watershed. Two small portions, in the west and southwest of the Village of Inverness fall into this watershed.

Figure 1.—Map of Major Sub-watersheds and Receiving Waters.



Section 2: Plan Management

This Section lists the Village Officials for the Village of Inverness.

2.1 *Organizational Structure*

The Village's President and Board of Trustees are the policy and budget setting authority for the Village of Inverness. The following outlines the organizational structure of the Village in the Village of Inverness:

Village President
Village Trustees
Village Clerk
Deputy Clerk
Treasurer
Village Attorney
Village Administrator
Chief of Police
Village Engineer
Building Inspector

Effective NPDES Phase II compliance requires cooperation. This SWMP explains a cooperative approach. By implementing this SWMP, the Village of Inverness is considered in compliance with the NPDES Phase II program. The Village Administrator, or designee, is the Village Engineer and is responsible for its oversight and implementation. The Village Engineer has many different responsibilities including:

- Coordinating with county officials, Metropolitan Water Reclamation District of Greater Chicago, the Illinois Environmental Protection Agency, contractors, the development community and other external regulatory agencies

- Understanding the requirements of ILR40, confirms that the SWMP meets the requirements of the permit and that the Village effectively implements the SWMP

- Ensuring that the Village complies with all minimum County Ordinance provisions

- Being aware when a Municipal Project is required to be authorized under the ILR10 permit. In these cases the Village Engineer should ensure that the NOI is received by IEPA at least 30 days prior to the start of construction

- Assisting the development community in understanding when an ILR10 permit is required and whether construction sites comply with the general ILR10 and permit conditions

- Understanding the role illicit discharges play in the overall NPDES Phase II program (In general, an incidence of non-compliance must be filed with IEPA for illicit discharges exiting an MS4's outfall into a receiving water)

2.2 *Coordination with the Metropolitan Water Reclamation District of Greater Chicago*

The Metropolitan Water Reclamation District of Greater Chicago (MWRD-GC) assumed authority over storm water management in Cook County when the Illinois State Legislature passed Public Act 93-1049 on November 17, 2004. In addition to assigning the MWRD-GC, the act required the preparation and adoption of a countywide storm water management plan and the development of a storm water management regulatory ordinance.

On February 15, 2007, the MWRD-GC's Board of Commissioners adopted the Cook County Storm Water Management Plan (CCSMP) by ordinance. The CCSMP is not a regulatory ordinance and does not set forth any rules, regulations or standards to which a municipality will be held to or be required to enforce. The CCSMP is a high level organizational plan wherein the overall framework for the countywide program is established and which the District is required per the Act to adopt as a first step in establishing the District's Countywide Storm Water Management Program.

2.3 *Coordination with Consultants*

The Village may enlist the services of consultants to assist in the implementation of the SWMP (including, but not limited to, plan review, site inspections, and enforcement), and the design of Village projects. The Village Administrator has the responsibility of administering these contracts.

2.4 *Coordination with the Public*

Coordination with the public occurs through public education and outreach, and public participation and involvement described in Sections 3.1 and 3.2, respectively. In addition, the public has the opportunity to comment on proposed preliminary and final plans through the review process established by the Village's municipal code.

2.5 *Coordination with the IEPA*

The Village of Inverness is required to complete an annual report which describes the status of compliance with the ILR40 permit conditions. The annual report must be posted on the Village's website and submitted to the IEPA by the first day of June each year. Annual reporting to IEPA should consist of "implemented SWMP" for all tasks completed in accordance with this SWMP. Additional information should be provided for areas of enhancement or tasks not completed.

Records regarding the completion and progress of the SWMP must be kept by the community. Task sheets should be updated throughout the year and kept in a binder with necessary supporting documentation. The binder must be available for inspection by both IEPA and the general public.

2.6 *Coordination with the Development Community*

The Village of Inverness has a responsibility to assist the development community in understanding when an ILR10 permit is required and whether construction sites comply with the general ILR10 permit conditions. Since illicit discharges have a high risk of occurrence on construction sites, the Village should understand the role illicit discharges play in the overall NPDES Phase II program. In general, an incidence of non-compliance must be filed with IEPA for illicit discharges exiting an MS4's outfall into a receiving water body.

2.7 *Coordination of Contractors*

The Village of Inverness may hire contracted services. The Village has a responsibility to educate contractors hired by the municipality as to the requirements described in this SWMP and applicable requirements of the ILR40 and ILR10 permits. Furthermore, the municipality has a responsibility to ensure that the development community hires contractors that meet the necessary qualifications for the program.

Section 3: The SWMP

This SWMP includes six components that are integral in assisting to reduce and eliminate storm water pollution in receiving water bodies.

1. Public Education and Outreach
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post Construction Runoff Control
6. Pollution Prevention and Good Housekeeping

Section 3.1 describes the efforts the Village of Inverness takes to educate the public about storm water pollution and storm water pollution prevention. The manner in which the Village of Inverness incorporates public participation and involvement into the SWMP is explained in Section 3.2. Section 3.3 describes the Village of Inverness's approach to detecting and eliminating storm water illicit discharges. Construction and post construction runoff control are addressed in Sections 3.4 and 3.5. Lastly, Section 3.6 discusses the Village of Inverness's responsibilities for the care and upkeep of its general facilities, associated maintenance yards and municipal roads to minimize pollution. This Section also discusses necessary training for Village employees on the implementation of the SWMP.

3.1 *Public Education and Outreach*

The Village of Inverness conducts public education programs that teach the residents how to reduce pollutants in storm water runoff and curb the potential impact to receiving streams and lakes within the community. The Village of Inverness utilizes a variety of methods to provide education material to the public about the importance of managing pollutants. The program includes the following activities which are discussed in greater detail in this Section:

- Distribution of informational sheets regarding storm water BMPs, water quality BMPs and proper hazardous waste disposal
- Include information on water quality and storm water in the Village of Inverness newsletter
- Coordinate, publicize and participate in events hosted by the Solid Waste Agency of Northern Cook County (SWANCC)
- Maintain the Village of Inverness's website which offers links to additional educational information, and ways to contact the Village of Inverness personnel

A. Distribution of Paper Materials

The Village of Inverness actively pursues the acquisition of educational sheets prepared by the MWRD, IEPA, USEPA, Center for Watershed Protection, Chicago Metropolitan Agency for Planning "CMAP" (previously Northeastern Illinois Planning Commission "NIPC"), University of Wisconsin Extension the Solid Waste Agency of Northern Cook County (SWANCC) as well as other agencies and organizations. The Village keeps a list of these and any other publications in a binder and on the website. In addition, the Village includes its telephone number on all the Village prepared outreach publications to encourage residences to contact the Village with environmental concerns.

Types of materials distributed include:

- The “Guidelines for Draining Swimming Pools” flyer
- The “Protect Our Water” flyer
- Informational sheets/pamphlets regarding storm water best management practices
- Informational sheets/pamphlets regarding water quality best management practices
- Informational sheets/pamphlets regarding construction site activities (soil erosion and sediment control best management practices)
- Informational sheets/pamphlets published by SWANCC regarding proper hazardous waste use and disposal

Publications are provided in the following manner:

- On the Village Website
- At annual outreach events
- The municipal newsletter, a quarterly publication
- At scheduled meetings with the general public (These meetings are on an as needed or as requested basis and may be with the home owners associations, businesses or local schools)

B. Website

The Village of Inverness’s website includes storm water quality specific elements. The website gives information regarding water quality, solid waste, hazardous material, storm water and general environmental health. The website is updated throughout the year and is tracked for hits. A significant amount of information is made available through links to other educational and informational sites.

This SWMP, the NOI, and any previous annual reports must be posted on the Village’s website. Each annual report must be posted on the Village’s website and submitted to the IEPA by the first day of June each year.

C. Outreach Events

When possible, Village of Inverness attends and/or sponsors outreach events and scheduled meetings with the general public. These events are held on an as needed or as requested basis. Audiences may include homeowners’ associations, lake associations, businesses and neighborhood groups.

D. Household Hazardous Wastes

The average garage contains numerous products that are classified as hazardous wastes. These substances include paints, stains, solvents, used motor oil, pesticides and cleaning products. While some household hazardous waste is deliberately dumped into storm drains, most enters the storm drain system unintentionally as a result of outdoor rinsing and cleanup. Improper disposal of hazardous waste can result in acute toxicity to downstream aquatic life. The desired neighborhood behavior is to participate in hazardous waste collection days, and to use appropriate pollution prevention techniques when conducting rinsing, cleaning and fueling

operations. The Village supports initiatives from organizations to employ a range of tools to improve resident participation. These include:

- Holding media campaigns to educate residents about proper outdoor cleaning/ rinsing techniques
- Using conventional outreach materials notifying residents about household hazardous waste and collection days

E. Vehicle Fluid Maintenance

The dumping of automotive fluids into storm drains can cause major water quality problems, since only a few quarts of oil or a few gallons of antifreeze can severely degrade a small stream. Automotive fluids can deliver hydrocarbons, oil and grease, metals, xylene and other pollutants that can be toxic to streams and lakes. The major culprit is often the backyard mechanic who changes his or her own automotive fluids. The Village employs a range of tools to improve vehicle maintenance. These include:

- Outreach materials posted on the Village website and in the Village Newsletter
- Fines and other enforcement actions

F. Recycling Events

The Village of Inverness provides its residents with weekly recycling service through Groot Inc. However, that service is limited and does not include the pickup of vehicle fluids or electronics. The Village provides a link to the Solid Waste Agency of Northern Cook County (SWANCC) on its website. Residents can contact SWANCC regarding information on getting rid of their household hazardous wastes. Limitations to the weekly recycling service can be found in the Solid Waste Program Brochure in Appendix 8.

G. Car Washing

Car washing is a common neighborhood activity that can produce transitory discharges of sediment, nutrients and other pollutants to the curb, which will eventually migrate to storm drains. Communities have utilized many innovative outreach tools to promote environmentally safe car washing that Inverness plans to use, including:

- Outreach materials posted on the Village website, and in the Village newsletter

H. Pool Dewatering

Chlorinated water discharged to surface waters, roadways or storm sewers has an adverse impact on local storm water quality. The pH of the water should be between 6.5 and 8.5. High concentrations of chlorine are toxic to wildlife, fish and aquatic plants. Algaecides such as copper or silver can interrupt the normal algal and plant growth in receiving waters and should not be present when draining. Residents are encouraged to prepare their pools before draining by following *one* of these measures:

I. De-chlorinate water in pools prior to draining through mechanical or chemical means with products available at local stores

II. De-chlorinate water in pools through natural means (by allowing pool water to sit for at least 2 days with a reasonable amount of sun, after the addition of chlorine or bromine). It is recommended that the chlorine level be tested after 2 days to ensure that concentrations are at a safe level (below 0.1-mg/l), or
III. Drain the pool slowly over a several day period across the lawn; or drain directly into the sanitary sewer using the following additional guidelines:

    i. Avoid discharging suspended particles (e.g. foreign objects blown into the pool like leaves, seedlings, twigs etc) with pool water
    ii. When draining your pool, do not discharge directly onto other private properties or into public right-of-way including storm sewer inlets

The Village has developed a Pool Dewatering Fact Sheet (Appendix 9), stating the above information. Outreach efforts (such as including information in the newsletter and other mail-outs should occur each fall, preferably in September.

3.2 *Public Participation and Involvement*

The public participation and involvement program allows for input from citizens during the development and implementation of the SWMP. The SWMP will be evaluated annually. Major highlights and deficiencies shall be noted annually and the plan revised accordingly on a minimum five year basis, or as necessary.

A. Public Hearing

Comments on the SWMP are continually accepted through the website, phone calls or other media. Comments are evaluated for inclusion and incorporated into the next revision of the SWMP.

B. Complaints, Suggestions and Requests

Calls are screened, logged and routed to the appropriate individual for action. General program related calls are directed to the Village Engineer, or designee. Construction activity, illicit discharge, storm sewer and other related storm water runoff concerns are directed to the Village Engineer. The Village maintains a website which enables and encourages public contact on these issues.

C. Watershed Planning and Stakeholder Meetings

The Village of Inverness participates (and encourages the participation of local stakeholders) in qualified local program (QLP) events or other sponsored watershed planning events. The Village attends these events and will adopt watershed plans per the direction and in coordination with the IEPA.

D. Illicit Discharge/Illegal Dumping

The Village of Inverness utilizes the phone number (847-358-7740) for residents to contact the Village with environmental concerns. Primary advertisement venues include the Village website and all related municipal publications. Telephone calls received from residents are

logged on the Indirect Illicit Discharge Tracking Form (Appendix 11). The comment recipient should transfer information from the tracking form to the Indirect Illicit Discharge Summary Form monthly. This tracking form should be reviewed by the Village Engineer annually to determine if trends occur, and if additional outreach efforts are needed.

3.3 *Illicit Discharge Detection and Elimination*

Currently, illicit discharges (defined in 40 CFR 122.26(B)(2)) contribute considerable pollutant loads to receiving waters. There are two primary situations that constitute illicit discharges; non-storm water runoff from contaminated sites and the deliberate discharge or dumping of non-storm water. Illicit discharges can enter the storm sewer system as either an indirect or direct connection.

A. Regulatory Authority

Effective implementation of an Illicit Discharge Detection and Elimination (IDDE) program requires adequate legal authority to remove and prohibit current and future illicit discharges. This regulatory authority is achieved through the municipal code. Additionally, IEPA has regulatory authority to control pollutant discharges and can take the necessary steps to correct or remove an inappropriate discharge beyond Village jurisdiction.

i. Municipal Code

The Village of Inverness municipal code contains restrictions on illicit discharges as follows:

Section 9-1-3: Water Pollution, states that pollution of the waters of the Village constitutes a menace to public health and welfare, impairs legitimate beneficial uses of water and offends the senses.

Section 9-3-1: Nuisances Enumerated

A. *Affecting watercourses*, states that “it is a nuisance to adversely affect the course of storm water runoff with any debris, organic or inorganic, as well as to obstruct watercourses and encourage stagnant water”.

B. *Sanitary System Discharge*, states that “it is a nuisance to cause or permit the discharge of any sanitary system, or laundry discharge into an MS4”.

C. *Discarding on Streets*, states that “it is a nuisance to throw or drop any debris or litter upon any public street, road or highway”.

Section 10-9-8: Dumping, states that no person shall dump any landscaping waste or junk of any kind on village property. Garbage must be placed in a receptacle.

See Appendix 17 for complete ordinances.

B. Understanding Outfalls, Receiving Waters and Illicit Discharges

Understanding the potential locations and the nature of illicit discharges in urban watersheds is essential to find, fix and prevent them.

i. Identifying Outfalls and Receiving Waters

An outfall (defined at 40 CFR 122.26(B)(9)) is a point source (defined by 40 CFR 122.2) where a municipal separate storm sewer discharges into a waters of the United States "receiving water". Open conveyances connecting two municipal storm sewers, pipes, tunnels or other conveyances which connect to segments of the same stream or other Waters of the United States are not considered Outfalls. For the purposes of this manual the following definitions shall be used:

Outfall: Storm sewer outlet, or other open conveyance point discharge location, that discharges into a Waters of the U.S. (WOUS), receiving water or another MS4.

Regulated systems include the conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, gutters, ditches, swales, manmade channels or storm sewers.

An outfall inventory was compiled by Gewalt Hamilton Associates, Inc. (GHA) during the Spring of 2010. This investigation was completed with data provided by Cook County and an existing Storm Sewer Atlas from the Village of Inverness. These two data sources were combined to create an Outfall Inventory Map. This map is used to help determine the extent of discharged dry weather flows, the possible sources of the dry weather flows, and the particular water bodies these flows may be affecting. The outfall and basin locations have been numbered and lettered respectively to facilitate detection and tracking of identified illicit discharges. The outfall inventory map is available from the Village Engineer.

The outfall map should be revised annually to incorporate permitted outfalls associated with new developments. Outfalls shall be inspected annually for detection of non-storm water discharges and illegal dumping.

ii. Potential Sources of Illicit Discharges

Table 1.—Shows that direct connections to storm sewer systems most likely originate from commercial/industrial facilities. Thus, the focus on Chapter 3.3 is on the identification of illicit discharges from commercial/industrial facilities.

Potential Sources	Storm Sewer Entry		Flow Characteristics	
	Direct	Indirect	Continuous	Intermittent
Residential Sources				
Sanitary Wastewater	√	X	√	X
Septic Tank Effluent	-	√	√	X
Household Chemicals	X	√	-	√
Laundry Wastewater	√	-	-	√
Excess Landscaping Watering	-	√	-	√
Leaking Potable Water Pipes	-	√	√	-
Commercial Sources				
Gasoline Filling Stations	√	X	-	√
Vehicle Maint/Repair Facilities	√	X	-	√
Laundry Wastewater	√	-	√	X
Construction Site Dewatering	-	√	√	X
Sanitary Wastewater	√	X	√	-
Industrial Sources				
Leaking Tanks and Pipes	X	√	√	X
Misc. Process Waters	√	X	√	X

√: Most likely condition. X: May Occur -: Not very likely

Source: *Adapted From: USEPA. January 1993. Investigation of Inappropriate Pollutant Entries Into Storm Drainage Systems: A User's Guide. Cincinnati, Ohio.*

iii. USEPA Exclusions

It is noted that not all dry-weather flows are considered illicit discharges. Under certain conditions, the following discharges are not considered illicit by USEPA:

- Water line flushing
- Landscaping irrigation
- Diverted stream flows
- Rising groundwaters
- Uncontaminated groundwater infiltration
- Uncontaminated pumped groundwater
- Discharges from potable water sources
- Flows from foundation drains
- Air conditioning condensation
- Irrigation water
- Springs
- Water from crawl spaces
- Lawn watering
- Individual car washing
- Flows from riparian habitats and wetlands
- Dechlorinated swimming pool water
- Street wash water

iv. Pollutant Indicators

Adapted from New Hampshire Estuaries Project and the IDDE Guidance Manual by the Center for Watershed Protection (CWP).

Odor

Water is a neutral medium and does not produce odor. However, most organic and some inorganic chemicals contribute odor to water. Odor in water may originate from municipal and industrial waste discharges, from natural sources such as decomposition of vegetative matter or from associated microbial activity.

Table 2.—Odor of Potential Illicit Discharges (adapted from CWP).

Odor	Possible Cause
Sewage	Wastewater treatment facilities, domestic waste connected into storm drain, failing septic system
Sulfide (rotten eggs)	Decaying organic waste from industries such as meat packers, dairies and canneries
Rancid/sour	Many chemicals, including pesticides and fertilizers, emit powerful odors that may produce irritation or stinging sensations
Petroleum/gas	Industry associated with vehicle maintenance or petroleum product storage; gas stations
Laundry	Laundromat, dry cleaning and household laundry

Color

Color is a numeric computation of the color observed in a water quality sample, as measured in cobalt-platinum units. Both industrial liquid wastes and sewage tend to have elevated color values. Unfortunately, some “clean” flow types can also have high color values. A color value higher than 500 units may indicate an industrial discharge.

Table 3.—Color of Potential Illicit Discharges (adapted from CWP).

Water Color	Possible Human Cause	Images
Brown Water – water ranging in color from light-tea to chocolate milk; it may have a rotten egg odor.	eroded, disturbed soils from construction sites, animal enclosures, destabilized stream banks and lake shore erosion due to boat traffic.	
Yellow –	textile facilities, chemical plants or pollen.	

Gray Water – water appears milky and may have a rotten egg smell and/or soap odor. There may also be an appearance of cottony slime.	illicit connections of domestic wastewater; untreated septic system discharge; illegal boat discharge; and parking lot runoff.	
Green Water – ranging from blue green to bright green color and may impart odor. Conditions typically occur from May to October.	over-fertilizing lawns, boat discharges, septic systems, agriculture operations, or discharging poorly treated wastewater.	
Orange/Red -	meat packing facilities or dyes.	
Green Flecks – resembling floating blue-green paint chips or grass clippings. These *Blooms* are potentially toxic.	excessive nutrients, fertilizers used on lawns can contaminate surface and ground water.	
Green Hair-Like Strands - bright or dark green, resembling cotton candy and often in floating mats.	excessive nutrients from fertilizers or failed on-shore septic systems.	
Multi-Color Water – various or uniform color, other than brown, green or gray. For rainbow sheen see floatables.	oil or hazardous waste spill, paint and paint equipment rinsed into storm drains or into failing septic systems.	

Turbidity

Turbidity is a measure of the clarity of water. Turbidity may be caused by many factors, including suspended matter like clay, silt or finely divided organic and inorganic matter. Turbidity is a measure of the optical properties that cause light to be scattered and not

transmitted through a sample. The presence of turbidity is to be assessed by comparing the sample to a clean glass sample container with colorless distilled water.

Turbidity and color are related terms but are not the same; turbidity is a measure of how easily light can penetrate through the sample bottle, whereas color is defined by the tint or intensity of the color observed.

Figure 2.—Turbidity Severity Examples (adapted from CWP).


Turbidity
Severity 1


Turbidity
Severity 2


Turbidity
Severity 3

Floatables

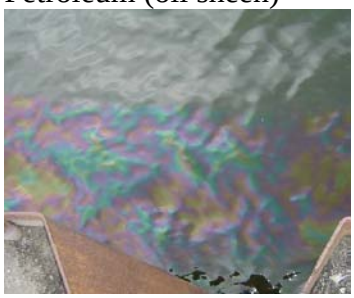
- If you think the floatable is sewage, you should automatically assign it a severity score of three
- Suds are rated based on their foaminess and staying power. A severity score of three is designated for thick foam that travels many feet before breaking up. Natural foam breaks apart easily, can be brown, black or yellowish and may smell fishy or musty
- Surface oil sheens are ranked based on their thickness and coverage. In some cases, surface sheens may not be from oil discharges, but instead created by in-stream processes. Petroleum sheens break apart and quickly flow back together

Figure 3.—Natural Sheen versus Synthetic (adapted from CWP).


Sheen from natural bacteria forms a swirl-like film that cracks if disturbed


Synthetic oil forms a swirling pattern

Table 4.—Floatables in Potential Illicit Discharges (adapted from CWP).

Floatables	Potential human causes
Sewage 	connection of domestic wastewater, leaking sanitary sewers or failing septic systems.
Suds and Foam – 	leaking sewer lines, boat discharges, and improper sewer connections to storm sewers and detergents from car washing activities.
Petroleum (oil sheen) 	leaking underground storage tank or illegal dumping.
Grease 	overflow from sanitary systems (due to clogging from grease) and illegal dumping.

v. Testing Indicators

Ammonia

Ammonia is a good indicator of sewage, since its concentration is much higher there than in groundwater or tap water. High ammonia concentrations (> 50 mg/l) may also indicate liquid wastes from some industrial sites. Ammonia is relatively simple and safe to analyze. Some challenges include the potential generation of wastes from non-human sources, such

as pets or wildlife. The Illinois Pollution Control Board (IPCB) has established a total ammonia limit (measured as nitrogen, N) of 15 mg/L.

Chloride

Chlorides in combination with a metal ion, such as sodium (Na^+) in small doses are essential to life. Too much of chloride has negative impacts on aquatic life. Fish and other aquatic life cannot survive in high levels of chloride. Chloride may enter surface water from sources such as: rocks containing chlorides, agricultural runoff, industrial wastewater, oil well wastes, wastewater treatment plant effluents and road salts. The Illinois general use water standard for chloride is 500 mg/L for chronic (long-term) exposures (not to be exceeded by the arithmetic average of at least four consecutive samples collected over any period of at least four days). Many winter test samples exhibit elevated levels of chlorides, the result of road salt runoff after a snowfall.

Fluoride

Fluoride, at a concentration of two parts per million, is added to drinking water supplies in most communities to improve dental health. Consequently, fluoride is an excellent conservative indicator of tap water discharges or leaks from water supply pipes that end up in the storm drain. Fluoride is obviously not a good indicator in communities that do not fluorinate drinking water, or where individual wells provide drinking water. Fluoride levels greater than 0.6-mg/L indicate a potable water source is connected to the storm water system.

Dissolved Oxygen

One of the most important measures of the health of the stream is the level of dissolved oxygen (DO) in the water. Oxygen (O_2) dissolves in water through the mixing of the water surface with the atmosphere. The oxygen is used by fish and other animals in the water to "breath" through their gills or other respiratory systems and by plants. If the levels fall too low, many species of fish, macroinvertebrates, and plants cannot survive. At very low levels of oxygen, the stream becomes "septic" and smells rotten because low oxygen sulfur bacteria begin to dominate.

Oxygen is measured in its dissolved form as dissolved oxygen. If more oxygen is consumed than is produced, dissolved oxygen levels decline and some sensitive animals may move away, weaken, or die. The level of oxygen dissolved in the water is inversely related to the water temperature. The lower the temperature, the more oxygen can dissolve in the water. Aquatic animals are most vulnerable to lowered DO levels in the early morning on hot summer days when stream flows are low, water temperatures are high, and aquatic plants have not been producing oxygen since sunset. The IPCB has established a minimum Dissolved Oxygen level of 5.0 mg/L between March and July and 3.5 mg/L between August and February.

Biochemical Oxygen Demand (BOD)

Biochemical oxygen demand is a measure of the quantity of oxygen used by microorganisms in the oxidation of organic matter. Natural sources of organic matter

include plant decay and leaf fall. Urban runoff carries nutrients from lawn fertilizers, pet wastes from streets and sidewalks, leaves, grass clippings and paper from residential areas, which increase oxygen demand. Oxygen consumed in the decomposition process robs other aquatic organisms of the oxygen they need to live. Organisms that are less tolerant of lower dissolved oxygen levels will die off and the diversity of natural water systems containing bacteria will decrease. Usually, a low reading generally means there is little pollution or little aerobic activity.

Phosphorus

Phosphorus is one of the key elements necessary for animal and plant growth. Phosphates (PO_4^{3-}) are formed chemically through the oxidation of this element. Phosphates exist in three forms, orthophosphate, polyphosphate, and organically bound phosphate, with varying formulations involving phosphorus. Ortho forms are formed naturally. Poly forms are used in detergents and in the treatment of boiler water. Organic phosphates may result from the breakdown of organic pesticides containing phosphorus. Rainfall causes varying amounts of phosphates and phosphorus to wash from farm soils and soils treated with certain pesticides into waterways.

Phosphates stimulate the growth of algae and aquatic plants that provide food for fish. This may cause an increase in the fish population, benefiting aquatic life forms. Excess phosphates, however, may cause an excessive growth in algae and aquatic plants, choking waterways and using up large amounts of oxygen, referred to as eutrophication. Phosphates are not directly toxic to humans or animals unless they are present in very high concentrations. Digestive problems, however, can result from high levels of consumed phosphates. The main concern related to phosphates is the potential for eutrophication. The IPCB has established a phosphorus limit of 0.05 mg/L for any reservoir or lake with a surface area of 20 acres or more, or in any stream at the point where it enters any such reservoir or lake.

Total Dissolved Solids (TDS)

Total dissolved solids comprise of inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonates, chlorides and sulfates) and some small amounts of organic matter that are dissolved in water. An elevated TDS concentration does not mean that the water is a health hazard, but it does mean the water may have aesthetic problems or can cause nuisance problems. These problems may be associated with staining, taste, or precipitation. Most aquatic ecosystems involving mixed fish fauna can tolerate TDS levels of 1000 mg/L.

Total Kjeldahl Nitrogen (TKN)

TKN is the sum of organic nitrogen; ammonia (NH3) and ammonium (NH4+) in the chemical analysis of soil, water, or wastewater (e.g. sewage treatment plant effluent). To calculate Total Nitrogen (TN), the concentrations of nitrate-N and nitrite-N are determined and added to TKN. Illinois does not have a general use standard. However, the Standard Methods for the Examination of Water and Wastewater describes typical organic nitrogen concentrations between a few hundred micrograms per liter in some lakes to more than 20 mg per liter in raw sewage.

Total Suspended Solids (TSS)

Total suspended solids are solid materials, organic and inorganic, that has a relatively low density and are too small to settle. The greater the TSS in the water, the higher its turbidity and lower its transparency. Usually suspended solids include silt, plankton, mud and industrial wastes. High concentrations of suspended solids can lower water quality by absorbing light; therefore, warming it which then lessens the ability of it to hold oxygen necessary for aquatic life. The combination of warmer water, less light and oxygen makes it impossible for some forms of life to exist. There is no established limit for TSS for the General Use Water Quality Standards. However, the effluent limit under Part 304 Effluent Standards is between 15 – 30 mg/L.

Copper

Copper is an abundant trace element found in the earth's crust and is a naturally occurring element that is generally present in surface waters. Copper is a micronutrient for both plants and animals at low concentrations and is recognized as essential to virtually all plants and animals. At higher concentrations it may become toxic to some forms of aquatic life. Concentrations of copper in dry-weather flows can be a result of corrosion of water pipes or automotive sources (for example, radiators, brake lines, and electrical equipment). The occurrence of copper in dry-weather flows could also be caused by inappropriate discharges from facilities that either use or manufacture copper-based products. Usually a copper value of greater than 0.025 mg/L may indicate an industrial discharge is present.

Industrial sources of copper include the following:

- Copper manufacturing (smelting)
- Copper metal processing/scrap remelting
- Metal plating
- Chemicals manufacturing
- Analytical laboratories
- Power plants
- Electronics
- Wood preserving
- Copper wire production

In each of these industries, wastes containing copper would normally be discharged to a treatment facility. Sludge from the waste treatment facility, whether on-site (including lagooning) or publicly operated treatment facilities, would contain copper. If the sludge (or the treatment process) is not managed properly, copper could enter the storm sewer system.

Phenolics

Phenol is a very commonly occurring chemical and can be found in foods, medicines, and cleaning products, as well as industrial products and by-products. Generally, the appearance of phenols in storm water would indicate a misconnected industrial sewer to a

storm drain or ditch. Exceptions would include runoff from treated wood storage yards (for example, treated lumber and telephone poles) and improper disposal (flash dumping) of cleaning products. A phenol value greater than 0.1-mg/L indicate an illicit discharge is present.

Industrial sources of phenol include the following:

- Chemical manufacturing (organic)
- Textile manufacturing
- Paint and coatings manufacturing
- Metal coating
- Resin manufacturing
- Tire manufacturing
- Plastics fabricating
- Electronics
- Oil refining and re-refining
- Naval stores (turpentine and other wood treatment chemicals)
- Pharmaceutical manufacturing
- Paint stripping (for example, automotive and aircraft)
- Military installations (rework and repair facilities)
- Coke manufacturing
- Iron production
- Ferro-alloy manufacturing

Other sources of phenol include improper handling and disposal of cleaning compounds by institutions such as hospitals and nursing homes.

Potassium

Potassium is found at relatively high concentrations in sewage, and extremely high concentrations in many industrial process waters. Consequently, potassium can act as a good first screen for industrial wastes, and can also be used in combination with ammonia to distinguish wash waters from sanitary wastes. An ammonium to potassium ratio of > 1 or < 1indicate waste water or wash water discharge respectively. A potassium value of > 20-mg/l is a good indicator for industrial discharges.

Temperature

The rates of biological and chemical processes depend on temperature. Aquatic organisms are dependent on certain temperature ranges for their optimal health. Optimal temperatures for fish depend on the species: some survive best in colder water, whereas others prefer warmer water. Benthic macroinvertebrates are also sensitive to temperature and will move in the stream to find their optimal temperature. If temperatures are outside this optimal range for a prolonged period of time, organisms are stressed and can die. Temperature affects the oxygen content of the water (oxygen levels become lower as temperature increases); the rate of photosynthesis by aquatic plants; the metabolic rates of aquatic organisms; and the sensitivity of organisms to toxic wastes, parasites, and diseases. Causes of temperature change include weather, removal of shading streambank vegetation, impoundments (a body of water confined by a barrier, such as a dam), discharge of

cooling water, urban storm water, and groundwater inflows to the stream. The maximum General Use Water Quality Standards limits established for Temperature are 60º F from December through March and 90° F from April through November. The water temperature at any location should not exceed the maximum limits by more than 3º F.

Conductivity

Conductivity is a measure of the ability of water to pass an electrical current. Conductivity in water is affected by the presence of inorganic dissolved solids such as chloride, nitrate, sulfate, and phosphate anions (ions that carry a negative charge) or sodium, magnesium, calcium, iron, and aluminum cations (ions that carry a positive charge). Organic compounds like oil, phenol, alcohol, and sugar do not conduct electrical current very well and therefore have a low conductivity when in water. Conductivity is also affected by temperature: the warmer the water, the higher the conductivity.
Discharges to streams can change the conductivity depending on their make-up. A failing sewage system would raise the conductivity because of the presence of chloride, phosphate, and nitrate; an oil spill would lower the conductivity.

The basic unit of measurement of conductivity is the mho or siemens. Conductivity is measured in micromhos per centimeter (µmhos/cm) or microsiemens per centimeter (µs/cm). Distilled water has conductivity in the range of 0.5 to 3 µmhos/cm. The conductivity of rivers in the United States generally ranges from 50 to 1500 µmhos/cm. Studies of inland fresh waters indicate that streams supporting good mixed fisheries have a range between 150 and 500 µhos/cm. Conductivity outside this range could indicate that the water is not suitable for certain species of fish or macroinvertebrates. Industrial waters can range as high as 10,000 µmhos/cm.

pH

Most discharge flow types are neutral, having a pH value around 7, although groundwater concentrations can be somewhat variable. pH is a reasonably good indicator for liquid wastes from industries, which can have very high or low pH (ranging from 3 to 12). The pH of residential wash water tends to be rather basic (pH of 8 or 9). Although pH data is often not conclusive by itself, it can identify problem areas that merit follow-up investigations using more effective indicators. The limit for pH in General Use Water Quality Standards is within the range 6.5 – 9.0.

C. Indirect Connection Program

Indirect connections are subtle connections, such as dumping or spillage of materials into storm sewer drains. Flash dumping is a common type of indirect connection. Generally, indirect modes of entry produce intermittent or transitory discharges, with the exception of groundwater seepage. There are five main modes of indirect entry for discharges.

i. Groundwater Seepage

Seepage discharges can be either continuous or intermittent, depending on the depth of the water table and the season. Groundwater seepage usually consists of relatively clean water that is not an illicit discharge by itself, but can mask other illicit discharges. If

storm drains are located close to sanitary sewers, groundwater seepage may intermingle with diluted sewage. Addressing seepage that is observed during the outfall screening process is described in more detail in this Chapter.

ii. Spills

These transitory discharges occur when a spill travels across an impervious surface and enters a storm drain inlet. Spills can occur at many industrial, commercial, and transport-related sites. A very common example is an oil or gas spill from an accident that then travels across the road and into a storm drain. The Spill Response Plan is described in Section 3.6.B.

iii. Dumping

This type of transitory discharge is created when liquid wastes such as oil, grease, paint, solvents, and various automotive fluids are dumped into the storm drain. Liquid dumping occurs intermittently at sites that improperly dispose of rinse water and wash water during maintenance and cleanup operations. Household Hazardous Wastes, Vehicle Fluid Maintenance and Pool Dewatering programs are designed to minimize dumping; these programs are described in Section 3.1. The procedure for handling a dumping incident is described in Section 3.6.B.

iv. Outdoor Washing Activities

Outdoor washing may or may not be an illicit discharge, depending on the nature of the generating site that produces the wash water. For example, hosing off individual sidewalks and driveways may not generate significant flows or pollutant loads. On the other hand, routine washing of fueling areas, outdoor storage areas, and parking lots (power washing), and construction equipment cleanouts may result in unacceptable pollutant loads. Individual washing activities are addressed through the Public Education and Outreach Program in Chapter 3.1 whereas observed/documented routine washing activities should be addressed through the Removal of Illicit Discharges Procedure in Section 3.3.

v. Non-target Irrigation from Landscaping or Lawns

Irrigation can produce intermittent discharges from over-watering or misdirected sprinklers that send tap water over impervious areas. In some instances, non-target irrigation can produce unacceptable loads of nutrients, organic matter or pesticides. The most common example is a discharge from commercial landscaping areas adjacent to parking lots connected to the storm drain system. This type of discharge is addressed by the Public Education and Outreach Program in Section 3.1.

D. Direct Connection Illicit Discharge Program

Direct connections enter through direct piping connections to the storm sewer system, and since direct connections exist regardless of whether or not a storm water event (e.g. rain or melting snow) is occurring. Illicit discharges are most easily detected during dry-weather periods. Inspection of storm water outfalls during dry-weather conditions reveals whether non-

storm water flows exist. If non-storm water flows are observed, they can be screened and tested to determine whether pollutants are present. If the presence of pollutants is indicated, source identification can begin. Once the source is identified, it can then be corrected. A direct connection illicit discharge program consists of three principal components: 1) program planning, 2) outfall screening, and 3) follow-up investigation and program evaluation.

Program Planning involves the office work, planning, and organization required to conduct subsequent outfall screening and follow-up investigative activities of the program. Program planning identifies the regulatory authority to remove directly connected illicit discharges and defines the outfalls and receiving waters in the Village (both discussed earlier in this chapter). Program planning for the direct connection portion of the overall program also includes the identification of the staffing and equipment needed to conduct the outfall screening, and scheduling of the outfall screening activities (Chapter 3.3).

Outfall Screening consists of pre-screening to determine whether dry-weather flows are present and outfall inspection which includes field-testing and grab samples to determine whether pollutants are present in any observed dry-weather flows (Chapter 3.3).

Follow-Up Investigation and Program Evaluation are the steps necessary to determine the source of any identified pollutant flows and eliminate them. The major follow-up investigation and program evaluation components (Chapter 3.3) include:

- Reviewing and assessing outfall inspection results
- Internal coordination
- Conducting detailed storm sewer investigations to identify pollutant sources (tracing),
- Coordinating with the appropriate regulatory authorities to achieve enforcement of the program objective (removal of pollutants at the source), and evaluating the program to determine whether subsequent screening activities are necessary

i. Program Planning

The program planning component is primarily office work related to assembling the necessary information and equipment for efficiently conducting outfall-screening activities. This component of the program addresses staffing, training, equipment needs, and scheduling.

Staffing

Personnel for an outfall inspection screening program are required for program administration, conducting the outfall screening, and any follow-up investigations. Based on the number of identified outfalls and program goals, it is anticipated that a two-member crew will be required to perform inspections for several weeks throughout the year.

Training

Applicable field personnel shall thoroughly read and understand the objectives of the IDDE subchapters of this manual and have completed a standard training session. It is recommended that applicable field personnel accompany a supervisor on at least two

outfall inspections to learn the use of the Storm Water Outfall Inspection Data Form (Appendix 2). As a training exercise, new field personnel should independently conduct outfall screening activities until two outfall screening data forms are accurate and consistent with the supervisor investigator's forms.

Equipment Needs

General field equipment and specialized outfall screening equipment are required for IDDE programs. The method of collecting and managing inspection screening data is driven by available technology. Field crews carry basic safety items, such as cell phones, surgical gloves, and first aid kits. It is recommended that an effort to keep up with applicable and appropriate technology be made. Working with equipment that can store data electronically will reduce the risk of error from poor hand writing, and smearing ink. Also, objectivity can be encouraged through technology be using devices that incorporate a template for inspections. Finally, keeping up with technology will keep field crews from growing accustomed to a single way of performing inspections.

Scheduling

Scheduling for pre-screening or outfall inspections is dependent on staff availability and weather. Pre-screening generally takes place during the late summer or fall months, ideally in August, September, or October. Other summer or fall months may be acceptable depending on weather conditions. This time period is generally warm, improving field efficiency, reliability, and consistency of field testing. This time period is also more likely to have the extended dry periods with little or no precipitation that are required for inspection activities.

In order to ensure that samples collected are representative of dry-weather flows, conduct pre-screening and follow-up inspections preceding a dry-weather period, a period of 72 hours of dry weather. A period of 72 hours is selected to allow local detention facilities to drain, and for groundwater flows to recede after precipitation events. However, some judgment may be exercised in evaluating the 72 hour period to sampling. For example, if very light rain or drizzle occurred and no runoff was experienced, it is likely that dry-weather conditions would exist, and outfall inspection can be conducted.

ii. Outfall Inspection Procedure

A Data Form (Appendix 2) is completed for each outfall. Follow-up inspections are required for those pipes found to have dry weather flow. Once probable illicit discharges are found, source identification and correction of any illicit discharges should begin per the removal procedure found in Chapter 3.3.D. Outfall inspection results should be logged in the Outfall Inventory Database. Outfalls with dry weather flows shall be scheduled for a follow up inspection.

During daily setup, safety issues associated with the screening process are of particular concern. Traffic control or difficult outfall access are common issues. Before performing an outfall inspection, field crews must ensure that all necessary equipment is available, operable, and calibrated appropriately.

Safety is the primary concern while inspecting upstream sampling locations. In general, the rule "if in doubt, don't" is followed. A first aid kit is included in each vehicle to treat minor injuries. Obtain medical help for major injuries as soon as possible. Report all injuries, minor and major to appropriate persons.

In some cases, it may be necessary for field personnel to enter or cross private property to investigate discovered illicit discharges. A form letter should be prepared that includes a short description of the project, the purpose of the access to the property, and the name of a project contact person with a telephone number. Personnel should attempt to contact each home or business owner for permission to access the outfall prior to entering the property. Field personnel shall have identification on them at all times. If the owner is not present, a letter should be left at the premises to facilitate return inspection. If permission to access property is denied, a public official should then contact the owner at a later date.

Avoid confrontational situations with citizens and attempt to answer questions concisely and without being alarmist. Field personnel should be coached on appropriate responses to questions from citizens. If a field crew feels uncomfortable or threatened, they should remove themselves from the situation and report the incident to their supervisor.

Confined space entry for this program would include climbing into or inserting one's head into a pipe, manhole, or catch basin. In general, do not cross the vertical plane defining an outfall pipe or the horizontal plane defining a manhole, unless properly prepared for confined space entry. **IN NO CASE SHALL FIELD CREW MEMBERS WHO ARE UNTRAINED AND/OR UNEQUIPPED FOR CONFINED SPACE ENTRY ATTEMPT TO ENTER CONFINED SPACES.** Confined space entry shall be conducted only by trained personnel with appropriate rescue and monitoring equipment.

Inspection Procedures

Upon arriving at an outfall, the field crew should approach the outfall on foot to a proximity that allows visual observations to be made. Outfalls are assessed to determine which one of the three following conditions applies:

- The outfall is dry or damp with no observed flow
- Flowing discharges are observed from the outfall
- The outfall is partially or completely submerged with no observed flow or is inaccessible

Scenario 1: No Observed Flow. Under Scenario 1, the field crew should photograph the outfall and complete applicable Sections of the Storm Water Outfall Inspection Data Form *(*Appendix 2). Use the flow chart, Figure 5**,** to identify applicable Sections of the form that must be filled out.

Scenario 2: Observed Flow. Under Scenario 2, the field crew photographs the outfall and completes applicable Sections of the Storm Water Outfall Inspection Data Form *(*Appendix 2). Use the flow chart, Figure 5**,** to identify applicable Sections of the form that must be filled out. The intent is to gather additional information to determine if an

illicit discharge is present. Determine the need for water quality testing with an independent outside lab. Testing results are then used to identify potential sources.

Scenario 3: Submerged or Inaccessible Outfall. Under Scenario 3, if standing water is present in an outfall or if it is inaccessible, then complete available information from Sections 1, 2, 3 and 5 of the Storm Water Outfall Inspection Data Form, with appropriate comments being written in the "Remarks" Section of the data form. Locating an upstream sampling point may be required if any of the following conditions exist at an outfall:

- The outfall discharge is submerged or partially submerged due to backwater conditions
- Site access and safety considerations prevent inspection
- The outfall is from a facility providing water quality treatment (for example, detention basin outlet)
- Other special considerations

Determine the upstream sampling location using the Village's storm sewer atlas. Manholes, catch basins, or culvert crossings can be used for upstream sampling locations. Make reasonable efforts to locate upstream sampling points that are accessible and exhibit flow. If inaccessible, resolve the problem in the office with appropriate supervisory personnel.

Figure 4.—Characterizing Submersion and Flow
Center for Watershed Protection

<table>
<tr>
<td> 
Submerged:
More than ½ below water</td>
<td> 
Partially submerged:
Bottom is below water</td>
<td> 
Fully submerged:
Can't see outfall</td>
</tr>
<tr>
<td> 
Outfall fully submerged by debris</td>
<td> 
Fully submerged from downstream trees trapping debris</td>
<td> 
Partially submerged by leaf debris "back water"</td>
</tr>
</table>

		
Trickle Flow: Very narrow stream of water	Moderate Flow: Steady stream, but very shallow depth	Significant flow (Source is a fire hydrant discharge)

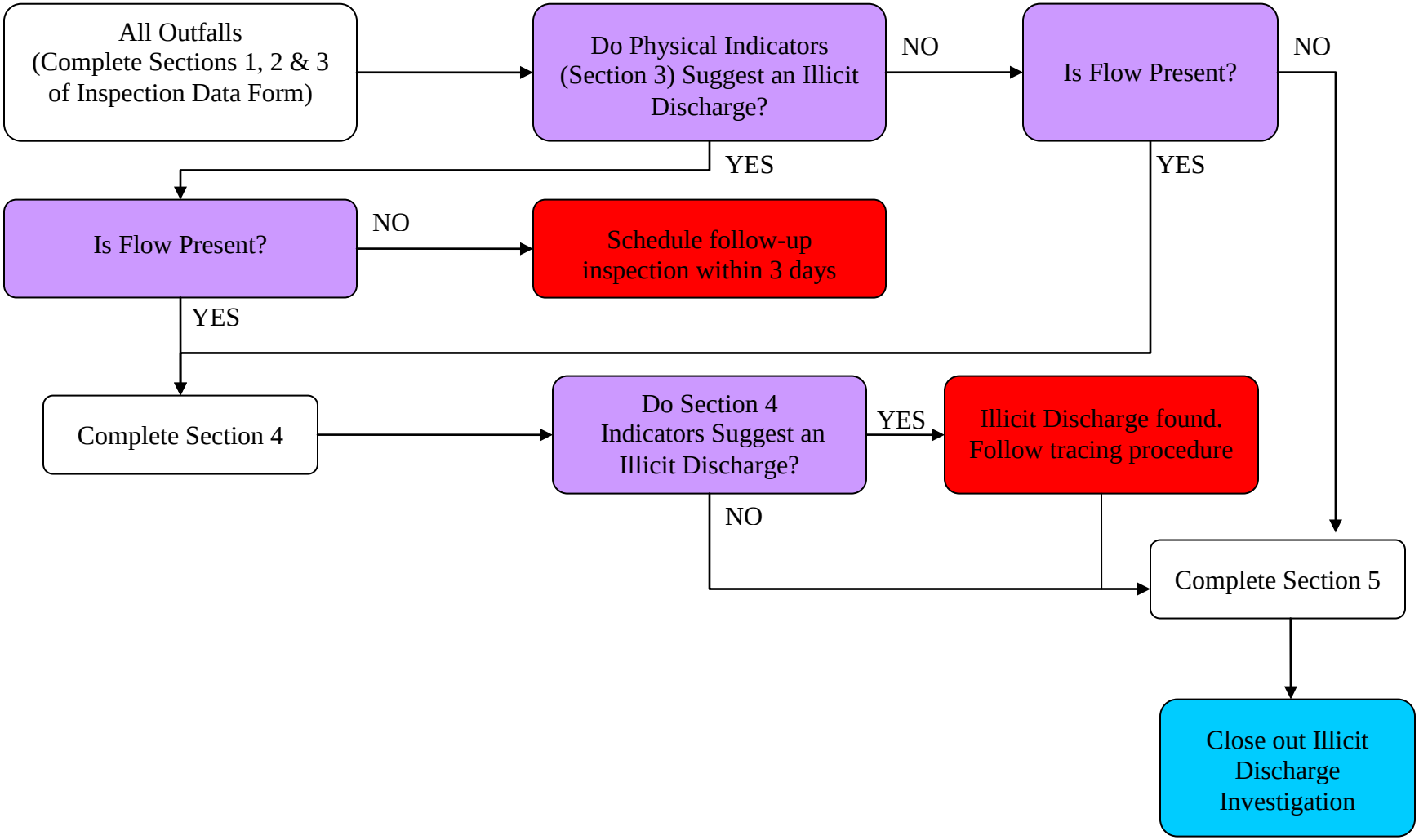
Outfall Assessment and Documentation

Complete the Storm Water Outfall Inspection Data Form for all outfall screening activities. All completed forms must be dated, legible, and contain accurate documentation of each outfall inspection. A separate data form must be completed for each outfall. It is recommended that non-smearing pens be used to complete the forms and that all data be objective and factual. Once completed, these data forms are considered accountable documents and are maintained as part of the Village files. In addition to standard information, the data form is used to record other information that is noted at the time the outfall inspection is conducted (e.g. observations of dead or dying plants, fish kills, algal blooms (excessive algae growth), construction activities, and other activities that might provide information regarding the potential for illicit connections or inappropriate discharges).

Daily Closeout

Scan and file copies of completed data forms in the office. Also, update the outfall screening scheduling and completion form and plan the next screening day's activities. Discuss any problems locating outfalls with appropriate supervisory personnel so that alternate sampling locations can be identified. Once a month, compile data from the Storm Water Outfall Inspection Data Form onto the Outfall Inspection Screening Summary Form (Appendix 2).

Figure 5: Outfall Inspection Procedure Flow Chart



iii. Follow Up Investigation and Program Evaluation

Follow up investigation is required for all outfalls with positive indicators for pollutant discharges. The outfall assessment results are reviewed to determine the magnitude of the dry-weather pollution problem and to determine the necessary steps to identify and remove the sources of any detected pollutants.

Outfall Screening Results Review and Assessment

Detailed investigations of the storm sewer system may be required upstream of the outfalls to locate sources of illicit discharges or improper disposal. The need for detailed investigations is based on evaluation of the data from the initial outfall screening. This element of the program serves to detect and remove pollutant sources. This is accomplished by reviewing the Outfall Inspection Screening Summary Form (Appendix 2) to determine if there are outfalls that require a follow up investigation. Then by targeting a sewer system area for a further detailed investigation and then conducting intensive field investigations upstream of the polluted outfall to identify potential sources.

Independent Verification

If the initial outfall assessment identifies potential illicit discharges, additional sampling is required. The results of the inspection and testing should be discussed with the Village Engineer. Contract an independent laboratory to take and test a sample. Use the established procedure to coordinate the independent laboratory sample and testing.

Source Identification

The procedure for detailed storm sewer investigation and source identification has three major components: 1) mapping and evaluation, 2) storm sewer investigation and 3) tracing.

Mapping and Evaluation

For each outfall to be investigated, a large-scale working map should be obtained (digitally or in paper form) that includes the entire upstream storm sewer network, outfall locations and parcel boundaries indicated. This map product is based on information from the storm sewer atlas and outfall map. Land use information is evaluated to determine the types of residential, commercial and industrial areas that might contribute the type of pollution identified at the outfall.

If the contributing area is determined to be non-residential, the available Industrial/Business information should also be reviewed. The pre-treatment inspection typically indicates chemicals located on-site at each business. The business type and on-site chemicals are logged into the Industrial/Business Inventory.

Storm Sewer Investigation

After conducting the mapping evaluation, a manhole-by-manhole inspection is conducted to pinpoint the location of the inappropriate discharge into the storm sewer/conveyance

system. This inspection requires a field crew to revisit the outfall where the polluted dry-weather discharge was detected. The field crew should be equipped with the same testing and safety equipment and follow procedures used during the initial outfall inspection.

After confirming that dry-weather flow is present at the outfall, the field crew will continue to move to the next upstream manhole or access point to investigate for dry weather flow. In cases where more than one source of dry-weather discharge enters a manhole, the field crew should record this information on the screening form and then track each source separately. All sources will be tracked upstream, manhole-by-manhole, until the dry-weather discharge is no longer detected. Finally, the last manhole where dry-weather flow is present will be identified and potential sources to that manhole will be assessed. This data is important for source identification.

The field crew should also determine whether there has been a significant change in the flow rate between manholes. If the flow rate appears to have changed between two manholes in the system, the illicit connection likely occurs between the two manholes. Changes in the concentration of pollutant parameters could also aid in confirming the presence of an illicit connection between the two manholes.

Tracing

Once the manhole inspection has identified the reach area between two manholes suspected of containing an inappropriate discharge, testing may be necessary. If there is only one possible source to this Section of the storm sewer system in the area, source identification and follow-up for corrective action are straightforward. Multiple sources or non-definitive sources may require additional evaluation and testing. The method of testing must be approved by the Village Engineer prior to testing. Potential testing methods include fluorometric dye testing, smoke testing and/or remote video inspections.

iv. Removal of Illicit Discharges

Eight steps are taken to definitively identify and remove an inappropriate discharge to the storm sewer system. These steps are as follows:

Step 1: Have an outside laboratory service take a grab sample and test for the illicit discharge at the manhole located immediately downstream of the suspected discharge connection.

Step 2: Conduct an internal meeting with appropriate personnel to discuss inspection and testing results and remedial procedures.

Step 3: The Village Engineer shall send a notification letter to the owner/operator of the property/site suspected of discharging a pollutant. The letter should request that the owner/operator describe the activities taking place on the site and the possible sources of non-storm water discharges including information regarding the use and storage of hazardous substances, chemical storage practices, materials handling and disposal practices, storage tanks, types of permits, and pollution prevention plans.

Step 4: Arrange a meeting for an inspection of the property with the owner/operator of the property where the pollution source is suspected. Most illicit connections and improper disposal can probably be detected during this step. Notify the site owner/operator of the problem and instruct them to take corrective measures.

Step 5: Conduct additional tests as necessary if the initial site inspection is not successful in identifying the source of the problem. The Village Engineer is responsible for determining the appropriate testing measure to pinpoint the source.

Step 6: If the owner/operator does not voluntarily initiate corrective action, the Village issues a notification of noncompliance. The notification includes a description of the required action(s) and a time frame in which to assess the problem and take corrective action. Upon notification of noncompliance, the owner can be subject to any penalties stipulated in the Municipal Code.

Step 7: Conduct follow-up inspections after the stipulated time frame has elapsed to determine whether corrective actions have been implemented to 1) remove the illicit connection or 2) eliminate the improper disposal practice.

Step 8: If corrective actions have been completed (i.e. and the illicit discharge has been eliminated) the Village Engineer sends a notification of compliance letter to the owner/operator of the property/site suspected of discharging a pollutant.

If corrective actions have not been completed, an additional internal meeting will be held to determine appropriate steps to obtain compliance. Appropriate actions may include monetary charges or other penalties.

Table 5: NPDES-Identified Industrial Facilities

SIC Code	Description
	Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards that are exempted).
1000-1400	Mineral industry, including active and inactive mining operations, with exceptions, and certain oil and gas exploration, production, processing, or treatment operations or transmission facilities.
2400	Lumber and wood products except furniture (except 2434-wood kitchen cabinets)
2600	Paper and allied products (except 2650-paperboard containers and boxes from purchased paperboard and 2670-converted paper and paperboard products)
2800	Chemicals and allied products (except 2830-drugs)
2900	Petroleum refining and related industries (except discharges subject to 40 CFR 419)
3110	Leather tanning and finishing
3200	Stone, clay, glass and concrete products (except discharges subject to 40 CFR 419)
3300	Primary metal industries
3441	Fabricated structural metal
3730	Ship and boat building and repair
	Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA
	Landfills, land application sites, and open dumps that receive or have received any industrial wastes, including those that are subject to regulation under Subtitle D of RCRA
	Facilities involved in the recycling of materials, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards, including, but not limited to, those classified as SIC codes 5015 (used motor vehicle parts) and 5093 (scrap and waste materials).
	Stream electric power generating facilities including coal handling sites
	Transportation facilities with vehicle maintenance shops, equipment cleaning operations, or airport deicing operations (except facilities with SIC codes 4221 through 4225) (only those portions of the station that are either involved in vehicle maintenance including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or that are otherwise identified as an industrial station.
	Construction activity including clearing, grading, and excavation activities except: operations that result in the disturbance of less than 5 acres of total land that are not part of a larger common plan of development or sale
THE FOLLOWING CODES REQUIRE AN NPDES PERMIT IF CERTAIN ACTIVITIES ARE EXPOSED TO SW	
2000	Food and kindred products manufacturing or processing
2100	Tobacco products
2200	Textile mill products
2300	Apparel and other finished products made from fabrics and similar materials
2434	Wood kitchen cabinets
2500	Furniture and fixtures
2650	Paperboard containers and boxes
2670	Converted paper and paperboard products
2700	Printing, publishing and allied industries
2830	Drugs
2850	Paperboard containers and boxes
3000	Rubber and miscellaneous products
3100	Leather and leather products (except 3110-leather tanning and finishing)
3230	Glass products, made of purchased glass
3400	Fabricated metal products, except machinery and transportation equipment (except 3441-fabricated structural metal)
3500	Industrial and commercial machinery and computer equipment
3600	Electronic and other electrical equipment and components, except computer equipment
3700	Transportation equipment (except 3730-ship and boat building and repairing)
3800	Measuring, analyzing, and controlling instruments; photographic, medical, and optical goods; watches and clocks
3900	Miscellaneous manufacturing industries
4221-25	Farm products warehousing and storage, refrigerated warehousing and storage, general warehousing and storage

v. Program Evaluation

Review the results of the screening program to examine whether any trends can be identified that relate the incidence of dry-weather flow observations to the age or land use of a developed area. Statistics from the USEPA NPDES program indicate a lower chance of observing polluted dry-weather flows in residential and newer development areas, than older and industrial land use areas. See Table 5 for areas that may be more likely to exhibit dry-weather flows. Examine the screening results to determine whether any such obvious conclusions can be made. If so, these conclusions may guide future outfall screening activities.

Outfalls with positive indicators of potential pollution are investigated to identify upstream pollutant sources. Identified illicit direct connections must be eliminated. However, new sources may appear in the future as a result of mistaken cross connections from redevelopment, new-development or remodeling. Indirect or subtle discharges such as flash dumping are difficult to trace to the source and can only be remedied through public education and reporting. Therefore, it is expected that to some degree they will continue, but ideally at a reduced magnitude and frequency. Although the outfall screening program will be successful in identifying and eliminating most pollutants in dry-weather discharges, the continued existence of pollutants in dry-weather flows will require an ongoing commitment to continue the outfall screening program.

The annual inspection screening will determine the effectiveness of the program on a long-term basis and show ongoing improvement through a reduced number of outfalls having positive indicators of potential pollutants. It is logical to assume that after several years of annual screening, the majority of the dry-weather pollution sources will be eliminated.

3.4 *Construction Site Runoff Control*

The Village's Municipal Code contains provisions for review, permitting and inspection & enforcement of construction site runoff control. These can be found under Title 4, Building Regulations, Chapter 8, Erosion and Sediment Control. The provisions of the Municipal Code are required for any development within the Village limits. The Village follows their inspection and Violation Notification Procedure to ensure compliance with the approved plan.

A. Regulatory Program

Applicants must submit the completed forms and supporting documentation to the Village for review and comment. After all applicable provisions of the Municipal Code have been addressed, a permit will be issued. Each permit lists any additional conditions that are applicable to the development. Ordinance provisions include, but are not limited to the following:

- Grading, soil erosion and sediment control plan
- Established inspection duties for the applicant and procedures for inspections
- Record keeping and reporting procedures
- Security deposits to ensure faithful performance
- Enforcement measures to achieve compliance

In addition to Village requirements, as part of the permit review process, applicants that hydrologically disturb greater than 1-acre are also required to seek coverage under the statewide construction general permit by filing a Notice of Intent (NOI) with the IEPA. A copy of the NOI must be submitted to the Village prior to commencement of any site work, including demolition. During construction, applicants are required to submit to the IEPA Incidence of Noncompliance (ION) forms, as necessary. After the site is substantially stabilized, the applicant is required to submit a Notice of Termination (NOT) to the IEPA.

B. Responsible Parties

The property owner is ultimately responsible for ensuring compliance with on-site soil erosion and sediment control measures. General contractors, sub-contractors and other hired employees of the property owner can assist in maintaining a compliant site; however the property owner remains the responsible party.

C. Site Inspection Procedures

The Permit Officer shall make inspections as hereinafter required and shall either approve the specified portion of work complete *or* shall notify the permittee wherein the work failed to comply with the site development permit. Where it is found by inspection that the conditions were not consistent within said plan, the Permit Officer may stop further work until approval of a revised grading plan that conforms to the existing conditions is obtained by the permittee. Plans for grading work, bearing the stamp of approval of the Permit Officer, shall be maintained at the site during the progress of the grading. Until the final inspection is made, a copy of the site development permit or the building permit or the building permit indicating permission to grade has been granted by the Village shall be prominently displayed on the property so as to be visible from the street on which the property fronts. In order to obtain inspections in accordance with the following schedule, the permittee shall notify the Permit Officer at least two (2) full working days before the said inspection is to be made:

1. Preconstruction site inspection
2. Rough Grading: When all rough grading has been completed
3. Final Inspection will be performed when all work, including installation of all drainage improvements and other structures are required planting has been completed

D. Complaints

Both site design and construction related phone calls are directed to the Village Engineer, or designee. Site design comments are handled on a case by case basis. Construction related calls are typically addressed by performing a site inspection.

E. Violation Notification Procedures

No person shall construct, enlarge, alter, repair or maintain any grading, excavation or fill, or cause the same to be done, contrary to or in violation of any provisions of this chapter, and no person shall fail to do any act required by this chapter. Any personal violation of the provisions of this chapter shall be deemed guilty of a separate offense for each and every day or portion thereof during which any violation of any of the provision of this chapter is committed, continued or permitted.

F. Performance Guarantees

The Village requires as a performance guarantee, a letter of credit or surety bond for developments that will grade a volume of over 100 cubic yards. The applicant shall be required to file with the Village Administrator a letter of credit or surety bond in a form satisfactory to the Village Attorney in the amount deemed sufficient by the Permit Officer to cover engineering, inspection fees, incidental expenses and all the costs of improvements, landscaping and maintenance of landscaping for such periods as specified by the Village.

In addition, each person who applies for a building permit for the construction of any new building, for an addition to an existing building, for remodeling of an existing building, or who applies for any site development permit to be issued pursuant to Chapter 8, Erosion and Sediment Control, for any demolition permit shall post with the Village Collector a cash performance bond.

G. BMP Reference Information

Reference information includes, but is not limited to, the following sources:

- MWRDGC draft Watershed Management Ordinance and Technical Guidance Manual
- Native Plant Guide
- Lake County SMC's Technical Reference Manual
- McHenry County Technical Reference Manual
- Kane County Technical Reference Manual
- Illinois Urban Manual
- SMC's soil erosion and sediment checklist, soil erosion and sediment control notes, and typical construction sequencing
- Chicago Metropolitan Agency for Planning (previously Northeastern Illinois Planning Commission) Course Manuals
- IDOT manuals
- Center for Watershed Protection documents
- IEPA and USEPA publications

H. Development Tracking

The Village maintains a tracking log of current construction projects and associated permits and inspections.

I. Pavement Projects

Pavement resurfacing and maintenance projects are determined through pavement evaluation studies. Project work typically follows IDOT Standard Specifications. At a minimum, it is expected that drainage structures with inlet filter bags during construction activities will be protected.

3.5 *Post Construction Runoff Control*

This Section describes how the Village complies with storm water discharge permit requirements for long-term post-construction practices that protect water quality and control runoff flow. The Village complies with NDPES permit requirements by incorporating Ordinance and BMP standards to minimize the discharge of pollutants from development projects.

This SWMP creates and references extensive policies and procedures for regulating design and construction activities for protecting the Village's receiving waters. The design and construction site practices selected and implemented by the responsible party for a given site are expected to meet BMP measures described in IEPA's Program recommendations. All proposed permanent storm water treatment practices must be reviewed and approved by the Village Engineer.

A. Regulatory Program

The Village's Municipal Code includes requirements for grading, storm water and soil erosion and sediment control that must be met for all parties undertaking construction.

B. Long Term Operation and Maintenance

The SWMP includes two long term maintenance plans. These sample maintenance plans are included in Appendix 12.

The first plan is the recommended plan for existing detention and storm water management facilities, whether publicly or privately maintained. The intent of this sample plan is to provide guidance for the maintenance of facilities that do not have an approved plan. If an existing facility already has an adequate plan, this document would supersede the sample plan.

The second plan is provided to applicants during the permit review period. This plan should be reviewed and enhanced by the applicant to reflect the sites specific design. Receipt of the signed and recorded maintenance plan is required prior to issuance of the permit or listed as a permit condition.

The maintenance plan should include requirements for post-construction management plans and ensure adequate long-term operation and maintenance of BMPs.

C. Site Inspections

The Village's inspection procedure for site inspections related to construction activities are discussed in detail in Section 3.4 and includes information pertaining to post construction inspections. The Village may perform additional inspections based on an observed violation or citizen complaint.

This Section focuses on post-construction inspections of previously developed sites, streambanks/shorelines, streambeds, and detention / retention ponds.

i. Previously Developed Sites

The Village will attempt to inspect approximately 20% of all existing properties with storm water management (detention) facilities a year; resulting in a re-occurrence inspection interval of every five years.

Previously accepted developments are inspected with respect to the approved maintenance plan. A letter indicating the maintenance activity highlights, deficiencies or additional enhancements to the plan should be provided to the responsible party

For older developments that do not have a maintenance plan, the Village will inspect facilities with respect to the sample existing facilities maintenance plan. A letter indicating the maintenance activity highlights and deficiencies should be provided to the responsible party. The sample maintenance plan is provided with the letter and the responsible party is encouraged to implement an annual maintenance program.

ii. Streambanks and Shorelines

Annually inspect 20% of receiving water streambanks/streambeds and detention basin shorelines in the spring and/or fall pending weather conditions. Observed erosion, seeding/re-seeding or slope stabilization needs will be documented. Documented deficiencies should be reported to the Village Engineer who evaluates and determines appropriate remediation activities. Remedial actions might include notifying the property owner or including maintenance activities in the Village's work program.

New developments are required to provide a maintenance plan for constructed detention/retention facilities. The recorded maintenance plan for developments permitted should be used if available. Typical BMP maintenance of these areas are similar to those for a construction site.

3.6 *Pollution Prevention and Good Housekeeping*

The Village of Inverness is responsible for the care and upkeep of general facilities and municipal roads. The Village employs contractors to perform specific activities. This Section describes how the Village complies with permit requirements by incorporating pollution prevention and good housekeeping management into day-to-day Village operations. The Village provides ongoing education and training to ensure that all of its employees and contractors have the knowledge and skills necessary to perform their functions effectively and efficiently.

A. Inspection and Maintenance Program

The following outlines areas/items that require inspection and maintenance, as well as their recommended inspection frequency. It further details recommended maintenance activities and subsequent tracking procedures for each of the tasks.

i. Drainageways

Drainageways include any river, stream, creek, brook, branch, natural or artificial depression, ponded area, lakes, 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. Primary drainageways, include Flint Creek, Poplar Creek and Salt Creek. Minor drainageways include roadside and sideyard swales, overland flow paths, pond outlets, etc.

Pond Outlets

The Detention/Retention Pond Checklist (Appendix 7) is used to determine inspection locations. Structures are added to the checklist after new developments are approved and accepted. Locations identified on the checklists are inspected both once every five years on a rotating basis, with approximately 20% inspected each year. Observed obstructions are noted and reported to the Village Engineer. During inspections, the water level is evaluated according to the following classifications:

Flood Height Classification

- Low – Normal Water Level (NWL)
- Medium – NWL to the top of the outlet
- High – To the top of the outlet and above

Condition

- Good – Outlet is unimpaired, not blocked
- Fair – Outlet obstructions observed although outlet is discharging
- Poor – Outlet is blocked or obstructed

Comments:

Note structural defects or other observances.

Inspections will continue until the water level recedes to mid-pipe (Medium classification). If maintenance work is required for a pipe culvert within the Village limits but in the State of Illinois right-of-way, the State's Maintenance Facility will be notified. Similarly, the Cook County Highway Department will be contacted for work within the right-of-way.

Catch Basins

Catch basin locations are identified on the Storm Sewer Atlas. The Village cleans catch basins on an as needed basis, to a minimum sump depth of 2 feet. Spoil waste obtained from catch basin cleaning will be disposed of in the spoil waste area. Locations of cleaned catch basins and their conditions will be logged into the Village's NPDES Database.

Catch basins found to have structural deficiencies should be reported to the Village Engineer. Necessary remedial actions will be completed by a contractor or incorporated into a capital project. Catch basins that have been cleaned will be tracked on the GIS data base using a color coded system.

Storm Sewers

If catch basin debris is at the invert elevation of the downstream pipe (i.e. has completely filled the sump area), then the downstream storm sewer system will also be cleaned. Likewise, if a water main break or other heavy flow occurs that flushes potential illicit discharges into the storm sewer system, the receiving storm sewer lines are inspected and then cleaned as necessary.

Other Inlet and Grate Cleaning

Cleaning of these areas will occur on an as-needed basis (e.g. complaints, incidences, standing water, etc). Spoil waste that is obtained from inlet and grate cleaning or vacuuming will be disposed of at a proper disposal location. Any waste jetted out will be picked up with a clapper bar if possible.

Swales and Overland Flow Paths

Right-of-Way Drainage Swales

The Village Engineer documents observed or reported erosion or sediment accumulation. Areas of significant concern are incorporated into a maintenance program.

Privately Owned Drainage Swales (side/rear yard)

Observed or reported erosion or sediment accumulation in privately owned swales are referred to the Village Engineer for follow-up. The Village Engineer notifies the property owner on an as needed basis for appropriate remediation required.

ii. Landscape Maintenance

The Village maintains care and upkeep of its general facilities, municipal roads and other public areas. A private contractor hired by the Village is responsible for litter and debris control described in Chapter 3.6.A below. Landscape contractors are responsible for the remainder of the landscape maintenance program. The Village is responsible for ensuring that their landscape contractors are provided with training and/or other information to ensure that they adhere to the Village's SWMP.

The Village of Inverness contracts with Groot Industries to provide trash, recycling and yard waste collection services to residential households, institutional, commercial and industrial units.

Private Residence Yard Waste

Yard waste and leaves from private residences are collected through the contract with Groot Industries. Yard waste is collected weekly throughout the growing season. Leaf collection typically starts in October and runs for approximately six weeks.

Fertilizers

The use of pesticides and fertilizers shall be managed in a way that minimizes the volume of storm water runoff and pollutants.

iii. Snow Removal and Ice Control

The Village of Inverness contracts for snow and ice removal on Village Roadways. During snow removal and ice control activities, salt, de-icing chemicals, abrasives and snow melt may pollute storm water runoff. To address these potential pollutants, the following procedures for the "winter season" (November 1 through May 1) will be implemented.

Roadway Ice Control

The use of minimal amounts of salt, de-icing chemicals and additives is necessary for effective ice control. Prior to November 1, preparation work to obtain seasonal readiness will be completed by the contractor. These tasks include installing, inspecting, re-conditioning, testing and calibrating per National Salt Institution Application Guidelines spreaders and spinners. Conducting driver training is also essential. The completion of these preparatory tasks helps to ensure that only the minimum amount of salt necessary is applied.

Snow Plowing

Snow plowing activities direct snow off the pavement and onto the parkways. This reduces the amount of salt, chemical additives, abrasives or other pollutants that go directly into the storm sewer system. Snow blowing, plowing or dumping into drainageways is not allowed.

iv. Animal Nuisance Control

Private contractors, upon receiving notification, collects and disposes of "road kill" from right-of-way areas that are maintained by the Village.

B. Spill Response Plan

Spill prevention and control procedures are implemented wherever non-hazardous chemicals and/or hazardous substances are stored or used. These procedures and practices are implemented to prevent and control spills in a manner that minimizes or prevents discharge to the storm water management system and receiving waters. The following general guidelines are implemented, when cleanup activities and safety are not compromised, regardless of the location of the spill:

- Cover and protect spills from storm water run-on and rainfall, until they are removed
- Dry cleanup methods are used whenever possible
- Disposal of used cleanup materials, contaminated materials and recovered spill material in accordance with the Hazardous Waste Management practices or the Solid Waste Management practices of this plan

- Contaminated water used for cleaning and decontamination shall not be allowed to enter the storm water management system
- Keep waste storage areas clean, well organized and equipped with appropriate cleanup supplies
- Maintain perimeter controls, containment structures, covers and liners to ensure proper function

i. Non-Hazardous Spills/Dumping

Non-hazardous spills typically consist of an illicit discharge of household material(s) into the street or storm water management system. Upon notification or observance of a non-hazardous illicit discharge, the Village Engineer contacts the Police Department, Township Road District, Fire District or private contractors for assistance with the following procedure:

- The sand bagging of the receiving inlet to prevent additional discharge into the storm sewer system, as necessary. It may be necessary to sand bag the next downstream inlet
- Check structures (immediate and downstream). If possible, materials are vacuumed out. The structure(s) are then jetted to dilute and flush the remaining unrecoverable illicit discharge
- Clean up may consist of applying “Oil Dry” or sand and then sweeping up the remnant material
- After containment and cleanup activities have been performed, the on-site personnel distribute the Storm Water Pollution Notice (Appendix 10) to adjoining residences/businesses. In residential areas, the flier should be provided to residences on both sides of the spill and on both sides of the street
- On-site personnel document the location, type of spill and action taken on the Indirect Illicit Discharge Tracking Form (Appendix 11)
- The on-site personnel provide the tracking form to their supervisor. The supervisor, or his designee, takes the information from the form and transfers it to the Indirect Illicit Discharge Summary Form (Appendix 11)
- If a person is observed causing an illicit discharge, the Village Engineer is notified and appropriate citations will be issued by the Police Department

ii. Hazardous Spills

Upon notification or observance of a hazardous illicit discharge, Village staff follows the following procedure:

- Call 911, explain the incident. The Fire District will respond
- The Village Police will provide emergency traffic control, as necessary
- The Fire District will evaluate the situation and apply “No Flash” or “Oil Dry” as necessary
- The Fire District’s existing emergency response procedure for hazardous spill containment clean-up activities, will be followed
- On-site personnel document the location, type of spill and action taken on the Indirect Illicit Discharge Tracking Form (Appendix 11)

- The on-site personnel provide the tracking form to their supervisor. The supervisor, or his designee, takes the information from the form and transfers it to the Indirect Illicit Discharge Summary Form (Appendix 11)

C. Employee Training

The Village's practice is to provide education and training to all of its employees to ensure that they have the knowledge and skills necessary to perform their functions effectively and efficiently. The purpose of the Employee Storm Water Training Program is to teach the appropriate employees about the following:

- Storm water characteristics and water quality issues
- The roles and responsibilities of the various departments, and individuals within these departments, regarding implementation of the SWMP to consistently achieve permit compliance
- Activities and practices that are, or could be sources, of storm water pollution and non-storm water discharges
- How to use the SWMP and available guidance materials to select and implement best management practices

i. Training Approach

Employees are encouraged to attend all relevant training sessions offered by county agencies and other entities on topics related to the goals/objectives of the SWMP. Additionally, the Village will develop employee training programs with curricula and materials tailored to specific functional groups. The materials focus on storm water pollution prevention measures and practices involved in routine activities carried out by the various functional groups. Training materials primarily focus on revisions to the various programs that were in place prior to the acceptance of the SWMP.

ii. Training Schedule and Frequency

The initial training program will be offered within six months of the acceptance of the SWMP. Digital and hard copies of the training materials will be kept and shared with new employees as part of their job introduction. Revisions and enhancements to this SWMP will be approved by the Village Officials and then shared with the applicable employees. The Village Engineer will monitor the potential need for material distributions and offer additional training as necessary.

Employees are encouraged to share information with other employees via email or other formats. Information may include:

- Updates and news which might enhance pollution control activities
- Feedback from field implementation of best management practices, or
- New product information

Section 4: Program and Performance Monitoring, Evaluation and Reporting

The SWMP represents an organized approach to achieving compliance with the NPDES Phase II program for both private and public activities within the Village. Land development, redevelopment and transportation improvement projects will be required to comply with the provisions of the respective County Ordinances prior acceptance of the SWMP. Additionally, the Village has numerous written and unwritten procedures for various tasks. This SWMP documents and organizes previously existing procedures and incorporates new ideas to create one cohesive program that addresses pre-development, construction, post-development and municipal activities.

This chapter describes how the Village will monitor and evaluate the proposed Storm Water Pollution Prevention Plan based on the above stated objective. As part of the Storm Water Management Plan, the Village:

- Reviews its activities
- Inspects its facilities
- Oversees, guides and trains its personnel
- Evaluates the allocation of resources available to implement storm water quality efforts

This chapter describes how program monitoring, evaluation, and reporting will be accomplished.

4.1 *Performance Milestones*

Previously established ordinances and programs implement many of the anticipated tasks. The following schedule describes general performance expectations:

- Within six months following the acceptance of this SWMP, applicable employees will receive training regarding the implementation of the SWMP
- Within one year following the acceptance of this SWMP, program enhancement items within Chapter 3 will be implemented. Refer to Chapter 2 for a description of tasks associated with the implementation of the SWMP
- Within five years after the acceptance of this SWMP, the Outfall Inspection Procedure will be completed for all pipes identified
- Within five years after the acceptance of this SWMP, tracing and removal procedures will have identified all pipes that contribute illicit discharges to receiving waters

4.2 *Program Monitoring and Research*

The IEPA NPDES ILR40 General Permit requires upstream and downstream monitoring for water quality. The Village of Inverness will obtain water quality samples on major rivers/creek at locations upstream downstream of the MS4 discharge. The samples will be sent to a private lab for testing. The following analyses will be generally performed: pH, Dissolved Oxygen, Conductivity, Ammonia, Chloride, Fluoride, Biochemical Oxygen Demand (five day), Phenolics, Total Phosphorus, Total Dissolved Solids, Total Kjeldahl Nitrogen and Total Suspended Solids and Metals (Copper and Potassium). Results will be summarized and reviewed to detect changes between upstream and downstream sampling points.

The Village Engineer will monitor research conducted by others regarding the effectiveness of various alternative storm water practices, procedures and technologies. The Village will continue to

seek innovative storm water practices and technologies. Information and guidance obtained from local agencies will be incorporated into this SWMP as practical. This information will be used to provide insight into how the program may need to evolve.

4.3 *Program Evaluation*

The primary mechanism for evaluating the program and ensuring that the field staff has adequate knowledge is supervision by responsible Administrators. Management support tasks include observing and evaluating design, construction and field personnel as they implement the requirements of the SWMP on both municipal and private projects, and maintenance personnel as they conduct their assigned activities. These responsibilities were outlined in detail in Chapter 2: Program Management.

The following types of questions/answers are discussed annually:

- Are proper storm water management practices integrated into planning, designing and constructing both (the Village) and private projects?
- Are efforts to incorporate storm water practices into maintenance activities effective and efficient?
- Is the training program sufficient?
- Is the SWMP sufficient?
- Are the procedures for implementing the SWMP adequate?