Illicit Discharge Detection and Elimination (IDDE) Program

City of Aberdeen Public Works

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City of Aberdeen, Washington
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Table of Contents

Appendices

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Overview

An illicit discharge is generally any discharge, release, or pumping of a pollutant or polluted water into the stormwater system. The National Pollutant Discharge Elimination System (NPDES) regulates the discharge of stormwater under the authority of the Federal Clean Water Act. Washington State Department of Ecology (Ecology) has the designated authority to administer NPDES within the State of Washington. Under this authority, Ecology has issued NPDES permits regulating the discharge of stormwater. The City of Aberdeen is under regulation of the Phase II Municipal Stormwater Permit issued on February 16, 2007. The current Phase II permit will remain in effect until February 15, 2012, after which a new Phase II permit will be issued.

The Phase II permit mandates permittees to prepare and implement an Illicit Discharge Detection and Elimination (IDDE) program. This plan and its implementation satisfies this requirement. The goal of this plan is to identify and then eliminate illicit discharges. Examples of illicit discharges include:

- Direct of indirect sanitary wastewater discharges that connect to the storm sewer or watercourse, such as a shop floor drain connected to a storm drain, a cross-connection between the municipal sanitary sewer and storm sewer systems, a damaged sanitary sewer line that is leaking sewage into a cracked storm sewer line, or a failing septic system that is leaking into a water course.
- Materials (e.g.; used motor oil) that have been dumped illegally into a storm drain catch basin.
- Improper home or business owner activities such as washing paint brushes into a catch basin, washing new textured concrete driveways into a storm drain, draining swimming pools to the storm system (swimming pools have high pH and chlorine), excess use of fertilizers, or washing cars with chemicals that enter the storm drain system.

The NPDES Permit sets forth the minimum elements of the plan which are listed below. These minimum elements are described throughout the remainder of this document.

- Municipal Storm Sewer System Mapping
- Ordinances (that effectively prohibit illicit discharges)
- Detection and Elimination Program
- Public Education
- Staff Training

Municipal Storm Sewer System Mapping

Current Program

The City currently has the following stormwater-related information in their geographic information system (GIS) database:

- Storm sewers
- Catch Basins and manholes
- Ditches
- Streams (watercourses)
- Outfalls

The current program is compliant with the NPDES permit requirements and is completed in advance of the established August 19, 2011 deadline within the permit. Some of the more specific elements of the program as required by the permit are listed below:

1. A Map of all structural BMPs owned, operated, or maintained by the City.
2. For pipe outfalls 24-inch-diameter pipes and watercourse outfalls, a map with the following attributes for each outfall: tributary conveyances (type, material, and size where known), associated drainage areas, and land use. Although most of the watercourses and pipes have a cross-sectional area less than a 24-inch-diameter pipe, the City has elected to consider and map all of the known pipe outfalls 6 inches or greater and all flowing (dry weather) watercourses including seeps and drainages.
3. A program to develop and maintain a map of all connections (ditch or pipe) to the City's storm system allowed or authorized after January 2011.

The City of Aberdeen is bisected by the Chehalis and Wishkah Rivers. There are also numerous small streams and drainage channels that run through the City. The City has implemented an IDDE outfall screening program and has physically inspected all 30+ outfalls of the stormwater drainage system.

Ordinances

Current Ordinances

Aberdeen Municipal Code Chapter 13.70 Storm and Surface Water Management prohibits illicit discharges and illicit connections and uses (section 13.70.200). Connections to the stormwater system must contain only stormwater and groundwater otherwise they are to be eliminated. The IDDE ordinance is included in the appendix for reference.

Detection and Elimination Program

Response to Suspected or Reported Illicit Charges

The City currently has a Surface and Stormwater Management Program to fulfill an illicit discharge detection and elimination (IDDE) program which includes: commercial property

inspections, outreach and education, water quality monitoring and stormwater system operation and maintenance.

The City of Aberdeen maintains a hotline that citizens can call during business hours to report a suspected illicit discharge. Calls relative to illicit discharges can be received by several Public Works offices.

Aberdeen Phone Numbers:

Hotline – (360) 537-3393
Street Department – (360) 537-3268
Sewer Department – (360) 537-3285
Engineering Department – (360) 537-3215

Calls to any of the above numbers will result in information being received and routed to the proper individuals.

Proactive Investigation

Prioritization Procedures

In addition to maintaining a hotline for citizen complaints, the City is required to proactively conduct field assessments to identify illicit discharges and illegal connections to the City's stormwater system and receiving water bodies.

The first step of the proactive work is to prioritize those areas most likely to contain illicit discharges ("hot spots") based on an analysis of land use and other specific information. It is felt that the following types of areas are more likely to generate polluted discharges than others:

1. Locations where there have been repeated problems in the past. This could include areas with water quality data or where repeated complaints have been filed.
2. Older areas of a community typically have a higher percentage of illegal connections. Also, deteriorating sewer pipes can allow wastewater to exfiltrate out of the sanitary lines and into the surrounding environment.
3. Commercial and industrial areas tend to have a higher percentage of illicit discharges.
4. Areas with large and/or many storage vessels of hazardous solids or liquids.

Another consideration for Aberdeen is the proximity of the higher risk land uses (commercial/industrial) to receiving waters. These areas will have a short flow path and greater chance of adversely affecting a larger aquatic system in the event of an illicit discharge or spill.

The City may also choose to conduct a qualitative assessment of the City's surface waters by walking the marine shoreline and streams to identify additional areas of concern. This activity can also be used to ground-truth the outfall map, determine the accessibility of the streams for future monitoring, and provide a photographic record of existing conditions.

As of 2010, the City conducted field assessments of all outfalls discharging to water bodies in the City of Aberdeen. During those inspections the City determined if the tide gates needed any maintenance and performed what was needed. The City found evidence of normal stormwater debris (i.e. trash, plastic, Styrofoam, and garbage) at many locations but did not document the amounts or location. At the time of the inspections there wasn't any evidence of other types of illicit discharges and the exact findings were not documented. Future inspections will include photographs and written documentation of each inspection.

A GIS-based map can be developed of potential hot spots and prioritized water bodies. It is expected that due to internal training of staff and public outreach efforts required by the NPDES permit, the City will develop a better understanding of the causes and locations of illicit discharges. The GIS map (or other tracking tool) can be regularly updated to reflect reports from staff and the public as well as information learned by the on-going field assessment work as the City's IDDE program matures.

Based on IDDE considerations such as those above, the City has implemented a program. Beginning in 2012 the City will:

- **Sub-watershed Assessments:** The City has prioritized sub-watersheds for IDDE risk based on four screening factors: total impervious area, wastewater infrastructure material and age, land use, and previous problems.
- **Storm Facility Inspections:** PW will identify and inspect private commercial, private residential and City maintained stormwater facilities throughout the City limits. Work on this will begin when we receive our new aerial photographs and should be completed within the next year.
- **Fecal Coliform Receiving Water Trend Monitoring Program:** Implement an ongoing water quality monitoring program. Monitoring focuses on outfalls to streams and river waters. The data will assist in prioritizing additional detailed system inspections. The sampling will be preformed as required by Phase II guidelines.
- **Outfall Reconnaissance:** Will complete a document inspection program for the mapped outfalls in 2011. The inspection program will include outfall location and screening for illicit discharges.

General Field Assessment Procedures

The following general recommendations apply to the dry weather field inspection and water sampling work (Center for Watershed Protection & Pitt, 2004):

1. Notify the public during field work projects. Public notices and informational mailers can improve the success of the program by educating the citizenry.
2. Develop training and protocols to keep workers safe during field work.
3. Make good use of the mapping information that has been developed by the City.
4. Fill out a standard field inspection form (see Appendix C).
5. Report spills illicit discharges or connections as required by the NPDES permit (Appendix B).

Physical Parameters

During dry weather field inspections, a variety of physical parameters will be recorded at each site to assess conditions. At flowing outfalls this includes flow, odor, color, turbidity, and presence or absence of floatables. The information that is obtained from the physical characteristics observed are indicators and cannot be fully relied upon by themselves.

A qualitative observation of flow (none, trickle, moderate, or substantial) should be made. Flow rates can be estimated by one of the following simple methods:

1. Record the time required for the full flow to fill container of a known volume.
2. Multiply cross-sectional flow area by flow velocity. For most instances, flow area is based on an estimate of mean depth and width. Flow velocity is based on the time of travel for an object floating near the surface over a known length.

Odor is described by one of the following terms: sewage, rancid/sour, petroleum/gas, sulfide, or other. The severity of the odor should also be recorded in the field.

Color can be a description of color type and intensity. It is also a quantitative measurement expressed in cobalt-platinum units (Table 1).

Turbidity can be a qualitative descriptor (clear, slight cloudiness, cloudy, or opaque). Alternatively, it can be measured in the field or in the office with a hand held turbidimeter. It is recommended that the City use a single make and model of meter to reduce the differences in readings associated solely with equipment readings.

Floatables are the best physical indicator. The most common floatables are sewage, suds, and oil sheens. Floatables do not include trash. The observation of sewage at an outfall location indicates that there is a severe problem with the MS4 and should be looked at as to where the source for the sewage is emanating from. Suds can indicate a variety of things. Some suds are naturally formed by the movement of the water. If the suds are located at a water drop off and break up quickly, this may only be water turbulence related. If the suds have a fragrant odor, this can indicate the presence of laundry water or wash water in the water body. Oil sheens need to be looked at to try and determine the source of the oil sheen. Some oil sheens are common and occur naturally by instream processes. This occurs when an iron bacteria forms a sheet-like film. This can be determined by looking at the sheen and seeing if it cracks when disturbed. Synthetic oil sheens, on the other hand, will swirl when disturbed. If this occurs, then the sheen is from an oil source.

The City may select a few water quality parameters that can be measured with inexpensive probes and test kits/strips in the field. These include temperature, pH, ammonia, conductivity, chlorine, and hardness. Other than conductivity, temperature and pH these same parameters can be assessed during laboratory analyses so the field testing is usually unnecessary. It is generally recommended that the majority of analyses be conducted in a more controlled “lab” setting.

There may be physical indicators of illicit discharges even if no flow is present. These include: outfall damage, deposits/stains, abnormal vegetation, poor quality of pooled water, benthic growth in pipe.

During a dry weather inspection, observed flows are considered non-stormwater related. The flow may or may not be the result of an illicit discharge. Also, the absence of a flow does not indicate the absence of an illicit discharge since these discharges can be intermittent or transitory. It is important to observe carefully during the dry weather inspection to determine if an intermittent or transitory pollution problem has occurred.

Water Quality Sampling and Testing

During dry weather inspections physical clues indicating a pollution problem often are not observable. Therefore, water quality sampling and testing will be an essential part of the City's IDDE program. Some parameters can be directly measured in the field using a portable instrument or test kit whereas others require laboratory analysis. Table 1 lists the parameters that must be sampled as well as suggested/optional parameters to be sampled to isolate an illicit discharge. The table also provides the analytical method used when samples are sent to an accredited laboratory and benchmark concentration that typically indicate when there is a problem. Note that these benchmark concentrations are based on samples collected from storm drains nationally. Therefore, benchmark concentrations would be lower for samples drawn from watercourses since the natural base flows would likely dilute any pollutants in water discharged from a contributing storm drainage system.

Table 1

Water Quality Parameter	**Use**	**Analytical Method**	**Benchmark Concentrations**
Specific conductance	B, I	SM 2510B	>2,000 _s/cm
Hardness	B, I	EPA 130.1/SM 2340B	<10 mg/L or >2,000 mg/L as CaCO3
Turbidity	B, I	SM 2130B	>1,000 NTU
Color	S, I	SM 2120 B	>500 units
Bacterial counts	B	SM 9222 D/SM 9223 B	>200/>50
Ammonia	R, I	EPA 350.2/SM4500-NH3	>50 mg/L
Surfactants (as MBAS)	R, I	EPA 425.1/SM5540C	>0.25 mg/L
pH	B, I	EPA 150.1/SM 4500H	< 5
Temperature	B	SM 2550 B	
Total chlorine	S	SM 4500-Cl G	
Fluoride	S	EPA 300.0	0.25 mg/L
Potassium	S, I	EPA 200.7	>20 mg/L
Optical brighteners (florescence)	S	Center for Watershed Protection 2004	
Dissolved oxygen	S	SM 4500-0 G	
Industrial (metals, metalloids, cyanide, oils, grease)	S (for industrial basins)	EPA 200.7/200.9 EPA 1664 Ecology NWTPH-Gx/Dx	
Other pollutants-nutrients, pesticides, automotive fluids	S	EPA 300.0 SM 2540 D	

Key:
B = basic parameter to be analyzed at all sites
R = key parameter to identify source of illicit discharge in a typical residential basin
S = possible supplemental parameter
I = key parameter to identify source of illicit discharge from an industrial/commercial area

Immediate Response Procedures

The field crew should be prepared to take immediate action in the event of encountering one of the following situations:

- Individuals actively in the process of introducing possible illegal substances or materials to the storm drain system
- Very strong chemical odor emanating from storm drain system
- Presence of fumes or smoke emanating from storm drain system
- Visible significant stream of a controlled chemical or petroleum product flowing in storm system or downstream waters
- Large chemical plume in stream or lake downstream of a City outfall
- Any condition that poses or could pose an immediate threat to property, human health or safety, or aquatic life.

The crew should take the following steps if one of the above situations is encountered:

1. Ensure crew and public safety by instructing people to stay clear of the area.
2. Call 911 to report active illegal dumping or potential fire or significant chemical incident.
3. Call the City's customer response number at 360-537-3393 to report a possible illegal discharge.
4. The following offices must all be called if an unauthorized discharge of oil or hazardous material such as a spill has occurred:

    a) The National Response Center at 1-800-424-8802;
    b) Washington Emergency Management Division at 1-800-OILS-911; and
    c) Washington State Department of Ecology – Southwest Regional Office at 1-360-407-6300.

5. If a spill is encountered the following information should be recorded if possible:

    a) Where is the spill?
    b) What spilled?
    c) How much spilled?
    d) How concentrated is the spilled material?
    e) Who spilled the material?
    f) Is anyone cleaning up the spill?
    g) Are there resource damages (e.g. dead fish or oiled birds)?
    h) Who is reporting the spill?
    i) Your contact information?

6. If possible isolate or contain visible chemical pollution in the effected water body with any materials that are accessible. For small discharges earth dams, absorbent pads, and containers may be useful to contain part of the illicit

discharge.
7. Take detailed notes and photos/video for subsequent investigation by City or other agencies.

At a minimum, follow-up work includes contacting the Washington State Department of Ecology – Southwest Office (see phone number above) to determine if any additional reporting or investigative actions are necessary.

For incidents not determined to be emergencies, the City should investigate or refer to the appropriate agency any complaints, reports, or monitoring information that indicates a potential illicit discharge, spill, or illegal dumping.

Isolating Illicit Discharges (Source Tracing)

The City's current hotline will continue to be an effective tool for locating illicit discharges. However, in situations where outfall screening identifies an illicit discharge several methods can be used to trace to the source of the illicit discharge. Tracing techniques include visual inspections of drainage structures and lines, dye testing, damming lines to isolate areas, video inspection, indicator monitoring, smoke testing, and optical brightener monitoring traps. Other more elaborate approaches include using remote sensing tools to identify soil moisture, water temperature, and vegetation anomalies associated with failing septic systems and tracking illegal dumping activities. The most common approach for the City will likely rely upon visual inspections of the catch basins in the storm line above the outfall in which an illicit discharge is suspected.

Several resources exist to assist in evaluating the likely source of an illicit discharge. Generally, the sources are washwater, sanitary sewer or septage, potable water leak, animal contamination, illegal dumping, or industrial discharge.

Investigation and Response Procedures

Once an illicit discharge or illegal connection has been located, details about the discharge connection should be documented. Photographs and video may be helpful to record the location and nature of an illicit connection. The City should determine the name and contact information of the property owner.

The response by the City will vary greatly depending on the type, location, frequency, severity, and source of illicit discharge. In general, the City will have several options available to address a specific discharge. In most cases where the violator is identified it is expected that they will voluntarily comply with any action required by the City to eliminate the potential for further illicit discharges. When the violation is the result of an illegal connection from a building, the property owner should respond once they are made aware of the connection, the environmental consequences, the applicable regulations, and the recommended remedy. If the violation is a failing septic system the violation is transferred to the Grays Harbor County Health District for enforcement. These transferred violations are monitored closely by the City to assure compliance with permit requirements.

The City will prepare a letter to be sent to the property owner for any illicit discharge or illegal connection. Depending on the circumstances the letter will describe the findings of the investigation, the required remedy, the required deadline for compliance, technical resources, and the enforcement actions, fines, and legal actions that could ensue for non-compliance. The letter should also describe the relevant codes and laws. The letter should specify who the property owner should contact for additional information and to notify the City when the required remedy has been completed.

The City will conduct a follow-up inspection following notification that the required remedy has been completed.

Should the owner not remedy the discharge, the City may proceed to abate the violation as a public nuisance in accordance with established City nuisance abatement policies and procedures.

Public Education

Public Information

As part of the City's public outreach program, outreach material will be made available to the citizens. The education campaign will rely upon the City's website (http://www.aberdeenwa.gov), brochures, print ads, website ads, drain markers and/or fact sheets to make citizens aware of stormwater, water pollution, and inform them of the City's hotline for reporting on possible illegal dumping, connections, or discharges. Additionally, target audiences with a high risk as a potential source, such as auto shops, mobile businesses, and commercial property owners/managers may receive specialized educational material.

The City has established a customer phone number (360-537-3393) for reporting of spills or illicit discharges.

Reporting and Recordkeeping

Tracking (Spills, Inspections, and Public Comment/Feedback)

Tracking and documentation and inspections of suspected violations is a required part of the IDDE program (section S5C3e) and will be recorded on the appropriate form (see Appendix B).

Public comment/feedback will be conveyed to the IDDE program manager to ensure that the program is responsive to citizen complaints. The public will be directed to either the program manager directly or the hotline if they have general comments they would like to make on the City's IDDE program.

Staff Training

Training Lead

For those staff responsible for implementing the IDDE program, on the job training will be managed by the City's IDDE program manager. The program manager will manage and assign training as described below and shown in the Training Summary Table below.

Detailed Training

Detailed training will be assigned to those individuals specifically involved in the immediate response procedures, source tracking of potential illicit discharges and sampling.

General Training

General training targets City field staff that may potentially see an illicit discharge including staff from the following departments: Street, Department of Community Development, Facilities Maintenance, Traffic, Sewer and Stormwater Maintenance and Parks. General training will be via PowerPoint presentation and printed material distributed to staff at staff meetings. DVD, print or webcast material may be distributed if the need arises as the program develops.

Training activities completed for the calendar year of 2012 are listed below. Training for 2013 shall maintain current levels and be progressive in areas deemed inadequate.

City of Aberdeen - Employee Stormwater Training

Date	Topic/ Message	Number of Participants	Subjects Discussed
4/18/2012	Stormwater Pollution Prevention for Construction Sites	43	Compliance with Stormwater Regulations General BMP Awareness Training Site Specific BMP Training Timing of Stormwater Training Trainee Evaluations Record Keeping
4/18/2012	Stormwater Pollution Prevention for MS4's	43	Good Housekeeping & Spill Prevention Spill Control & Response Vehicle Fueling Vehicle & Equipment Maintenance Vehicle & Equipment Washing Materials Management Waste Management Municipal Facility Maintenance Street and Parking Lot Cleaning Stormdrain System Cleaning Landscaping & Ground Maintenance Working over & Near Water
10/17/2012	NPDES - IDDE	33	Recognizing Illicit Discharges Reporting of Illicit Discharges Illicit Discharge Reporting Forms