CITY OF WALLA WALLA

Illicit Discharge Detection and Elimination Program Manual

CITY OF WALLA WALLA

City of Walla Walla
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Walla Walla, WA 99362

August 24, 2011

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Acronyms and Abbreviations

BMPs	Best Management Practices
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
IDDE	Illicit Discharge Detection and Ellimination
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
ORI	Outfall Reconnaissance Inventory
Phase II Permit	Eastern Washington Phase II Municipal Stormwater Permit
QAPP	Quality Assurance Project Plan
SOPs	Standard Operating Procedures
SWMP	Stormwater Management Program
TMDL	Total Maximum Daily Load
UIC	Underground Injection Control
WWMC	Walla Walla Municipal Code

Section 1—Introduction

1.1 Background

The City of Walla Walla (City) has made a strong commitment to protect and manage Walla Walla's natural resources. The Public Works Department seeks to minimize the negative effects of development and pollution, while maximizing environmental protection and conservation. Protecting and preserving the quality of the City's surface water and groundwater is a key focus area for the Department.

According to the US EPA's 2004 National Water Quality Inventory, 44 percent of assessed river and stream miles, 64 percent of assessed lake acres, and 30 percent of assessed estuarine square miles do not meet water quality standards. The top causes of impairment include siltation, nutrients, bacteria, metals (primarily mercury), and oxygen-depleting substances. Polluted stormwater runoff, including runoff from urban/suburban areas and construction sites is a leading source of this impairment. To address this problem, EPA established the National Pollutant Discharge Elimination System (NPDES) program as part of the Clean Water Act to regulate stormwater discharges.

In the State of Washington, EPA has delegated the NPDES program administration to the Wasington State Department of Ecology (Ecology). Ecology issued a Phase II Municipal Stormwater Permit to the City of Walla Walla in January 2007. The Phase II Permit requires the City to develop and implement a stormwater management program (SWMP) that addresses six major elements. One of those elements requires that "Each Permittee shall develop, implement and enforce a program to detect and eliminate illicit discharges (as defined at 40 CFR 122.26(b)(2)) into the MS4." (Permit Condition S5.B.3) The City must have a fully implemented illicit discharge detection and elimination (IDDE) program in place by August 2011. Therefore, the overreaching program goal is to prevent, locate, and correct illicit discharges.

The City's IDDE program is managed by the Engineering Division of the Public Works Department. Maintenance staff and construction site inspectors play an important role in identifying illicit discharge problems and responding to clean-up requests. However, all Public Works (Engineering, Streets, Sanitation, Water, etc.), Parks and Recreation, and Police staff will play a role in locating, identifying and reporting potential illicit discharges.

1.2 Summary of the IDDE Program

The Phase II Permit requires the permittees to develop and implement an IDDE program encompassing the elements listed below. Each element is addressed in the sections of this IDDE Program Manual as noted below:

- Develop a municipal stormwater drainage system map (Section 2);
- Adopt an ordinance to prohibit non-stormwater, illicit discharges, and dumping into the stormwater drainage system (Section 3);

- Implement an on-going program to detect and address non-stormwater discharges, including spills, illicit connections, and illegal dumping to the City's stormwater drainage system (Sections 4, 5, and 6);
- Educate employees, businesses, and the general public about illicit discharge concerns (Section 7);
- Adopt and implement procedures for program evaluation and assessment (Section 8);
- Maintain records of all IDDE program activities (Section 8); and
- Provide IDDE training for municipal staff (Section 9).

This manual is intended to assist City staff in implementing the IDDE program. It is to be used as a guidance document for staff in their day-to-day activities related to IDDE. This document can also be used as a training tool to ensure that all staff are following the same procedures in responding to illicit discharge concerns.

Section 2—Storm Sewer System Map

2.1 Overview

The first major component of the City's IDDE program is the mapping of the municipal stormwater drainage system. Maintaining an accurate map of the stormwater drainage system will make it easier for City staff to track and locate the source of suspected illicit discharges. The Phase II Permit outlines minimum information that should be included in the City's municipal stormwater drainage system map:

- Locations of all known and new connections to the City's stormwater drainage system;
- Locations of all known municipal stormwater drainage system outfalls;
- Names and locations of all waters of the State that receive discharges from those outfalls including groundwater; and
- Drainage areas within the City served by discharges to the ground.

The Department of Ecology requires that the map be prepared in a GIS-based format and be made available to Ecology upon request.

The City of Walla Walla has developed a comprehensive map of the City's stormwater drainage system in a GIS-based format and performs regular maintenance on the map as new connections are made and verifications are brought forth. This map also includes, all known publically owned and operated Underground Injection Control (UIC) facilities, as wells as limited private UIC facilties. Collectively, this map can be used to schedule and track maintenance activities and plan for capital improvement projects.

2.2 Mapping Procedures

The City is planning to develop a Drainage System Mapping Field Guide to be used as a quick reference by staff or contractors when mapping/verifying the City's drainage features. Upon completion, the Field Guide will be included in Appendix A. In addition to providing detailed information about features that should be mapped and the types of information to collect, the Field Guide will likely include:

- Safety Procedures
- Field Equipment Checklist
- General Field Guidelines
- Definitions
- Contact Information

When using the Field Guide, City staff or contracted crews will locate drainage features and record the locations and feature attributes using GPS receivers. The data can then be

downloaded and imported into the City's GIS map. Sketches of the drainage infrastructure completed in the field can also be used to verify or clarify the electronic mapping information downloaded from the GPS receiver.

The City's Standard Operating Procedures (SOPs) that are followed by the GIS Department when updating the City's stormwater drainage system map will be formally documented at a later date. These SOPs will further clarify the steps involved in the mapping process. These SOPs will help ensure that future data collection efforts are consistent and accurate over time. The SOPs related to the City's IDDE program, including SOPs for mapping/verifying the stormwater drainage system, will be included in Appendix F.

Section 3—IDDE Ordinance

3.1 What is an Illicit Discharge?

An illicit discharge is any direct or indirect non-stormwater discharge to the City's stormwater drainage system, UIC facility, and/or surface and ground waters, except as expressly allowed in Section 13.15.040 of the Walla Walla Municpal Code (WWMC). Examples of illicit discharges include:

- A measurable flow during dry weather that contains pollutants or pathogens;
- Disposal of vehicle maintenance fluids into a storm drain inlet or UIC facility;
- Hosing or washing loading areas in the vicinity of storm drain inlets or UIC facilities;
- Leaking dumpsters flowing into a storm drain inlet or UIC facility; and
- Old and damaged sanitary sewer line leaking fluids into a cracked or damaged storm drain line.

3.2 What is an Illicit Connection?

An illicit connection is any manmade conveyance that is connected to the City's stormwater drainage system without a permit, excluding roof drains and other similar type connections. Examples of illicit connections include:

- Sanitary sewer piping that is connected directly from a building to the stormwater drainage system;
- A basement or shop floor drain that is connected to the stormwater drainage system; or
- A cross connection between the municipal sanitary sewer and the stormwater drainage system.

3.3 City of Walla Walla IDDE Ordinance

On January 13, 2010, the City adopted Ordinance 2010-01 (effective date January 22, 2010), which adds a new chapter (13.15) to the WWMC to address IDDE. Portions of WWMC 13.15 are included below. A copy of the full ordinance and code chapter, including definitions and a listing of discharges specifically or conditionally allowed under the WWMC, is included in Appendix B.

3.3.1 Prohibited Discharges

No person shall throw, drain, or otherwise discharge, cause or allow others under its control to throw, drain or otherwise discharge into the municipal storm drain system, underground injection control well, and/or surface and ground waters any materials other than stormwater. Existing pollution-generating land use activities shall implement operational or structural best management practices (BMPs) to prevent illicit discharges. Approved operational and structural BMPs are those contained in Chapter 8 of Ecology's *Stormwater Management Manual for Eastern Washington* (2004).

Examples of prohibited contaminants include but are not limited to the following:

1. Trash or debris.
2. Construction materials.
3. Petroleum products, including but not limited to oil, gasoline, grease, fuel oil, and heating oil.
4. Antifreeze and other automotive products.
5. Metals in either particulate or dissolved form.
6. Flammable or explosive materials.
7. Radioactive material.
8. Batteries.
9. Acids, alkalis, or bases.
10. Paints, stains, resins, lacquers, or varnishes.
11. Degreasers and/or solvents.
12. Drain cleaners.
13. Pesticides, herbicides, or fertilizers.
14. Steam cleaning wastes.
15. Soaps, detergents, or ammonia.
16. Swimming pool or spa filter backwash.
17. Chlorine, bromine, or other disinfectants.
18. Heated water.
19. Domestic animal wastes.
20. Sewage.
21. Recreational vehicle waste.
22. Animal carcasses.
23. Food wastes.
24. Bark and other fibrous materials.
25. Lawn clippings, leaves, or branches.
26. Silt, sediment, concrete, cement or gravel.
27. Dyes.
28. Chemicals not normally found in uncontaminated water.
29. Any other process-associated discharge except as otherwise allowed.
30. Any hazardous material or waste not listed above.

3.3.2 Prohibition of Illicit Connections

The following activities related to connections to stormwater systems are prohibited:

A. The construction, use, maintenance, or continued existence of illicit connections to the storm drain system is prohibited. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

B. A person is considered to be in violation Chapter 13.15 (WWMC) if the person connects a line conveying sewage to the City's stormwater drainage system, or allows such a connection to continue.

Section 4—Illicit Discharge Detection Procedures

4.1 Purpose

Illicit discharges and connections are identified through Citizen Reporting, Interdepartmental or Interagency Referral, through Outfall Reconnaissance Inventory (ORI) activities, or through UIC facility inspections. The City relies on local citizens, City field staff, and inspections to detect potential problem areas quickly, so that they can be addressed before they cause significant water quality degradation.

4.2 Citizen Reporting and Interdepartmental/Interagency Referral

4.2.1 Contact Information

Citizens that suspect an illicit discharge, an illicit connection, or an illegal dumping action can call the City's Public Works Department at (509) 527-4363 to report the incident. Likewise, any City department or outside agency can report water quality incidents to the City's Public Works department. If after hours messages are left on the City's Public Works voicemail, staff follow-up with the caller during the next business day.

After hours, emergency problems should be reported through 911, where operators will assess the severity of the incident and determine if emergency response (fire, hazmat, etc.) is needed. Callers will then be put in contact with the City's on-call utility contact to address the problem. Residents that encounter a non-emergency incident are encouraged to report the problem the next business day to the City's Public Works Department.

4.2.2 Problem Documentation

When water quality incident reports are received at Public Works the staff person taking the call should complete the Water Quality Incident Report Form and submit it to the Stormwater Engineer for follow-up. The Water Quality Incident Report Form is located in Appendix C and an electronic version is available on the City's computer network.

The City should consider developing Standard Operating Procedures (SOPs) to direct the Public Works clerks and Utilities on-call staff in how to handle illicit discharge reports. The SOPs should include flow charts to help staff collect the appropriate information for the type of problem being reported. Once completed, the SOPs should be included in Appendix F.

Once recorded, incident information is referred to the appropriate City department and/or staff person for follow-up. In most cases, IDDE problems should be referred to the Stormwater Engineer for further investigation. Staff will either follow the investigation procedures in Section 5 to identify the source of the problem or, if the source is known, the corrective action procedures outlined in Section 6 will apply.

4.3 Outfall Inspection Procedures

The City will conduct an Outfall Reconnaissance Inventory (ORI) to visually inspect each known outfall from the City's stormwater drainage system to identify areas of obvious pollution or non-stormwater discharges. Outfall inspections locate potential problem areas without the need for in-depth field investigation and/or sampling for laboratory analysis. Potential problem discharges can be identified by outfalls that are flowing during dry weather (potential illicit connection) or outfalls that have high turbidity, strong odors, or unusual colors.

Note: If inspection staff encounter a transitory discharge, such as a liquid or oil spill, during inspection activities, the problem should be immediately referred to the appropriate agency or response contractor for clean-up. Staff should also complete the Water Quality Incident Report Form located in Appendix C.

4.3.1 Prioritization Schedule

The City estimates that the stormwater drainage system includes approximately 212 outfalls that discharge to creeks, springs, or other water bodies. The City has developed a comprehensive map of the City's stormwater infrastructure in GIS format and performs regular maintenance on the map as new connections are made and corrections are brought forth. A copy of the stormwater drainage system map is included in Appendix D.

The Phase II Permit requires that the City prioritize receiving waters for visual inspection to identify areas most likely to have illicit discharges. Receiving water priorities have been identified based primarily on impaired receiving waters identified in the Walla Walla River Basin Fecal Coliform Bacteria Total Maximum Daily Load (TMDL) Study (Ecology, 2005), as well as current land use. A map of the receiving waters is included in Appendix D.

The Phase II Permit requires the City to inspect the outfalls in three high priority receiving waters by the end of 2010 and one high priority receiving water each year thereafter. Given that the inspection work was not completed in 2010, the City will inspect a total of four high priority receiving waters during 2011. Table 4.1 outlines the City's proposed outfall inspection schedule:

Table 4.1
Receiving Water Outfall Reconnaissance Inventory Schedule

2011 Major Creeks	2012 Tributaries to Mill Creek	2013 Tributaries to Garrison Creek	2014 Other
Mill Creek	Lincoln Creek	Bryant Creek	Peter Spring
Garrison Creek	Butcher Creek	Kathy Creek	Titus Creek
Stone Creek	College Creek		Intermittent Creek
Yellowhawk Creek	Airport Drainage Ditch		

4.3.2 Responsibility

Inspections are the responsibility of the Stormwater Engineer. Inspections may be performed by City staff or by outside consultants hired by the City. In either case, all field reports will be reviewed by the Stormwater Engineer.

4.3.3 Timing

Timing is important when scheduling ORI field days. The preferred conditions for outfall inspections include:

- Dry season – preferably in the summer or early fall
- No run-off producing rainfall within the last 48 hours
- Low vegetation conditions

The preferred conditions allow detection of flows when there should be none and prevent the dilution of pollutants.

4.3.4 Equipment

Prior to conducting field work, crews should assemble all required equipment (see Table 4.2) and review records from prior inspections in the same area to become familiar with the outfall locations and any potential inspection challenges. Field crews should prepare for consecutive days of field work when possible.

Table 4.2
Field Equipment for Outfall Inspections

Minimum 2 person crew	Flash light or headlamp
Safety gear – vest, hard hat, cones	Tool box (hammer, tape measure, duct tape, zip ties)
Field notebook/writing utensils	Spray paint or other marker
Outfall Inspection Report Forms	First aid kit
Stormwater system map of inspection area	Clear sample bottles
GPS unit	Exendable water sampling pole
Cell phone	Buckets (1 gallon and 5 gallon)
Digital camera	Watch with second hand
Machete/clippers	

4.3.5 Activities

During ORI field days, verify the location of known outfalls, identify previously unknown outfalls, field crews should visually inspect each outfall and the immediate surrounding area, photograph the current conditions, and complete the Outfall Inspection Report Form located in Appendix C.

Potential problems are indicated by outfalls that are flowing in dry weather and/or foul odors or discolored water in or around the outfall pipe. If delayed stormwater runoff has been ruled out as the source of the flow, then a flowing outfall indicates a potential illicit discharge concern.

When illicit discharge problems are identified field crews will photograph the problem area and conduct a quick visual inspection of the surrounding area to identify any obvious pollution sources. These simple actions can give valuable direction to subsequent illicit discharge investigations, as discussed in Section 5. Field crews should also report problem areas to the Stormwater Engineer within 24 hours of completing the field inspection, file all outfall report forms, and update the record keeping database as appropriate. Additional record keeping information is included in Section 8.

During field inspections, crews should also note whether the outfalls have maintenance issues, such as trash around the outfall or damaged infrastructure that should be brought to the attention of the Engineering Division. Observed spills or environmental hazards should be immediately reported to the Stormwater Engineer and the incident should be documented using the Water Quality Incident Report Form located in Appendix C. The Stormwater Engineer will arrange for clean-up and proper disposal of the spilled material.

4.4 Drywell Inspection Procedures

Discharges to groundwater from UIC facilities will be investigated separately from discharges to surface waters.

The City will visually inspect each UIC facility to identify areas of obvious pollution or non-stormwater discharges. UIC facility inspections locate potential problem areas without the need for in-depth field investigation and/or sampling for laboratory analysis. Potential illicit discharges or illegal dumping can be identified at UIC facilities by:

- Observations of standing water more than 24 hours after a storm event has occurred;
- Observations of flowing water directly to the UIC facility or from connecting surface inlets/catch basins during dry weather;
- Evidence of illegal dumping or spills in the vicinity of the UIC facility or connecting surface inlets/catch basins; and
- Excessive sediment accumulation, strong odors, or unusual colors.

Note: If inspection staff encounter a transitory discharge, such as a liquid or oil spill, during inspection activities, the problem should be immediately referred to the appropriate agency or response contractor for clean-up. Staff should also complete the Water Quality Incident Report Form located in Appendix C.

4.4.1 Prioritization Schedule

The City estimates that the stormwater drainage system includes approximately 429 publically owned and operated UIC facilities, including drywells, manholes with perforated pipe, and infiltration trenches. The City has developed a comprehensive map of the City's stormwater infrastructure in GIS format and performs regular maintenance on the map as new connections are made and corrections are brought forth. A copy of the stormwater drainage system map is included in Appendix D.

All UIC facilties are inspected twice annually according to the schedule outlined in the City's *Stormwater Pollution Prevention O&M Plan* (2011).

4.4.2 Responsibility

Inspection of UIC facilities is the responsibility of the Streets Division. If during an inspection an illicit discharge or illegal dumping is observered, a Water Quality Incident Report Form must be completed and submitted to the Stormwater Engineer for review.

4.4.3 Timing

Timing is not as critical when scheduling UIC facility inspections. The preferred condition for UIC facility inspection is no run-off producing rainfall within the last 24 hours. This condition ensures detection of non-stormwater flows when there should be none.

4.4.4 Equipment

Prior to conducting field work, crews should assemble all required equipment (see Table 4.3) and review records from prior inspections in the same area to become familiar with the UIC facility location and any potential inspection challenges.

Table 4.3
Field Equipment for UIC Facility Inspections

Minimum 2 person crew	Flash light or headlamp
Safety gear – vest, hard hat, cones	Tool box (hammer, tape measure, duct tape, zip ties)
Field notebook/writing utensils	Pick or CB grate/cover remover
UIC Facility Inspection Report Forms	Spray paint or other marker
Stormwater system map of inspection area	First aid kit
GPS unit	Clear sample bottles
Cell phone	Exendable water sampling pole
Digital camera	

4.4.5 Activities

When illicit discharge or illegal dumping problems are identified field crews will photograph the problem area and conduct a quick visual inspection of the surrounding area to identify any obvious pollution sources. These simple actions can give valuable direction to subsequent illicit discharge investigations, as discussed in Section 5. Field crews should also report problem areas to the Stormwater Engineer within 24 hours of completing the field inspection, file all outfall report forms, and update the record keeping database as appropriate. Additional record keeping information is included in Section 8.

During field inspections, crews should also note whether the UIC facilities have maintenance issues, such as trash around the UIC facility or structural damage that should be brought to the attention of the Streets Division Supervisor. Observed spills or environmental hazards should be immediately reported to the Stormwater Engineer and the incident should be documented using the Water Quality Incident Report Form located in Appendix C. The Stormwater Engineer will arrange for clean-up and proper disposal of the spilled material. In addition, the Stormwater Engineer will assess whether the UIC facility and affected surrounding drain rock must be replaced to prevent potential groundwater contamination.

4.5 Follow-Up Actions

When potential problem areas are identified, field crews should report the observations to the Stormwater Engineer. Based on the severity of the problem, the Stormwater Engineer will direct staff to open a case log and begin the investigation procedures outlined in Section 5. The Stormwater Engineer will also determine if other City departments or outside agencies need to be involved. For example, polluted discharges that may be the cause of leaking septic tanks warrant contacting the Walla Walla County Health Department for assistance and follow-up.

Section 5—Investigation Procedures

5.1 Purpose

Potential illicit discharge problems can be revealed through outfall inspections, UIC facility inspections, reports from staff, or the general public as described in Section 4. When a complaint is reported, the Phase II Permit requires that a follow-up investigation be initiated within seven (7) days, on average. The follow-up investigation could include a site visit to look at the problem area, review of mapping information, review of past complaints or investigations at the location, or other data collection and review activities. Once a problem has been verified the City will begin an official illicit discharge investigation, following the procedures outlined in this section. Figure 5.1 illustrates the steps that lead to an illicit discharge investigation.

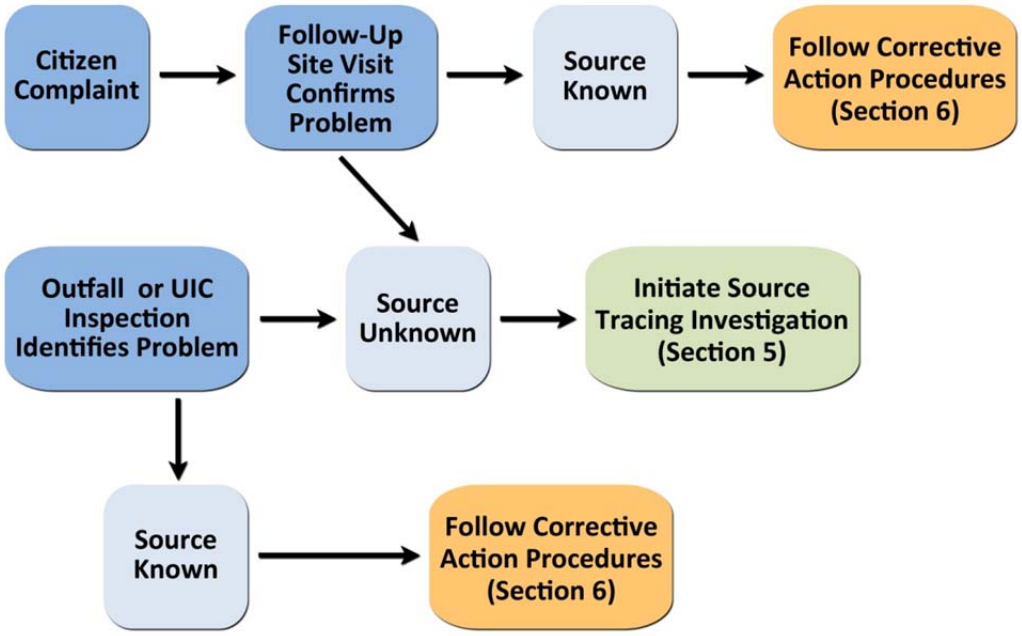

Figure 5.1
Routes to an Illicit Discharge Investigation

When an illegal dumping or illicit discharge problem is directly observed by a member of the City staff, it is generally not necessary to follow these investigation procedures. In those scenarios, the source of the problem discharge is already known. Problems revealed through direct observation are referred directly to the corrective action procedures outlined in Section 6. In the event that a reported problem does not have a defined source, the procedures in this section should be followed to trace the sources of the illicit discharge.

5.2 Source Investigation Priority Levels

Table 5.1 outlines the priority levels to assist City staff in determining the appropriate response time for initiating a source investigation after a problem is identified in the field. Priority levels are based on the suspected pollutant source(s) of a reported problem. According to the Phase II Permit, illicit discharge investigations should begin within seven days of identifying a problem. In most cases, the City of Walla Walla strives to respond faster than the required timeline.

Table 5.1
Source Investigation Priority Levels

Priority Level	Suspected Pollutants		Response Time (Work Days)
1	• Alkalis • Ammonia • Automotive products • Bases • Cleaning products • Degreaser or solvent • Drain cleaner • Fertilizer • Flammable/explosive materials	• Herbicide • Metals • Painting products • Pesticide • Petroleum • Process Wastewater • Sewage • Unknown chemicals	1 – 2
2	• Construction runoff (silt, sediment, gravel) • Detergents	• Food waste (fats, oils, grease) • Soap	3 – 5
3	• Car washing • Pressure washing waste • Spa or pool water	• Steam cleaning waste • Yard waste	5 – 7
4	• Animal carcasses • Bacteria • Construction materials • Foam	• Rust • Trash and Debris • Other	≤ 10 days

Priority levels were determined based on the potential public health and/or water quality threat posed by a given pollutant. The response time indicates a target time frame for opening a case log and initiating a source investigation as described in Section 5.3. *Contact Emergency Services (911) and the City's Public Works Department immediately if the discharge poses a severe threat to human health or the environment, see Appendix F for Spill Response procedures.*

5.3 Tracing the Source

This section outlines the basic tools that can be used to trace the source of a suspected illicit discharge. Source tracing begins when a suspected problem area is identified through the ORI, UIC facility inspections, field staff observations, monitoring results, or a complaint call. When the source of the non-stormwater discharge is not known, one of two primary methods can be used to locate the source of an illicit discharge:

- Method A – Storm Drain Network Investigations
- Method B – Drainage Area Investigations

The method used will depend on the type of information collected or reported, level of understanding of the storm drain network, and existing knowledge of operations and activities on the surrounding properties. All source tracing investigations should be documented and recorded on the Incident Response Form provided in Appendix C.

5.3.1 Open a Case Log

When problems are identified, a case log should be established in the IDDE investigation tracking database. Each case log is assigned a case number, creation date, case description, and the primary staff contact/investigator. A work order is created in the Cartegraph software listing the case log number, property address, person responsible, and tracking all information related to the observed or suspected problem. The investigator assigned to the case shall keep an accurate log of labor, materials and costs associated with the investigation for invoicing the responsible party. The case log should be opened prior to completing any additional field work unless the nature of the discharge necessitates immediate response. The case log file should include copies of the following, if applicable:

- Water Quality Incident Report Form;
- Copy of Outfall Inspection Report Form or UIC Facility Inspection Checklist;
- Incident Response Forms;
- Photographs;
- Additional field notes;
- Lab testing results;
- Compliance letters sent and responses received;
- Correspondence (mail, email, telephone logs); and
- Proof of corrected problems (contract and invoice or clean field investigation report).

Any field investigations, photographs, corrective actions, or other activities associated with the suspected problem area should be documented in the case log. This becomes the City's official record of the IDDE investigation. Additional record keeping information is included in Section 8.

5.3.2 Method A – Storm Drain Network Investigations

The source of some illicit connections or discharges can be located by systematically isolating the area from which the polluted discharge originates. This method involves progressive investigation at manholes in the storm drain network to narrow down the location where the illicit discharge is entering the drainage system. This method is best used to identify constant or frequent discharge sources such as an illicit connection from a sewer line or sink drain into the storm drain network. One-time illicit discharges (such as a surface spill or intentional dumping into the stormwater drainage system) should be investigated using Method B described later in this section.

Field crews should work progressively upstream from the outfall or UIC facility and inspect manholes until indicators reveal that the discharge is no longer present. Manhole observations can be time-consuming, but they are generally a necessary step before conducting other tests. In particularly large stormwater drainage systems, it may be helpful to first identify major branches of the system and test one manhole at the downstream end of each branch. This can help to reduce the area that must be investigated.

Storm drain network investigations include the following steps:

1. Consult the stormwater drainage system map (if available) and identify the major branches.
2. Starting from the outfall or UIC facility, observe and take probe readings using a hand-held water quality mulit-parameter meter at the next upstream manhole or junction to see if there is evidence of polluted discharge. As with the outfall and UIC facility inspections, field crews are looking for the presence of flow during dry weather, foul odors, colors or stained deposits, oily sheen, floatable materials, and/or unusual probe readings.
3. Repeat observations and probe readings at each upstream manhole or junction until a junction is found with no evidence of discharge; the discharge source is likely located between the junction with no evidence of discharge and the next downstream junction.
4. Work downstream from the "clean" manhole or junction to isolate the location where the polluted discharge is entering the stormwater drainage system.
5. If discharge is evident from private property, initiate private property site entry procedures.
6. Document all findings on the Incident Response Form and record all information in the IDDE investigation tracking database.

Figure 5-2 shows the observation steps to isolate the location where an illicit discharge is entering the storm drain network.

When visual inspections are not enough to isolate the source of the illicit discharge, a number of additional field tests can be performed. These include:

- Dye testing;
- Video testing; and
- Smoke testing.

The Center for Watershed Protection's *Illicit Discharge Detection and Elimination: A Guidance Manual* provides instructions for employing these testing techniques. The relevant pages from that manual are included in Appendix E.

Confirmed illicit discharge sources should be referred to the follow-up actions and corrective action procedures described at the end of this section and in Section 6.

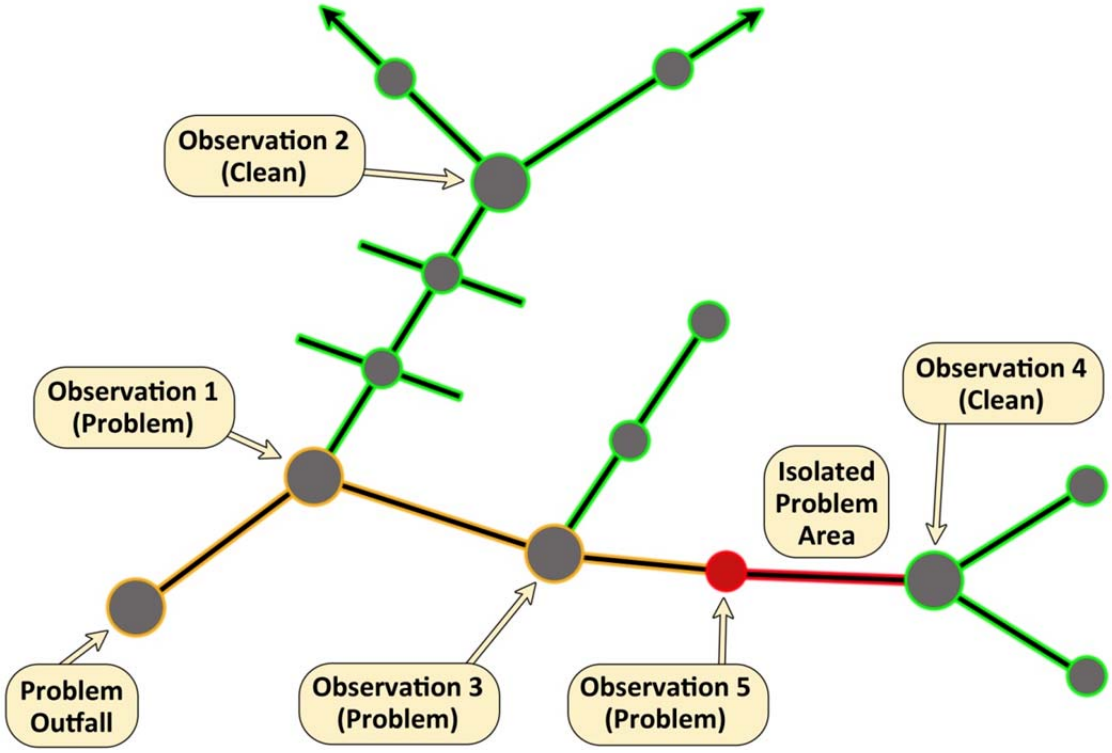

Figure 5.2
Example Observation Steps for Storm Drain Network Investigation

5.3.3 Method B – Drainage Area Investigations

The source of some illicit discharges can be determined through a survey or analysis of the drainage area for the problem outfall or UIC facility. Drainage area investigations are particularly useful when the discharge observed at the outfall or UIC facility has a distinct or unique characteristic that can allow field crews to quickly determine the type of activity or non-point source that is generating the discharge. However, drainage area investigations are generally not helpful in tracing sewage discharges, since they are not related to a specific land use.

Drainage area investigations should begin with a discussion between the field crews, Stormwater Engineer, and other knowledgeable City staff to identify the type of site most likely to produce the observed discharge. Table 5.2 shows some of the activities or land uses most likely associated with specific discharge problems.

Table 5.2
Common Discharges and Potential Sources

Observed Discharge	Potential Causes
Clogging Sediment	• Construction activity without proper erosion and sediment controls • Roadway sanding operations • Outdoor work areas or material storage areas
Thick Algae Growth	• Failing or leaking septic system • Fertilizer leak or spill • Landscaping operations • Hydroseeding following construction
Oil	• Refueling operations • Vehicle or machinery maintenance activities
Sudsy Discharge	• Power washing of buildings • Vehicle or equipment washing operations • Mobile cleaning crew dumping • Laundry or cleaner • Household greywater discharge
Clogging Grease	• Restaurant sink drain connection to stormwater drainage system • Dumping of restaurant waste (e.g., fats, oils, and grease)
Sewage	• Cross-connection of sanitary sewer line to stormwater drainage system

Staff should make a list of likely discharge sources and consult City land use and stormwater drainage system maps to identify areas of likely pollution sources near the storm drain network. Field crews should then conduct a windshield survey of the drainage area to confirm and identify potential sources of the discharge. Once potential discharge sites are identified, City staff should conduct individual site inspections to locate the specific source of the illicit discharge. In some cases, dye testing (See Appendix E) may be needed to confirm that a suspected activity is actually draining into the storm drain network.

All drainage area investigations should be documented on the Incident Response Form and recorded in the IDDE investigation tracking database.

5.3.4 Equipment

Prior to conducting field work, crews should assemble all required equipment (see Table 5.3) and review the outfall/UIC facility inspection records or water quality incident reports from the area to become familiar with the background information and potential pollution sources.

Table 5.3
Field Equipment for Source Investigations

Minimum 2 person crew	Machete/clippers
Safety gear – vest, hard hat, cones	Flash light or headlamp
Field notebook/writing utensils	Tool Box (hammer, tape measure, duct tape, zip ties)
Incident Response Forms	Pick or CB grate/cover remover
Stormwater system map of inspection area	Spray paint or other marker
GPS unit	First aid kit
Cell phone	Field test kit (See Appendix E)
Digital camera	

5.3.5 Analytical Sampling (if needed)

If illicit discharge sources cannot be identified based on a storm drain network investigation and/or drainage area investigation, the Stormwater Engineer may request that water samples be collected from potential problem discharges and sent to a lab for analytical testing. The results of lab tests may isolate the source or type of illicit discharge. Lab tests may also be important for documentation in the event that an enforcement action must be taken against a property owner or operator. Table 5-4 shows the recommended water quality testing parameters. These parameters serve as indicators of the likely presence or absence of a specific type of discharge. Appendix E includes additional information regarding indicator parameters in water quality testing.

Results of any analytical testing should be recorded on the Incident Response Form and reported to the Stormwater Engineer. Testing results may lead to another round of field investigations using either Method A or B. All data shall be recorded in the database case log.

The City should consider developing a Quality Assurance Project Plan (QAPP) to supplement their IDDE program. A QAPP would identify sampling protocals, as well as outline a monitoring plan. The plan would detail proper quality assurance and quality control, proper calibration of field equipment, how to properly take samples, and how to ensure that samples are valid.

Table 5.4 Water Quality Test Parameters and Uses	
Water Quality Test	**Use of Water Quality Test**
Conductivity*	Used as an indicator of dissolved solids.
pH*	Extreme pH values (high or low) may indicate commercial or industrial flows. Not useful in determining the presence of sanitary wastewater (tends to have a neutral pH like uncontaminated base flows).
Temperature*	Sanitary wastewater and industrial cooling water can substantially influence outfall discharge temperatures. This measurement is most usefull during cold weather.
Ammonia	High levels can be an indicator of the presence of sanitary wastewater
Surfactants	Indicate the presence of detergent (e.g. laundry, car washing)
Total Chlorine	Used to indicate inflow from potable water sources. Not a good indicator of sanitary wastewater because chlorine will not exist in a "free" state in water for long (it will combine with organic compounds).
Potassium	High levels may indicate the presence of sanitary wastewater.
Bacteria	Used to indicate the presence of sanitary wastewater or septic systems.

Source: *Illicit Discharge Detection and Elimination Manual* (New England Interstate Water Pollution Control Board, January 2003)
* Test parameters that can be taken in the field utilizing a hand-held water quality multi-parameter meter.

5.4 Follow-Up Actions

Once the source of an illicit discharge has been identified, the Stormwater Engineer and/or Enforcement Officer should initiate private property site entry procedures (if needed), notify the property owner or operator of the problem, and provide the appropriate educational materials and/or a copy of the City's IDDE ordinance. This is an important first step in the corrective action process. The Stormwater Engineer should complete the Incident Response Form, and enter all information in the IDDE investigation tracking database to document the findings. The Stormwater Engineer and Enforcement Officer can then begin working through the corrective action steps outlined in Section 6.

Section 6—Corrective Action

6.1 Purpose

The City will respond to identified illicit discharges, illicit connections, or illegal dumping activities using progressive enforcement actions. Corrective actions will focus first on education to promote voluntary compliance and escalate to increasingly severe enforcement actions if voluntary compliance is not obtained. The Stormwater Engineer and Enforcement Officer should use judgment in exercising the right mix of compliance assistance and enforcement to correct identified problems. The administrator may immediately levy fines if the violation is found to be willful, intentional, or egregious.

6.2 Voluntary Compliance

The preferred approach to address illicit discharge problems is to pursue voluntary compliance through property owner or responsible party education. Often, business operators and property owners are not aware of the existence of illicit connections or activities on their properties that may constitute an illicit discharge. In these cases, providing the responsible party with information about the connection or operation, the environmental consequences, and suggestions on how to remedy the problem may be enough to secure voluntary compliance.

Education begins during the site investigation when the operation or connection is first confirmed. Property owners or operators should be notified that the problems must be corrected in a timely manner and that the City will be conducting a follow-up site visit to verify compliance. Field staff should also provide the property owner or operator with an educational brochure describing illicit discharge violations and a copy of the City's IDDE ordinance. Field staff should also remind property owners of their obligation to report discharges to the proper agencies.

6.2.1 Operational Problems

Property owners are responsible for correcting operational problems that are leading to illicit discharges to the stormwater drainage system. This could include moving washing activities indoor or undercover, covering material storage areas, locating an appropriate discharge location for liquid wastes, or other operational modifications. Through site visits and education, the City can provide technical assistance to aid property owners in identifying the required modifications.

6.2.2 Structural Problems

Most illicit connection problems will require a structural modification to correct the problem. Structural repairs can be used to redirect discharges such as sewage, industrial, and commercial cross-connections. Such cross-connections must be re-routed to an approved sanitary sewer system. Correcting structural problems is the responsibility of the property owner, though the City may provide technical assistance throughout the process.

6.3 Enforcement Actions

When voluntary compliance does not produce the desired result, the City is required to pursue follow-up enforcement action. All enforcement actions will be the responsibility of the Stormwater Engineer and the Enforcement Officer. Table 6-1 and Figure 6-1 outline the detailed enforcement steps. More serious violations or continued non-compliance may warrant a more aggressive, enforcement-oriented approach.

Table 6.1
Illicit Discharge Enforcement Steps

Enforcement Step	Details	Responsibility
Step 1 Initial Actions	• Provide educational materials (i.e. brochure and copy of City's IDDE ordinance) • Encourage voluntary compliance through issuance of a Voluntary Correction Agreement; includes summary letter outlining necessary corrective action(s) and setting expected compliance date • Additional staff support or technical assistance • Request evidence of corrected problem (if applicable) • Site visit to verify compliance	Stormwater Engineer
Step 2 Follow-Up Actions	• Send "notice of civil violation" letter* to property owner regarding unresolved issues; outlining necessary corrective action(s) and setting expected compliance date • Request evidence of corrected problem (if applicable) • Site visit to verify compliance	Stormwater Engineer; Enforcement Officer
Step 3 Final Actions	• City may correct problem(s) and send bill to property owner • Levy fines following WWMC 8.07.060.	Enforcement Officer

* Keep copies of all letters within the case log database

Figure 6.1
City of Walla Walla IDDE Enforcement Steps

6.3.1 Enforcement Timeline

The timeline of corrective action procedures is highly dependent on the nature of the violation and the responsiveness and cooperation from the person(s) responsible. The urgency of addressing identified problems will be based on the nature of the pollutant in question and potential impacts to receiving waters, including groundwater. Compliance dates should be included in all violation notices.

The Phase II Permit requires identified problems to be corrected and illicit connections removed within 180 days of identifying the source. If property owners are not addressing problems in a timely manner, the City may step in and perform the repairs necessary to remove an illicit connection, eliminate an illicit discharge, and/or clean-up a dumping incident. Property owners will also be responsible for reimbursing the City for any costs occurred in correcting IDDE problems.

6.3.2 Potential Fines

Illicit discharge violations are subject to fines and penalties under Chapters 8.07 WWMC. The City has the ability to back charge costs and penalties to the violator or reduce or waive the penalty if the property owner can show that they have been actively working to correct the problem and have run into time delays beyond their control.

6.3.3 Record Keeping

Effective enforcement procedures require comprehensive recordkeeping and documentation to show that all program steps have been followed. Throughout the problem investigation and corrective action activities, all information related to the incident or property in question should be documented in the case log. Section 8 discusses illicit discharge record keeping in greater detail.

Section 7—Public Education

Section 7—Public Education

The NPDES Phase II Permit requires the City to conduct outreach activities to educate the public and business community about water quality protection. Outreach activities focus on reducing pollutants at the source by educating the public and businesses about their ultimate impact on the natural environment. Many members of the community are apt to modify behaviors once they understand the potential negative consequences.

To date, the City has conducted outreach activities aimed at educating local residents about natural yard care techniques, water conservation, habitat protection, and personal impact on the natural environment. These programs have been well received by the general public, and the City is hoping to expand the education efforts and direct more focus to the local business community.

Illicit discharge detection and elimination will be the focus on the educational outreach to the local business community. During the first 5-year Phase II Permit cycle (2007-2012) a basic business education program will be developed focused on informing business owners and their employees of their responsibilities related to water quality protection. During the next 5-year Phase II Permit cycle, the City will develop a direct outreach campaign to educate business owners/operators on illicit discharge and illicit connection regulations, as well as development of a source reduction team and program as funding and staff are available.

The details of the City's education and outreach program are described in a previously published document: *City of Walla Walla Public Involvement and Education Plan* (2011) (Appendix G). The report includes a prioritization of target audiences (e.g., business owners/operators, residential property owners, developers, etc.), suggested outreach strategies, and schedule of activities.

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Section 8—Record Keeping

The NPDES Phase II Permit requires the City to keep records of all stormwater program activities. Thorough record keeping is particularly important for a successful IDDE program. Records of past problems can help focus an investigation in the right direction or identify repeat offenders. Thorough record keeping is also critical to the enforcement process. Examples of the different types of information to be retained are included below:

Citizen Complaints – retain Water Quality Incident Report Forms

Outfall Inspections – maintain Outfall Inspection Report Forms, catalog and organize photographs, open case logs for suspected problem areas.

Investigations – retain Incident Response Forms, photographs, correspondence records, and lab testing results.

Corrective Action – in addition to the information collected during the investigation process, retain copies of compliance letters, correspondence with property owners, and proof of corrected problems.

8.1 Data Sources

Outfall Inspections – ORI data is captured using a handheld GPS unit, custom field data forms, and digital cameras. Data gathered is uploaded to the City's IDDE program ArcGIS geodatabase.

UIC Facility Inspections – Inspection of UIC facilities is the responsibility of the Streets Division. If during an inspection an illicit discharge or illegal dumping is observered, a Water Quality Incident Report Form must be completed and submitted to the Stormwater Engineer for review.

Investigations – Illicit discharge investigation records are maintained in the IDDE investigation tracking database. A case log is created for each suspected problem identified through the ORI, UIC facility inspections, field staff obersvations, monitoring results, or a complaint call. The database tracks actions completed by the investigator including education opportunities, technical assistance, communications, sample collection, analytical lab results, and enforcement actions.

Financial Records – Financial records are stored in a separate database using Cartegraph software. A work order is created for each compliant investigation. The work order and case log are linked by the unique case number. The Cartegraph work order module allows the City to capture vendor invoices, employee hours, equipment allocation, and inventory supplies.

8.2 Long Term Record Storage

The NPDES permit requires that all IDDE program records be retained for a minimum of five (5) years. However, longer term record storage will be helpful in building a library of data that describes pollutant problems in Walla Walla. To facilitate this process, the City will maintain the two most recent inspection reports for each receiving water/outfall location and UIC facility. Case log files (including analytical sampling results) will be kept for at least ten (10) years, or longer as data storage availability allows.

Section 9—Staff Training

Section 9—Staff Training

The City has developed a comprehensive training schedule to meet the requirements of the NPDES Phase II Permit. Two primary trainings have been identified related to IDDE:

- Training for operations and maintenance staff who may observe illicit discharges during the course of their normal work; and
- Training for field technicians (or Stormwater Engineers) who will be actively screening City storm drains for evidence of illicit discharges and who must respond appropriately to identify, trace, and eliminate the source of the illicit discharge.

These trainings are generally conducted by Public Works staff using materials developed for other aspects of the IDDE program. The City has developed a Microsoft PowerPoint presentation and purchased videos that are used for conducting the training for operations and maintenance staff. The City will schedule follow-up trainings as needed to keep the information fresh or introduce new information acquired during implementation of the IDDE program.

Training for the Stormwater Engineer, Enforcement Officer, or other designated field staff will primarily include distribution and review of this procedures manual as well as a refresher on City spill response procedures. Follow-up trainings for staff responsible for implementing and enforcing the IDDE program may take the form of debriefings following significant IDDE incidents. Debriefings allow staff to review the actions that were taken and identify what worked well and what should be modified for future responses.

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Section 10—References

Center for Watershed Protection. (2004). *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*.

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City of Bainbridge Island. (2010). *Illicit Discharge Detection and Elimination Program Manual*.

City of Walla Walla Municipal Code, Chapter 8.07 and 13.15.

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Ecology. (2007). *Eastern Washington Phase II Muncipal Stormwater Permit*.

New England Interstate Water Pollution Control Commission (NEIWPCC). (2003). *Illicit Discharge Detection and Elimination Manual, A Handbook for Municipalities*.

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Appendix A—Drainage System Mapping Field Guide

To Be Developed By City

Appendix B—City of Walla Walla IDDE Ordinance

ORDINANCE NO. 2010-01

AN ORDINANCE PROTECTING WATER QUALITY IN THE CITY OF WALLA WALLA AND TAKING OTHER ACTION RELATED THERETO

WHEREAS, the City of Walla Walla passed Municipal Ordinance A-2405 on May 13, 1970 which classified the City of Walla Walla as a nonchartered code city under Title 35A of the Revised Code Washington; and

WHEREAS, the Walla Walla City Council has considered this matter during a regularly and duly called public meeting of said Council, has given said matter careful review and consideration, and finds that good government and the best interests of the City of Walla Walla will be served by passage of this ordinance;

NOW THEREFORE, the City Council of the City of Walla Walla do ordain as follows:

Section 1: Section 8.05.030 of the Walla Walla Municipal Code is amended as follows (added terms are bolded and italicized and removed terms are stricken):

8.05.030 Types of nuisances

In addition to the places, acts, and omissions defined as a public nuisance by chapter 9.66 of the Revised Code of Washington, each of the following places, conditions or things is declared to constitute a public nuisance, and whenever the enforcement officer determines that any of these conditions exist upon any premises, the officer may require or provide for the abatement thereof pursuant to this chapter:

A. The growing, maintaining, permitting or allowing of any weed, vegetable or horticultural growth which either:

1. Overhangs, encroaches upon, obstructs or in any manner interferes with the full and free use by the public of any street, sidewalk or sidewalk area upon which such property so owned or occupied abuts,

2. Has grown and died upon any premises owned, occupied or in control of the responsible person or persons and which constitutes the detriment to the public health, safety or welfare, including, but not limited to, a fire hazard, or

3. Is so overgrown upon any premises owned, occupied or in control of the responsible person or persons, as to cause the degradation of the character of the neighborhood, and for which a general rule of thumb shall be an average length of twelve inches or more;

B. The existence of any junk, litter or refuse within the city which, is harmful to the surrounding neighborhood or the use of property in the surrounding neighborhood, unless such materials are kept or stored in an orderly and sightly manner and so as not to create a fire, safety, health or sanitary hazard;

C. The depositing, leaving or throwing away of any junk, litter or refuse within the city for an unreasonable length of time beyond what is necessary for proper disposal, which length of time shall be not less than thirty days, except at the city landfill or in covered containers or receptacles acceptable to the enforcement officer of the city;

D. The causing or permitting to be discharged, placed or thrown, or the throwing into, or upon any premises or any public street or alley of any nauseous, foul or putrid liquid or substance, or any liquid or substance likely to become nauseous, foul, offensive or putrid;

E. The erection, continuance or use of any building, room, property or other place in the city for the exercise of any trade, employment or manufacturer which results in offensive odors or other annoyances being released, and which annoys, injures or is offensive or detrimental to the health of the individuals there employed or residing, or to the public;

F. The burning of refuse or other material in such a manner as to cause or permit the smoke, ashes, soot or gases arising from such burning to become discomforting or annoying, or to injure or endanger the health of any person or neighborhood;

G. The maintenance or use of any building, house, room or other structure or vehicle for the purpose of lewdness, assignation or prostitution;

H. Any pit, basin, hole, well or other excavation which is unguarded and dangerous to life, or has been abandoned, or is no longer used for the purpose for which it was constructed, or is maintained contrary to law;

I. All obstructions to streets, rights-of-way or other public ways in the city, and all excavations in or under the same, which are by ordinance prohibited, or which may be made without lawful permission, or which, having been made by lawful permission, are kept and maintained after the purpose thereof has been accomplished, or for an unreasonable length of time;

J. All premises, buildings and vehicles whereon or wherein intoxicating liquor is manufactured, sold, bargained, exchanged, given away, furnished, disposed of, consumed or permitted to be consumed, in violation of laws of the state and in ordinances of the city;

K. All vacant, unused or unoccupied buildings and structures within the city, which are allowed to become or remain open to entrance by unauthorized persons or the general public, because of broken, missing or open doors, windows or other openings, so that the same may be used by vagrants or other persons in a manner detrimental to the health and welfare of the inhabitants of the city;

L. Any refrigerator, ice box or deep freeze locker having a capacity of one and one-half cubic feet or more or any other container manufactured, custom-made or homemade designed for storage which is discarded, abandoned or left in any place accessible to children and which has not had the door or latching mechanism removed to prevent the latching or locking of the door;

M. Any sign, poster or other advertising matter of any nature placed upon a telephone, utility or other poles, trees, sidewalks, streets, signs, traffic signs or other traffic

control devices or other structures or places within streets, alleys or other public places or rights-of-way;

N. All buildings or parts thereof, vehicles, or other structures, wherein any gambling, as defined by RCW 9.46.020 may be found, and any gambling device, as defined by RCW 9.46.020, may be found, except as licensed and within the scope of the requirement of the license required under state law and this municipal code;

O. The depositing or allowing of irrigation or other water to run by any street, alley or other public place, in such manner as to cause settling or damage to the street, alley or other public place, or to cause annoyance, damage or hazard to any user of the street, alley or other public place.

P. Any violation of the City's Critical Areas Ordinance (Chapter 21.04) shall be declared a public nuisance, and shall be subject to the provisions of this Chapter and Section 21.04.140.

Q. Any violation of the city's illicit discharge ordinance, Chapter 13.15, shall be declared a public nuisance, and shall be subject to the provisions of this chapter and Section 13.15.070.

Section 2: Chapter 13.15 is hereby added to the Walla Walla Municipal Code as follows:

Chapter 13.15
ILLICIT DISCHARGE, DETECTION AND ELIMINATION

Sections:

13.15.010	Purpose
13.15.020	Definitions
13.15.030	Prohibited Discharges
13.15.040	Allowable Discharges
13.15.050	Conditional Discharges
13.15.060	Prohibition of Illicit Connections
13.15.070	Inspection, Enforcement and Penalties

13.15.010 Purpose

The purpose of this Chapter is to protect groundwater, surface water, critical areas and stormwater facilities from the accidental and/or intentional discharge of pollutants and associated impacts to water quality.

13.15.020 Definitions

For the purposes of this chapter, the words defined in this section shall have the following meanings:

A. AKART – All Known, Available, and Reasonable methods of prevention, control, and Treatment. See also the State Water Pollution Control Act, sections 90.48.010 RCW and 90.48.520 RCW.

B. "Best management practices (BMPs)" mean schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and structural or managerial practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

C. "Clean Water Act" means the federal Water Pollution Control Act (33 USC Section 1251 et seq.), and any subsequent amendments thereto.

D. "Combined sewer" means a system that collects sanitary sewage and stormwater in a single sewer system.

E. "Ground water" means water in a saturated zone or stratum beneath the surface of the land or below a surface water body.

F. "Hazardous materials" means any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

G. "Hyperchlorinated" means water that contains more than 10mg/Liter chlorine.

H. "Illicit discharge" means any direct or indirect non-stormwater discharge to the city's storm drain system or surface waters of the State, except as expressly allowed by this chapter.

I. "Illicit connection" means any man-made conveyance that is connected to a municipal separate storm sewer without a permit, excluding roof drains and other similar type connections. Examples include sanitary sewer connections, floor drains, channels, pipelines, conduits, inlets, or outlets that are connected directly to the municipal separate storm sewer system.

J. "Infiltration" as defined under 40 CFR 35.2005(20) means water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow.

K. "Municipal separate storm sewer system" (MS4) means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

1. Owned or operated by the City of Walla Walla;
2. Designed or used for collecting or conveying stormwater;
3. Which is not part of a Publicly Owned Treatment Works (POTW); and
4. Which is not a combined sewer.

L. "National Pollutant Discharge Elimination System (NPDES) Stormwater Discharge Permit" means a permit issued by the Environmental Protection Agency (EPA) (or by the Washington Department of Ecology under authority delegated pursuant to 33 USC Section 1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

M. "Non-stormwater discharge" means any discharge to the storm drain system that is not composed entirely of stormwater.

N. "Person" means any person, firm, association, institution, public or private corporation, political subdivision, government agency, municipality, industry, individual, partnership, co-partnership or other entity whatsoever. The term shall also mean the occupant and the owner of the premises)

O. "Pollutant" means anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; nonhazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; soils; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

P. "Pollution-generating land use activities" means any activity that results in prohibited contaminants entering the storm drain system and/or surface or ground waters, with the exception of activities operating under and meeting requirements of a NPDES Permit.

Q. "POTW" means any device or system used in treatment of municipal sewage or industrial wastes of a liquid nature which is publicly owned

R. "Premises" means any building, lot, parcel of land, or portion of land, whether improved or unimproved, including adjacent sidewalks and parking strips.

S. "Storm drainage system" means publicly or privately owned facilities, including the city's municipal separate storm sewer system, by which stormwater is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.

T. "Stormwater" means runoff during and following precipitation and snowmelt events, including surface runoff and drainage.

U. "Stormwater pollution prevention plan" means a document which describes the best management practices and activities to be implemented by a person to identify sources of pollution or contamination at a premises and the actions to eliminate or reduce pollutant

discharges to stormwater, stormwater conveyance systems, and/or receiving waters to the maximum extent practicable.

V. "UIC well" or "underground injection control well" means a well that is used to discharge fluids into the subsurface. A UIC well is one of the following:

1. A bored, drilled or driven shaft, or dug hole whose depth is greater than the largest surface dimension; or
2. A subsurface fluid distribution system.

13.15.030 Prohibited Discharges

No person shall throw, drain, or otherwise discharge, cause or allow others under its control to throw, drain or otherwise discharge into the municipal storm drain system, underground injection control well, and/or surface and ground waters any materials other than stormwater. Existing pollution-generating land use activities shall implement operational or structural best management practices (BMPs) to prevent illicit discharges. Approved operational and structural BMPs are those contained in chapter 8 of the Washington State Department of Ecology's Stormwater Management Manual for Eastern Washington.

A. Examples of prohibited contaminants include but are not limited to the following:

1. Trash or debris.
2. Construction materials.
3. Petroleum products including but not limited to oil, gasoline, grease, fuel oil and heating oil.
4. Antifreeze and other automotive products.
5. Metals in either particulate or dissolved form.
6. Flammable or explosive materials.
7. Radioactive material.
8. Batteries.
9. Acids, alkalis, or bases.
10. Paints, stains, resins, lacquers, or varnishes.
11. Degreasers and/or solvents.
12. Drain cleaners.
13. Pesticides, herbicides, or fertilizers.
14. Steam cleaning wastes.
15. Soaps, detergents, or ammonia.
16. Swimming pool or spa filter backwash.
17. Chlorine, bromine, or other disinfectants.
18. Heated water.
19. Domestic animal wastes.
20. Sewage.

21. Recreational vehicle waste.
22. Animal carcasses.
23. Food wastes.
24. Bark and other fibrous materials.
25. Lawn clippings, leaves, or branches.
26. Silt, sediment, concrete, cement or gravel.
27. Dyes.
28. Chemicals not normally found in uncontaminated water.
29. Any other process-associated discharge except as otherwise allowed in this section.
30. Any hazardous material or waste not listed above.

13.15.040 Allowable Discharges

The following types of discharges shall not be considered illegal discharges for the purposes of this chapter unless the Director of Public Works determines that the type of discharge, whether singly or in combination with others, is causing or is likely to cause pollution of surface water or groundwater:

A. Diverted stream flows.
B. Rising ground waters.
C. Uncontaminated ground water infiltration
D. Uncontaminated pumped ground water.
E. Footing/Foundation drains.
F. Air conditioning condensation.
G. Irrigation water from agricultural sources that is commingled with urban stormwater.
H. Springs.
I. Water from crawl space pumps.
J. Flows from riparian habitats and wetlands.
K. Discharges from emergency fire fighting activities.

13.15.050 Conditional Discharges

The following types of discharges shall not be considered illegal discharges for the purposes of this chapter if they meet the stated conditions, or unless the Director of Public Works determines that the type of discharge, whether singly or in combination with others, is causing or is likely to cause pollution of surface water or groundwater:

A. Potable water, including water from water line flushing, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water. Planned discharges shall be de-chlorinated to a concentration of 0.1 ppm or less, pH-adjusted, if

necessary and in volumes and velocities controlled to prevent re-suspension of sediments in the stormwater system;

B. Lawn watering and other irrigation runoff are permitted but shall be minimized;

C. De-chlorinated swimming pool discharges. These discharges shall be de-chlorinated to a concentration of 0.1 ppm or less, pH-adjusted if necessary, and in volumes and velocities controlled to prevent re-suspension of sediments in the stormwater system;

D. Street and sidewalk wash water, water used to control dust, and routine external building wash down that does not use detergents are permitted if the amount of street wash and dust control water used is minimized. At active construction sites, street sweeping must be performed prior to washing the street;

E. Non-stormwater discharges covered by another NPDES permit, provided, that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations; and provided, that written approval has been granted for any discharge to the storm drain system;

F. Unintentional discharges from a public sewer; provided that the public authority which controls and maintains the sewer has developed, or is working to develop, a City approved maintenance and repair plan to minimize such discharges.

G. Other non-stormwater discharges. The discharges shall be in compliance with the requirements of a stormwater pollution prevention plan (SWPPP) reviewed and approved by the City, which addresses control of such discharges by applying AKART to prevent contaminants from entering surface or ground water.

13.15.060 Prohibition of Illicit Connections

The following activities related to connections to stormwater systems are prohibited:

A. The construction, use, maintenance, or continued existence of illicit connections to the storm drain system is prohibited. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

B. A person is considered to be in violation of this ordinance if the person connects a line conveying sewage to the municipal separate storm sewer system (MS4), or allows such a connection to continue.

13.15.070 Inspection, Enforcement and Penalties

Any violation of this Chapter is defined as a public nuisance pursuant to Section 8.05.030(Q), and shall be subject to the inspection, enforcement and penalty provisions set forth in Chapters 8.05 and 8.07 of this Code.

Section 3: The index to any chapter of the Walla Walla Municipal Code in which sections are added or removed or in which section titles are changed herein shall also be amended to reflect the such section amendments.

Section 4: The City Clerk and the codifiers of this ordinance are authorized to make necessary clerical corrections to this ordinance including, but not limited to, the correction of scrivener's/clerical errors, references, ordinance numbering, section/subsection numbers and any references thereto.

Section 5: If any portion or part hereof shall be determined to be invalid or unenforceable, it shall be deemed severable from the remainder hereof.

Section 6: This ordinance is remedial and shall become effective upon passage and publication of summary thereof approved by the City Attorney.

PASSED by the City Council of the City of Walla Walla, Washington, January 13, 2010.

Barbara Clark
Mayor

Attest:

Tammy Dillard
City Clerk

Form approved:

Tim O
City Attorney

SUMMARY OF ORDINANCE 2010-01

AN ORDINANCE PROTECTING WATER QUALITY IN THE CITY OF WALLA WALLA AND TAKING OTHER ACTION RELATED THERETO

The Walla Walla City Council passed Municipal Ordinance 2010-01 at its January 13, 2010 regular meeting which provides in summary:

Section 1: Provides that illicit discharges into the municipal storm drain system, underground injection control wells, and/or surface and ground waters are declared a public nuisance.

Section 2: Adds chapter 13.15 to the Walla Walla Municipal Code regulating discharges into discharge into the municipal storm drain system, underground injection control well, and surface and ground waters. Provides that certain types of discharges are allowed, certain types of discharges are prohibited, and certain types of discharges are conditionally allowed. Prohibits illicit connections to the municipal storm drain system. Provides inspection and enforcement mechanisms, and prescribes penalties.

Section 3: Integrates the ordinance into the Walla Walla Municipal Code.

Section 4: Authorizes the City Clerk and the codifiers of this ordinance to make necessary clerical corrections to this ordinance including, but not limited to, the correction of scrivener's/clerical errors, references, ordinance numbering, section/subsection numbers and any references thereto.

Section 5: Provides that if any portion or part hereof shall be determined to be invalid or unenforceable, it shall be deemed severable from the remainder hereof.

Section 6: Provides that the ordinance is remedial and shall become effective upon passage and publication of this summary.

The full text of Municipal Ordinance 2010-01 will be mailed upon request made to the Walla Walla City Clerk at Walla Walla City Hall, 15 N. Third Ave., Walla Walla, WA 99362.

Summary approved as to form

City Attorney

CITY OF WALLA WALLA

COUNCIL REQUEST FOR ACTION

AGENDA No. VI-A

ITEM TITLE: Adoption of Illicit Discharge Ordinance.	Agenda Date: ~~December 2, 2009~~ 1/13/2010
Originating Source: Public Works, Engineering Division	Funding Certification: N/A
Division Manager Review	Department Director Review
City Manager Approval	
	Ord. 2010-01

HISTORY:

February 2007	Coverage under the Eastern Washington Phase 2 Municipal Stormwater Permit became effective. One requirement of this permit was for the City of Walla Walla to adopt an ordinance addressing illicit discharges to the storm drain system.
August 2007	City Council passed Resolution 2007-070 authorizing execution of a Professional Services Contract with OTAK, Inc. to assist the City in preparation of an overall stormwater management plan. This document was completed in April 2009.
July 2009	City of Walla Walla formally established a hotline number for the public to report illicit discharges.
November 17, 2009	The City and County, in conjunction with Walla Walla Community College, conducted two 2-hour workshops as part of the public outreach and education process.

ITEM COMMENTARY:

Request – In accordance with Federal and State laws, the City has developed an "Illicit Discharge (IDDE) Ordinance, which is reflected in the attached Ordinance. **Therefore, staff is**

requesting the City Council consider and adopt the attached Ordinance formally identifying and regulating illicit discharges.

Background - In compliance with The Federal Water Pollution Control Act (The Clean Water Act) and The State of Washington Water Pollution Control Law, the State Department of Ecology (DOE) issued an Eastern Washington Phase II Municipal Stormwater Permit to the City of Walla Walla. One of the stipulations of the Permit is that the City develops, implement and enforce a program to detect and eliminate illicit discharges as defined by federal law. This is one of the first steps in development of a comprehensive stormwater management program for the City.

City staff has worked extensively with an outside consultant, as well as Walla Walla County Staff to ensure that the proposed ordinance meets the requirements imposed by the DOE permit, and is consistent with the requirements that have already been adopted by the County. Based on recommendations from the City Attorney's office, violations of the proposed ordinance will be classified and treated as a public nuisance, and would be administered by the City's Code Enforcement Division, with technical assistance as necessary from the Public Works Department.

Public Outreach & Education - Some of the activities proposed to be regulated under the proposed ordinance are not currently addressed in City codes. Staff has begun a concerted public outreach effort to educate contractors and the general public about the new regulations and how they may be impacted.

The City and County, in conjunction with Walla Walla Community College, conducted two 2-hour joint workshops on November 17 at the WWCC Water Resources Center. The afternoon session was oriented to contractors, and provided a brief overview of not only the proposed Illicit Discharge Ordinance, but also forthcoming stormwater management regulations. It is noted that Walla Walla County is ahead of the City in adoption of the regulations. The second 2-hour session was oriented to property and homeowners, and focused on Best Management Practices and proper disposal of household hazardous waste.

Illicit discharges and connections are currently considered a violation of state and federal laws. Adoption of the proposed ordinance would bring the City into compliance with those laws, and the requirement of the City Municipal Stormwater General Permit to adopt such regulations.

Enforcement Provisions – The City Attorney's office has recommended any violation of the Illicit Discharge Ordinance be classified as a "public nuisance", and subject to the penalty provisions for a public nuisance. Therefore, it is recommended that Section 8.05.030 of the City's Public Nuisance Ordinance be amended to include a new Subsection "Q" to read as follows:

> *Q. Any violation of the city's illicit discharge ordinance, Chapter 13.15, shall be declared a public nuisance, and shall be subject to the provisions of this chapter and Section 13.15.070.*

The recommended amendment to Section 8.05.030 has been incorporated into the adopting Ordinance.

Dept. of Commerce Review - Based on a staff inquiry submitted to the Washington Department of Commerce (formerly the Department of Community, Trade & Economic Development) it was determined the proposed regulations are not considered development standards, and are **therefore not subject to the 60-day Review Period typically required under the Growth Management Act**.

Environmental Review – A determination has been made since the primary purpose of the Illicit Discharge Ordinance is to protect the health, safety and welfare of the general public and violation of the provision are classified as a public nuisance, and because it does not constitute a development regulation, SEPA review is not required.

POLICY ISSUES:

The following primary Goals, Objectives, Policies and Tasks contained in the Walla Walla Urban Area Comprehensive Plan 2007 Review and Update the proposed Illicit Discharge Ordinance:

Goal 5, Objective 2 - To establish procedures to protect, preserve, and manage cultural, archaeological, historic and natural resources

Goal 6, Objective 3 - To protect, enhance, and conserve the natural environment

ENR Policy 11 - The City should develop and maintain stormwater regulations per the Washington State Department of Ecology (Goal 6, Objective 4)

UT Policy 16 - The City and the County should continue to cooperate and coordinate as a Stormwater Plan for the City's UGA is prepared and implemented to protect public and private properties from flooding and form polluting fish bearing streams (Goal 3, Objective 1; Goal 6, Objective 4)

ENR Policy 1 - Water, air, and soil resources in the Walla Walla UGA should be appropriately protected. This ought to include implementation of best management practices to ensure protection of surface and groundwater resources and ecosystems in locations where roadway and highway construction projects are occurring. (Goal 6, Objective 4)

UT Policy 5 - Water should be managed to protect ground water recharge areas and fish bearing streams (Goal 6, Objective 4)

CC Policy 4. Walla Walla's many streams are the foundation of the community's character, and protection and revitalization of stream corridors in residential neighborhoods should be a priority (Goal 1, Objective 4; Goal 6, Objective 3 and 4)

RC Policy 2. The region's communities should cooperate fully in the protection and

revitalization of the region's natural resources (Goal 5, Objective 2)

TASK 27 – Develop and implement stormwater regulations.

ALTERNATIVES:

Council may decide to approve, approve with modification or deny adoption of the Illicit Discharge Ordinance. Not approving any version of an IDDE ordinance would place the City into non-compliance with the terms of our current NPDES permit.

FINANCIAL IMPACTS:

City administrative costs are part of the proposed Storm Water rates to be considered by City Council on December 16, 2009. Adoption of the proposed Illicit Discharge Ordinance will result in establishment of a regionally consistent and clear set of standards and regulations, which should help contain any associated administrative costs.

STAFF RECOMMENDATION:

Staff recommends that the City Council review the draft ordinance and any written comments timely submitted to the City Clerk prior to the meeting at which the proposed ordinance is considered, and approve the attached Illicit Discharge, Detection and Elimination Ordinance.

ATTACHMENTS:

1. Illicit Discharge, Detection and Elimination Ordinance.

SUMMARY OF ORDINANCE 2010-01
AN ORDINANCE PROTECTING WATER QUALITY IN THE CITY OF WALLA WALLA AND TAKING OTHER ACTION RELATED THERETO

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The full text of Municipal Ordinance 2010-01 will be mailed upon request made to the Walla Walla City Clerk at Walla Walla City Hall, 15 N. Third Ave., Walla Walla, WA 99362.

Summary approved as to form /s/ Tim Donaldson
City Attorney
(Pub. Jan. 22, 2010)

Affidavit of Publication

STATE OF WASHINGTON,
County of Walla Walla } ss.

William Thyken, being first duly sworn upon oath deposes and says:

I am Controller of the Walla Walla Union-Bulletin, Inc., Publisher of the

WALLA WALLA UNION
WALLA WALLA DAILY BULLETIN

approved as a legal newspaper by order of the Superior Court of the State of Washington, in and for Walla Walla County; as such officer I make this affidavit on behalf of said publisher.

The legal notice, a true copy of which is annexed hereto, was published in the regular issues (and not in supplement form) of said newspaper, for a period of one day, commencing on the 22nd day of January, 2010, and ending on the 22nd day of January, 2010, both dates inclusive, and said newspaper was regularly distributed to its subscribers during all of said period. The full amount of the fee charged for the foregoing publication is the sum of $ 101.85; which amount has been paid in full.

Subscribed and sworn to before me this 22nd day of January, 2010.

Douglas B Finch
Notary Public in and for the State of Washington
Residing at Walla Walla, Washington

DOUGLAS B FINCH
COMMISSION EXPIRES
NOTARY PUBLIC
SEPT. 12, 2012
STATE OF WASHINGTON

Appendix C—IDDE Reporting Forms

Water Quality Incident Report Form
Outfall Inspection Report Form
Incident Response Form

Water Quality Incident Report Form

WATER QUALITY INCIDENT REPORT FORM

(In the event of a hazardous spill or release to water, soil, or air follow the Spill Response Plan)

Today's Date _____ Time Reported _____ CORR LOG # _____

Call Taker's Name _____ # _____

Date of Incident _____ Time of Occurrence _____

CALLER INFORMATION

Name _____

First Middle Last

Business Name _____

Street Address _____

_____

City _____ State _____ Zip _____

Email _____

External Reference No. _____

Phone _____ Ext _____ Type _____

☐ Caller Requests to Remain Anonymous

LOCATION OF INCIDENT

Business/Location Name _____

Street Address _____

_____

City _____ State _____ Zip _____

County, Region _____

Land Use: ☐ Commercial ☐ Residential ☐ Rural ☐ Forest ☐ Shoreline ☐ Park/Open Space ☐ Other _____

Directions/Landmarks: _____

_____

_____

INCIDENT DESCRIPTION

Matrix: ☐ Soil ☐Sediment ☐ Water

Contaminant: ☐ Oil/Fuel ☐ Sewage/Septic ☐ Detergents ☐ Other _____

Odor: ☐ Sewage ☐ Rancid/Sour ☐ Petroleum/Gas ☐ Sulfide ☐ Other* _____

Color: ☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other* _____

Floatables: ☐ Toilet Paper ☐ Suds ☐ Oil Sheen ☐ Excessive Algae ☐ Other* _____

Quantity: _____ ***Cause:*** _____

OTHER AGENCIES COMPLAINANT CONTACTED:

Agencies Responding: ☐ Fire ☐ Police ☐ City Other _____

Referred to 911? ☐ Yes ☐ No

REFERRED TO:

_____

Name Phone Ext Type

*** ADDITIONAL INFORMATION**

Outfall Inspection Report Form

OUTFALL INSPECTION REPORT FORM

Section 1: Background Data

Receiving Water:		Outfall ID:	
Today's date:		Time (Military):	
Investigators:		Form completed by:	
Temperature (°F):	Rainfall (in.): Last 24 hours: Last 48 hours:		
Latitude:	Longitude:	GPS Unit:	GPS LMK #:
Camera:		Photo #s:	

Land Use in Drainage Area (Check all that apply):

- ☐ Industrial
- ☐ Ultra-Urban Residential
- ☐ Suburban Residential
- ☐ Commercial
- ☐ Open Space
- ☐ Institutional
- Other: _____
- Known Industries: _____

Notes (e.g., origin of outfall, if known):

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☐ **Closed Pipe**	☐ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Elliptical ☐ Box ☐ Other: _____	☐ Single ☐ Double ☐ Triple ☐ Other: _____	Diameter/Dimensions: _____	In Water: ☐ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: _____	☐ Trapezoid ☐ Parabolic ☐ Other: _____		Depth: _____ Top Width: _____ Bottom Width: _____	
Flow Present?	☐ Yes ☐ No *If No, Skip to Section 5*				
Flow Description (If present)	☐ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		RESULT	UNIT	EQUIPMENT
☐Flow #1	Volume		Liter	Bottle
	Time to fill		Sec	
☐Flow #2	Flow depth		In	Tape measure
	Flow width	_____' _____"	Ft, In	Tape measure
	Measured length	_____' _____"	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature			°F	WQ Meter
pH			pH Units	WQ Meter
DO			mg/L	WQ Meter
Conductivity			µs/cm	WQ Meter
Ammonia			mg/L	Test strip

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☐ No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☐	☐ Brown ☐ Gray ☐ Yellow ☐Other: ☐ Green ☐ Orange ☐ Red	☐ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See Severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☐ Yes ☐ No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☐	☐ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	

Section 6: Overall Outfall Characterization for Illicit Discharge and Action Level (check one)

☐ Unlikely	☐ Potential (presence of 2 or more indicators)	☐ Suspect (1 or more indicators with severity of 3)	☐ Obvious
No Further Action Needed	*Open Case Log: Prioritize for Investigation*	*Open Case Log: Refer for Investigation*	*Open Case Log: Refer for Investigation*

Section 7: Data Collection

1. Sample for the lab?	☐ Yes	☐ No	
2. If yes, collected from:	☐ Flow	☐ Pool	
3. Intermittent flow trap set?	☐ Yes	☐ No	If Yes, type: ☐ OBM ☐ Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

Incident Response Form

INCIDENT RESPONSE REPORT FORM

Section 1: Background Data

Receiving Water:		Outfall ID:	
Today's date:		Time (Military):	
Investigators:		Form completed by:	
Temperature (°F):	Rainfall (in.): Last 24 hours: Last 48 hours:		
Latitude:	Longitude:	GPS Unit:	GPS LMK #:
Camera:		Photo #s:	

Suspected Pollutants (Circle):	Priority Level*
Alkalis Automotive Products Bases Cleaning Products Degreaser or Solvent Drain Cleaner Fertilizer Flammable/Explosive Materials Herbicide Metals Painting Products Pesticide Petroleum Process Wastewater Sewage Unknown Chemicals	1
Construction Runoff (silt, sediment, gravel) Detergents Food Waste (fats, oils, greases) Soap	2
Car Washing Pressure Washing Waste Spa or Pool Water Steam Cleaning Waste Yard Waste	3
Animal Carcasses Bacteria Construction Materials Foam Rust Trash/Debris Other_____	4

*Refer to IDDE Program Manual for target response times based on priority level

Section 2: Investigation Methods

☐ Storm Drain Network Investigation ☐ Drainage Area Investigation ☐ Other:

Section 3: Field Notes

Describe field activities (e.g., manholes inspected, odors/colors observed, suspected land uses, activities observed, any dye testing, smoke testing, or video testing conducted, etc.)

Attach map, field sketch, or additional notes as needed to describe field activities.

INCIDENT RESPONSE REPORT FORM

Section 4: Sampling Data (as needed)

Attach any laboratory testing results to this form and file with case log.

Investigation Field Test Parameters/Locations							
Date of Field Tests:							
Parameter	**Equipment**	**Unit**	**Describe Location:**	**Describe Location:**	**Describe Location:**	**Describe Location:**	**Describe Location:**
Temperature	WQ Meter	°F					
pH	WQ Meter	pH Units					
DO	WQ Meter	mg/L					
Conductivity	WQ Meter	ms/cm					
Ammonia	Test Strip	mg/L					

Section 5: Additional Observations

Note any other concerns observed during investigations (e.g., trash, damage, excessive vegetation impeding flow, or needed repairs):

Appendix D—Stormwater Drainage System Maps

Stormwater Drainage System Map

Receiving Water Location Map with Prioritization Table

Stormwater Drainage System Map

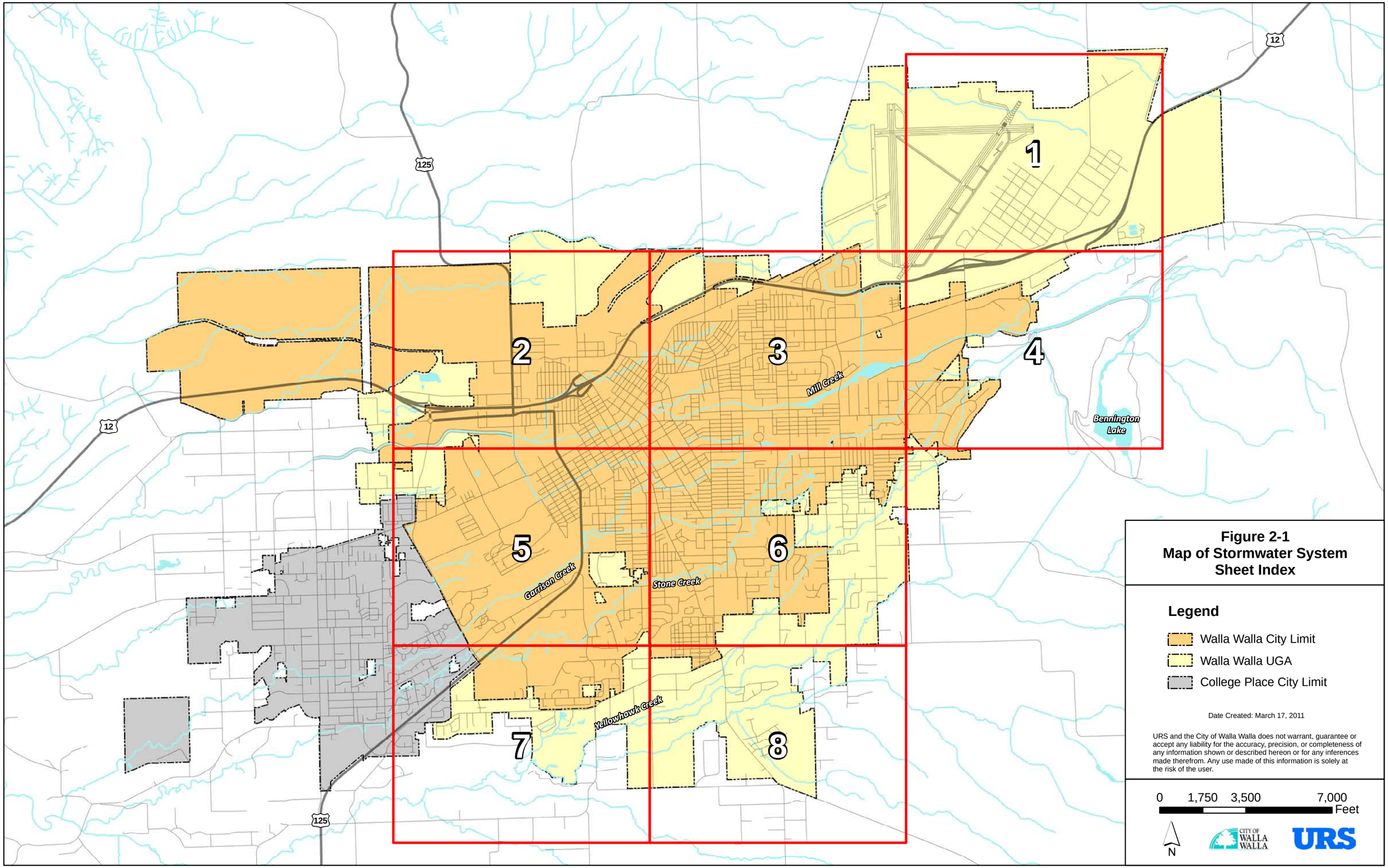
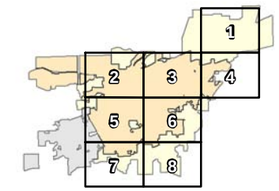


Figure 2-1
Map of Stormwater System
Sheet Index

Figure 2-1-1
Map of Stormwater System
Sheet 1



Legend

- BubbleUp
- CatchBasin
- Cleanout
- Down Spout
- Illicit Catch Basin
- Illicit Drain
- Inlet
- Outfall
- Outflow
- Barrel Bubble Up
- DiversionBox
- DryWell
- Manhole
- Unknown
- Stormwater Conveyance Network
- Creek
- Bodies of Water
- Stormwater Facility
- Walla Walla City Limit
- Walla Walla UGA
- College Place City Limit

Date Created: April 15, 2011

URS and the City of Walla Walla does not warrant, guarantee or accept any liability for the accuracy, precision, or completeness of any information shown or described hereon or for any inferences made therefrom. Any use made of this information is solely at the risk of the user.

0 400 800 1,600 Feet

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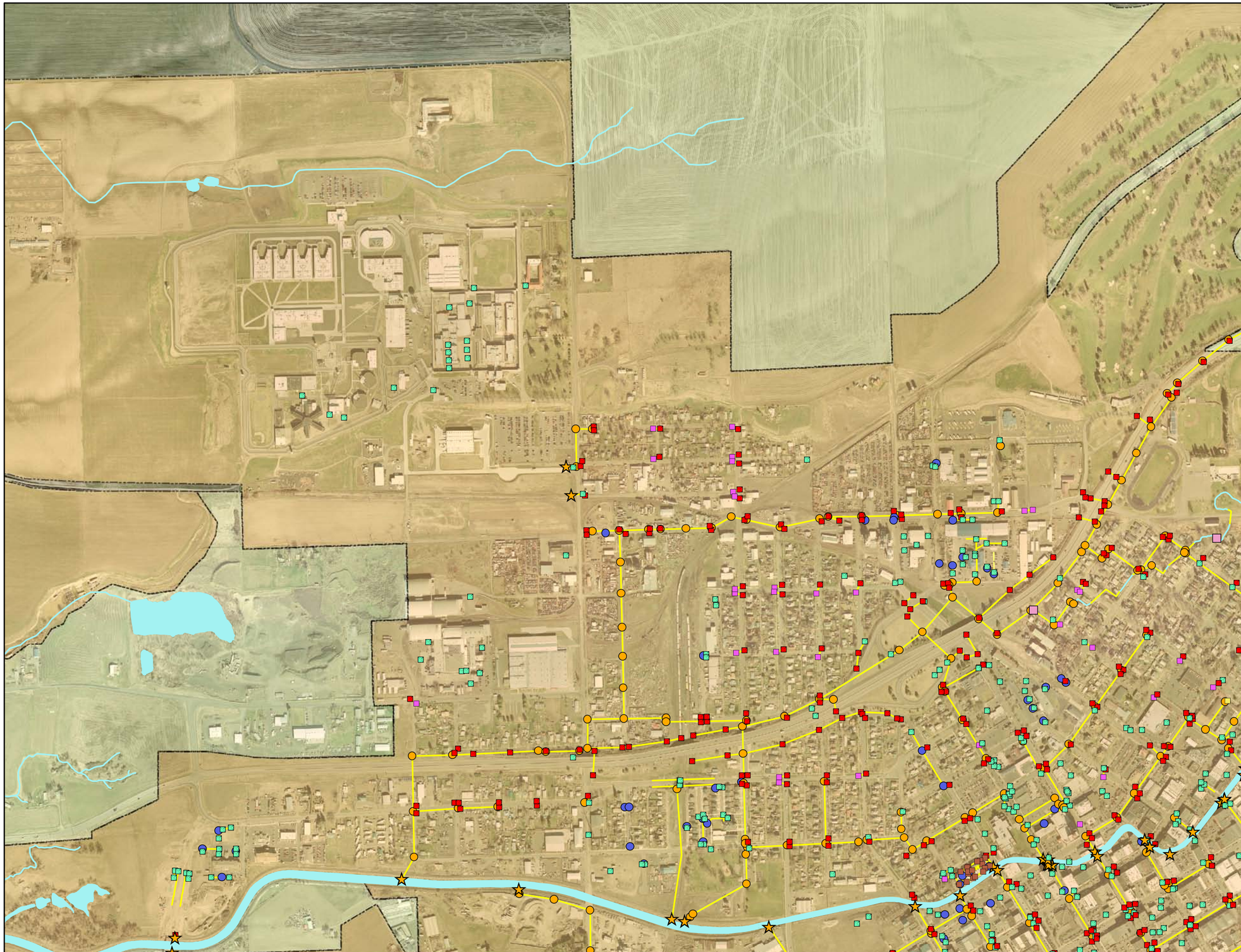
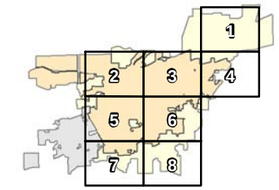
CITY OF WALLA WALLA

URS

Figure 2-1-2
Map of Stormwater System
Sheet 2





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CITY OF WALLA WALLA

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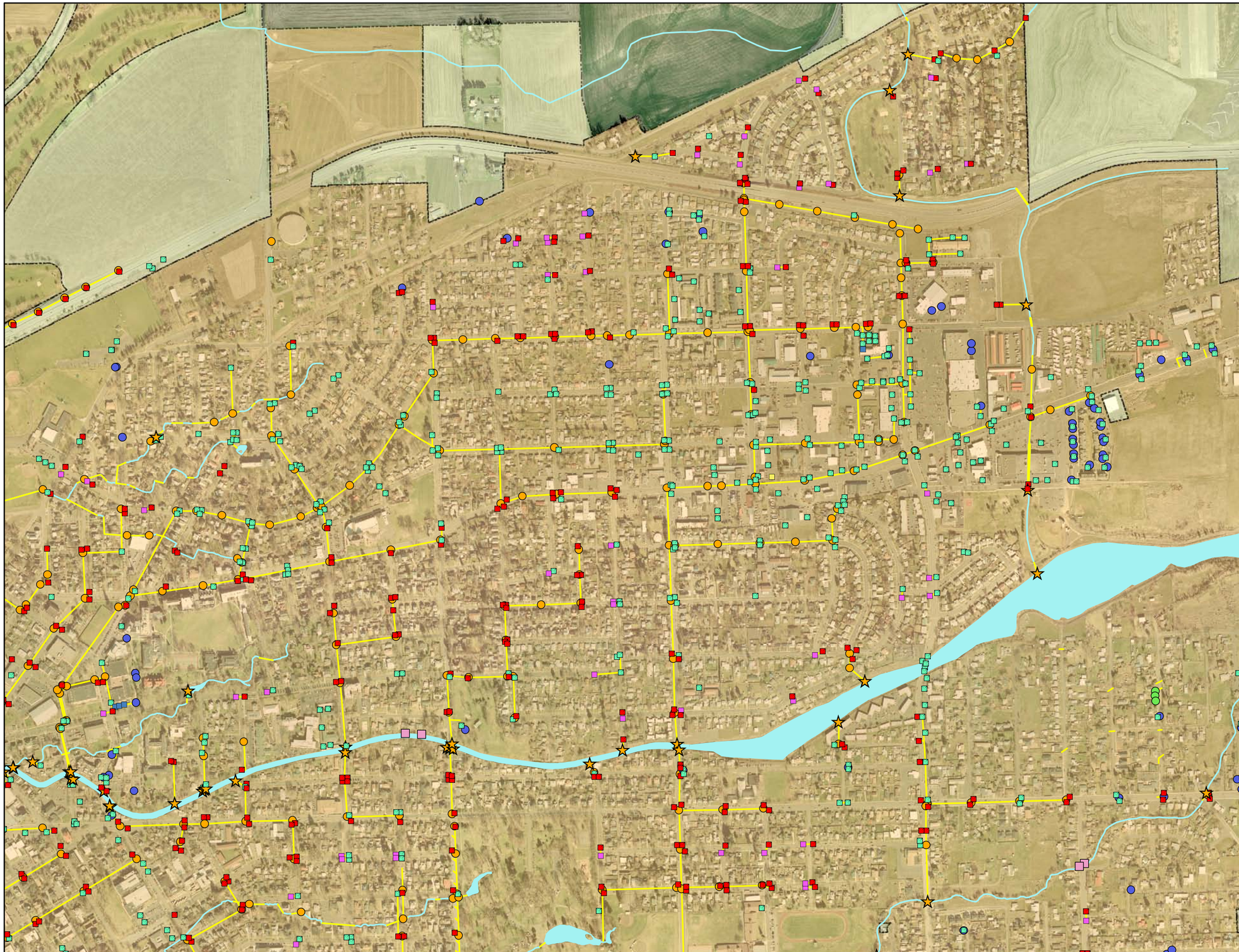
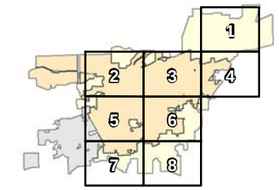


Figure 2-1-3
Map of Stormwater System
Sheet 3



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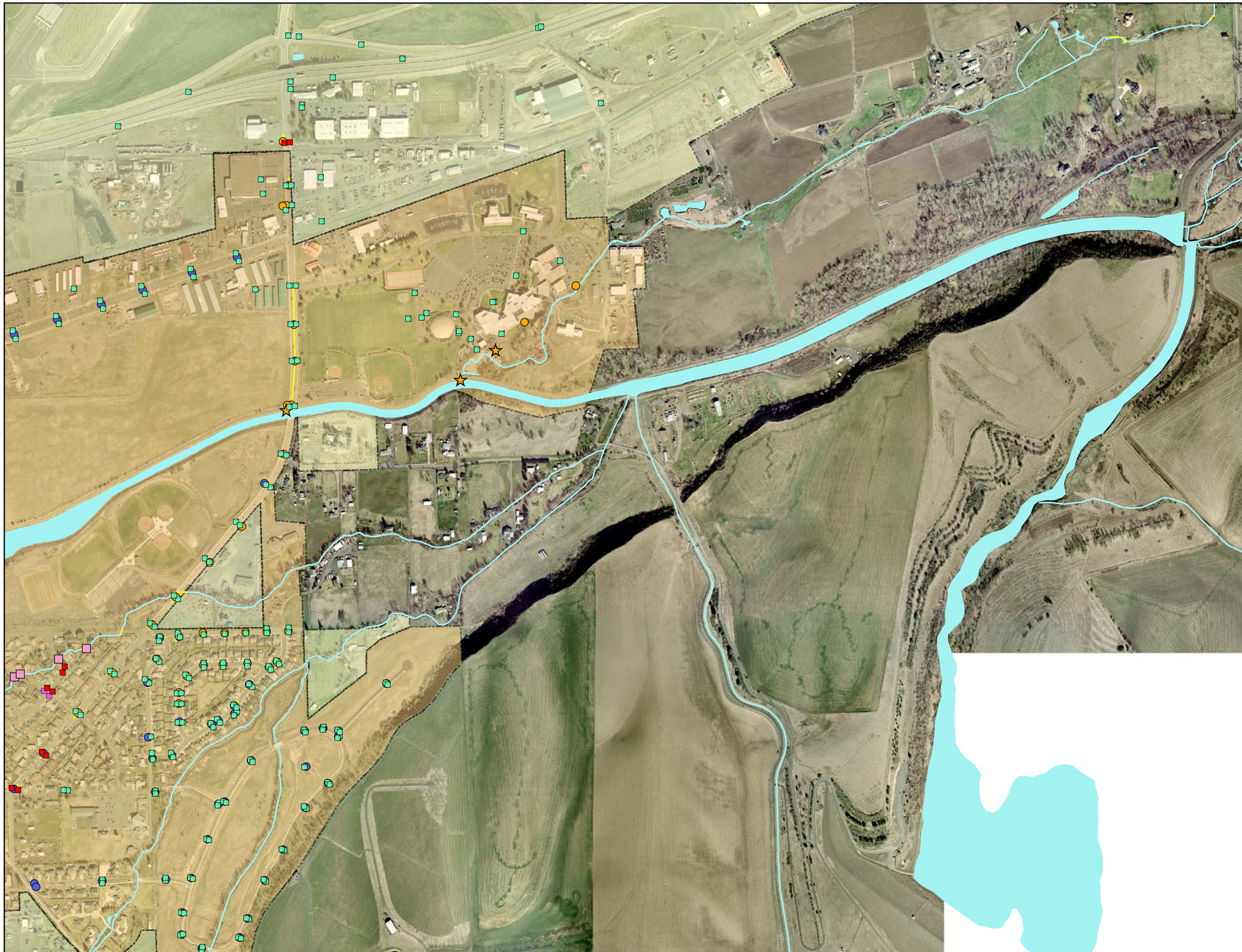
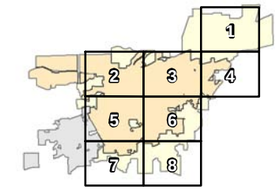


Figure 2-1-4
Map of Stormwater System
Sheet 4



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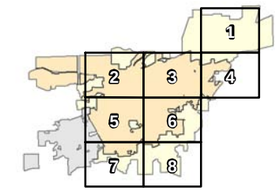
CITY OF WALLA WALLA

URS

Figure 2-1-5
Map of Stormwater System
Sheet 5



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- College Place City Limit

Date Created: April 15, 2011

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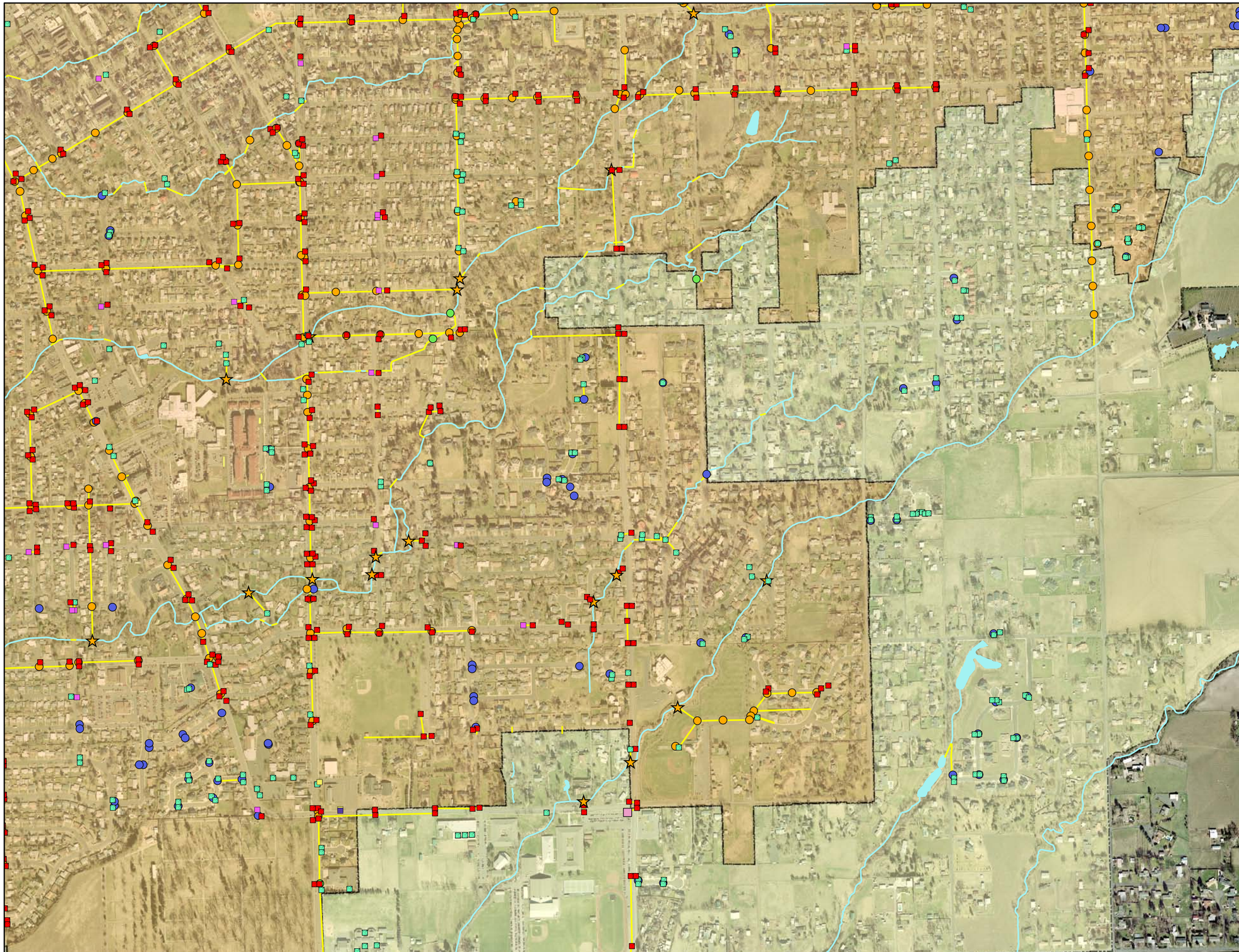
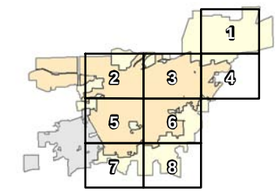


Figure 2-1-6
Map of Stormwater System
Sheet 6



Legend

- BubbleUp
- CatchBasin
- Cleanout
- Down Spout
- Illicit Catch Basin
- Illicit Drain
- Inlet
- Outfall
- Outflow
- Barrel Bubble Up
- DiversionBox
- DryWell
- Manhole
- Unknown
- Stormwater Conveyance Network
- Creek
- Bodies of Water
- Stormwater Facility
- Walla Walla City Limit
- Walla Walla UGA
- College Place City Limit

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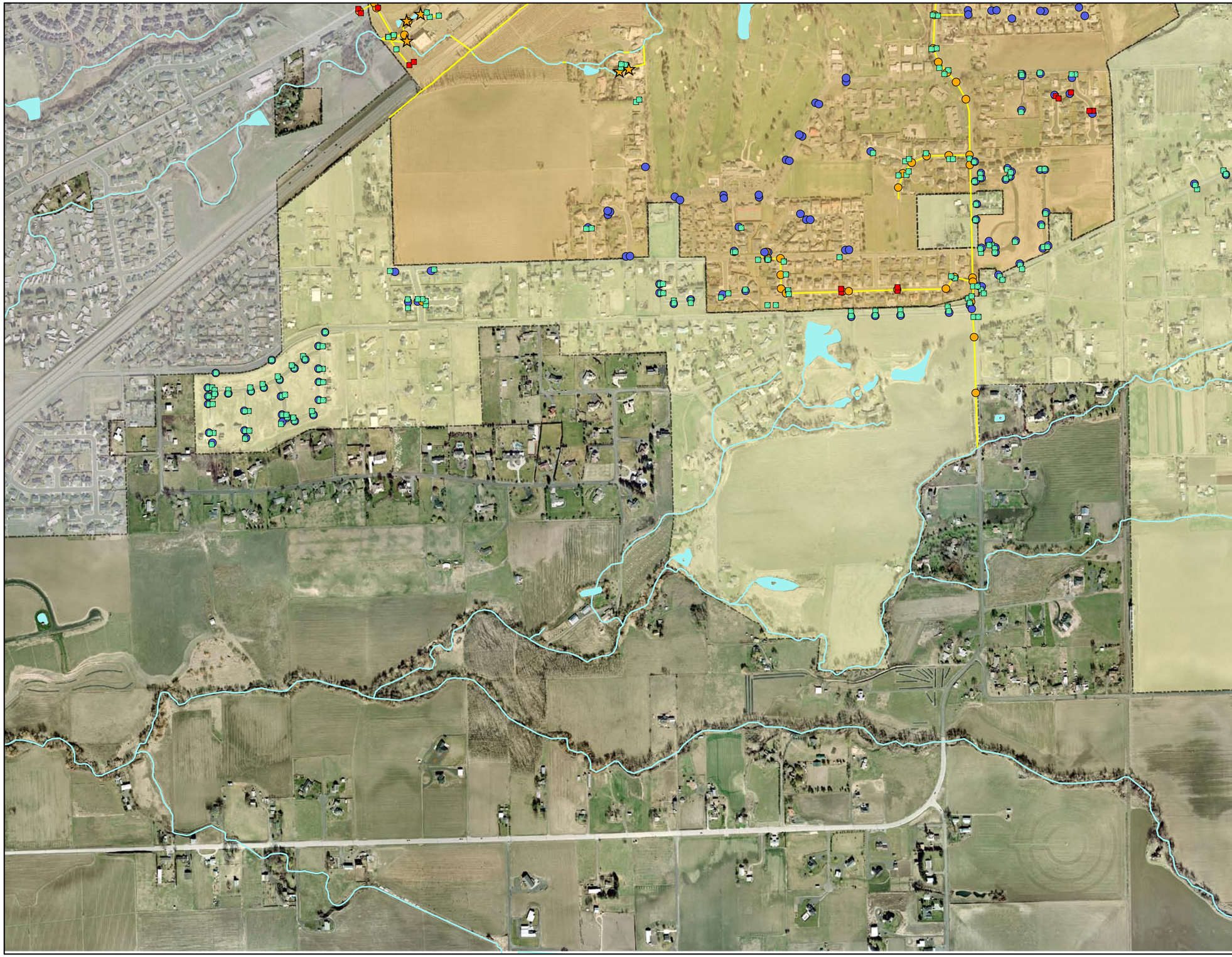
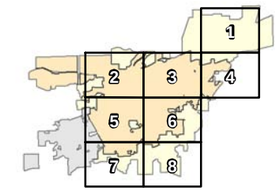


Figure 2-1-7
Map of Stormwater System
Sheet 7



Legend

- BubbleUp
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- Outfall
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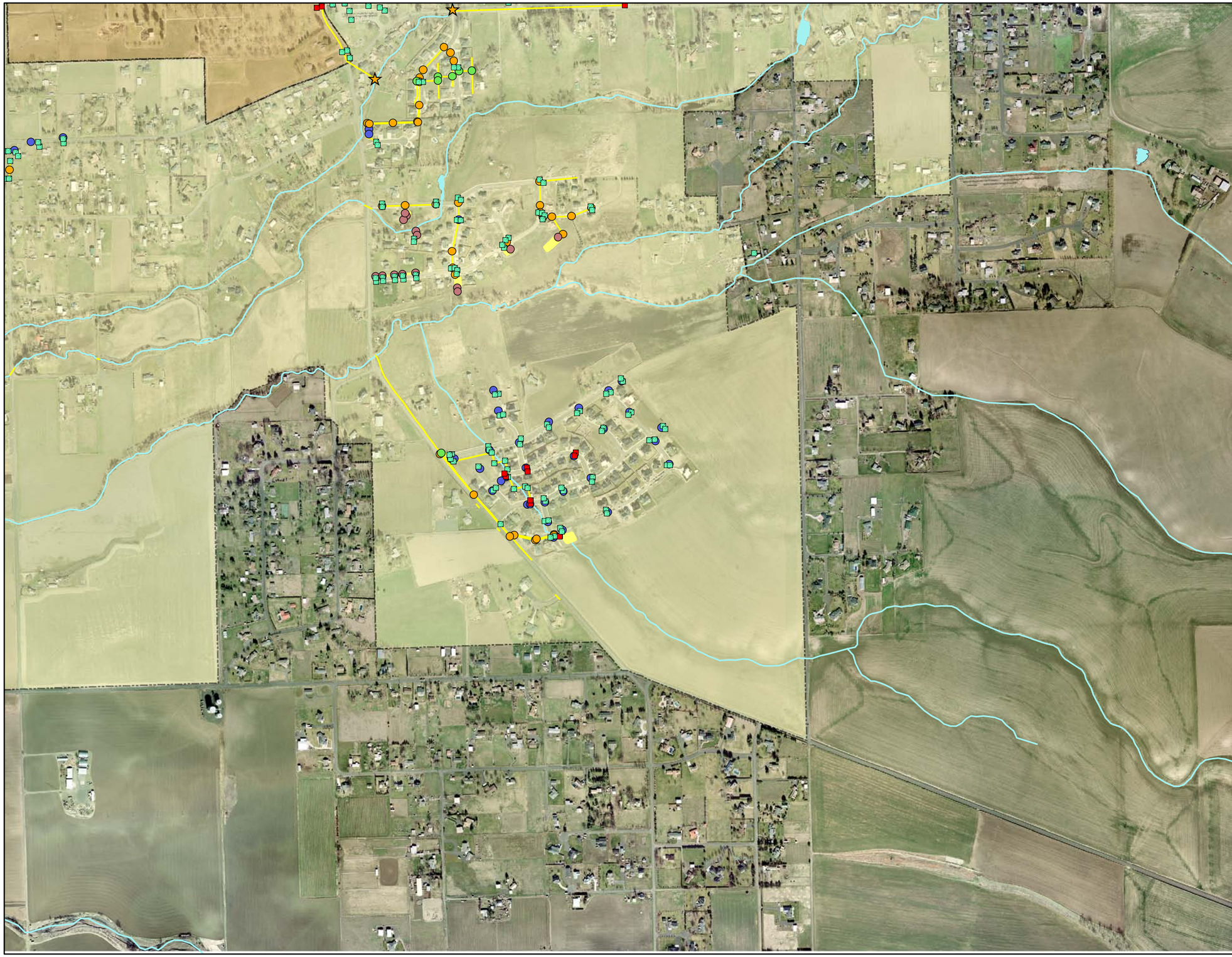
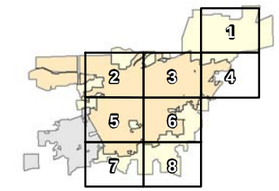


Figure 2-1-8
Map of Stormwater System
Sheet 8



Legend

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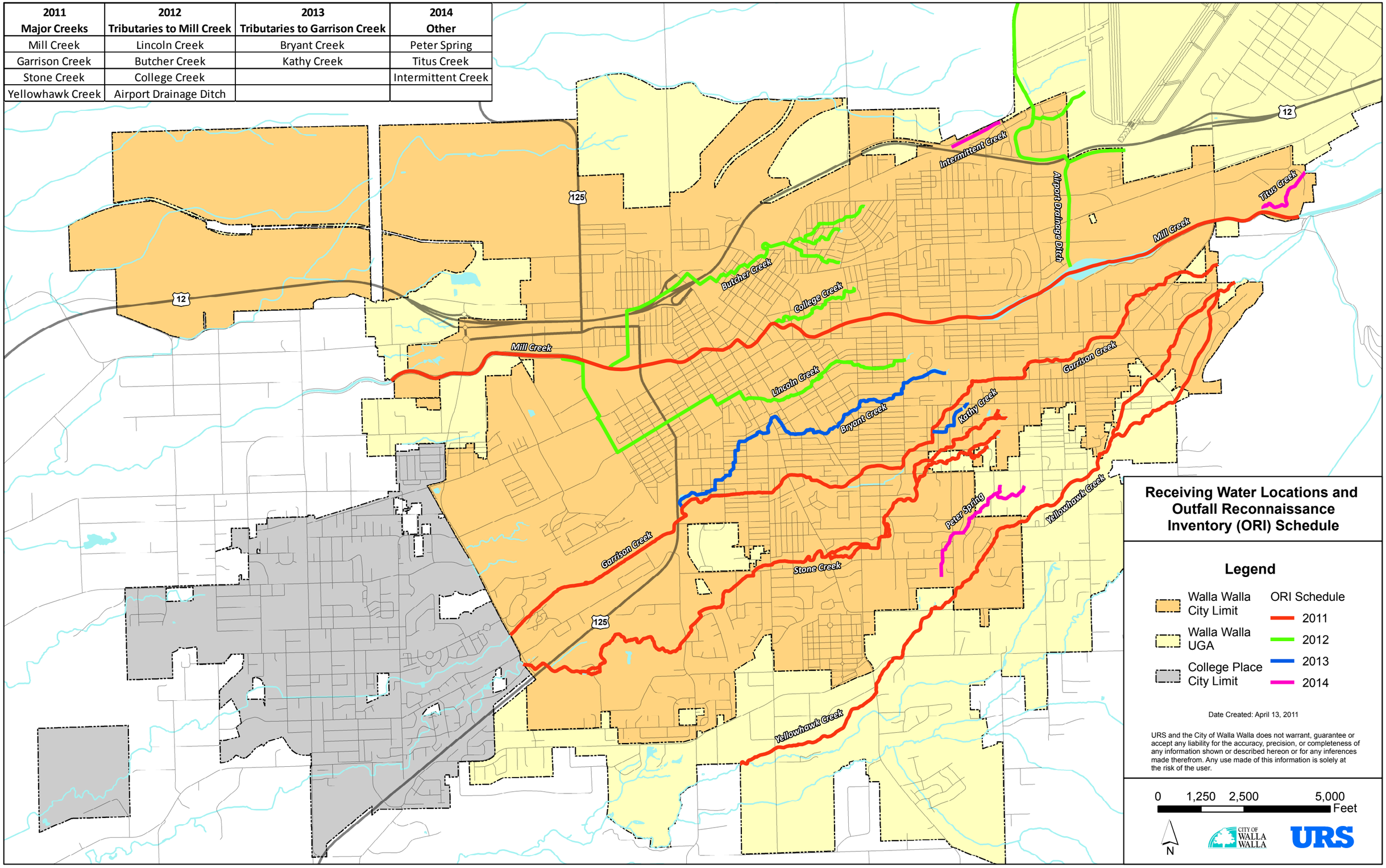
Receiving Water Location Map with Prioritization Table

2011 Major Creeks	2012 Tributaries to Mill Creek	2013 Tributaries to Garrison Creek	2014 Other
Mill Creek	Lincoln Creek	Bryant Creek	Peter Spring
Garrison Creek	Butcher Creek	Kathy Creek	Titus Creek
Stone Creek	College Creek		Intermittent Creek
Yellowhawk Creek	Airport Drainage Ditch		



Appendix E—IDDE Investigation Resources

Field Equipment Checklists
Smoke Testing, Dye Testing, Video Testing Information (CWP)
Water Quality Test Parameters (NEIWPCC)

Field Equipment Checklists

Field Equipment Checklists

Equipment for Outfall Inspections

- ☐ Minimum 2 person crew
- ☐ Safety gear – boots, high visibility vest, hard hat, safety cones
- ☐ Field notebook/writing utensils
- ☐ Outfall Inspection Report Forms
- ☐ Stormwater system map of inspection area
- ☐ GPS unit
- ☐ Cell phone
- ☐ Digital camera
- ☐ Machete/clippers
- ☐ Flash light or headlamp
- ☐ Tool box – hammer, tape measure, duct tape, zip ties
- ☐ Spray paint or other marker
- ☐ First Aid Kit
- ☐ Clear sample bottles
- ☐ Exendable water sampling pole
- ☐ Buckets (1 gallon and 5 gallon)
- ☐ Watch with second hand

Equipment for UIC Facility Inspections

- ☐ Minimum 2 person crew
- ☐ Safety gear – boots, high visibility vest, hard hat, safety cones
- ☐ Field notebook/writing utensils
- ☐ UIC Facility Inspection Report Forms
- ☐ Stormwater system map of inspection area
- ☐ GPS unit
- ☐ Cell phone
- ☐ Digital camera
- ☐ Flash light or headlamp
- ☐ Tool box – hammer, tape measure, duct tape, zip ties
- ☐ Pick or CB grate/cover remover
- ☐ Spray paint or other marker
- ☐ First Aid Kit
- ☐ Clear sample bottles
- ☐ Exendable water sampling pole

Equipment for Incident Response / Source Investigations

- ☐ Minimum 2 person crew
- ☐ Safety gear – boots, high visibility vest, hard hat, safety cones
- ☐ Field notebook/writing utensils
- ☐ Incident Response Forms
- ☐ Stormwater system map of inspection area
- ☐ GPS unit
- ☐ Cell phone
- ☐ Digital camera
- ☐ Machete/clippers
- ☐ Flash light or headlamp
- ☐ Tool box – hammer, tape measure, duct tape, zip ties
- ☐ Pick or CB grate/cover remover
- ☐ Spray paint or other marker
- ☐ First aid kit
- ☐ Field test kit (see next)

Equipment for Field Test Kit

- ☐ Dye tracer
- ☐ Test strips
- ☐ Sets of sample bottles for laboratory
- ☐ Coolers (non metallic) and ice packs
- ☐ Laboratory chain of custody forms
- ☐ Nitrile/latex gloves
- ☐ Water quality mulit-parameter meter
- ☐ Turbidimeter
- ☐ Exendable water sampling pole
- ☐ KimWipes
- ☐ Distilled water for equipment decontamination
- ☐ Deionized water for field blanks
- ☐ Storage bags – clean zip-type
- ☐ Garbage bags
- ☐ Sharpie Markers/Pencils/Pens

Smoke Testing, Dye Testing, Video Testing Information (CWP)

Table 56: Techniques to Locate the Discharge		
Technique	**Best Applications**	**Limitations**
Dye Testing	• Discharge limited to a very small drainage area (<10 properties is ideal) • Discharge probably caused by a connection from an individual property • Commercial or industrial land use	• May be difficult to gain access to some properties
Video Testing	• Continuous discharges • Discharge limited to a single pipe segment • Communities who own equipment for other investigations	• Relatively expensive equipment • Cannot capture non-flowing discharges • Often cannot capture discharges from pipes submerged in the storm drain
Smoke Testing	• Cross-connection with the sanitary sewer • Identifying other underground sources (e.g., leaking storage techniques) caused by damage to the storm drain	• Poor notification to public can cause alarm • Cannot detect all illicit discharges

TIP

The Wayne County Department of the Environment provides excellent training materials on on-site investigations, as well as other illicit discharge techniques. More information about this training can be accessed from their website: http://www.wcdoe.org/Watershed/Programs____Srvcs_/IDEP/idep.htm.

Figure 63: Dye Testing Plumbing (NEIWPCC, 2003)

Dye Testing

Dye testing is an excellent indicator of illicit connections and is conducted by introducing non-toxic dye into toilets, sinks, shop drains and other plumbing fixtures (see Figure 63). The discovery of dye in the storm drain, rather than the sanitary sewer, conclusively determines that the illicit connection exists.

Before commencing dye tests, crews should review storm drain and sewer maps to identify lateral sewer connections and how they can be accessed. In addition, property owners must be notified to obtain entry permission. For industrial or commercial properties, crews should carry a letter to document their legal authority to gain access to the property. If time permits, the letter can be sent in advance of the dye testing. For residential properties, communication can be more challenging. Unlike commercial properties, crews are not guaranteed access to homes, and should call ahead to ensure that the owner will be home on the day of testing.

Communication with other local agencies is also important since any dye released to the storm drain could be mistaken for a spill or pollution episode. To avoid a costly and embarrassing response to a false alarm,

crews should contact key spill response agencies using a "quick fax" that describes when and where dye testing is occurring (Tuomari and Thomson, 2002). In addition, crews should carry a list of phone numbers to call spill response agencies in the event dye is released to a stream.

At least two staff are needed to conduct dye tests – one to flush dye down the plumbing fixtures and one to look for dye in the downstream manhole(s). In some cases, three staff may be preferred, with two staff entering the private residence or building for both safety and liability purposes.

The basic equipment to conduct dye tests is listed in Table 57 and is not highly specialized. Often, the key choice is the type of dye to use for testing. Several options are profiled in Table 58. In most cases, liquid dye is used, although solid dye tablets can also be placed in a mesh bag and lowered into the manhole on a rope (Figure 64). If a

Table 57: Key Field Equipment for Dye Testing
(Source: Wayne County, MI, 2000)

Maps, Documents
- Sewer and storm drain maps (sufficient detail to locate manholes)
- Site plan and building diagram
- Letter describing the investigation
- Identification (e.g., badge or ID card)
- Educational materials (to supplement pollution prevention efforts)
- List of agencies to contact if the dye discharges to a stream.
- Name of contact at the facility

Equipment to Find and Lift the Manhole Safely (small manhole often in a lawn)
- Probe
- Metal detector
- Crow bar
- Safety equipment (hard hats, eye protection, gloves, safety vests, steel-toed boots, traffic control equipment, protective clothing, gas monitor)

Equipment for Actual Dye Testing and Communications
- 2-way radio
- Dye (liquid or "test strips")
- High powered lamps or flashlights
- Water hoses
- Camera

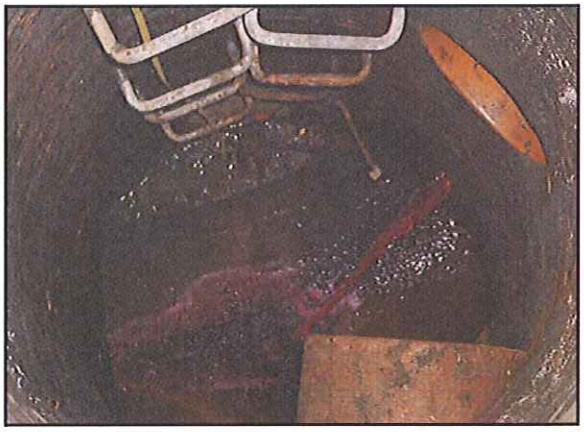


Figure 64: Dye in a mesh bag is placed into an upstream manhole (left); Dye observed at a downstream manhole traces the path of the storm drain (right)

longer pipe network is being tested, and dye is not expected to appear for several hours, charcoal packets can be used to detect the dye (GCHD, 2002). Charcoal packets can be secured and left in place for a week or two, and then analyzed for the presence of dye. Instructions for using charcoal packets in dye testing can be accessed at the following website: http://bayinfo.tamug.tamu.edu/gbeppubs/ms4.pdf.

The basic drill for dye tests consists of three simple steps. First, flush or wash dye down the drain, fixture or manhole. Second, pop open downgradient sanitary sewer manholes and check to see if any dye appears. If none is detected in the sewer manhole after an hour or so, check downgradient storm drain manholes or outfalls for the presence of dye. Although dye testing is fairly straightforward, some tips to make testing go more smoothly are offered in Table 59.

Table 58: Dye Testing Options

Product	Applications
Dye Tablets	• Compressed powder, useful for releasing dye over time • Less messy than powder form • Easy to handle, no mess, quick dissolve • Flow mapping and tracing in storm and sewer drains • Plumbing system tracing • Septic system analysis • Leak detection
Liquid Concentrate	• Very concentrated, disperses quickly • Works well in all volumes of flow • Recommended when metering of input is required • Flow mapping and tracing in storm and sewer drains • Plumbing system tracing • Septic system analysis • Leak detection
Dye Strips	• Similar to liquid but less messy
Powder	• Can be very messy and must dissolve in liquid to reach full potential • Recommended for very small applications or for very large applications where liquid is undesirable • Leak detection
Dye Wax Cakes	• Recommended for moderate-sized bodies of water • Flow mapping and tracing in storm and sewer drains
Dye Wax Donuts	• Recommended for large sized bodies of water (lakes, rivers, ponds) • Flow mapping and tracing in storm and sewer drains • Leak detection

Table 59: Tips for Successful Dye Testing
(Adapted from Tuomari and Thompson, 2002)

Dye Selection
- Green and liquid dyes are the easiest to see.
- Dye test strips can be a good alternative for residential or some commercial applications. (Liquid can leave a permanent stain).
- Check the sanitary sewer before using dyes to get a "base color." In some cases, (e.g., a print shop with a permitted discharge to the sanitary sewer), the sewage may have an existing color that would mask a dye.
- Choose two dye colors, and alternate between them when testing multiple fixtures.

Selecting Fixtures to Test
- Check the plumbing plan for the site to isolate fixtures that are separately connected.
- For industrial facilities, check most floor drains (these are often misdirected).
- For plumbing fixtures, test a representative fixture (e.g., a bathroom sink).
- Test some locations separately (e.g., washing machines and floor drains), which may be misdirected.
- If conducting dye investigations on multiple floors, start from the basement and work your way up.
- At all fixtures, make sure to flush with plenty of water to ensure that the dye moves through the system.

Selecting a Sewer Manhole for Observations
- Pick the closest manhole possible to make observations (typically a sewer lateral).
- If this is not possible, choose the nearest downstream manhole.

Communications Between Crew Members
- The individual conducting the dye testing calls in to the field person to report the color dye used, and when it is dropped into the system.
- The field person then calls back when dye is observed in the manhole.
- If dye is not observed (e.g., after two separate flushes have occurred), dye testing is halted until the dye appears.

Locating Missing Dye
- The investigation is not complete until the dye is found. Some reasons for dye not appearing include:
- The building is actually hooked up to a septic system.
- The sewer line is clogged.
- There is a leak in the sewer line or lateral pipe.

Video Testing

Video testing works by guiding a mobile video camera through the storm drain pipe to locate the actual connection producing an illicit discharge. Video testing shows flows and leaks within the pipe that may indicate an illicit discharge, and can show cracks and other pipe damage that enable sewage or contaminated water to flow into the storm drain pipe.

Video testing is useful when access to properties is constrained, such as residential neighborhoods. Video testing can also be expensive, unless the community already owns and uses the equipment for sewer inspections. This technique will not detect all types of discharges, particularly when the illicit connection is not flowing at the time of the video survey.

Different types of video camera equipment are used, depending on the diameter and condition of the storm sewer being tested.

Field crews should review storm drain maps, and preferably visit the site before selecting the video equipment for the test. A field visit helps determine the camera size needed to fit into the pipe, and if the storm drain has standing water.

In addition to standard safety equipment required for all manhole inspections, video testing requires a Closed-Circuit Television (CCTV) and supporting items. Many commercially available camera systems are specifically adapted to televise storm sewers, ranging from large truck or van-mounted systems to much smaller portable cameras. Cameras can be self-propelled or towed. Some specifications to look for include:

- The camera should be capable of radial view for inspection of the top, bottom, and sides of the pipe and for looking up lateral connections.
- The camera should be color.
- Lighting should be supplied by a lamp on the camera that can light the entire periphery of the pipe.

When inspecting the storm sewer, the CCTV is oriented to keep the lens as close as possible to the center of the pipe. The camera can be self-propelled through the pipe using a tractor or crawler unit or it may be towed through on a skid unit (see Figures 65 and 66). If the storm drain has ponded water, the camera should be attached to a raft, which floats through the storm sewer from one manhole to the next. To see details of the sewer, the camera and lights should be able to swivel both horizontally and vertically. A video record of the inspection should be made for future reference and repairs (see Figure 67).

Figure 65: Camera being towed

Smoke Testing

Smoke testing is another "bottom up" approach to isolate illicit discharges. It works by introducing smoke into the storm drain system and observing where the smoke surfaces. The use of smoke testing to detect illicit discharges is a relatively new application, although many communities have used it to check for infiltration and inflow into their sanitary sewer network. Smoke testing can find improper

Figure 66: Tractor-mounted camera

Figure 67: Review of an inspection video

connections, or damage to the storm drain system (Figure 68). This technique works best when the discharge is confined to the upper reaches of the storm drain network, where pipe diameters are to small for video testing and gaining access to multiple properties renders dye testing infeasible.

Notifying the public about the date and purpose of smoke testing before starting is critical. The smoke used is non-toxic, but can cause respiratory irritation, which can be a problem for some residents. Residents should be notified at least two weeks prior to testing, and should be provided the following information (Hurco Technologies, Inc., 2003):

- Date testing will occur
- Reason for smoke testing
- Precautions they can take to prevent smoke from entering their homes or businesses
- What they need to do if smoke enters their home or business, and any health concerns associated with the smoke
- A number residents can call to relay any particular health concerns (e.g., chronic respiratory problems)

Program managers should also notify local media to get the word out if extensive smoke testing is planned (e.g., television, newspaper, and radio). On the actual day of testing, local fire, police departments and 911 call centers should be notified to handle any calls from the public (Hurco Technologies, Inc., 2003).

The basic equipment needed for smoke testing includes manhole safety equipment, a smoke source, smoke blower, and sewer plugs. Two smoke sources can be used for smoke testing. The first is a smoke "bomb," or "candle" that burns at a controlled rate and releases very white smoke visible at relatively low concentrations (Figure 69). Smoke bombs are suspended beneath a blower in a manhole. Candles are available in 30 second to three minute sizes. Once opened, smoke bombs should be kept in a dry location and should be used within one year.

The second smoke source is liquid smoke, which is a petroleum-based product that is injected into the hot exhaust of a blower where it is heated and vaporized (Figure 70). The length of smoke production can vary depending on the length of the pipe being

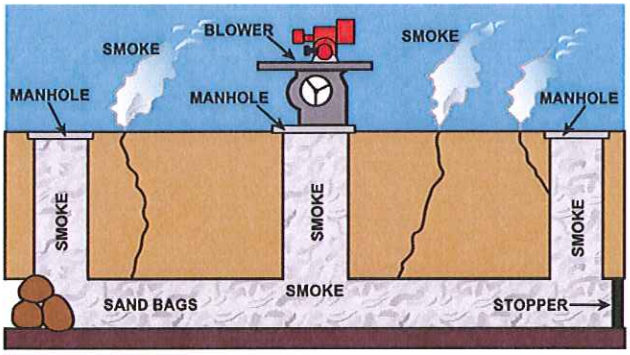


Figure 68: Smoke Testing System Schematic

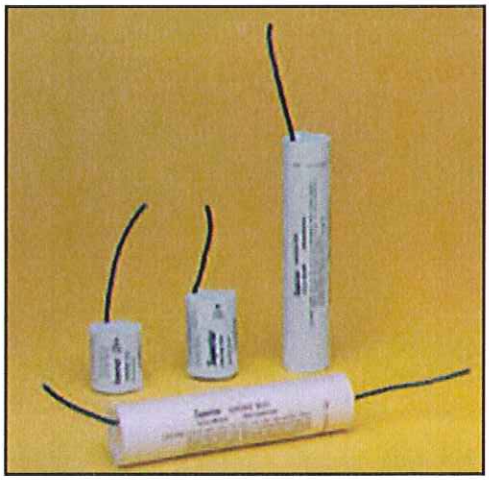


Figure 69: Smoke Candles

Figure 70: Smoke blower

tested. In general, liquid smoke is not as consistently visible and does not travel as far as smoke from bombs (USA Blue Book).

Smoke blowers provide a high volume of air that forces smoke through the storm drain pipe. Two types of blowers are commonly used: "squirrel cage" blowers and direct-drive propeller blowers. Squirrel cage blowers are large and may weigh more than 100 pounds, but allow the operator to generate more controlled smoke output. Direct-drive propeller blowers are considerably lighter and more compact, which allows for easier transport and positioning.

Three basic steps are involved in smoke testing. First, the storm drain is sealed off by plugging storm drain inlets. Next, the smoke is released and forced by the blower through the storm drain system. Lastly, the crew looks for any escape of smoke above-ground to find potential leaks.

One of three methods can be used to seal off the storm drain. Sandbags can be lowered into place with a rope from the street surface. Alternatively, beach balls that have a diameter slightly larger than the drain can be inserted into the pipe. The beach ball is then placed in a mesh bag with a rope attached to it so it can be secured and retrieved. If the beach ball gets stuck in the pipe, it can simply be punctured, deflated and removed. Finally, expandable plugs are available, and may be inserted from the ground surface.

Blowers should be set up next to the open manhole after the smoke is started. Only one manhole is tested at a time. If smoke candles are used, crews simply light the candle, place it in a bucket, and lower it in the manhole. The crew then watches to see where smoke escapes from the pipe. The two most common situations that indicate an illicit discharge are when smoke is seen rising from internal plumbing fixtures (typically reported by residents) or from sewer vents. Sewer vents extend upward from the sewer lateral to release gas buildup, and are not supposed to be connected to the storm drain system.

Ammonia

Ammonia is a good indicator of sewage, since its concentration is much higher there than in groundwater or tap water. High ammonia concentrations may also indicate liquid wastes from some industrial sites. Ammonia is relatively simple and safe to analyze. Some challenges include the tendency for ammonia to volatilize (i.e., turn into a gas and become non-conservative) and its potential generation from non-human sources, such as pets or wildlife.

Boron

Boron is an element present in the compound borax, which is often found in detergent and soap formulations. Consequently, boron is a good potential indicator for both laundry wash water and sewage. Preliminary research from Alabama supports this contention, particularly when it is combined with other detergent indicators, such as surfactants (Pitt, IDDE Project Support Material). Boron may not be a useful indicator everywhere in the country since it may be found at elevated levels in groundwater in some regions and is a common ingredient in water softeners products. Program mangers should collect data on boron concentrations in local tap water and groundwater sources to confirm whether it will be an effective indicator of illicit discharges.

Chlorine

Chlorine is used throughout the country to disinfect tap water, except where private wells provide the water supply. Chlorine concentrations in tap water tend to be significantly higher than most other discharge types. Unfortunately, chlorine is extremely volatile, and even moderate levels of organic materials can cause chlorine levels to drop below detection levels. Because chlorine is non-conservative, it is not a reliable indicator, although if very high chlorine levels are measured, it is a strong indication of a water line break, swimming pool discharge, or industrial discharge from a chlorine bleaching process.

Color

Color is a numeric computation of the color observed in a water quality sample, as measured in cobalt-platinum units (APHA, 1998). Both industrial liquid wastes and sewage tend to have elevated color values. Unfortunately, some “clean” flow types can also have high color values. Field testing by Pitt (IDDE Project Support Material) found high color values associated for all contaminated flows, but also many uncontaminated flows, which yielded numerous false positives. Overall, color may be a good first screen for problem outfalls, but needs to be supplemented by other indicator parameters.

Conductivity

Conductivity, or specific conductance, is a measure of how easily electricity can flow through a water sample. Conductivity is often strongly correlated with the total amount of dissolved material in water, known as Total Dissolved Solids. The utility of conductivity as an indicator depends on whether concentrations are elevated in “natural” or clean waters. In particular, conductivity is a poor indicator of illicit discharge in estuarine waters or in northern regions where deicing salts are used (both have high conductivity readings).

Field testing in Alabama suggests that conductivity has limited value to detect sewage or wash water (Pitt, IDDE Project Support Material). Conductivity has some

value in detecting industrial discharges that can exhibit extremely high conductivity readings. Conductivity is extremely easy to measure with field probes, so it has the potential to be a useful supplemental indicator in subwatersheds that are dominated by industrial land uses.

Detergents

Most illicit discharges have elevated concentration of detergents. Sewage and washwater discharges contain detergents used to clean clothes or dishes, whereas liquid wastes contain detergents from industrial or commercial cleansers. The nearly universal presence of detergents in illicit discharges, combined with their absence in natural waters or tap water, makes them an excellent indicator. Research has revealed three indicator parameters that measure the level of detergent or its components-- surfactants, fluorescence, and surface tension (Pitt, IDDE Project Support Material). Surfactants have been the most widely applied and transferable of the three indicators. Fluorescence and surface tension show promise, but only limited field testing has been performed on these more experimental parameters. Methods and laboratory protocols for each of the three detergent indicator parameters are reviewed in Appendix F2.

E. coli, Enterococci and Total Coliform

Each of these bacteria is found at very high concentrations in sewage compared to other flow types, and is a good indicator of sewage or septage discharges, unless pet or wildlife sources exist in the subwatershed. Overall, bacteria are good supplemental indicators and can be used to find “problem” streams or outfalls that exceed public health standards. Relatively simple analytical methods are now available to test for bacteria indicators, although they still suffer from two monitoring constraints. The first is the relatively long analysis time (18-24 hours) to get results, and the second is that the waste produced by the tests may be classified as a biohazard and require special disposal techniques.

Fluorescence

Laundry detergents are highly fluorescent because optical brighteners are added to the formula to produce “brighter whites.” Optical brighteners are the reason that white clothes appear to have a bluish color when placed under a fluorescent light. Fluorescence is a very sensitive indicator of the presence of detergents in discharges, using a fluorometer to measure fluorescence at specific wavelengths of light. Since no chemicals are needed for testing, fluorometers have minimal safety and waste disposal concerns.

Some technical concerns do limit the utility of fluorescence as an indicator of illicit discharges. The concerns include the presence of fluorescence in non-illicit flow types such as irrigation water, the considerable variation of fluorescence between different detergent brands, and the lack of a readily standard or benchmark concentration for optical brighteners. For example, Pitt (IDDE Project Support Material) measured fluorescence in mg/L of Tide™ brand detergent, and found the degree of fluorescence varied regionally, temporally, and between specific detergent formulations.

Given these current limitations, fluorescence is best combined with other detergent indicators such as surfactants. Appendix F3 should be consulted for more detailed information on analytical methods and experimental field testing using fluorescence as an indicator parameter.

Fluoride

Fluoride is added to drinking water supplies in most communities to improve dental health, and normally found at a concentration of two parts per million in tapwater. 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 fluoridate drinking water, or where individual wells provide drinking water. One key constraint is that the reagent used in the recommended analytical method for fluoride is considered a hazardous waste, and must be disposed of properly.

Hardness

Hardness measures the positive ions dissolved in water and primarily include magnesium and calcium in natural waters, but are sometimes influenced by other metals. Field testing by Pitt (IDDE Project Support Material) suggests that hardness has limited value as an indicator parameter, except when values are extremely high or low (which may signal the presence of some liquid wastes). Hardness may be applicable in communities where hardness levels are elevated in groundwater due to karst or limestone terrain. In these regions, hardness can help distinguish natural groundwater flows present in outfalls from tap water and other flow types.

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). The pH of a discharge is very simple to monitor in the field with low cost test strips or probes. Although pH data is often not conclusive by itself, it can identify problem outfalls that merit follow-up investigations using more effective indicators.

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. (See Chapter 12). Simple field probes can detect potassium at relatively high concentrations (5 mg/L), whereas more complex colorimetric tests are needed to detect potassium concentrations lower than 5 mg/L.

Surface Tension

Surfactants remove dirt particles by reducing the surface tension of the bubbles formed in laundry water when it is agitated. Reduced surface tension makes dirt particles less likely to settle on a solid surface (e.g., clothes or dishes) and become suspended instead on the water's surface. The visible manifestation of reduced surface tension is the formation of foam or bubbles on the water surface. Pitt (IDDE Project Support Material) tested a very simple procedure to measure surface tension that quantifies the formation of foam and bubbles in sample bottles. Initial laboratory tests suggest that surface tension is a good indicator of surfactants, but only when they are present at relatively high concentrations. Section F3 provides a more detailed description of the surface tension measurement procedure.

Surfactants

Surfactants are the active ingredient in most commercial detergents, and are typically measured as Methyl Blue Active Substances (or MBAS). They are a synthetic replacement for soap, which builds up deposits on clothing over time. Since surfactants are not found in nature, but are always present in detergents, they are excellent indicators of sewage and wash waters. The presence of surfactants in cleansers, emulsifiers and lubricants also makes them an excellent indicator of industrial or commercial liquid wastes. In fact, research by Pitt (IDDE Project Support Material) found that detergents were an excellent indicator of "contaminated" discharges in Alabama (i.e., discharges that were not tap water or groundwater). Several analytical methods are available to monitor surfactants. Unfortunately, the reagents used involve toluene, chloroform, or benzene, each of which is considered hazardous waste with a potential human health risk. The most common analysis method uses chloroform as a reagent, and is recommended because it is relatively safer when compared to other reagents.

Turbidity

Turbidity is a quantitative measure of cloudiness in water, and is normally measured with a simple field probe. While turbidity itself cannot always distinguish between contaminated flow types, it is a potentially useful screening indicator to determine if the discharge is contaminated (i.e., not composed of tap water or groundwater).

Research Indicators

In recent years, researchers have explored a series of other indicators to identify illicit discharges, including fecal steroids (such as coprostanol), caffeine, specific fragrances associated with detergents and stable isotopes of oxygen. Each of these research indicators is profiled in Pitt (IDDE Project Support Material) and summarized below in Table F1. Most research indicators require sophisticated equipment and specific expertise that limit their utility as a general indicator, given the high sampling cost and long turn-around times needed. To date, field tests of research indicators have yielded mixed results, and they are currently thought to be more appropriate for special research projects than for routine outfall testing. While they are not discussed further in this manual, future research and testing may improve their utility as indicators of illicit discharges.

Table F1: Summary of Research Indicators Used for Identifying Inappropriate Discharges into Storm Drainage		
Parameter Group	**Comments**	**Recommendation**
Coprostanol and other fecal sterol compounds	Used to indicate presence of sanitary sewage	Possibly useful. Expensive analysis with GC/MSD. Not specific to human wastes or recent contamination. Most useful when analyzing particulate fractions of wastewaters or sediments.
Specific detergent compounds (LAS, fabric whiteners, and perfumes)	Used to indicate presence of sanitary sewage	Possibly useful. Expensive analyses with HPLC. A good and sensitive confirmatory method.
Pharmaceuticals (colfibric acid, aspirin, ibuprofen, steroids, illegal drugs, etc.)	Used to indicate presence of sanitary sewage	Possibly useful. Expensive analyses with HPLC. A good and sensitive confirmatory method.
Caffeine	Used to indicate presence of sanitary sewage	Not very useful. Expensive analyses with GC/MSD. Numerous false negatives, as typical analytical methods not suitably sensitive.
DNA profiling of microorganisms	Used to identify sources of microorganisms	Likely useful, but currently requires extensive background information on likely sources in drainage. Could be very useful if method can be simplified, but with less specific results.
UV absorbance at 228 nm	Used to identify presence of sanitary sewage	Possibly useful, if UV spectrophotometer available. Simple and direct analyses. Sensitive to varying levels of sanitary sewage, but may not be useful with dilute solutions. Further testing needed to investigate sensitivity in field trials.
Stable isotopes of oxygen	Used to identify major sources of water	May be useful in area having distant domestic water sources and distant groundwater recharge areas. Expensive and time consuming procedure. Can not distinguish between wastewaters if all have common source.
GC/MSD - Gas Chromatography/Mass Selective Detector HPLC - High Performance Liquid Chromatography		

Water Quality Test Parameters (NEIWPCC)

TABLE 1 **WATER QUALITY TEST PARAMETERS AND USES**

Water Quality Test	Use of Water Quality Test	Comments
Conductivity	Used as an indicator of dissolved solids	- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Typically measured in the field with a probe
Ammonia	High levels can be an indicator of the presence of sanitary wastewater	- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Used very often and equipment is readily available; Boston, MA uses a field test kit (see case example)
Surfactants	Indicate the presence of detergent (e.g., laundry, car washing)	- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Boston, MA uses a field test kit (see case example)
pH	Extreme pH values (low or high) may indicate commercial or industrial flows; not useful in determining the presence of sanitary wastewater (which, like uncontaminated baseflows, tends to have a neutral pH, i.e., close to 7)	- Pitt et al. 1993 suggested parameter; EPA Phase II regulations recommended parameter - Typically measured in the field or lab with a probe
Temperature	Sanitary wastewater and industrial cooling water can substantially influence outfall discharge temperatures. This measurement is most useful during cold weather.	- Pitt et al. 1993 suggested parameter - Measured in the field with a thermometer or probe
Hardness	Used to distinguish between natural and treated waters	- Pitt et al. 1993 suggested parameter
Total Chlorine	Used to indicate inflow from potable water sources; not a good indicator of sanitary wastewater because chlorine will not exist in a "free" state in water for long (it will combine with organic compounds)	- Pitt et al. 1993 suggested parameter
Fluoride	Used to indicate potable water sources in areas where water supplies are fluoridated	- Pitt et al. 1993 suggested parameter
Potassium	High levels may indicate the presence of sanitary wastewater	- Pitt et al. 1993 suggested parameter
Optical Brighteners (Fluorescence)	Used to indicate presence of laundry detergents (which often contain fabric whiteners, which cause substantial fluorescence)	-Pitt et al. 1993 suggested parameter -Used by City of Winooski, VT (see case example)
Bacteria (fecal coliform, *E. coli,* and/or *enterococci)*	Used to indicate the presence of sanitary wastewater	- Used by NHDES (see case example in chapter 5)

Appendix F—Standard Operating Procedures for IDDE Program

City of Walla Walla Spill Response Plan
Additional Standard Operating Procedures

City of Walla Walla Spill Response Plan

City of Walla Walla
Spill Response Plan

Event: Hazardous Material Spill, Release, or Encounter to Water, Soil, or Air

↓

Immediately Call the Two 24-Hour Numbers:
Washington Emergency Management Division
1-800-258-5990 OR 1-800-OILS-911
AND
National Response Center
1-800-424-8802

↓

Call Ecology Eastern Regional Office:
1-509-329-3400

↓

Call Local Emergency Responders:
911

Be prepared to provide the following information (see Water Quality Incident Report Form):

- Where is the spill?
- What spilled?
- How much spilled?
- How concentrated is the spilled material?
- Who spilled the material?
- Is anyone cleaning up the spill?
- Are there resource damages (e.g. dead fish or oiled birds)?
- Who is reporting the spill?
- How can you be reached?

Required Spill Control and Reporting BMPs:

- Stop, contain, and clean up all spills immediately upon discovery. Do not flush absorbent materials or other spill cleanup materials to a storm drain or to surface water. Collect the contaminated absorbent material as a solid and place in appropriate disposal containers.
- If any spill has reached, or may reach, a sanitary or a stormwater drainage system, groundwater, or surface water, notify Ecology and the local sewer authority immediately (not to exceed one hour). Take reasonable steps to minimize any adverse impacts to waters of the state and to correct the problem. Follow up with written documentation covering the event within thirty (30) days unless otherwise directed by Ecology.
- Place and maintain emergency spill containment and cleanup kit(s) at outside areas where there is a potential for fluid spills. These kits should be appropriate for the materials being handled and the size of the potential spill, and readily accessible to personnel responsible for spill response.
- Oil includes the following: oil, gasoline, or diesel fuel that causes a violation of the state of Washington's Water Quality Standards, or, that causes a film or sheen upon or discoloration of the waters of the state or adjoining shorelines or causes a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.
- In the event of a spill or release to water, soil, or air utilize the Water Quality Incident Report Form to document information.

WATER QUALITY INCIDENT REPORT FORM

(In the event of a hazardous spill or release to water, soil, or air follow the Spill Response Plan)

Today's Date _____ Time Reported _____ CORR LOG # _____

Call Taker's Name _____ # _____

Date of Incident _____ Time of Occurrence _____

CALLER INFORMATION

Name _____

First Middle Last

Business Name _____

Street Address _____

_____

City _____ State _____ Zip _____

Email _____

External Reference No. _____

Phone _____ Ext _____ Type _____

☐ Caller Requests to Remain Anonymous

LOCATION OF INCIDENT

Business/Location Name _____

Street Address _____

_____

City _____ State _____ Zip _____

County, Region _____

Land Use: ☐ Commercial ☐ Residential ☐ Rural ☐ Forest ☐ Shoreline ☐ Park/Open Space ☐ Other _____

Directions/Landmarks: _____

_____

_____

INCIDENT DESCRIPTION

Matrix: ☐ Soil ☐Sediment ☐ Water

Contaminant: ☐ Oil/Fuel ☐ Sewage/Septic ☐ Detergents ☐ Other _____

Odor: ☐ Sewage ☐ Rancid/Sour ☐ Petroleum/Gas ☐ Sulfide ☐ Other* _____

Color: ☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other* _____

Floatables: ☐ Toilet Paper ☐ Suds ☐ Oil Sheen ☐ Excessive Algae ☐ Other* _____

Quantity: _____ ***Cause:*** _____

OTHER AGENCIES COMPLAINANT CONTACTED:

Agencies Responding: ☐ Fire ☐ Police ☐ City Other _____

Referred to 911? ☐ Yes ☐ No

REFERRED TO:

_____

Name Phone Ext Type

*** ADDITIONAL INFORMATION**

Additional Standard Operating Procedures

Additional SOPs To Be Developed By City

Appendix G—City of Walla Walla Public Involvement and Education Plan

City of Walla Walla

Public Involvement and Education Plan

Public Works
Engineering Division
55 Moore Street
Walla Walla, WA 99362

03/25/2011

Introduction

Many people are unaware that some of their every day actions contribute to stormwater pollution, or that stormwater pollution degrades the quality of local streams, rivers, and groundwater. In order for the City of Walla Walla (City) stormwater management program (SWMP) to be successful, the public must be made aware of their day-to-day activities that contribute to stormwater pollution, and alternative activities they can adopt to better protect receiving water quality. While it can be difficult to change public behavior patterns, it is a necessary step toward cleaner surface waters. Informing the public also aids in their understanding of the key issues related to stormwater and what the City must do to stay in compliance with the Washington State Department of Ecology (Ecology) National Pollutant Discharge Elimination System (NPDES) Phase II Permit.

Special Condition S5.B.1 of the Phase II Permit requires the City to develop and implement a public education and outreach program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of stormwater discharges to water bodies and the steps the public can take to reduce pollutants in stormwater. Outreach and educational efforts are to be targeted and presented to specific audiences for increased effectiveness. As such, the Phase II Permit requires the City to identify and characterize target audiences for education and outreach activities by February 16, 2010 and to have developed and fully implement the public education and outreach program by August 15, 2011.

The following sections describe: 1) the City's public involvement and education strategies; 2) target audiences selected from within the community, and 3) planned education and outreach activities. Collectively, these elements represent the City's Public Involvement and Education (PIE) Plan.

City's Public Education and Outreach Strategy

The City intends to focus its education and outreach activities on two general strategies: 1) broadly disseminating stormwater information to the general public and 2) developing targeted outreach campaigns for small audiences that are receptive to behavioral change and that are also likely to have a larger-than-average impact on stormwater quality. This approach is recommended by the Environmental Protection Agency's 2003 publication, *Getting in Step, a Guide for Conducting Watershed*

Outreach Campaigns.

Generally, the activities for the remainder of the first 5-year permit cycle focus on educating and informing the general public on the impacts of polluted stormwater on the health of aquatic systems. During the next 5-year permit cycle, the emphasis will shift from a general educational approach to a more focused approach that encourages and enables behavioral changes that decrease stormwater pollution. The City intends to piggy-back information dissemination efforts with existing education and outreach campaigns, both to reduce program costs and to increase the weight of the intended message.

Potential local partner organizations with active outreach campaigns include:

- Walla Walla County
- Walla Walla Community College
- Walla Walla University
- Whitman College
- Walla Walla County Conservation District
- Walla Walla Area Resource Conservation Committee
- Tri-State Steelheaders
- Kooskooskie Commons

Target Audiences and Proposed Activities

Target audiences for focusing various stormwater education and outreach activities are identified below. A roadmap for reaching each specific target audience is provided in the form of a matrix, which includes objectives, activities, responsible staff, and evaluation strategies. Proposed public education and outreach activities targeted for a specific permit year will be described in detail in the annual stormwater report for the preceding year. This PIE Plan targets the following audiences:

- Residential Property Owners
- Developers/Contractors/Engineers
- Business Owners/Operators
- K-12 Students
- City Employees

Target Audience: RESIDENTIAL PROPERTY OWNERS

Driving force: Nutrients, organic matter, pet waste, oil and grease; failing septic systems; illicit discharges.

Rationale for inclusion: General residents represent the largest population group likely to have an impact on stormwater runoff quality. Raising the basic level of understanding of the general population makes it more likely that they will be receptive to adopting new behaviors with respect to stormwater in the future.

Messages: Coordinate messages with regional outreach materials under development by Asotin County.

"Treat with care. Right dose at the right time."
"Don't pollute, flows to waterways"
"Slow it down, spread it out, soak it in"

Future planning: Revise to include objectives aimed at changing behavior during next 5-year permit cycle.

RESIDENTIAL PROPERTY OWNERS							
Objective	**Format/ Distribution**	**Schedule (quarters)**				**Responsible Party**	**Evaluation**
Provide general information to raise awareness and build support for the stormwater management program	Develop PIE Plan, post on stormwater website	x				Stormwater Engineer	Update annually
	Post updated info on stormwater website	x	x	x	x	Stormwater Engineer	Update quarterly
	TV ad on channel 17 to talk about stormwater pollution prevention and preparation for the rainy season	x	x	x	x	Public Works Department	Update as needed
	Storm drain stenciling				x	Stormwater O&M crew, Stormwater Engineer	Stencil 50% of known storm drain grates within Phase II Permit area
	Newspaper press release/article		x		x	Stormwater Engineer	Time press release with spring runoff and start of fall rainy season
	Booths at the County Fair and Farmer's Market			x		Stormwater Engineer, Walla Walla County	Track number of visitors to booth
	Radio interview		x		x	Stormwater Engineer	Highlight simple changes that can reduce water pollution
	Stencil IDDE hotline on street sweeper			x		Stormwater Engineer	Track all calls received and responses made

Target Audience: DEVELOPERS/CONTRACTORS/ENGINEERS

Driving force: Erosion and sediment from construction sites; post-construction stormwater pollution prevention.

Rationale for inclusion: Education and outreach for contractors is a required activity under the Phase II Permit. Runoff from development project sites during the construction phase can contribute to sedimentation of streams and can carry other contaminants as well. Erosion and sediment control can significantly reduce the impact of construction sites on the aquatic environment, and planning for erosion and sediment control, as well as post-construction stormwater management, during the early design phase can reduce project costs and improve compliance. Informing developers, contractors, architects, and engineers on requirements and providing guidance on acceptable ways to meet regulations is far more effective than relying solely on an enforcement-driven stormwater management program.

Messages: Coordinate messages with regional outreach materials under development by Asotin County.

"Maintain your BMPs"

Future Planning: Continue providing training and resources; provide copies of the *Eastern Washington Erosion Prevention and Sediment Control Field Guide* developed by Asotin County; host CESCL training every 3 years.

DEVELOPERS/CONTRACTORS/ENGINEERS							
Objective	**Format/ Distribution**	**Schedule (quarters)**				**Responsible Party**	**Evaluation**
Inform developers of new stormwater requirements; provide information on where to obtain training; improve access to CESCL training	Host CESCL training in Walla Walla		x			Stormwater Engineer	Publicize widely; track publicity and number of attendants
	Provide informational handouts; post upcoming training opportunities on stormwater website		x			Stormwater Engineer	Update annually
	Provide information on construction/post-construction ordinance; provide informational handouts and post on stormwater website	x	x	x	x	Stormwater Engineer	Update quarterly
	Answer questions and provide guidance on erosion control and stormwater management	x	x	x	x	Stormwater Engineer	Track all calls and emails received
Provide developers "shortcuts" to help them navigate the SWMMEW and remain compliant with City and Ecology permit requirements	Provide copies of materials developed by other organizations (e.g., LID manuals, erosion prevention and sediment control field guides); post on stormwater website	x	x	x	x	Stormwater Engineer	Track copies of manual distributed

Target Audience: BUSINESS OWNER/OPERATORS

Driving force: Nutrients, organic matter, pet waste, oil and grease; illicit discharges, including spills, and illicit connections.

Rationale for inclusion: Business owners/operators have a moderately high likelihood of contributing to illicit discharges, through improper connections, equipment washing, grease mismanagement, and problems with parking facilities. During the first 5-year permit cycle, the City intends to respond with enforcement activities as needed, but to target business owners/operators along with the general population through a broadly disseminated basic education program. Activities will be expanded during the next 5-year permit cycle to directly reach and educate, and possibly inspect, business owners/operators.

Messages: Coordinate messages with regional outreach materials under development by Asotin County.

Future planning: Develop direct outreach campaign to educate business owners/operators on illicit discharge and illicit connection regulations during next 5-year permit cycle; consider developing a source reduction team and program if external funding is secured.

BUSINESS OWNERS/OPERATORS							
Objective	**Format/ Distribution**	**Schedule (quarters)**				**Responsible Party**	**Evaluation**
Reach business owners/operators in same manner as the residential property owners during remainder of the current 5-year permit cycle	See Residential Property Owner matrices					Stormwater Engineer	

Target Audience: K - 12 STUDENTS

Driving force: Low-level of general knowledge regarding non-point source water pollution and impacts to receiving water quality.

Rationale for inclusion: Students are generally more receptive than the general population as whole in adopting environmentally friendly behavior. Educating students on the impact of non-point source pollution educates the next generation of homeowners, business owners, developers, etc.

Messages: Coordinate messages with regional outreach materials under development by Asotin County.

"Only rain down the drain"

Future planning: Continue working with local schools to help them build their own stormwater education programs. Work with local environmental groups to build a stormwater speaker's list, and to build an educational kit for loan to schools.

K – 12 STUDENTS							
Objective	**Format/ Distribution**	**Schedule (quarters)**				**Responsible Party**	**Evaluation**
Increase awareness of impacts of individual actions on water quality; improve basic level of understanding in K-12 students	Establish school stormwater curriculum and programs			x	x	Stormwater Engineer	Enroll 25% of schools in first 5-year permit cycle
	WWCC Kid's College class			x		Stormwater Engineer, WWCC	Use WWCC evaluation forms to assess impact
	Public Works Week stormwater presentation		x			City of Walla Walla	Track number of participants
	Mascot/slogan contest			x		Stormwater Engineer	Track number of participants; include questionnaire with entry form

Target Audience: CITY EMPLOYEES

Driving force: Sediment, oil and grease, pesticides, and fertilizers from O&M activities; plan-check and inspection requirements; stormwater management for new facilities.

Rationale for inclusion: The employees at the City of Walla Walla have the potential to have a large impact on stormwater quality through routine operations and maintenance activities such as stormwater collection and conveyance system maintenance, vehicle maintenance, building maintenance, vegetation control, road and bridge projects, and permitting new development and redevelopment. Education of City forces is a required element of the Phase II Permit.

Messages: Coordinate messages with regional outreach materials under development by Asotin County.

"Don't forget about stormwater"

Future planning: Continue building internal program to provide annual stormwater training to City staff.

CITY EMPLOYEES							
Objective	**Format/ Distribution**	**Schedule (quarters)**				**Responsible Party**	**Evaluation**
Train staff to understand the requirements of the Phase II Permit and to recognize what actions and situations may pose a threat to water quality	General NPDES training for Community Development	x				Stormwater Engineer	Distribute quiz before and after to assess general level of understanding; track attendees
	CESCL training for inspectors		x			Stormwater Engineer	Maintain current certification for inspection staff
	General erosion and sediment control training for Road Division staff		x			Stormwater Engineer	Distribute quiz before and after to assess general level of understanding; track attendees
	Stormwater webinars for stormwater management staff	x	x	x	x	Stormwater Engineer	Track webinars attended
	General NPDES training for fairgrounds staff				x	Stormwater Engineer	Distribute quiz before and after to assess general level of understanding; track attendees
	O&M training for all staff who have primary construction, operations, and maintenance job functions that are likely to impact stormwater quality					Stormwater Engineer	
	IDDE training for all staff responsible for identification, investigation, termination, cleanup, and reporting of illicit discharges, including spills, and illicit connections					Stormwater Engineer	