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SURVEY RESULTS AND LITERATURE REVIEW

ILLICIT DISCHARGE DETECTION AND ELIMINATION FIELD SCREENING

King County Department of Natural Resources & Parks
Water & Land Resources Division

Prepared by
Herrera Environmental Consultants, Inc.

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Illicit Discharge Detection and Elimination Field Screening

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Introduction

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Washington State Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual (Manual) for the State of Washington. The Manual is being specifically developed to help National Pollutant Discharge Elimination System (NPDES) Phase I and Phase II Municipal Stormwater Permit jurisdictions in Washington perform field screenings pursuant to IDDE program requirements in the permits. The intended audience for the Manual includes the permit coordinators and field staff in each jurisdiction. Note that the term IDDE used in this memo is meant to include illicit connections (IC), which is the term included in municipal stormwater permit language.

As initial steps towards the development of the Manual and per the project work plan, Herrera Environmental Consultants (Herrera) partnered with the Washington Stormwater Center and King County to conduct a survey of Phase I and II jurisdictions in Washington State. A literature review was also conducted with the goal of determining which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the United States, and which methodologies should be included in the Manual for use in Washington State.

This report summarizes the methods and results of the survey and the literature review and provides an annotated outline of the proposed Manual. The report is organized into the following sections:

- IDDE Field Screening Survey
- Literature Review
- Annotated Outline of IDDE Field Screening Manual

Attachments to this report include the IDDE Field Screening Survey Responses (Attachment A) and tables summarizing the findings of the Literature Review (Attachment B).

This report will be presented and discussed at the following regional meetings to obtain a consensus on the field screening methodologies that have proven most effective and warrant consideration in the Manual:

- Regional Operations and Maintenance Program (ROADMAP) meeting on September 12, 2012
- Eastern Region Stormwater Coordinators Group (ERSCG) meeting on September 20, 2012

IDDE Field Screening Survey

This section summarizes the methods used for the IDDE Field Screening Survey and provides a summary of the survey results. Please refer to Appendix A for the questions included in the survey and the responses from each jurisdiction.

Methods

IDDE Field Screening Surveys were distributed via e-mail in July 2012 to the following regional forums:

- ROADMAP
- ERSCG
- North Sound Coordinators Forum
- South Sound Phase II Coordinators Group
- West Sound Stormwater Managers' Coordination Group
- Regional Stormwater Policy Group
- Wenatchee Valley Stormwater Technical Advisory Committee
- NPDES Permit Coordinators Forum
- Southwest Washington Coordinators Forum

Survey responses were due on July 31, 2012. Follow-up phone calls were made to targeted jurisdictions to ensure that sufficient responses were received from Phase I jurisdictions with established IDDE programs.

Results and Discussion

Completed IDDE Field Screening Surveys were received from 35 respondents. The number of surveys received from Phase I and Phase II jurisdictions are summarized in Table 1 while the actual surveys from each respondent are provided in Attachment A.

Table 1. IDDE Field Screening Survey Responses.

Permittee Type	Number of Responses Received		Percentage of Permittees Responding	
	Western Washington	Eastern Washington	Western Washington	Eastern Washington
Phase I	5	NA	83%	NA
Phase II	22	5	26%	21%
Secondary Phase II	0	1	NA	10%
Other [a]	2	0	NA	NA
Total	**29**	**6**	**30%** [b]	**21%** [b]

[a] Survey responses listed under other were from the Kitsap Public Health District (works with Kitsap County on the IDDE program) and the Washington State Department of Transportation (WSDOT).

[b] The total percentage does not include secondary permittees due to the low response rate from that group or the two surveys listed under the other category.

NA = not applicable

The following sections summarize the IDDE Field Screening Survey results for methodologies and indicators.

Methodologies

Table 2 summarizes the percentage of survey respondents who reported using the field screening methodologies listed in the survey. The methodologies are ranked based on the number of respondents reporting that the method was effective in their jurisdiction. Rankings are reported in Table 2 in two different manners. The "reported" effectiveness ranking indicates how individual jurisdictions ranked these methodologies within each survey, given the choice between low, moderate, and high effectiveness. The "comparative" effectiveness ranking indicates how each methodology ranked between jurisdictions, based on an overall comparison of results from all surveyed jurisdictions. Manhole/Catch Basin Inspections, IDDE Hotline/Staff or Citizen Complaint, and Outfall Inspections topped the list as being the methodologies used the most frequently. Since the IDDE Hotline and Outfall Inspections are currently required by the NPDES Phase I and Phase II permits, this result was not surprising; however, Manhole/Catch Basin Inspections were deemed to be nearly as effective as the IDDE Hotline and more effective than the Outfall Inspections. Septic system inspections were at the bottom of the list in terms of the comparative effectiveness ranking, but had a moderate reported effectiveness ranking. Business inspections were on the low end of the reported effectiveness scale (low to moderate), but fell in the middle based on the comparative effectiveness ranking. Other methodologies that were identified in the survey responses that were not included on the initial list of 11 methodologies shown on the survey included:

- Kayak inspections
- Commercial property maintenance inspections
- Business license survey for hazardous waste disposal and usage

Table 3 summarizes the percentage of survey respondents who reported using the field screening methodologies listed in the survey for specific applications (urban vs. rural, pipes vs. ditches, small vs. large drainage areas). The percentages in the table were calculated based on the number of survey respondents who reported using the methodology rather than the total number of survey respondents. Several methodologies were deemed useful for all of the applications listed. A majority of the methodologies were considered to be applicable in urban areas and small drainage areas. As to be expected, ditch walks were applicable to storm drainage systems with ditch infrastructure and in rural areas. Video inspections, dye testing, and smoke testing were the most applicable to storm drainage systems with pipe infrastructure and in urban areas.

Table 4 summarizes who is responsible for implementing the field screening methodologies. The percentages in the table were calculated based on the number of survey respondents who reported using the methodology rather than the total number of survey respondents. A majority of respondents indicated that field screening was conducted by internal staff (including Public Works staff, O&M staff, and interns); however, some jurisdictions

Table 2. Field Screening Methodology Responses and Effectiveness.			
Field Screening Methodology	**Survey Respondents Using this Methodology (%) [a]**	**Reported Effectiveness (Low/Moderate/High) [b]**	**Comparative Effectiveness Ranking [c]**
IDDE Hotline/Staff or Citizen Complaint	100%	Moderate	1
Manhole/Catch Basin Inspections	100%	High	2
Outfall Inspection	100%	Moderate	3
Dye Testing	71%	High	3
Video Inspections	69%	High	4
Business Inspections	69%	Low-Moderate	4
Windshield Survey of Drainage Area	54%	Moderate	5
Stream Walk or Ditch Walk	71%	Moderate	6
Smoke Testing	46%	High	7
Infrared Imagery, Thermography, or Aerial Photography	6%	High	7
Septic System Investigations	23%	Moderate	8
Kayak Inspections	3%	High	9
Commercial Property Maintenance Inspections	3%	High	NA
Business License Survey for Hazardous Waste Disposal and Usage	3%	Moderate	NA

[a] 3% of survey respondents using this methodology corresponds to a single survey response.

[b] The reported effectiveness (Low/Moderate/High) is based on the highest percentage of jurisdictions that said each method was either very effective, moderately effective, or not effective.

[c] The comparative effectiveness ranking was based on Question 2 in the survey (Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?), with 1 = most effective and 9 = least effective.

NA = not applicable

Table 3. Field Screening Methodology Applications.							
		Percentage of Survey Respondents who Reported Using this Field Screening Methodology for Specific Applications (%) [a]					
Field Screening Methodology	n	Urban Areas	Rural Areas	Pipes	Ditches	Small Drainage Areas	Large Drainage Areas
Outfall Inspection	35	94%	40%	60%	49%	57%	54%
Stream Walk or Ditch Walk	25	88%	48%	28%	60%	60%	36%
Windshield Survey of Drainage Area	19	100%	37%	47%	58%	63%	63%
IDDE Hotline/Staff or Citizen Complaint	35	83%	37%	34%	31%	37%	34%
Manhole/Catch Basin Inspections	35	89%	37%	37%	17%	46%	37%
Business Inspections	24	96%	33%	17%	21%	29%	29%
Dye Testing	25	84%	16%	56%	16%	32%	20%
Septic System Investigations	8	88%	50%	50%	38%	50%	38%
Smoke Testing	16	88%	19%	56%	13%	38%	25%
Video Inspections	24	79%	21%	71%	13%	33%	21%
Infrared Imagery, Thermography, or Aerial Photography [b]	2	100%	50%	50%	50%	50%	50%
Commercial Property Maintenance Inspections	1	100%	0%	100%	0%	100%	100%

n = number of survey respondents who reported using this field screening methodology

[a] Percentages are based on the number of survey respondents who reported using the methodology rather than total number of survey respondents.

[b] Survey respondents only reported using aerial photography, not infrared imagery or thermography.

Table 4. Field Screening Methodology Implementation.						
		IDDE Investigations Performed by (%) [a,b]				
Field Screening Methodology	n	Internal Staff	Contract with Other City or County	Contractor	Consultant	Other [c]
Outfall Inspection	35	100%	0%	0%	3%	3%
Stream Walk or Ditch Walk	25	92%	4%	0%	4%	NA
Windshield Survey of Drainage Area	19	100%	0%	0%	0%	NA
IDDE Hotline/Staff or Citizen Complaint	35	89%	3%	3%	0%	NA
Manhole/Catch Basin Inspections	35	94%	0%	3%	0%	3%
Business Inspections	24	96%	0%	0%	0%	17%
Dye Testing	25	96%	4%	0%	0%	8%
Septic System Investigations	8	75%	25%	0%	0%	25%
Smoke Testing	16	56%	0%	38%	0%	6%
Video Inspections	24	71%	0%	33%	0%	8%
Infrared Imagery, Thermography, or Aerial Photography [d]	2	0%	0%	0%	50%	50%

n = number of survey respondents who reported using this field screening methodology

[a] Percentages are based on the number of survey respondents who reported using the method rather than total number of survey respondents. Percentages do not add up to 100% since some respondents reported using internal staff in combination with another staffing resource and some respondents did not address this question.

[b] 3% of survey respondents using this methodology corresponds to a single survey response.

[c] The other category included health district, local public works staff (referring to Kitsap County staff on survey submitted by Kitsap Health District), grant funded local source control inspectors, and Waste Management public outreach campaign.

[d] Survey respondents only reported using aerial photography, not infrared imagery or thermography.

NA = not applicable

coordinated with a local health district for septic system inspections and dye testing. Some jurisdictions relied on the local source control inspector (grant-funded position) or waste management public outreach campaigns for business inspections. Contractors were primarily brought onboard to assist with smoke testing and video inspections. Some consultant support was utilized for outfall inspections, stream walks or ditch walks, and aerial photography investigations.

Indicators

Table 5 summarizes the percentage of survey respondents who reported using specific indicators for IDDE field screening. The indicators are ranked based on the number of respondents reporting that the indicator was effective in their jurisdiction. Most of the indicators were listed as being moderately effective. Hardness, nitrate, phosphate, and alkalinity were listed as not effective as IDDE field screening indicators. Biochemical oxygen demand (BOD) and *Sphaerotilus natans* were the only indicators listed as highly effective, but each indicator was only listed by a single survey respondent. Odor topped the list in terms of effectiveness rankings, followed by color and fecal coliform bacteria. Flow, detergents/ surfactants, and floatables rounded out the list of the top five indicators (which actually included 6 indicators due to a tie for fourth). Other indicators that were submitted in the survey responses that were not included on the initial list of 12 indicators included:

- Alkalinity
- Bacteriodes
- BOD
- Enterococcus bacteria
- Nitrate
- Phosphate
- *Sphaerotilus natans* (species that grows in flowing sewage, considered to be a visual indicator)
- TPH (total petroleum hydrocarbons)
- Vegetation
- Volatiles/semi volatiles

Table 6 summarizes the equipment and methods used for indicator testing. As to be expected, the type of equipment or method varies depending on the parameter. A relatively high percentage of respondents reported using laboratory analysis for turbidity, chlorine, fluoride, ammonia, potassium, and detergents/surfactants. Field meters, test strips, or test kits are available for these parameters and could be more effective for use in an IDDE field screening setting. Laboratory testing; however, is more sensitive than field test strips or test kits and can provide better quantitative reliability. Field test strips or test kits can be used to

Table 5. Indicator Responses and Effectiveness.			
Indicator	**Survey Respondents Using this Indicator (%) [a]**	**Reported Effectiveness (Low/Moderate/High) [b]**	**Comparative Effectiveness Ranking [c]**
Odor	97%	Moderate	1
Color	85%	Moderate	2
Fecal coliform bacteria	58%	Moderate	3
Flow	85%	Moderate	4
Detergents/surfactants	55%	Moderate	4
Floatables	94%	Moderate	5
Turbidity	61%	Moderate	6
Ammonia	36%	Moderate	7
E. coli bacteria	33%	Moderate	7
Fluoride	18%	Moderate	8
Chlorine	30%	Moderate	8
Temperature	48%	Moderate	9
Potassium	18%	Moderate	9
pH	61%	Moderate	10
Specific conductivity	39%	Moderate	11
Optical brighteners	18%	Moderate	11
Dissolved oxygen	21%	Moderate	12
Hardness	12%	Low	12
BOD	3%	High	NA
Sphaerotilus natans	3%	High	NA
Bacteriodes	3%	Moderate	NA
TPH	3%	Moderate	NA
Volatiles/ semi volatiles	3%	Moderate	NA
Nitrate	3%	Low	NA
Phosphate	3%	Low	NA
Alkalinity	3%	Low	NA
Enterococcus bacteria	3%	NA	NA

[a] 3% of survey respondents using this methodology corresponds to a single survey response.

[b] The reported effectiveness (Low/Moderate/High) is based on the highest percentage of jurisdictions that said each indicator was very effective, moderately effective, or not effective.

[c] The comparative effectiveness ranking was based on Question 5 in the survey (Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?), with 1 = most effective and 11 = least effective.

BOD = biochemical oxygen demand

NA = not applicable

TPH=total petroleum hydrocarbons

Table 6. Indicator Equipment and Methods for Field and Laboratory Testing.					
Indicator	**Field Meter**	**Field Test Strips or Kit**	**Laboratory Analysis**	**Visual Observations**	**Other**
pH	65%	40%	–	–	–
Turbidity	76%	–	10%	–	–
Chlorine	50%	–	40%	–	–
Fluoride	17%	33%	33%	–	–
Ammonia	17%	25%	58%	–	–
Potassium	33%	0%	50%	–	–
Detergents/surfactants	–	–	50%	–	50% - Surfactant test kit
Specific conductivity	100%	–	8%	–	–
Optical brighteners	–	–	-	–	100% - Optical brightener monitoring trap
Fecal coliform bacteria	–	–	100%	–	–
E. coli bacteria	–	–	100%	–	One respondent reported using the Indess colilert18 method
Temperature	63%	–	-	–	13% - Thermometer
Hardness	0%	–	100%	–	–
Dissolved oxygen	63%	–	14%	–	–
Color	–	–	–	89%	–
Odor	–	–	–	–	91% - Olfactory observations
Floatables	–	–	–	97%	–
Flow	–	–	–	86%	–
TPH	–	–	100%	–	–
Volatiles/ semi volatiles	–	–	100%	–	–
BOD	–	–	100%	–	–
Enterococcus bacteria	–	–	100%	–	–
Nitrate	–	–	100%	–	–
Bacteriodes	–	–	100%	–	–
Sphaerotilus natans	–	–	–	100%	–
Phosphate	–	–	100%	-	–
Alkalinity	–	–	100%	-	–

[a] Percentages are based on the number of survey respondents who reported using the method rather than total number of survey respondents. Percentages do not add up to 100% since some respondents reported using multiple types of equipment or methods and some respondents did not address this question.

BOD = biochemical oxygen demand

NA = not applicable

TPH= total petroleum hydrocarbons

indicate a potential illicit discharge, but some jurisdictions may choose to follow up with laboratory testing.

Table 7 summarizes the thresholds of indicators that, when exceeded, trigger further investigation for potential illicit discharges or connections. Since a range of thresholds was reported in the surveys, this table summarizes the low, median, and high value for each parameter that had a threshold reported. Only the indicators with quantitative thresholds are included in this table. Optical brighteners are commonly investigated further if the optical brightener monitoring trap shows a positive test result. Abnormal colors and odors typically trigger further investigation.

Table 7. Indicator Thresholds used for Investigation.

Indicator	Low	Median	High
pH	< 4.0	6.0 to 8.5	> 11
Turbidity	25 NTU	25 NTU	200 NTU
Chlorine	0.01 mg/L	0.23 mg/L	5 mg/L
Fluoride	0.25 mg/L	0.55 mg/L	1 mg/L
Ammonia	0.1 mg/L	1.0 mg/L	5 mg/L
Potassium	1 mg/L	4 mg/L	5 mg/L
Detergents/surfactants	0.25 mg/L	0.25 mg/L	1 mg/L
Specific conductivity	300 µS/cm	500 µS/cm	1,000 µS/cm
Fecal coliform bacteria	<200 CFU/ 100mL	500 CFU/ 100mL	5,000 CFU/ 100mL
E. coli bacteria	<200 CFU/ 100mL	500 CFU/ 100mL	5,000 CFU/ 100mL
	135 mpn (using Indess colilert18 method)		
Enterococcus bacteria	104 mg/L		
Temperature [a]	20 °C	25 °C	30 °C
Hardness	<10 mg/L	500 mg/L	2,000 mg/L
Dissolved oxygen	5 mg/L	5.5 mg/L	6 mg/L
BOD	2 mg/L		
Nitrate	3 mg/L		
Phosphate	1.5 mg/L		

[a] Two survey respondents specified "above ambient" temperatures as the threshold for temperature.
BOD= biochemical oxygen demand
°C = degrees Celsius
NA = not applicable
NTU = Nephelometric Turbidity Units
mg/L = milligrams per liter
mpn = most probable number
µS/cm = micro Siemens per centimeter
µg/L = micrograms per liter
CFU/100 mL= colony forming units per 100 milliliters
col/100 mL=colonies per 100 milliliters
mg/L as $CaCO_3$= milligrams per liter as calcium carbonate

Literature Review

This section summarizes the methodologies used for the literature review and provides a summary of the literature review results.

Methods

A total of 25 references from local and national sources were reviewed as part of the literature review. The full list of references is provided in Attachment B. The references included IDDE manuals, program reviews, standard operating procedures (SOPs), sampling and analysis plans (SAPs), fact sheets, technical memorandums, and standardized forms.

Results

A total of 14 field screening methodologies (including the 11 field screening methodologies included in the IDDE Field Screening Survey) were discussed in the references that were reviewed. The Center for Watershed Protection (CWP) Illicit Discharge Detection and Elimination Guidance Manual (CWP 2004) was the most comprehensive and included 14 field screening methodologies followed by the Lake County, Illinois Stormwater Management Program Plan (Lake County 2009) which included 10 field screening methodologies. The most frequently discussed field screening methodology was outfall inspections, which was discussed in 19 out of 25 references followed by dye testing, which was discussed in 15 out of 25 references (see Table 8). Three field screening methodologies that were discussed in these references, but were not included in the IDDE Field Screening Survey referenced above were:

- Optical Brightener Monitoring
- Sand Bagging
- Automated or Intensive Sampling

Detailed tables summarizing the field screening methodologies included in each reference along with the pros, cons, applications, indicators, and equipment for each field screening methodology are included in Tables B-1 through B-13 in Attachment B. Brief descriptions of each methodology and its pros and cons are also summarized in Table 8.

A total of 39 indicators (including the 18 indicators included in the IDDE Field Screening Survey) were discussed in the references that were reviewed. The indicator that was mentioned in the most references (15 out of 25 references) was pH; followed by color and odor (14 out of 25 references); and detergents/surfactants, ammonia, turbidity, and temperature (13 out of 23 references) (see Table 9). Other indicators mentioned in 10 or more references included:

- Specific conductivity
- Fecal coliform bacteria
- Flow
- Surface scum or sheen

Table 8. Field Screening Methodology Literature Review Summary.				
Field Screening Methodology	**Number of References Reviewed that Included this Methodology [a]**	**Description**	**Pros**	**Cons**
Outfall Inspection	19	**Outfall inspections** are conducted during dry weather to identify areas with flowing water that may indicate a continuous (sewage cross connection) or intermittent source. Inspections include visual observations and indicator sampling if flow is observed. Follow-up laboratory testing may also be involved.	• Can perform in conjunction with outfall structural assessments and identification of streambank erosion • Detects obvious illicit discharges • Physical condition of outfall can provide clues as to history of discharges passing through it	• Not effective in identifying and eliminating discharges in large urban areas with numerous outfalls • Expensive • Safety issues • Does not identify the source of the outfall
Dye Testing	15	**Dye testing** is typically used when an illicit connection is suspected within a particular building at a property located along an isolated segment of the storm drainage system. Dye testing is performed on all plumbing fixtures within a building (i.e., sinks, toilets, and floor drains) using colored dyes.	• Dye is water soluble, biodegradable, stable, and has low toxicity • Effectively locates specific illicit connections • Quick (about 30 minutes per test) • Inexpensive and easy to implement • Fewer health and safety precautions than outfall inspections • Does not require confined space entry	• Private property access • Coordination with property owners can be time consuming • Locating manholes after snowfall may be difficult • Difficult to see dye in high flow or turbid conditions • Time consuming in low flow conditions
Video Inspections	11	**Video inspections** are typically used when looking for an illicit connection between two manhole structures or along an isolated segment of the storm drainage system. Video inspections are performed using a sewer inspection camera (i.e., push camera). Video inspections provide documentation of actively flowing illicit connections, grease buildup, and other deposits or conditions caused by illicit discharges.	• Thorough and definitive • Pinpoints exact location of breaks, infiltration, active taps, and illicit cross connections • Safer than confined space entry • Provides a record of observations • Can observe pipes between manholes • Does not require intrusion on members of public	• Expensive • Does not detect inactive taps or discharges from submerged pipes • Limited pipe size • Cameras cannot function if pipes are water-filled or obstructed • Requires line cleaning prior to use • Requires crew training to operate equipment • Time-consuming to interpret results

Table 8 (continued). Field Screening Methodology Literature Review Summary.				
Field Screening Methodology	**Number of References Reviewed that Included this Methodology [a]**	**Description**	**Pros**	**Cons**
Manhole/Catch Basin Inspections	10	**Manhole/catch basin inspections** of the storm drainage network can be used to isolate an illicit discharge to a specific segment of the network.	• Cost efficient	• Time consuming • Potential for back or foot injury • Potential for toxic or flammable pollutants
Smoke Testing	10	**Smoke testing** is used as an alternative to video inspections or dye testing, especially when pipe diameters are too small for video inspections and gaining access to multiple properties makes dye testing an infeasible option.	• Locates illicit connections or damage to the storm drainage system • Quick (30 minutes) • Effective • Cheap	• Must notify public • May cause irritation of respiratory passages • More effective for infiltration/ inflow investigations of the sanitary sewer system
IDDE Hotline/Staff or Citizen Complaint	9	An **illicit discharge/spill hotline** is a permit requirement in Washington State. It is an established number that staff or citizens can call if they see a potential illicit discharge. Staff observations may also be reported directly to a supervisor instead of being routed through the illicit discharge/spill hotline. Citizens may also make complaints directly to the City/County that are not routed through the illicit discharge/spill hotline.	• Leads to public stewardship, early detection, and correction • Useful in identifying source of intermittent or transitory illicit discharges • Most cost effective method of identifying illicit discharges	• Time and money to provide 24/7 service, marketing hotline number, and establish inter- and intra-departmental process
Septic System Investigations	7	**On-site septic system investigations** include homeowner surveys and surface condition analysis. **Detailed septic system investigations** include a thorough investigation performed by a certified professional or infrared imagery (described below).	• Low cost	NG

Table 8 (continued). Field Screening Methodology Literature Review Summary.				
Field Screening Methodology	**Number of References Reviewed that Included this Methodology [a]**	**Description**	**Pros**	**Cons**
Sand Bagging	6	**Sand bags** are used to form a temporary dam to collect intermittent flow. Accumulated water is assessed using indicator sampling or visual observations.	• Isolates intermittent flows • Small enough that they do not block the storm drain outlet	• Weather dependent (96-hour dry period) • Requires at least two trips to each manhole • May be washed downstream is left in place during heavy rainstorm
Optical Brightener Monitoring	5	Absorbent pads are anchored in a pipe, catch basin, or inlet to capture intermittent dry weather flows and can be used to determine if detergents (**optical brighteners**) are present.	• Inexpensive supplies • Animal/ human waste differentiation • Laboratory test not required to obtain results • Tests can be conducted by one person • Detects intermittent or highly concentrated flows	• Time consuming • Results not obtained for 1 week • Heavy rains require longer deployment periods • Can only detect high concentrations of detergents
Automated or Intensive Sampling	5	Method uses **automated sampling** equipment installed in catch basins or manholes, or near outfalls to sample intermittent flows. Laboratory testing is performed on the collected samples. **Intensive sampling** can also be performed with automated sampling equipment or sampling conducted during base flow or storm events.	• Automatically samples during dry weather flows • Isolates source areas for investigation • Completes field data gaps between sampling events	• Expensive • Does not identify the specific source • Data variances may make establishing trends difficult • May require confined space entry

Table 8 (continued). Field Screening Methodology Literature Review Summary.				
Field Screening Methodology	**Number of References Reviewed that Included this Methodology [a]**	**Description**	**Pros**	**Cons**
Infrared Thermography or Infrared Aerial Photography	4	**Infrared thermography** uses the temperature difference of sewage as a marker to locate failing septic systems. **Color infrared aerial photography** uses color as an indicator to detect changes in plant growth, differences in soil moisture content, and the presence of standing water on the ground to identify failing septic systems.	NG	• Developing technology for IDDE programs • Must be completed by certified professional • Equipment needs to detect small temperature differences • May require follow-up site-specific testing
Stream Walk or Ditch Walk	4	**Stream walks** involve walking along or wading in a stream and identifying outfall locations, indicators of potential illicit discharges, illegal dumping, and streambank erosion. **Ditch walks** have similar goals, but are performed in rural areas or other areas where pipe infrastructure is not present.	NG	NG
Business Inspections	3	**Business inspections** are performed to identify pollutant-generating sources at commercial, industrial and multifamily properties to enforce implementation of required BMPs to control pollution discharging into storm drainage systems.	NG	NG
Windshield Survey of Drainage Area	3	A **windshield (or drive-by) survey** of the drainage area can be a useful tool to pinpoint potential locations for follow-up on-site investigations. Distinct color or odor characteristics are key indicators that are necessary for this type of investigation.	NG	NG

NG = no guidance provided

Table 9. Indicator Literature Review Summary.							
Field Screening Methodology	Number of References Reviewed that Included this Indicator [a]	Description	Method Used for Detection			Advantages	Disadvantages
			Field Meter, Test Kit, or Test Strip	Lab	Visual or Field Observation		
pH	15	**pH** measures the hydrogen ion activity in stormwater on a scale from 1 to 14. Water with a pH below 7.0 is acidic and water with a pH above 7.0 is alkaline or basic.	X			• Good indicator for industrial discharges • Low cost (test strips and colorimetric tests) • pH meters are slightly costlier, but provide the best results • Simple	• Not a good indicator for sanitary waste • Not conclusive by itself • Not accurate for small changes • pH paper must be kept dry • pH meters require routine calibration and maintenance
Color	14	The **color** of water is influenced by the presence or absence of substances such as metallic salts, organic matter, dissolved or suspended materials.			X	Easy to track colored water upstream through underground drainage system	Not every illicit discharge will have a color to trace
Odor	14	Clean stormwater has no **odor**. Abnormal odors typically trigger further investigation			X	Helpful in identifying source of flow and narrowing focus	• Not every illicit flow will have an odor • Can become de-sensitized to a particular odor within a few minutes
Turbidity	13	**Turbidity** is a measure of how transparent or clear water is based on the amount of sediment or suspended particulates.	X		X	Type of turbidity may help identify source	• Cannot identify if multiple sources are present • No single meter is good for all conditions

Table 9 (continued). Indicator Literature Review Summary.							
Field Screening Methodology	Number of References Reviewed that Included this Indicator [a]	Description	Method Used for Detection			Advantages	Disadvantages
			Field Meter, Test Kit, or Test Strip	Lab	Visual or Field Observation		
Ammonia	13	**Ammonia** is produced by the decomposition of plant and animal proteins and is also a main ingredient in fertilizers.		X		• Test strips and kits are easy to use • Provide results in field to facilitate immediate tracking • Good indicator of sanitary sewage	• Ammonia can change into other nitrogen forms • Concentrations can be too low to track • Interference can occur with salt water, chlorine, iron, sulfides, and hardness • Regular calibration and maintenance required for meters • Potential generation of wastes from non-human sources
Detergents/ surfactants	13	**Detergents** contain substances called surfactants that are added to lower the surface tension of water to allow dirt or grease to be washed off more easily.	X			Excellent indicator	Reagent is a hazardous waste
Temperature	13	**Temperature** is critical to the health and survival of fish and other aquatic species in many life stages including embryonic development, juvenile growth, and adult migration.				• Inexpensive • Time efficient	Only useful during cold weather when temperature difference is significant

Table 9 (continued). Indicator Literature Review Summary.							
Field Screening Methodology	Number of References Reviewed that Included this Indicator [a]	Description	Method Used for Detection			Advantages	Disadvantages
			Field Meter, Test Kit, or Test Strip	Lab	Visual or Field Observation		
Specific conductivity	12	**Specific conductivity** is a measure of how well water can conduct an electrical current.	X	X		NG	Ineffective in saline waters
Fecal coliform bacteria	12	**Fecal coliform bacteria** are used as indicators of fecal contamination from humans and other warm-blooded animals. Human sources include failing septic systems, municipal wastewater discharges, leaking wastewater conveyance systems or side sewers, and cross-connections. Animal sources include pets, livestock, and wildlife (e.g., birds and mammals).		X		• Good indicator of pollution sources • Inexpensive • Easy sampling technique • Fast results	• Samples must transported to lab within 6 hours • 24 hour wait for results • Need to modify standard monitoring protocols for high concentrations • Sterile conditions necessary
Flow	12	**Flow** during dry weather is an indicator that another water source is present that is contributing to the storm drainage system. The observed flow could be groundwater inputs, but could also indicate a sanitary sewer cross-connection, potable water inputs, or illegal dumping.	X			• Inexpensive and time efficient • Can help prioritize outfall investigations	• Methods of estimating flow are not exact (bucket, stopwatch, tracing dye) • Bucket method non functional if end of pipe is submerged
Surface scum or sheen	12	**Surface scum or sheen** can include soap suds, petroleum sheens, or organic sheens.			X	NG	NG

Table 9 (continued). Indicator Literature Review Summary.							
Field Screening Methodology	Number of References Reviewed that Included this Indicator [a]	Description	Method Used for Detection			Advantages	Disadvantages
			Field Meter, Test Kit, or Test Strip	Lab	Visual or Field Observation		
Chlorine	11	**Chlorine** is added to potable water supplies.	X	X		• Quick and easy methods • Able to identify water line breaks, pool and spa discharges, water line breaks, vehicular wash water, and industrial discharges from copper bleaching	• High chlorine demand in natural waters • Test strips are expensive and do not detect low concentrations • Meters require routine calibration and maintenance • Extremely volatile • Not useful for sanitary waste
Fluoride	11	**Fluoride** is often added to potable water supplies.	X	X		Excellent conservative indicator of tap water discharge or leaks	• Poor indicator when used alone • Can distinguish between sewage and washwater when used in combination with other indicators • Reagent is a hazardous waste • Only applicable where water supplies are fluorinated

Table 9 (continued). Indicator Literature Review Summary.							
Field Screening Methodology	Number of References Reviewed that Included this Indicator [a]	Description	Method Used for Detection			Advantages	Disadvantages
			Field Meter, Test Kit, or Test Strip	Lab	Visual or Field Observation		
E. coli bacteria	11	***E. coli* bacteria** is a type of fecal coliform bacteria commonly found in the intestines of animals and humans.		X		• Good indicator of pollution sources • Inexpensive • Easy sampling technique • Fast results	• Samples must transported to lab within 6 hours • 24 hour wait for results • Need to modify standard monitoring protocols for high concentrations • Sterile conditions necessary
Floatables	11	**Floatables** can include animal fats, food products, oils, solvents, sawdust, foams, packing materials, fuel, fecal matter, and toilet paper.			X	NG	NG
Deposits and staining	11	**Deposits and staining** are coatings that remain on the streambank or on the outfall structure after a non-stormwater discharge has ceased. Dark staining often indicates an industrial source. Black or gray staining can indicate a sanitary source.			X	NG	NG
Potassium	10	**Potassium** is found at relatively high concentrations in sewage and can be used in combination with ammonia to distinguish between washwater and sanitary wastewater using the ammonia/potassium ratio.	X	X		NG	Need to use two separate analytical techniques depending on the concentration

Table 9 (continued). Indicator Literature Review Summary.							
Field Screening Methodology	Number of References Reviewed that Included this Indicator [a]	Description	Method Used for Detection			Advantages	Disadvantages
			Field Meter, Test Kit, or Test Strip	Lab	Visual or Field Observation		
Vegetation	10	**Excessive vegetation** or **dead vegetation** near an outfall can indicate an illicit discharge.			X	NG	NG
Hardness	9	**Hardness** is the dissolved mineral content (calcium and magnesium) of water. Hard water contains a high mineral content and soft water contains a low mineral content.		X		NG	NG
Dissolved oxygen	9	**Dissolved oxygen** is an important parameter for salmonids and other aquatic organisms. Low dissolved oxygen levels can be harmful to larval life stages and respiration of juveniles and adults.	X	X		• Simple • Easy to learn procedure • Test kits are relatively inexpensive • Not considered a key parameter, but is easy to obtain and may provide useful information	• "Low DO does not indicate pollution, may be due to high water temperature • DO meters are expensive and require regular calibration and maintenance
Phosphate	7	**Phosphate (or phosphorus)** is a concern in fresh water because high levels can lead to accelerated plant growth, algal blooms, low dissolved oxygen, decreases in aquatic diversity, and eutrophication.	X	X		• Test strips and kits are easy to use in field • Provide results in field to help immediate tracking	• Test strips are accurate for gross contamination only • Can be time consuming • Values can be too low to track • Phosphate occurs naturally • Chemical indicator test strips are unreliable

Table 9 (continued). Indicator Literature Review Summary.							
Field Screening Methodology	Number of References Reviewed that Included this Indicator [a]	Description	Method Used for Detection			Advantages	Disadvantages
			Field Meter, Test Kit, or Test Strip	Lab	Visual or Field Observation		
Structural damage	7	**Structural damage** such as pitting or spalling of outfall structures can be caused by abnormal pH from an industrial discharge.			X	NG	
Optical brighteners	6	**Optical brighteners** are added to household detergents to make clothes appear whiter after being washed.	X			• Inexpensive supplies • Animal/ human waste differentiation • Laboratory test not required to obtain results • Tests can be conducted by one person • Detects intermittent or highly concentrated flows	• Time consuming • Results not obtained for 1 week • Heavy rains require longer deployment periods • Can only detect high concentrations of detergents
Copper	5	At higher concentrations **copper** can become toxic to aquatic life. At low concentrations, copper can negatively affect olfaction in salmonids that plays a key role in species recognition, migration, reproduction, and predator avoidance.		X		NG	NG
Metals	5	**Metals** are inorganic substances that occur naturally. Typical metals measured as water quality parameters include copper, lead, and zinc.		X		NG	NG

Table 9 (continued). Indicator Literature Review Summary.							
Field Screening Methodology	Number of References Reviewed that Included this Indicator [a]	Description	Method Used for Detection			Advantages	Disadvantages
			Field Meter, Test Kit, or Test Strip	Lab	Visual or Field Observation		
Nitrate and nitrite	5	**Nitrate+nitrite nitrogen** is a concern in fresh water because it may contribute to an overabundant growth of aquatic plants and to a decline in diversity of the biological community.		X		NG	NG
Sewage fungus	4	**Sewage fungus** is a white or grayish growth that can be found in flowing water with sewage and/or industrial waste inputs.			X	NG	NG
Phenol	3	**Phenols** are organic compounds that are produced for various industrial processes. Phenols are can be toxic to both humans and aquatic organisms.		X		NG	NG
Boron	2	**Boron** is added as a water softener to washing powders and detergents and may indicate sewage or washwater discharges		X		NG	• Boron levels in tap and groundwater can vary regionally • Not always a strong indicator
Debris	2	**Trash and debris** typically are not considered to be an illicit discharge; however, excessive amounts of trash and debris can indicate that illegal dumping is occurring which may involve other pollutants.			X	NG	NG

Table 9 (continued). Indicator Literature Review Summary.							
Field Screening Methodology	Number of References Reviewed that Included this Indicator [a]	Description	Method Used for Detection			Advantages	Disadvantages
			Field Meter, Test Kit, or Test Strip	Lab	Visual or Field Observation		
Glycol	1	**Glycol** (e.g., ethylene glycol) is the main component of automotive antifreeze.		X		NG	NG
Tannins and lignins	1	**Tannins and lignins** are released during the decomposition of wood and tend to make water look dark brown or tea-colored.	X		X	NG	NG
Total dissolved solids	1	**Total dissolved solids** reflects the amount of dissolved material in water and strongly affects conductivity; most often used to detect industrial discharges.		X		NG	NG
Toxicity screening test	1	**Toxicity screening testing** is performed in a laboratory to determine whether a given water sample is harmful or lethal on aquatic organisms.		X		NG	NG
Fish kills	1	**Fish kills** are the number of dead fish observed in a stream or other water body where an illicit discharge is suspected.			X	NG	NG
Alkalinity	1	**Alkalinity,** along with pH, hardness, temperature, and conductivity, may be an indicator of an industrial wash water discharge.		X		Not considered a key parameter, but is easy to obtain and may provide useful information	NG

Table 9 (continued). Indicator Literature Review Summary.							
Field Screening Methodology	Number of References Reviewed that Included this Indicator [a]	Description	Method Used for Detection			Advantages	Disadvantages
			Field Meter, Test Kit, or Test Strip	Lab	Visual or Field Observation		
Total Kjeldahl nitrogen (TKN)	1	**TKN** is a combination of organically bound nitrogen and ammonia. TKN is frequently used as an indicator of pollution from industrial sources and municipal sewage.		X		NG	NG
Total petroleum hydrocarbons (TPH)	1	**TPH** is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil.		X		NG	NG
Semi-volatile organic compounds (SVOCs)	1	**SVOCs** are used and produced in the manufacturing industry (e.g. in plastic, pharmaceutical and pesticide manufacture)		X		NG	NG

NG = no guidance provided

- Chlorine
- Fluoride
- *E. coli* bacteria
- Floatables
- Deposits or staining
- Potassium
- Vegetation

The 21 additional indicators that were not included in the IDDE Field Screening Survey were:

- Phosphate
- Glycol
- Debris
- Vegetation
- Deposits and staining
- Structural damage
- Sewage fungus
- Surface scum or sheen
- Boron
- Tannins and lignins
- Phenol
- Copper
- Metals
- Nitrate and nitrite
- TKN
- Total dissolved solids
- Toxicity screening test
- Fish kills
- Alkalinity
- TPH
- SVOCs

Several of these indicators (debris, vegetation, deposits and staining, structural damage, sewage fungus, surface scum or sheen, fish kills) are visual indicators that were assumed to be part of an outfall or catch basin inspection, thus they were not included in the IDDE Field Screening Survey. Several of the laboratory or field test parameters are implemented by other jurisdictions, but are not commonly used for illicit discharges investigations in Washington. Out of the list above, only phosphate, alkalinity, and vegetation were listed in the IDDE Field Screening Survey responses as additional indicators.

Detailed tables summarizing the indicators included in each reference along with the threshold levels, potential discharges, advantages, and disadvantages of each indicator are included in Tables B-14 through B-18 in Attachment B. Brief descriptions of each indicator, methods used for detection (field, lab, or visual observations), potential sources, advantages, and disadvantages are also summarized in Table 9.

Annotated Outline of IDDE Field Screening Manual

Based on the information presented above from the IDDE Field Screening Survey and literature review, the following outline is proposed for the Manual:

Section 1 – Introduction

- Project background
- Includes input and recommendations from Washington permittees and other IDDE programs in the county (IDDE field screening survey, literature review, group discussions at ROADMAP and ERSCG regional forums)
- Scope of manual (what is included and what is not included)
- Manual organization

Section 2 – Definitions and Regulatory Requirements

- Definitions/acronyms (illicit discharge, illicit connections, IDDE, etc.)
- Regulatory requirements
    - IC and IDDE in the Phase I permit
        - Phase I NPDES Municipal Stormwater Permit (effective February 16, 2007 through February 15, 2012; extended through August 31, 2012)
        - Phase I NPDES Municipal Stormwater Permit (effective September 1, 2012 through July 31, 2013)
        - Phase I NPDES Municipal Stormwater Permit (effective August 1, 2013 through July 31, 2018)
    - IDDE in the Western Washington Phase II Permit

        - Western Washington Phase II NPDES Municipal Stormwater Permit (effective February 16, 2007 through February 15, 2012; extended through August 31, 2012)
        - Western Washington Phase II NPDES Municipal Stormwater Permit effective September 1, 2012 through July 31, 2013)
        - Western Washington Phase II NPDES Municipal Stormwater Permit (effective August 1, 2013 through July 31, 2018)
    - IDDE in the Eastern Washington Phase II Permit
        - Eastern Washington Phase II NPDES Municipal Stormwater Permit (effective February 16, 2007 through February 15, 2012; extended through August 31, 2012)
        - Eastern Washington Phase II NPDES Municipal Stormwater Permit effective September 1, 2012 through July 31, 2014)
        - Eastern Washington Phase II NPDES Municipal Stormwater Permit (effective August 1, 2014 through July 31, 2019)

Section 3 – IDDE Field Screening Methodologies

- Decision making process
    - Identify potential pollutants or water quality issues
    - How do you decide which methodology to use?
    - Flow chart
- 4 to 6 page pull out sections for each methodology
    - General description
    - Applications
        - Urban vs. rural
        - Pipes vs. ditches
        - Small vs. large drainage areas
        - New vs. old
        - Pros and cons
    - Methods
        - SOP format

        - How do you perform the work?
        - Data management recommendations
    - Indicators (list of applicable indicators with links to Indicators section)
    - Equipment (will include checkboxes for field crews)
    - References
- Methodologies that will be included in the manual are proposed to include the following (the final list will be selected following discussion at the ROADMAP and ERSCG regional forums):
    - Outfall inspections
    - Stream walk or ditch walk
    - Windshield survey of drainage area
    - IDDE hotline/staff or citizen complaint
    - Manhole/catch basin inspections
    - Business inspections
    - Dye testing
    - Septic system inspections
    - Smoke testing
    - Video inspections
    - Infrared thermography and/or infrared aerial photography
    - Kayak inspections
    - Commercial property maintenance inspections
    - Business license survey for hazardous waste disposal and usage
    - Optical brightener testing
    - Sand bagging
    - Automated or intensive sampling

Section 4 – Indicators

- Decision making process
    - How do you decide which indicator to use?
    - Flow chart

- 4 to 6 page pull out sections for each indicator
    - General description
    - Applications
    - Pros and cons
    - Methods
        - How do you collect and analyze the samples?
        - Thresholds
            - Assessment of threat to human health, welfare, or the environment
            - What levels trigger further investigation?
            - Water quality standards (if applicable)
        - Field and laboratory quality assurance/quality control
    - Field Screening Methodologies (list of applicable methodologies with links to Field Screening Methodology section)
    - Equipment (will include checkboxes for field crews)
    - References
- Indicators that will be included in the manual are proposed to include the following (the final list will be selected following discussion at the ROADMAP and ERSCG regional forums):
    - pH
    - Turbidity
    - Chlorine
    - Fluoride
    - Ammonia
    - Potassium
    - Detergents/surfactants
    - Specific conductivity
    - Optical brighteners
    - Fecal coliform bacteria

- *E. coli* bacteria
- Temperature
- Hardness
- Dissolved oxygen
- Color
- Odor
- Flow
- Visual indicators*
- BOD
- Bacteriodes
- Alkalinity
- Enterococcus bacteria
- Phosphate
- Glycol
- Phenol
- Metals (copper and zinc)
- Nitrate
- Total Kjeldahl nitrogen (TKN)
- Boron
- TPH
- SVOCs
- Tannins and lignins

* Visual indicators include floatables, debris, vegetation, deposits and staining, structural damage, sewage fungus, surface scum or sheen, fish kills.

Next Steps

The results of the IDDE field screening survey and the literature review will be presented and discussed at the September 12, 2012, ROADMAP meeting and the September 20, 2012, ERSCG meeting to obtain a consensus on the field screening methodologies and indicators that have

proven most effective and warrant consideration in the Manual. This regional input will assist with the development of the content for the draft Manual. The draft Manual will be presented at two half-day peer review sessions (one in Western Washington and one in Eastern Washington) hosted by ROADMAP and the ERSCG in 2013. Feedback from these peer review sessions, Ecology, and the Stormwater Work Group will be incorporated into the final Manual. A training session for municipal staff will also be hosted in the spring of 2013 that is focused on implementation of the Manual. The training will include a classroom presentation, a field demonstration session focused on field equipment and sampling techniques, and a question and answer session.

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APPENDIX A

IDDE Field Screening Survey Responses

Table A-1. IDDE Field Screening Survey Respondents.

Name	Title	Jurisdiction/Organization	Phase I/II/Secondary	Western/ Eastern WA
Gene Patterson	Public Health Manager	WSU	Secondary Phase II	Eastern
Bobbi Wallace	Surface and Wastewater Manager	City of Kirkland	Phase II	Western
Steve Carstens, P.E.	Stormwater Engineer	City of Puyallup	Phase II	Western
Dana Zlateff	Environmental Science Associate	City of Issaquah	Phase II	Western
Chris Thorn	Water Quality Programs Coordinator	City of Auburn	Phase II	Western
Shawn Gilbertson	NPDES Coordinator	City of Kent	Phase II	Western
Laura Frolich	Surface Water Engineer	City of Newcastle	Phase II	Western
Blaine Chesterfield	Engineering Manager	City of Mount Vernon	Phase II	Western
Rod Swanson	Senior Planner	Clark County	Phase I	Western
Bob Eddy, P.E.	Storm and Water Compliance Inspector	City of Milton	Phase II	Western
Richard Bazzell	Environmental Health Specialist	Kitsap Public Health District	NA - works with Kitsap Co.	Western
Mike Shaw	Stormwater Program Manager	City of Mountlake Terrace	Phase II	Western
Mindy Fohn	Water Quality Manager	Kitsap County	Phase II	Western
Doug Christenson	Water Resources Engineer	City of Lacey	Phase II	Western
Russ Connole	Project Manager	Spokane County	Phase II	Eastern
Matt Durkee	Surface Water Engineer	Yakima County	Phase II	Eastern
Jon Morrow	Stormwater Manager	City of Ellensburg	Phase II	Eastern
Jerry Shuster	Stormwater Engineering Program Manager	City of Edmonds	Phase II	Western
Jessica Shaw	Environmental Manager	City of Wenatchee	Phase II	Eastern
Jennifer Oden	Water Quality Specialist II	Snohomish County	Phase I	Western
Dan Smith	Water Quality Program Coordinator	City of Federal Way	Phase II	Western
Laura S. Keehan	Associate Planner	City of Olympia	Phase II	Western
Scott McQuary	Environmental Compliance	City of Redmond	Phase II	Western
Anya Funk	Stormwater Program Manager	City of Poulsbo	Phase II	Western
Diana Halar	Compliance Inspector	City of Lakewood	Phase II	Western
Lauren Broudy	Community Volunteer Coordinator / Surface Water Programs Assistant	City of Lake Forest Park	Phase II	Western
Lynn Schmidt, P.E.	Stormwater Permit Coordinator	City of Spokane	Phase II	Eastern
Don Robinett	Stormwater Compliance Manager	City of SeaTac	Phase II	Western
Heather Kibbey	Surface Water Manager	City of Everett	Phase II	Western
Kevin Schmidt	Maintenance & Operations Crew Chief	City of University Place	Phase II	Western
Kristin Terpstra	Civil Engineer	City of Bothell	Phase II	Western
Jeanne Dorn	Engineer II	King County	Phase I	Western
Kurt Fremont		City of Tacoma	Phase I	Western
Louise Kulzer	Source Control Manager	City of Seattle	Phase I	Western
Chris Gustafson	Stormwater Technician/IDDE	WSDOT	Other	Statewide

Name: Gene Patterson Jurisdiction: WSU

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☒ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Gene Patterson Jurisdiction: WSU

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   10 and 11

Name: Gene Patterson Jurisdiction: WSU

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☒ Yes ☐ No	☐ Field test strips ☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Gene Patterson Jurisdiction: WSU

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☒ Field meter ☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   temperature, fecal, chlorine

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   5-visual

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Bobbi Wallace Jurisdiction: City of Kirkland

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
2. Stream Walk or Ditch Walk	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Bobbi Wallace Jurisdiction: City of Kirkland

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Dye Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Septic System Investigations	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: KC Health Dept.	☐ Not effective ☒ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   #11 and #1

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

Name: Bobbi Wallace Jurisdiction: City of Kirkland

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☐ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☐ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☐ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☐ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Bobbi Wallace Jurisdiction: City of Kirkland

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   Color and smell/odor
   Citizens calling about neighbors pouring paint and oils down CB's is common.
   Smoke testing for accurate data, but expensive and must PR it with public…

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   Our staff found a few (approx. 4)

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Steve Carstens Jurisdiction: City of Puyallup

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☒ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Steve Carstens Jurisdiction: City of Puyallup

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   #3 windshield survey of the drainage area and/or input from other field people as they drive around areas in the jurisdiction.

Name: Steve Carstens Jurisdiction: City of Puyallup

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   Citizen call-ins that go to numbers other than the hotline – i.e; calling public works directly. Most people will do this over looking for the hotline.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☒ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☒ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: NA	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Steve Carstens Jurisdiction: City of Puyallup

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold: NA	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: NA	☐ Not effective ☒ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold: NA	☐ Not effective ☐ Moderately effective ☒ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   #18 – flows in the drainage storm system.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   NA

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   2 total. Both were called in by citizens. One was visually observed an actual illicit discharge occurring the other smelled septic emanating from a Storm CB and was knowledgeable enough to call it in.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Dana Zlateff Jurisdiction: City of Issaquah

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☒ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective

Name: Dana Zlateff Jurisdiction: City of Issaquah

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Septic System Investigations	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   Business Source control inspections have been found to be most effective in finding an illicit discharge at the time of a visit or providing assistance to prevent the discharge from occurring in the future.
   Now that the spill hotline number has been more publicized this has been an effective tool in eliminating illicit discharges, dealing with mobile business, or target stormwater education.

Name: Dana Zlateff Jurisdiction: City of Issaquah

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold: below 4 greater than 10	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: 100 NTU	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☒ Laboratory analysis	Threshold: 0.20	☐ Not effective ☒ Moderately effective ☐ Highly effective
6. Potassium	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☒ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☐ Surfactant test kit ☒ Laboratory analysis	Threshold: 0.25	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☒ Laboratory analysis	Threshold: 1,000	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: 1,000	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☒ Field meter ☐ Thermometer	Threshold: 25	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis	Threshold: 5	☐ Not effective ☒ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Dana Zlateff Jurisdiction: City of Issaquah

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
19. Other: BOD	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis ☐ Other:	Threshold: 2	☐ Not effective ☐ Moderately effective ☒ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   Fecal coliforms, ammonia-n, surfactants, conductivity, BOD, flow, color, smell.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   The illicit discharges we found were through business inspections. A smaller percentage we were alerted to through the spill hotline. None were found by outfall field assessments. 10 total.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Chris Thorn Jurisdiction: City of Auburn

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Chris Thorn Jurisdiction: City of Auburn

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

   Number 4, citizen and employee reporting.

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

Name: Chris Thorn Jurisdiction: City of Auburn

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☐ Field meter ☒ Test strips	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☒ Yes ☐ No	☒ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☐ Field meter ☒ Thermometer	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Chris Thorn Jurisdiction: City of Auburn

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

   Odor, color, flow and floatables.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?

   61 illicit discharges and illicit connections were found in 2011. Of these 44 were reported by citizens or staff through the City's hotline. The majority of discharges and/or connections were found during routine municipal field operations and/or by municipal staff active within the City.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Shawn Gilbertson Jurisdiction: City of Kent

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ **ALL areas** ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ **ALL areas** ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Shawn Gilbertson Jurisdiction: City of Kent

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ **ALL areas** ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Septic System Investigations	☒ Yes ☐ No	☐ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☒ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   Manhole and Catch Basin Inspections.

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

Name: Shawn Gilbertson Jurisdiction: City of Kent

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☐ Field meter ☒ Test strips	Threshold: outside of State WQS	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: above State WQS	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Chlorine	☒ Yes ☐ No	☒ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: trace	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. Fluoride	☒ Yes ☐ No	☒ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: trace	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☒ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: abnormal color	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold: abnormal smell	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: abnormal floatables	☐ Not effective ☒ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold: dry weather flow	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Shawn Gilbertson Jurisdiction: City of Kent

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   Flow when there shouldn't be flow; observed discoloration; observed sheen.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   Observed sheen on surface water or in the MS4 always warrants source tracing.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   70 – This number includes spills, illicit discharges, and illicit connections. Most were reported by NPDES Inspection Staff and were pretty easy to trace. We used smoke testing and dye testing on a couple of instances related to septic system illicit connections.

NOTE: If we can't trace the source of an illicit discharge by using the simple indicators checked above, we will hire a consultant to perform some of the more involved sampling and analysis options.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Laura Frolich Jurisdiction: City of Newcastle

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Laura Frolich Jurisdiction: City of Newcastle

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: Waste Management Public Outreach Campaign	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

   Video inspections and manhole/catch basin inspections for illicit connections. For the illicit discharges, through the IDDE hotline, which are tracked as Request for Action or from outfall inspections.

Name: Laura Frolich Jurisdiction: City of Newcastle

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   no

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☐ Field meter ☒ Test strips	Threshold: below 5 or above 10	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: 25 NTU	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☒ Yes ☐ No	☒ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: 1	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: 500	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: 500	☐ Not effective ☒ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☒ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: Any color	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Laura Frolich Jurisdiction: City of Newcastle

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold: Any strong non-organic type odor	☐ Not effective ☐ Moderately effective ☒ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: non organic material	☐ Not effective ☒ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   Color, odor and turbidity. Fecal tests are tricky because of natural animal wastes in stormwater systems, especially ones adjacent to wetlands. We hope to start testing more parameters like DO, Temp and overall biological oxygen demand.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   no

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   2 total. One was a paint dumping in a residential area that was visible from the street. Paint was on top of the open vane grate inlet. It was discovered by maintenance crew. The other was during a business inspection; a mobile pet grooming business was dumping their soapy water by opening the valve and releasing water directly onto road. Soap was visible on ground and roadway.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Blaine Chesterfield Jurisdiction: City of Mount Vernon

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☒ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☒ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☒ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Blaine Chesterfield Jurisdiction: City of Mount Vernon

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: Health District	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   4, 5, 6, 7, 10

Name: Blaine Chesterfield Jurisdiction: City of Mount Vernon

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   None

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☐ Field meter ☒ Test strips	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☒ Surfactant test kit ☒ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☒ Yes ☐ No	☒ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☐ Field meter ☒ Thermometer	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Blaine Chesterfield Jurisdiction: City of Mount Vernon

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   2, 7, 15, 16, 17

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   None

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   13 illicit discharges or connections in 2011. Hotline response, visual inspections, windshield survey, business inspections, and video inspections. Tests performed are pH, turbidity, detergents/surfactants, fecal, DO, color, odor, and floatables.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Rod Swanson Jurisdiction: Clark County

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Rod Swanson Jurisdiction: Clark County

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☒ Highly effective
7. Dye Testing	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

Clark County has found that outfall screening is not effective and very time consuming. More illicit discharges are discovered driving to outfalls than screening outfalls.

Business and multifamily source control and stormwater facility inspections are our most effective tools for discovering illicit discharges.

Name: Rod Swanson Jurisdiction: Clark County

We use sweeps of all businesses targeted at subwatershed scale.
Stream walks don't work well due to extensive vegetation cover and large numbers of natural seeps.

Catch basin inspections are part of source control inspections and O and M inspections.

Dye testing and video are used for investigations once a illicit connection is suspected. Note that counties often do not provide water and sewer services as cities do.

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   No

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☒ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☒ Laboratory analysis	Threshold: Ammonia/K ratio > 1	☒ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: Ammonia/K ratio > 1	☒ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☐ Surfactant test kit ☒ Laboratory analysis	Threshold: 0.25 mg/l	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: 500	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☒ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Rod Swanson Jurisdiction: Clark County

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
13. Hardness	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☐ Yes ☒ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

   Detergents/surfactants, fecal coliform bacteria, Temperature and Turbidity.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

   Not yet.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?

   We typically find very few. Each permittee lists the number discovered in annual reports to Ecology.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Bob Eddy, P.E. Jurisdiction: City of Milton

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☒ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Bob Eddy, P.E. Jurisdiction: City of Milton

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

Methods 1 through 6 with 7 (dye) test as an option and within the city of Milton Pierce County operates sewer system.

Name: Bob Eddy, P.E. Jurisdiction: City of Milton

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   No Comments

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☐ Field meter ☒ Test strips	Threshold: unknown	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold: Visual examination	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☒ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Bob Eddy, P.E. Jurisdiction: City of Milton

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: None known	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold: Observable	☐ Not effective ☐ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: Per NPDES	☐ Not effective ☐ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold: Any restriction	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   1 through 7

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   No comments

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   5 discharges--one connection in 2011. the city of Milton is a hot bed of Connection De Ullicite

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Richard Bazzell Jurisdiction: Kitsap Public Health Department

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☒ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: local public works staff	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Richard Bazzell Jurisdiction: Kitsap Public Health Department

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: local public works staff	☐ Not effective ☐ Moderately effective ☒ Highly effective
10. Video Inspections	☐ Yes ☒ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: local public works staff	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: local public works staff	☐ Not effective ☐ Moderately effective ☒ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   1,2,5,7,8,11

Name: Richard Bazzell Jurisdiction: Kitsap Public Health Department

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold: low- 6 to >5, high-9 to less than 10	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: 25 to 50 NTU	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Chlorine	☒ Yes ☐ No	☒ Field test strips ☐ Field meter ☒ Laboratory analysis	Threshold: 0.04 to <0.1 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☒ Yes ☐ No	☐ Field test strips ☒ Field meter ☒ Laboratory analysis	Threshold: 0.1 to 0.2 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☒ Surfactant test kit ☐ Laboratory analysis	Threshold: 0.25 to 0.5 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: 300 to 500 us/cm	☐ Not effective ☒ Moderately effective ☐ Highly effective
9. Optical brighteners	☒ Yes ☐ No	☒ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: < 200 FC/100mL	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. *E. coli* bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: < 200 FC/100mL	☐ Not effective ☒ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☒ Field meter ☐ Thermometer	Threshold: 20 to 25 C	☐ Not effective ☒ Moderately effective ☐ Highly effective
13. Hardness	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis	Threshold: 200 to 500 ug/L	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Richard Bazzell Jurisdiction: Kitsap Public Health Department

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: 100 to 250	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☐ Visual observations ☒ Other: (illegible)	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
19. Other: enterococcus	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis ☐ Other:	Threshold: 104 mg/L	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   1,5,7,9-12,15,16,17-18

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   Salinity...false positives can be a problem when sampling fecal coliform, E. Coli and enterococcus in brackish water or tidally influenced environments. Salinity concentrations can help determine the appropriate bacteria to sample for.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   From 2009 through 2011, 126 illicits were confirmed through visual observations, bacteria testing and dye testing. Please note the above number represents joint work conducted by ALL of Kitsap's Phase II permittees.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Mike Shaw Jurisdiction: Mountlake Terrace

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Mike Shaw Jurisdiction: Mountlake Terrace

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Dye Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   1, 5, 7, and 10.

Name: Mike Shaw Jurisdiction: Mountlake Terrace

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☒ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☒ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Mike Shaw Jurisdiction: Mountlake Terrace

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
15. Color	☐ Yes ☒ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☐ Yes ☒ No	☐ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
17. Floatables	☐ Yes ☒ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold: Volume, color, odor, visual	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   I have not used any indicators for illicit discharge to date.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   6 illicit discharges were observed or reported and investigated in 2011 in the City of Mountlake Terrace.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Mindy Fohn Jurisdiction: Kitsap County

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Mindy Fohn Jurisdiction: Kitsap County

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☒ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other: commercial property maintenance inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

commercial property maintenance inspections (these are very different from business/ LSC inspections); hotline reports; training ALL COUNTY FIELD staff to report spills; business inspections to find floordrains and require abandonment; (more, see survey)

Name: Mindy Fohn Jurisdiction: Kitsap County

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   Public education about fundrainer car washes; one-on-one education with commercial property owners that hold car washes and providing clear options. We have been able to nearly stop all fundraising car washed in our jurisdiction.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold: <6.5, >8.5	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis	Threshold: >= 200	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☒ Laboratory analysis	Threshold: >=1.0	☒ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: >1	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☒ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: >500	☒ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☒ Yes ☐ No	☒ Optical brightener monitoring trap ☐ Other:	Threshold: positive	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: >500	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. *E. coli* bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: >400	☐ Not effective ☐ Moderately effective ☒ Highly effective
12. Temperature	☒ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold: >30	☒ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis	Threshold: >500	☒ Not effective ☐ Moderately effective ☐ Highly effective

Name: Mindy Fohn Jurisdiction: Kitsap County

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☐ Yes ☒ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold: positive	☐ Not effective ☐ Moderately effective ☒ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: presence	☐ Not effective ☐ Moderately effective ☒ Highly effective
18. Flow	☐ Yes ☒ No	☐ Field meter ☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
19. Other: Nitrate	☐ Yes ☐ No	☐ Field meter ☒ Laboratory analysis ☐ Other:	Threshold: 3 mg/L	☒ Not effective ☐ Moderately effective ☐ Highly effective
20. Other: phosphate, alkalinity	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis ☐ Other:	Threshold: 1.5 mg/L, >500	☒ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   Fecal, E. Coli, floatables, color, detergent, odor (eyeballs and hose are the best; and bacteria testing)

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   No- TPH and glycols were useless, too.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   About 45. Most reports to the hotline and commercial inspections (washing, dumpster drool, grease spillage)

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Doug Christenson Jurisdiction: City of Lacey

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint (citizen calls for spills)	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Doug Christenson Jurisdiction: City of Lacey

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Dye Testing (as needed)	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☒ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections (as needed)	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   #3 windshield survey, #7 dye testing, and #5 manhole/catch basin inspections

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

Name: Doug Christenson Jurisdiction: City of Lacey

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Chlorine	☒ Yes ☐ No	☐ Field test strips ☒ Field meter ☐ Laboratory analysis	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☐ Moderately effective ☒ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☐ Surfactant test kit ☒ Laboratory analysis (as needed)	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☒ Moderately effective ☐ Highly effective
9. Optical brighteners	☒ Yes ☐ No	☒ Optical brightener monitoring trap ☐ Other:	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☒ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☒ Field meter ☐ Thermometer	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☐ Moderately effective ☒ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☐ Moderately effective ☒ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☐ Moderately effective ☒ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☐ Moderately effective ☒ Highly effective
18. Flow	☒ Yes ☐ No	☒ Field meter ☒ Visual observations ☐ Other:	Threshold: Discharge-specific; we test as needed/suspected	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Doug Christenson Jurisdiction: City of Lacey

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   They are all effective in different ways, depending on what is being discharged.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   137 illicit discharges

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Russ Connole Jurisdiction: Spokane County

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☐ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Russ Connole Jurisdiction: Spokane County

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Dye Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   outfall inspections, stream walk, kayak inspections

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   We inspect various primary waterways by using kayaks

Name: Russ Connole Jurisdiction: Spokane County

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☐ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Chlorine	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☐ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☐ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☐ Yes ☐ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☐ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Russ Connole Jurisdiction: Spokane County

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☐ Yes ☐ No	☐ Field meter ☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   turbidity

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   N/A

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   5. Outfall inspections, kayak inspection, windshield inspection

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Matt Durkee Jurisdiction: Yakima County

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☐ Urban areas ☒ Rural areas ☐ Pipes ☒ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☒ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Matt Durkee Jurisdiction: Yakima County

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Dye Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
10. Video Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

   The IDDE hotline/staff complaint, observations (color, odor, and flow) during outfall and manhole/catch basin inspections, and smoke testing have been used extensively for screening by Yakima County. The other methods may or may not be just as effective in appropriate situations, but Yakima County has yet to use these during screening. Yakima County has used or could use in the future some of the other methods (video inspection, dye testing, septic investigations) for the

Name: Matt Durkee Jurisdiction: Yakima County

investigation phase of finding the source of a specific illicit discharge/connection, but does not plan on using these for recurring screening. Please see the Yakima Regional Stormwater Program's "Illicit Discharge Detection and Elimination Procedures" document for a comprehensive listing of methods and indicators either currently used or under consideration for future use by Yakima County and its regional partners.

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☒ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☒ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Matt Durkee Jurisdiction: Yakima County

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

   Fecal coliform bacteria, color, odor, and flow have been the screening indicators Yakima County has most frequently used. The other indicators listed above may also be just as effective as these for follow-up and finding discharges/connections, but Yakima County has yet to have a reason to use them during investigations.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?

   Three illicit discharges and connections were reported and investigated in 2011. Methods used to find these three included IDDE hotline/staff or citizen complaint, manhole/catch basin inspections, septic system investigations, smoke testing, and video inspections. Indicators to find these included color, odor, and flow.

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Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Jon Morrow Jurisdiction: City of Ellensburg

IDDE Field Screening Survey

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1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Jon Morrow Jurisdiction: City of Ellensburg

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other: Business Lic. Survey for haz waste disposal and usage	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   catch basin/manhole inspection/windshield survey

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   N/A

Name: Jon Morrow Jurisdiction: City of Ellensburg

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☐ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☐ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☐ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: 500	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: 500	☐ Not effective ☒ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☐ Yes ☐ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☒ Field meter ☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Jon Morrow Jurisdiction: City of Ellensburg

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   bacteria, potassium, fluoride, floatables, odor, flow

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   N/A

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   20 illicit discharges and 0 connections.

   Illicit discharges are more common than illicit connections.

   Most IDDE problems are found by accident during inspection/cleaning or when a citizen or internal complaint comes in. It is almost impossible to detect a problem that is occurring without being at the right place at the right time. Most illicit discharges happen at night or on the weekend when staff is away.

   Outfall screening offers a chance to visualize the flow characteristics and water quality parameters when onsite. Looking for staining and past signs of problems is measureable, but without deploying a composite sampler onsite, it is hard to catch the incident as it occurs.

   I have found that routine maintenance and cleaning of the public system catches a lot of the problems associated with IDDE. Drive by windshield surveys can yield information about source control measures at most locations and give an opportunity to visually see the storm system on the ground. This can determine if further investigation is required.

   Probably the best tool to combat IDDE is public education. Educating the general public about stormwater pollution prevention can yield good results. Citizens will often time call in complaints that require follow up in the field.

   Training Municipal staff to spot problems in the field is another way to get good results. Most complaints come from within. Field crews can be your best resource for spotting problems.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Jerry Shuster Jurisdiction: City of Edmonds

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Jerry Shuster Jurisdiction: City of Edmonds

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Dye Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

   - IDDE Hotline / Staff or Citizen Complaint
   - Video inspection, when we get a program going

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

Name: Jerry Shuster Jurisdiction: City of Edmonds

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold: <6.5 or >8.5	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: 25 NTU	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Chlorine (Free)	☒ Yes ☐ No	☐ Field test strips ☒ Field meter ☐ Laboratory analysis	Threshold: 0.2 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☒ Yes ☐ No	☒ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: 3 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
6. Potassium	☒ Yes ☐ No	☐ Field test strips ☒ Field meter ☐ Laboratory analysis	Threshold: 5 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☒ Surfactant test kit ☐ Laboratory analysis	Threshold: 0.5 mg/L	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: NA	☐ Not effective ☒ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☒ No	☒ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☒ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Jerry Shuster Jurisdiction: City of Edmonds

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

   - IDDE Hotline / Staff or Citizen Complaint
   - Video inspection, when we get a program going.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   Six, all from IDDE Hotline / Staff or Citizen Complaint.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Jessica Shaw Jurisdiction: City of Wenatchee

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☒ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Jessica Shaw Jurisdiction: City of Wenatchee

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☒ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   The windshield surveys are probably the most effective especially when combined with dye testing and video inspections. Business inspections have also been effective but are more time-consuming.

Name: Jessica Shaw Jurisdiction: City of Wenatchee

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   Plan reviews can also be effective. As-builts may show existing illicit connections and we have found designers proposing illicit connections on new plans. Also, citizen complaints are useful though not do not always result in the identification of an illicit discharge.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☒ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☒ Yes ☐ No	☐ Field test strips ☒ Field meter ☐ Laboratory analysis	Threshold: 0.01 mg/L	☐ Not effective ☐ Moderately effective ☒ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☒ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Jessica Shaw Jurisdiction: City of Wenatchee

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   Odor and floatables are the most effective for identifying sanitary sewer discharges. Chlorine has also been effective for some industrial discharges and pools.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   When conducting video inspections damage to pipes and staining are indicators of possible illicit discharges.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   In 2011 we conducted 48 investigations which resulted in the identification of 1 illicit connection and 22 illicit discharges. Most of the investigations were started based on a windshield survey or citizen complaint. Visual inspections for dirt, floatables, and flow as well as odor were the main indicators used in the field.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Jennifer Oden Jurisdiction: Snohomish County

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Jennifer Oden Jurisdiction: Snohomish County

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

   Citizen complaint hotline and business inspections are the most effective

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   Education and outreach efforts for proper BMPs are highly effective at preventing illicit discharges.

Name: Jennifer Oden Jurisdiction: Snohomish County

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold: less than 6, greater than 8.5	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: visible	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Chlorine	☒ Yes ☐ No	☒ Field test strips ☐ Field meter ☒ Laboratory analysis	Threshold: >0.25 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. Fluoride	☒ Yes ☐ No	☐ Field test strips ☒ Field meter ☒ Laboratory analysis	Threshold: >0.25 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Ammonia	☒ Yes ☐ No	☐ Field test strips ☒ Field meter ☒ Laboratory analysis	Threshold: 3 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
6. Potassium	☒ Yes ☐ No	☐ Field test strips ☒ Field meter ☒ Laboratory analysis	Threshold: 3 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☒ Surfactant test kit ☒ Laboratory analysis	Threshold: detection	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: >500 uS/cm	☐ Not effective ☒ Moderately effective ☐ Highly effective
9. Optical brighteners	☒ Yes ☐ No	☒ Optical brightener monitoring trap ☐ Other:	Threshold: detection	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: 5000 CFU	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: 5000 CFU	☐ Not effective ☒ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☒ Field meter ☐ Thermometer	Threshold: > ambient	☐ Not effective ☒ Moderately effective ☐ Highly effective
13. Hardness	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis	Threshold: less than 10 mg/L, greater than 2000 mg/L	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: depends on situation	☒ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: visible	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold: presence	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: visible	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Jennifer Oden Jurisdiction: Snohomish County

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold: visible	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other: TPH	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis ☐ Other:	Threshold: detection	☐ Not effective ☒ Moderately effective ☐ Highly effective
20. Other: Volatiles/semi volatiles	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis ☐ Other:	Threshold: detection	☐ Not effective ☒ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

   The effectiveness of the above indicators is dependent upon the type of discharge and/or surrounding land use.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?

   Three illicit connections and 6 illicit discharges confirmed

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Dan Smith Jurisdiction: City of Federal Way

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Dan Smith Jurisdiction: City of Federal Way

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: interface with local public sanitary utility	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
10. Video Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

We do not routinely conduct "field screening", but do screen the MS4 during active IDDE investigations. In these cases, screening is limited in scope to the general vicinity of the discharge when the source cannot be immediately identified. As such, the answers provided above need further clarification and more detail as given below:

Name: Dan Smith Jurisdiction: City of Federal Way

- #1, #2 – Primarily, we do outfall inspections and the accompanying stream walks not because we want to, but because it is permit required. The permit-required dry weather outfall screening exercise is not highly effective in locating illicit discharges (because outfalls are so very removed from potential sources). But in some respects, dry weather screening has been beneficial in helping us to become familiar with the system in remote areas where we could locate and field identify many outfalls (either known or unknown) to assess their condition and allowing us to find them more rapidly in case of a severe upstream event.

- #3 - I consider windshield surveys to be a "source control" exercise. The Phase II permit does not require source control inspections, so therefore we do not routinely do them. That said, I do believe them to be highly effective in locating illicit discharges if they were permit-required as part of IDDE field screening.

There are dozens of common sense windshield survey observational tips we have learned over the years that should be included in a manual.

- #4 - Complaints/reports – Whether Hotline, citizen, or employee driven – these constitute the spark that generates the majority of our IDDE investigations. I find it confusing that Ecology asks for the number of "Hotline Calls" received by a permittee in the annual reporting. Most of our IDDE investigations are triggered by calls/reports that come to us by other reporting avenues other than the Hotline (i.e. email, personal phone call). If Ecology is using the number of Hotline calls received to judge success, it is misleading as there are many other sources of illicit discharge reports that we receive.

- #5, – Manhole/catch basin inspections are done on a routine basis per our O&M program and through our public/private facility inspections (but they are not to be considered an IDDE field screening exercise). This work generates many follow up IDDE investigations, and crews are trained to be cognizant of unusual conditions. Once an active IDDE investigation is initiated, manhole/catch basin inspections become an important and integral part in attempting to track the discharge back to its source, or when we inspect for the extent of contamination. Again, there are many common sense manhole/catch basin inspection observational tips we have learned over the years that should be included in a manual.

- #6 – We do not do routine business inspections as this is also a source control exercise not required by the Phase II permit. But business inspections are inevitably completed during and following IDDE investigations. They are very important, and would be a critical part of a future permit-required field screening component.

- #7, #9 - We have only performed dye testing or smoke testing during and following IDDE investigations, or in efforts to determine where drainage is going for mapping of public or private systems. We have not used these methods proactively. Again, they would be important field screening tool.

- #8 – We do not perform septic system inspections. This effort is left to KC Public Health when we become aware of or suspect that an illicit discharge originates from a private septic system. The collaboration has been excellent with 100% compliance as KC health steps in with enforcement.

- #10 – We have a very progressive video inspection program to track MS4 assets which has been recently implemented by our field engineering staff. We are now in the process of thinking how IDDE-related information gathered during these inspections can be used for future permit-required field

screening requirements (we may begin implementing video IDDE field screening before the final permit requirements take place to get a jump start on it). We believe that the video inspection process will be our premier tool in field screening for illicit connections.

- #11 – Aerial photography is sometimes useful to get a feel for on-site structures, topography and potential flow patterns. Used also to identify affected parcels/property owners for enforcement or notifications.

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   I think the above list is fairly comprehensive.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☒ Test strips	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☒ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Chlorine	☒ Yes ☐ No	☐ Field test strips ☒ Field meter ☒ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☐ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Dan Smith Jurisdiction: City of Federal Way

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
14. Dissolved oxygen	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☐ Yes ☐ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☐ Yes ☐ No	☐ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
17. Floatables	☐ Yes ☐ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

I have personally conducted testing using most of these indicators, but not in the context of "field screening". Usage of particular indicators have been associated with an active IDDE investigation where I am first determining if there are non-compliance conditions; and then second to document exceedances. In most cases, there are no thresholds because just the presence of detectable contaminants in stormwater (in addition to photodocumentation, etc) has been enough for the issuance of enforcement. The selection of an indicator has been based upon the particular discharge (i.e. turbidity for sediment & erosion problems). We have not put much thought into what a good concise suite of parameters to test for in tracking potential illicit discharges where the source was completely unknown, such as in the case where there is clear, dry weather flow but no unusual material or odors noted. Keep in mind that there must be common sense applied to the selection and evaluation of the testing (i.e. is a fecal coliform hit caused by a raccoon in a pipe or by leaking sanitary/septic?). Indicator information may lead in a wrong or unfounded direction.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   No thoughts at this time.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?

   Careful how you interpret the answers to this question.

   As I have mentioned, none of our IDDE investigations have been discovered through genuine field screening – unless you consider private/public system O&M inspections a form of field screening; or a random observation made by staff in a drive-by through town that generated a report of a suspicious discharge.

Name: Dan Smith Jurisdiction: City of Federal Way

We conducted approximately 40 IDDE investigations in 2010 and about 20 in 2011. The reports were received from a variety of sources and included everything from discarded kitty litter in the right of way at a private residence to an illicit connection into the MS4 from a NPDES Sand and Gravel operation. Methods and indicators were used once we had a good suspicion of an active discharge -- using everything from visual observation of dumped waste to video camera to grab samples as tools to document/detect the discharges

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Laura Keehan Jurisdiction: City of Olympia

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Laura Keehan Jurisdiction: City of Olympia

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☐ Yes ☒ No County does septic inspections	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   For fecal and sediment, we've found smoke and dye testing and TVing to be very helpful.

Name: Laura Keehan Jurisdiction: City of Olympia

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   Often we look up any site/construction records we have on file to help determine what may have occurred in the past. This is used once we're aware of a problem in the area.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☐ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis Also Visual observation	Threshold: 25 NTU	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Chlorine	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☐ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☐ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: varies	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. *E. coli* bacteria	☐ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: milky, bubbles, etc.	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Laura Keehan Jurisdiction: City of Olympia

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold: septic, sulfer, laundry	☐ Not effective ☐ Moderately effective ☒ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: toilet paper	☐ Not effective ☐ Moderately effective ☒ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold: flow during dry weather periods	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   Fecal coliform, floatables, turbidity

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?

   Hotline and ERTS system
   Televising
   Targeted Business Inspections

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Scott McQuary Jurisdiction: City of Redmond

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: City Main. & Oper. Personnel-MS4 & Private	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Scott McQuary Jurisdiction: City of Redmond

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: Ecy Grant & County funded LSC- Private Storm inspections	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: Initially investigated internally until issue confirmed then passed to KC Health. Compliance process needs streamlining.	☐ Not effective ☒ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: City Maint & Oper. Personnel- MS4	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   Method 6 (Business/ property source control inspections), 4 (internal stormwater related staff), 5, 10

Name: Scott McQuary Jurisdiction: City of Redmond

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   We have had success just visually source tracing the stormwater infrastructure. Usuall the case when something is reported existing an outfall. In addition, it doesn't hurt to perform off hour windshield/ weekend inspections.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☒ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: Variable. Depending on conditions.	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☐ Surfactant test kit ☒ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: > 500 cfu/100ml	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☒ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Scott McQuary Jurisdiction: City of Redmond

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: Traceable to source	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold: Traceable to source	☐ Not effective ☐ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: Traceable to source	☐ Not effective ☐ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold: Traceable to source	☐ Not effective ☐ Moderately effective ☐ Highly effective
19. Other: E. Coli bacteria	☒ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☒ Other: In-house indess colilert18 method	Threshold: tentatively > 135 mpn	☐ Not effective ☒ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

Fluoride, ammonia, E. Coli, and potassium are all effective at source tracing. Most effective if testing multiple parameters at one time, not all discharges have the same signative. If needing to narrow the list, fluoride and ammonia are most effective.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?

33 illicit discharges, 0 illicit discharges. Most issues are reported via staff so the most effective method has been IDDE aware employees. Effective indicators are discharge dependent. Discharges of an obvious nature are tracked up system to source.

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Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Anya Funk Jurisdiction: City of Poulsbo

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: health district	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☐ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other: Planned for future use	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other: Only as part of O & M. Effective if crew reports findings.	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Anya Funk Jurisdiction: City of Poulsbo

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: County LSC & PIC Programs	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: Health district	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Video Inspections	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   Business visits, windshield survey (observations reported by staff during course of daily work)

   Note about <u>least</u> effective methods: Flow is not routinely useful for us because we have so many curtain drains and springs tied into the drainage system that run year-round. Also, there are no industrial or manufacturing businesses that would produce suspect process flows. Of course, a high flow could be observed for some discrete event, and we would check it out, but we rarely see that.

Name: Anya Funk Jurisdiction: City of Poulsbo

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold: 5-4 & 10-11	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☒ Laboratory analysis	Threshold: 0.2+	☐ Not effective ☐ Moderately effective ☒ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☒ Surfactant test kit ☐ Laboratory analysis	Threshold: 0.5+	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: 500+	☐ Not effective ☐ Moderately effective ☒ Highly effective
9. Optical brighteners	☒ Yes ☐ No	☒ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: 151+	☐ Not effective ☐ Moderately effective ☒ Highly effective
12. Temperature	☒ Yes ☐ No	☒ Field meter ☐ Thermometer	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: ANY	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Anya Funk Jurisdiction: City of Poulsbo

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold: ANY	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
18. Flow	☐ Yes ☐ No	☐ Field meter ☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   E. coli, conductivity, detergents, color
   (Note: we have no industry or manufacturing)

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   18 – All were observed directly (e.g. pressure washing, colored/ water in CB, construction erosion)

   Dry weather outfall screening had high E. coli at multiple outfalls & high conductivity in the vicinity of an auto repair shop & large public parking lot

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Diana Halar Jurisdiction: City of Lakewood

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Diana Halar Jurisdiction: City of Lakewood

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

   Business Inspections, Outfall inspections and video inspections

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   none

Name: Diana Halar Jurisdiction: City of Lakewood

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☐ Field meter ☒ Test strips	Threshold: 6.6 – 7.4	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☐ Surfactant test kit ☒ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☒ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☒ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Diana Halar Jurisdiction: City of Lakewood

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

   Color, odor, visual observation, public reporting

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

   Public reporting on help line. (I get more illicit discharges from private individuals reporting)

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   15 illicit discharges
   1 illicit connection

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Lauren Broudy Jurisdiction: City of Lake Forest Park

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Lauren Broudy Jurisdiction: City of Lake Forest Park

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   PW crew invest in general. The issue is staff time/ funds.

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

Name: Lauren Broudy Jurisdiction: City of Lake Forest Park

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Lauren Broudy Jurisdiction: City of Lake Forest Park

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☒ Yes ☐ No	☒ Field meter ☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

   Fecal and other indicator chemicals. However, we don't have staff/ funds to test these advanced contaminants.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?

   Any reported issues are found through RW crew field detection or citizens calling in with complaints/ issues.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Lynn Schmidt, P.E. Jurisdiction: City of Spokane

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
2. Stream Walk or Ditch Walk	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Lynn Schmidt, P.E. Jurisdiction: City of Spokane

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   #1. Having different things in your toolbox and different options at our needs.

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

Name: Lynn Schmidt, P.E. Jurisdiction: City of Spokane

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☒ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☒ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Lynn Schmidt, P.E. Jurisdiction: City of Spokane

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☐ Yes ☒ No	☐ Field meter ☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   29- Files w/ pictures, 31- Form's total. 31 illicit discharges, 0 connections found through hotline reports, staff observations, Indicators: color, odor, visual observation

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Don Robinett Jurisdiction: City of SeaTac

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Don Robinett Jurisdiction: City of SeaTac

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Video Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   Business inspections

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   IDDE level B Training Muni. Field Staff

Name: Don Robinett Jurisdiction: City of SeaTac

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☐ Field meter ☒ Test strips	Threshold: < 6.5, >8.5	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: >0.6 mg/L	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: >0.5 mg/L	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: >1.0	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold: Presence	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold: above ambient	☐ Not effective ☒ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Don Robinett Jurisdiction: City of SeaTac

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other: Vegetation	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   color, odor, flow, vegetation, chlorine, fluorine, ammonia, detergents

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   vegetation

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   approx 20

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rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Heather Kibbey Jurisdiction: City of Everett

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

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1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Heather Kibbey Jurisdiction: City of Everett

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

4, 5, 7 and 10. Mind you, they are most effective when there is a suspicion/report that something is going on already.

Name: Heather Kibbey Jurisdiction: City of Everett

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   Just by virtue of street crews being in the field every day doing all the things they do, they find the majority of problems. Training on who to call if they see something suspicious is a must.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☐ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☒ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☐ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: state stds.	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. *E. coli* bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective

Name: Heather Kibbey Jurisdiction: City of Everett

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   #10 and to a lesser extent (due to low amounts) #7

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   Again, we find the majority of our problems thru observation of field crews.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   3, done via observation of field crews during normal work, including inspection of ditches and catchbasins.

   Some comments: There is no filter here for cost of methods and indicators, which worries me. TVing lines routinely may be well and good, but it is very expensive. Fecal coliform sampling can give good indication of a problem sometimes, or it may indicate an intractable problem, like birds in a wetland, or landing on parking lots. Everett is fortunate in the we have an environmental lab that can run samples for us –most jurisdictions are not so lucky, and will be fighting holding times, expensive transportation, loss of manhours to transportation, and big expense if they have to get samples to a commercial lab. My personal feeling is that use of whiz wheels such as Hach kits should be adequate for many screening level activities. Something like ammonia is probably underutilized currently. The biggest problems are dilution and expense. If someone sees something(staff or public), calls it in, and we can respond immediately, that is about the best we can hope for in this program. I would point to longer term programs, like Snohomish County, and an analysis of how many IDDE problems they have found, and equate that back to cost per unit, and I think it will show that this does not pencil out. We are better off doing source control inspections, which a number of Phase 2s already do.

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rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Kevin Schmidt Jurisdiction: City of University Place

IDDE Field Screening Survey

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1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☒ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Kevin Schmidt Jurisdiction: City of University Place

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Dye Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   #4 reporting, also 1, 2, 3, 5 all having similar effectiveness.

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

   physically seen or observed properties

Name: Kevin Schmidt Jurisdiction: City of University Place

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☐ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold: visual	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☐ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☐ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☐ Yes ☐ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Kevin Schmidt Jurisdiction: City of University Place

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☐ Yes ☐ No	☐ Field meter ☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   3, Hotline and catchbasin inspections

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Kristin Terpstra Jurisdiction: City of Bothell

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: Interns	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: Interns	☒ Not effective ☐ Moderately effective ☐ Highly effective

Name: Kristin Terpstra Jurisdiction: City of Bothell

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☒ Other: Grant paid staff	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

Reports from staff and citizens, as well as preventative outreach to businesses through Local Source Control Program.

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

No

Name: Kristin Terpstra Jurisdiction: City of Bothell

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Many of these we only use once an investigation is already initiated. These have stars

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH**	☐ Yes ☒ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity - visual	☒ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride**	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia**	☐ Yes ☒ No	☒ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ **surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☒ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Specific conductivity**	☐ Yes ☒ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria**	☐ Yes ☒ No	☒ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature**	☐ Yes ☒ No	☒ Field meter ☐ Thermometer	Threshold:	☒ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen**	☐ Yes ☒ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Kristin Terpstra Jurisdiction: City of Bothell

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   We trace visible signs and detectable odors upstream.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   No

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   Approximately 30 discharges, no connections. Visual observation, citizen complaints, then used testing to narrow down source of contamination.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Jeanne Dorn Jurisdiction: King County

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☒ Pipes ☒ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☒ Not effective ☐ Moderately effective ☐ Highly effective

Name: Jeanne Dorn Jurisdiction: King County

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?

   Water quality complaints and **dye testing** so far have been the most effective techniques for us to find IC/IDs. Thanks to water quality complaints by citizens, called in our Drainage and Water Quality Complaint Line, we found at least two sewer-to-storm illicit discharges related to sewer system infrastructure breakdowns such as broken sewer lines and sub-par functioning sewer lift pumps in the last two years. We found two illicit connections in White Center by conducting dye testing, following up on a study related to water quality for Hick's (Hicklin) Lake in White Center, which is on the States

Name: Jeanne Dorn Jurisdiction: King County

303(d) list. For the **outfall reconnaissance inventory** portion of our IC/IDDE work, we conducted outfall (and catch basin/manhole) inspecting with limited follow-up screening (gathering in-situ data on pH, conductivity, ammonia, and surfactants) and even more limited sampling and lab analysis throughout the urban and higher density rural subbasins of King County. Because of the huge land area these subbasins cover, our visits were restricted to mainly visual/olfactory observations of "non-stormwater, dry season" flows. We did not identify any illicit connections or discharges related to this work, possibly because our inspectors did not collect screening or analytical data as a matter of course, due to the prohibitively high expense and complication this would entail.

We have not been using any of the other techniques as of this date to actively seek illicit connections and discharges, mainly due to cost considerations.

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold: <6 or >8	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☒ Yes ☐ No	☒ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold: >5 mg/L	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☒ Surfactant test kit ☒ Laboratory analysis	Threshold: >0.25	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: >500 us/cm	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: 5000 cfu/100mL	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: Use Coliscan Easygel.	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Jeanne Dorn Jurisdiction: King County

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
12. Temperature	☒ Yes ☐ No	☒ Field meter ☐ Thermometer	Threshold: >ambient	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: <6.0 mg/L	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold: any, in dry weather	☐ Not effective ☐ Moderately effective ☐ Highly effective
19. Other: Becteriodes	☒ Yes ☐ No	☐ Field meter ☒ Laboratory analysis ☐ Other:	Threshold: see note below	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other: Sphaerolitus natans (species that grows in flowing sewage)	☒ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☒ Other: Visual	Threshold: Any, in flowing ditches	☐ Not effective ☐ Moderately effective ☒ Highly effective

King County's notes on above: The rightmost column above was not answered because there are various ways King County uses these measures in conducting IC/IDDE. Therefore the effectiveness of these measures above cannot be captured in this single survey form. As previously stated, most of our **outfall (catch basin/manhole) reconnaissance inventory** did not include field metering, field testing or lab analyses, but rather was largely visual/olfactory based. So these techniques (field metering, field testing and lab analyses) haven't been done enough to adequately critique their efficacies in finding IC/IDs. In the cases during the outfall reconnaissance inventory work where field metering, field testing and limited lab testing were done, they did not identify illicit connections or illicit discharges. This doesn't mean they weren't effective—they may have been highly effective--at identifying normal groundwater flows. In the cases where sewage line breaks were suspected (reported on our **water quality complaint line)**, fecal coliform testing ("before" and "after") was highly effective in both confirming sewage line breaks, and confirming their repairs. Where we have performed follow-up testing related to science water quality testing, fecal coliform, E. coli and Bacteriodes tests have allowed us to narrow down the search to actual and suspect human waste/animal waste sources.

Note on thresholds: E. coli is not used as a regulatory standard, so we have used various rough ballpark levels to try to figure out whether or not human waste is impacting the water in the stormwater conveyance system—both pipes and ditches. We have used the Coliscan Easygel equipment available at low cost from Micrology Labs of Goshen, Indiana (www.micrologylabs.com). Basically we've used it as a gross indicator of a huge amount or a small amount of colonies, rather than using it highly quantitatively.

Name: Jeanne Dorn Jurisdiction: King County

We determined quickly that for turbidity, our eyes were as or more sensitive than the turbidity meter, so we quickly moved to visual description rather than having to use (calibrate and keep in good repair) a turbidity meter.

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?

   The triple combination of fecal coliform, E. coli and Bacteroides. As the latter is human gut-specific, it is very useful in finding sewage discharges. The problem is this "triple test" is expensive.

   Sphaerolitus natans, which is a filamentous bacteria, can be highly useful in finding sewage discharging into ditches, as this species commonly grows in flowing sewage. As soon as the sewage source is eliminated, S. natans disappears from the flowing water.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

   See answer to Question 5 above.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?

No identified illicit connections or discharges were found or reported to King County Water Quality Compliance Unit in 2011. However, one sewage discharge was found in 2010 due to citizen complaint and subsequent fecal coliform testing (before and after it was repaired). Another sewage discharge was found in 2012 due to a citizen complaint; no testing needed to be done as the sewage odor in the ditch and the presence of Sphaerolitus natans were enough field evidence for the sewage pump station leak to be suspected and subsequently found and repaired. Two illicit connections were found in 2012 by dye testing, following up on water quality studies that weren't related to our outfall reconnaissance inventory mandated by the NPDES Phase I Municipal Stormwater Permit.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Kurt Fremont Jurisdiction: City of Tacoma

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	**Do your staff use this method?**	**Where do you use this method?**	**Who performs the work?**	**How effective do you think this method is?**
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Stream Walk or Ditch Walk	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Kurt Fremont Jurisdiction: City of Tacoma

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☒ Small drainage areas ☒ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☒ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   Smoke-testing combined with dye-testing yields about a dozen cross connections per year in Tacoma.

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

Name: Kurt Fremont Jurisdiction: City of Tacoma

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☐ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☐ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☐ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☐ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☐ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☐ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☐ Yes ☐ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
16. Odor	☐ Yes ☐ No	☐ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
17. Floatables	☐ Yes ☐ No	☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

Name: Kurt Fremont Jurisdiction: City of Tacoma

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☐ Yes ☐ No	☐ Field meter ☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   Tacoma uses its Source Control Program in combination with other functions such as maintenance inspections, sediment trap monitoring, smoke testing and business inspections/complaint response in-lieu of the IDDE field screening as suggested by the IDDE Guidance Manual.

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   When necessary to source trace particular discharges, the parameters caffeine and cholesterol have been useful for determining sanitary influence.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   Smoke and dye testing resulted in about a dozen sanitary cross connections. Source Control complaint response, business inspections and windshield surveys found hundreds of illicit discharges from activities such as car washing, dumping and poor housekeeping that were impacting the MS4.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Louise Kulzer Jurisdiction: City of Seattle

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

By completing the following survey, you will have an opportunity to provide valuable input and enhance the quality of the manual and its value to other Permit Coordinators and City/County staff. We anticipate that the survey will take approximately 10 minutes to complete. We would like to receive completed surveys by **Tuesday, July 31st** (see instructions at the bottom of this survey).

1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
2. Stream Walk or Ditch Walk	☐ Yes ☒ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☒ rban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections (Dry weather screening)	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Louise Kulzer Jurisdiction: City of Seattle

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
7. Dye Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
10. Video Inspections	☒ Yes ☐ No	☒ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☒ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   10, 7, 5, 1 provided that 5 & 1 are dry weather screening

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

Name: Louise Kulzer Jurisdiction: City of Seattle

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☒ Yes ☐ No	☒ Field meter ☐ Test strips	Threshold: >9, <5.5	☐ Not effective ☒ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☒ visual	Threshold: severity index	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☒ Laboratory analysis	Threshold: 0.6	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Ammonia	☒ Yes ☐ No	☐ Field test strips ☒ Field meter ☐ Laboratory analysis	Threshold:> 5 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
6. Potassium	☒ Yes ☐ No	☐ Field test strips ☐ Field meter ☒ Laboratory analysis	Threshold: >5 mg/L	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☒ Yes ☐ No	☒ Surfactant test kit ☐ Laboratory analysis	Threshold: >1 mg/L	☐ Not effective ☒ Moderately effective ☐ Highly effective
8. Specific conductivity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold: >700 uS/cm	☐ Not effective ☒ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: >5,000 cfu/100mL	☐ Not effective ☐ Moderately effective ☒ Highly effective
11. *E. coli* bacteria	☒ Yes ☐ No	☒ Laboratory analysis	Threshold: NYD, doing parallel comparison with fecals this year	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☒ Yes ☐ No	☒ Field meter ☐ Thermometer	Threshold: >80 F	☐ Not effective ☒ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: severity index 3	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold: severity index 3	☐ Not effective ☐ Moderately effective ☒ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold: severity index 3	☐ Not effective ☐ Moderately effective ☒ Highly effective

Name: Louise Kulzer Jurisdiction: City of Seattle

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☐ Yes ☐ No	☐ Field meter ☐ Visual observations ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   Fecals, floatables & visual obs, odor, all others moderately effective. We dropped DO as in our system values were almost always low, indicative of groundwater

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.
   Sometimes diurnal flow patterns in continuous flow data have helped us find sewage diversions in our system.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections? Dry weather screening + cctv & dye testing: found 8 illicit connections affecting 17 households

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

Name: Chris Gustafson Jurisdiction: WSDOT

IDDE Field Screening Survey

King County, the Washington Stormwater Center, and Herrera Environmental Consultants have received a Grant of Regional or Statewide Significance (GROSS grant) from the Department of Ecology to develop an Illicit Discharge Detection and Elimination (IDDE) Field Screening Manual for the State of Washington. The Manual is being designed specifically for use by NPDES Permit Coordinators and field staff. The data gathering process includes a survey of Phase I and II jurisdictions to determine which IDDE field screening methodologies are the most effective, what innovative techniques are currently being used in the state, and which methodologies should be included in the IDDE Field Screening Manual.

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1. Which of the following field screening methods do you currently use for IDDE (continued on page 2)?

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
1. Outfall Inspections	☒ Yes ☐ No	☒ Urban areas ☒ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☒ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☒ Highly effective
2. Stream Walk or Ditch Walk	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☒ Pipes ☒ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Windshield Survey of Drainage Area	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. IDDE Hotline / Staff or Citizen Complaint	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective
5. Manhole/Catch Basin Inspections	☒ Yes ☐ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Chris Gustafson Jurisdiction: WSDOT

Field screening method	Do your staff use this method?	Where do you use this method?	Who performs the work?	How effective do you think this method is?
6. Business Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Dye Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Septic System Investigations	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Smoke Testing	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Video Inspections	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. Infrared Imagery, Thermography, or Aerial Photography	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Other:	☐ Yes ☒ No	☐ Urban areas ☐ Rural areas ☐ Pipes ☐ Ditches ☐ Small drainage areas ☐ Large drainage areas	☐ Internal staff ☐ Contract with other City or County ☐ Contractor ☐ Consultant ☐ Other:	☐ Not effective ☐ Moderately effective ☐ Highly effective

2. Which field screening method(s) above (methods 1 – 12) do you think are the most effective for finding illicit discharges and connections?
   Ditch walking allows us to see the most ground and spot the most IDDEs and incoming connections

3. Are there any methods not listed above that you have found to be effective? If so, please provide additional detail below.

Name: Chris Gustafson Jurisdiction: WSDOT

4. What indicators and methods do you use for IDDE field screening (continued on page 3)?

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
1. pH	☐ Yes ☒ No	☐ Field meter ☐ Test strips	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
2. Turbidity	☒ Yes ☐ No	☒ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
3. Chlorine	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
4. Fluoride	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
5. Ammonia	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
6. Potassium	☐ Yes ☒ No	☐ Field test strips ☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
7. Detergents/ surfactants	☐ Yes ☒ No	☐ Surfactant test kit ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
8. Specific conductivity	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
9. Optical brighteners	☐ Yes ☒ No	☐ Optical brightener monitoring trap ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
10. Fecal coliform bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
11. *E. coli* bacteria	☐ Yes ☒ No	☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
12. Temperature	☐ Yes ☒ No	☐ Field meter ☐ Thermometer	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
13. Hardness	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
14. Dissolved oxygen	☐ Yes ☒ No	☐ Field meter ☐ Laboratory analysis	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
15. Color	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
16. Odor	☒ Yes ☐ No	☒ Olfactory observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
17. Floatables	☒ Yes ☐ No	☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective

Name: Chris Gustafson Jurisdiction: WSDOT

Indicator	Is this indicator used in your jurisdiction?	What method do you use for field or lab testing?	What is your established threshold for investigation?	How effective do you think this indicator is?
18. Flow	☒ Yes ☐ No	☐ Field meter ☒ Visual observations ☐ Other:	Threshold:	☐ Not effective ☒ Moderately effective ☐ Highly effective
19. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective
20. Other:	☐ Yes ☐ No	☐ Field meter ☐ Laboratory analysis ☐ Other:	Threshold:	☐ Not effective ☐ Moderately effective ☐ Highly effective

5. Which indicator(s) listed above do you think are the most effective for finding illicit discharges and connections?
   WSDOT does not test or do screening, we only use visual indicators

6. Are there any indicators not listed above that you have found to be effective? If so, please provide additional detail below.

7. How many illicit discharges and illicit connections did you find in 2011? Which methods and indicators did you use to find these illicit discharges and illicit connections?
   67, visual indicators used by WSDOT people performing routine work.

Completed surveys should be submitted via email by **Tuesday, July 31st** to stormwater@herrerainc.com

Any questions can be directed towards Rebecca Dugopolski
rdugopolski@herrerainc.com or 206-787-8261 (direct office line)

Thank you for your participation and support of this project!

APPENDIX B

IDDE Field Screening Literature Review

Table B-1. Illicit Discharge Field Screening Methods Resource Matrix.

Reference Information						Field Screening Method													
Reference Number	Jurisdiction	Reference Title	Prepared by	Year	Reference Type	Outfall Inspections	Stream or Ditch Walk	Windshield Survey	IDDE Hotline/Staff or Citizen Complaints	Manhole/ Catch Basin Inspections	Business Inspections	Dye Testing	Septic System Investigations	Smoke Testing	Video Inspections	Infrared Imagery, Thermography, or Aerial Photography	Optical Brightener	Sand Bagging	Automated or Intensive Sampling
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	Center for Watershed Protection (Edward Brown, Deb Caraco, Robert Pitt)	2004	Manual	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2	Galveston County, TX	A Guidance Manual for Identifying and Eliminating Illicit Connections to Municipal Separate Storm Sewer Systems (MS4)	Galveston County Health District Pollution Control Division	2002	Manual	●	●					●			●		●		
3	Wayne County, MI	Summary of Illicit Connection Detection Programs in Michigan	The Rouge River Project (Christine Pomeroy, Kelly Cave, Dean Tuomari)	1996	Program Review							●							
4	Wayne County, MI	Illicit Connection Control Program: Field Inspection Procedures	The Rouge River Project	1995	Standard Operating Procedure						●	●							●
5	Wayne County, MI	Comparison Analysis of Alternatives for Finding Illicit Discharges to Storm Water Systems	The Rouge River Project & Alliance of Rouge Communities	2007	Program Review	●		●	●			●	●						
6	Wayne County, MI	"Sherlocks of Stormwater" Effective Investigation Techniques for Illicit Connection and Discharge Detection	Dean C. Tuomari, Susan Thompson, Wayne County Department of Environment Watershed Management Division	NA	Program Review	●						●			●				
7	Wayne County, MI	Guidelines for Conducting an Outfall Inventory	Rouge River Project (Robert Cignac, Ashraf Ibrahim)	1997	Technical Memorandum	●													
8	Missouri	Detecting Illicit StormWater Discharges-Fact Sheet Series	Missouri Department of Natural Resources	2007	Fact Sheet							●		●					
9	Kitsap County, WA	Illicit Discharge Detection and Elimination Program Summary Report 2000-2010: A Comparison of Outfall Screening, Reporting, and Inspection Programs	Kitsap County Department of Public Works Surface and Stormwater Management Program (Mindy Fohn, Stan Olsen, Mauro Heine)	2011	Program Review	●	●		●				●						
10	Seattle, WA	IDDE Dry Weather Screening Procedure	Seattle Public Utilities	2010	Standard Operating Procedure	●	●			●	●	●		●	●				
11	City of Auburn	City of Auburn Standard Operating Procedure: Locating Priority Areas	NA	NA	Standard Operating Procedure				●										
12	Lake County, IL	Isolating and Fixing Illicit Discharges	Lake County Stormwater Management, Center for Watershed Protection, Deb Caraco	2012	Program Review	●		●	●			●	●	●	●	●		●	●
13	Lake County, IL	Stormwater Management Program Plan	Lake County Stormwater Management Commission	2009	Manual	●			●	●		●		●	●			●	
14	Lower Charles River, MA	Lower Charles River Illicit Discharge Detection & Elimination (IDDE) Protocol	NA	2004	Standard Operating Procedure	●				●		●							
15	Snohomish County, WA	Dry Weather Outfall Screening Manual	Snohomish County Public Works Surface Water Management Division, Jennifer Oden	2010	Manual	●													
16	Ohio	Illicit Discharge Detection and Elimination Manual	The Cuyahoga County Board of Health Watershed Protection, Harry Stark	2006	Manual	●			●	●		●		●	●		●		●
17	New England	Illicit Discharge Detection and Elimination Manual	New England Interstate Water Pollution Control Commission	2003	Manual	●				●				●	●	●		●	
18	Minnesota	Homeowner Survey-Onsite Septic System	University of Minnesota	2009	Form								●						
19	New Hampshire	Anonymous Septic System Survey (Example)	New Hampshire	NA	Form								●						

Table B-1. Illicit Discharge Field Screening Methods Resource Matrix.

Reference Information						Field Screening Method													
Reference Number	Jurisdiction	Reference Title	Prepared by	Year	Reference Type	Outfall Inspections	Stream or Ditch Walk	Windshield Survey	IDDE Hotline/Staff or Citizen Complaints	Manhole/ Catch Basin Inspections	Business Inspections	Dye Testing	Septic System Investigations	Smoke Testing	Video Inspections	Infrared Imagery, Thermography, or Aerial Photography	Optical Brightener	Sand Bagging	Automated or Intensive Sampling
20	NA	Methods for Detection of Inappropriate Discharges to Storm Drainage Systems	Robert Pitt	2001	Study	●													
21	New Hampshire	Illicit Discharge Detection and Elimination and Pollution Prevention/ Good Housekeeping Guidelines and Standard Operating Procedures	Edwards and Kelcey	2006	Manual	●			●	●		●	●	●	●		●	●	
22	North Central Texas	Illicit Discharge Detection & Elimination (IDDE) Field Investigation Guide	NA	2011	Manual	●						●		●	●		●	●	●
23	Town of Parker, CO	Illicit Discharge Detection and Elimination (IDDE) Manual	Town of Parker Department of Public Works	2004	Manual	●			●	●		●		●	●	●			
24	King County, WA	King County Illicit Connection/Illicit Discharge Detection and Elimination (IC/IDDE) Field Screening, Sampling and Analysis Program Sampling and Analysis Plan	King County Department of Natural Resources and Parks, Water and Land Resources Division, Stormwater Services Section	2011	Sampling and Analysis Plan	●				●									
25	King County, WA	King County Dry Weather Outfall Reconnaissance Inventory (ORI) Standard Operating Procedures (SOP)	King County Department of Natural Resources and Parks, Water and Land Resources Division, Stormwater Services Section	2011	Standard Operating Procedure	●				●									

NA= not available

Table B-2. Outfall Inspections.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	ORI used to help guide future outfall monitoring and discharge prevention efforts	NG	Applies to all outfalls encountered during stream walk, except: drop inlets from roads to culverts, cross drainage culverts in transportation ROW, weep holes, flexible HDPE pipes as slope drains, obvious roof downspouts. Adaptations include: open channels, submerged/ tidally influenced outfalls, cold climates, use of biological indicators	■ Odor ■ Flow ■ Color ■ Turbidity ■ Floatables ■ Temperature ■ pH ■ Ammonia ■ Vegetation ■ Stains or deposits ■ Sewage fungus ■ Scum, film, foam	■ Waders ■ Measuring tape ■ Watch ■ Camera ■ GPS unit ■ Surgical gloves ■ Cell phone
2	Galveston County, TX	A Guidance Manual for Identifying and Eliminating Illicit Connections to Municipal Separate Storm Sewer Systems (MS4)	NG	NG	Part of the initial dry weather flow survey. Important to document physical characteristics of dry weather flows and collect lab samples if needed.	■ Flow ■ Color ■ Odor ■ Turbidity ■ Temperature ■ Vegetation ■ Stains or deposits ■ Sewage fungus ■ Scum, film, foam ■ Debris	NG
5	Wayne County, MI	Comparison Analysis of Alternatives for Finding Illicit Discharges to Storm Water Systems	Can occur in conjunction with other activities and observations such as periodic structural assessment of the outfalls and identification of streambank erosion.	Not effective in identifying and eliminating discharges in large urban areas with numerous outfalls. Expensive, safety issues.	Smaller communities with enclosed storm sewers and fewer points of discharge, rural areas or areas served by septic systems and open waterways	NG	NG
6	Wayne County, MI	"Sherlocks of Stormwater" Effective Investigation Techniques for Illicit Connection and Discharge Detection	NG	NG	Used to define investigation area, suspicious observations can trigger an investigation	NG	NG
7	Wayne County, MI	Guidelines for Conducting an Outfall Inventory	Useful to identify the quantity and location of outfalls within communities	Does not identify the source of outfall	NG	NG	■ 2 way radios ■ Camera ■ Conductivity, temperature, pH meter ■ Clipboards ■ Compasses ■ Tape measure ■ Spray paint ■ Backpacks ■ Chest waders ■ GPS survey forms ■ Field observation worksheets ■ Water quality alert checklists ■ Sledge hammer ■ Pocket knife ■ Orange vests ■ Rain ponchos ■ GPS ■ First aid kit ■ Maps ■ Machete ■ Batteries ■ Battery chargers ■ Bug repellent

Table B-2. Outfall Inspections.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
9	Kitsap County, WA	Illicit Discharge Detection and Elimination Program	Detects obvious illicit discharges	NG	NG	■ Flow ■ Fecal Coliform ■ E. Coli ■ Chemical sample results	NG
10	Seattle, WA	IDDE Dry Weather Screening Procedure	NG	NG	The general approach to field screening is to begin at an accessible location at or near the discharge point of a drainage basin, such as an outfall. Field screening is performed at multiple key locations in most drainage basins instead of relying on elevated concentrations to be found only at the downstream discharge point. The size of the drainage basin is used to determine the number of locations screened.	■ pH ■ Conductivity ■ Turbidity ■ Temperature ■ Odor ■ Color ■ Floatables ■ Surfactants ■ Ammonia ■ Dissolved oxygen ■ Flow ■ Fecal coliform bacteria ■ Fluoride ■ Potassium	NG
12	Lake County, IL	Isolating and Fixing Illicit Discharges	NG	NG	NG	NG	NG
13	Lake County, IL	Stormwater Management Program Plan	NG	NG	Outfall inspection procedure: prescreening (summer or late fall), inspection setup, inspection, assessment and documentation, daily closeout. Outfall inspection is required for outfalls with dry weather flow, submerged outlets.	NG	■ All field analysis tests (pH test strips, chlorine test strips, etc.) ■ Sampling equipment (extended sampler, 250mL and 500mL glass sample containers, labels, cooler with ice ■ Outfall screening data forms (at least 10) ■ Outfall sampling report ■ Clipboard ■ Pens ■ Resident form letters ■ Training manual ■ Storm sewer atlas ■ Camera ■ Flashlight ■ Manhole hook ■ Tape measure ■ Folding rule ■ Brush clearing tool ■ Plastic trash bags ■ Paper towels ■ Safety equipment (traffic cones, flags, light sticks, traffic safety vest, first aid kit, steel toed boots, work gloves, safety glasses, rubber boots, gloves, ID badge) ■ Insect repellent ■ Sunscreen
14	Lower Charles River,	Lower Charles River Illicit Discharge Detection & Elimination (IDDE) Protocol	NG	NG	NG	NG	NG

Table B-2. Outfall Inspections.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
15	Snohomish County, WA	Dry Weather Outfall Screening Manual	NG	NG	NG	■ Dry weather flow ■ Floatables ■ Foam ■ Oil sheen ■ Sewage and sanitary trash ■ Iron and sulfur bacteria ■ Algae ■ Color ■ Staining ■ Odor ■ Abnormal vegetation ■ Solid waste ■ Structural damage	■ Field notebook ■ Cell phone w/ charger ■ Sharpies/pencils/pens ■ Camera w/ batteries ■ Compass ■ Trimble GPS unit ■ White board w/ markers ■ Hydrolab ■ Hach 2100 Turbidimeter ■ Smart 2 Colorimeter ■ Kim-wipes ■ Steel toed boots or hip boots ■ High visibility vest ■ Safety gear ■ Food and water ■ IDDE toolbox (machete, hammer, screw driver, tape measure, hand shears, duct tape, zip ties, bungee cords) ■ CB puller ■ Extension sampling pole ■ Sample bottles ■ Coolers ■ Ice ■ 60mL syringes ■ 5-gallon bucket ■ Storage bags ■ Garbage bags
16	Ohio	Illicit Discharge Detection and Elimination Manual	NG	NG	Best during low flows or in dry weather. If not possible to conduct inspection in dry weather, perform field survey whenever possible and then follow up with dry weather inspections and sampling at a later date. Once outfalls have been identified and mapped, the dry weather inspection and sampling will be easier.	NG	■ Paper maps ■ Field/survey sheets ■ Camera ■ GPS unit ■ Clip board ■ Pens ■ Tape measure ■ Waders (either chest or hip) ■ Waterproof flashlight ■ First aid kit ■ Cell phone or radio ■ Cones ■ Safety vest
17	New England	Illicit Discharge Detection and Elimination Manual	NG	NG	Used to map storm system. Prioritize older areas of the community before newer areas (more likely to have illicit discharge)	NG	NG
20	NA	Methods for Detection of Inappropriate Discharges to Storm Drainage Systems	NG	NG	NG	■ Color ■ Turbidity ■ Oil sheen ■ Floatables ■ Course solids ■ Fluorides ■ Potassium ■ Ammonia ■ Surfactants	NG

Table B-2. Outfall Inspections.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
21	New Hampshire	Illicit Discharge Detection and Elimination and Pollution Prevention/ Good Housekeeping Guidelines and Standard Operating Procedures	NG	NG	Use dry weather outfall inspection form during mapping or initial inspections to detect continuous and intermittent discharges. Should be completed whenever evidence of an illicit discharge is observed. Also use dry weather inspection form during long-term dry weather inspections. these forms can be recorded electronically (larger communities) or paper forms can be kept (smaller communities). Use Incident Tracking Form when an illicit discharge is observed during an informal or non-routine inspection.	■ Odor ■ Color ■ Floatables ■ Solids ■ Turbidity ■ Oil sheen	■ Existing paper maps ■ Field sheets ■ Camera ■ GPS unit ■ Spray paint (or other marker) ■ Cell phones or hand held radios ■ Clip boards and pencils ■ First aid kit ■ Flashlight or head lamp ■ Surgical gloves ■ Tape measure/collapsible yard stick ■ Temperature probe ■ Waders ■ Watch with a second hand ■ Five 1-L sample bottles ■ Dry erase board (for photos) ■ Hand sanitizer ■ Sampling pole ■ Mirror (for light) ■ Safety vests
22	North Central Texas	Illicit Discharge Detection & Elimination (IDDE) Field Investigation Guide	Physical condition of outfall can provide clues as to history of discharges passing through it	NG	NG	■ Deposits ■ Stains	NG
23	Town of Parker, CO	Illicit Discharge and Detection Elimination (IDDE) Manual	NG	NG	Investigate commercial/ industrial areas, older areas, areas where illegal dumping has been reported	■ Odor ■ Color ■ Turbidity ■ Floatable matter ■ Deposits and stains ■ Vegetation ■ Structural damage	Field inspection form
24	King County, WA	Illicit Connection/Illicit Discharge Detection and Elimination (IC/IDDE) Field Screening, Sampling and Analysis Program Sampling and Analysis Plan	NG	NG	Lists specific field and laboratory indicators for different land use types (agricultural, commercial, and residential).	■ pH ■ Temperature ■ Conductivity ■ Dissolved oxygen ■ Alkalinity ■ Ammonia ■ Chlorine ■ Fluoride ■ Hardness ■ Surfactants ■ Fecal coliform bacteria ■ Total phosphorus ■ Potassium ■ TKN ■ Nitrate + nitrite ■ TPH ■ Total lead and zinc ■ SVOCs	■ Calibrated Hydrolab Multisonde ■ Hach Test Strips (ammonia single test strips and “5-in 1” strips) ■ CHEMetrics MBAS surfactant test ampoules ■ Nitrile gloves ■ Sample coolers ■ Ice ■ Tap water for preliminarily rinsing equipment ■ Distilled water for decontamination and equipment blank ■ Stainless steel sampling buckets for obtaining screening samples ■ Clean/sterile sample bottles and labels ■ Thomas Guide and reference mapbooks ■ Sample Sheets ■ Water Quality Sampling Data Sheets (field forms) ■ Pens, pencils ■ Personal protective equipment (orange vest, safety glasses, rain gear, boots, gloves) ■ Digital camera ■ Cell phone ■ Tape measure ■ First aid kit for cuts and scratches ■ Miscellaneous equipment (safety, other)

Table B-2. Outfall Inspections.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
25	King County, WA	King County Dry Weather Outfall Reconnaissance Inventory (ORI) Standard Operating Procedures (SOP)	NG	NG	NG	■ Odor ■ Flow ■ Color ■ Turbidity ■ Floatables ■ Temperature ■ pH ■ Ammonia ■ Vegetation ■ Stains or deposits ■ Sewage fungus ■ Scum, film, foam	■ Laptop computer ■ Digital and paper versions of the ORI Field Forms ■ Key to Paper Field Form ■ Rite-in-the-Rain level notebook ■ Digital camera ■ Dry erase board and markers ■ Field mapbook ■ Cell phone with contact numbers ■ Flashlight ■ Personal protective equipment ■ Measuring tape ■ Dip cup/clear bottle on stick ■ Clear sample bottles ■ Nitrile surgical-type gloves ■ Heavy gloves ■ Alcohol hand cleaner ■ Paper towels ■ Machete

NG = no guidance
ORI= outfall reconnaissance inventory
GPS= global positioning station
ROW = right-of-way
HDPE= high-density polyethylene
TKN = total Kjeldahl nitrogen
TPH = total petroleum hydrocarbons
SVOCs = semi volatile organic compounds

Table B-3. Stream Walk or Ditch Walk.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	NG	NG	Needed for ORI	NG	NG
2	Galveston County, TX	A Guidance Manual for Identifying and Eliminating Illicit Connections to Municipal Separate Storm Sewer Systems (MS4)	NG	NG	After maps of area are complete, investigators should walk, drive, or float each waterway to identify any outfalls with flow	NG	NG
9	Kitsap County, WA	Illicit Discharge Detection and Elimination Program	NG	NG	Walk shorelines to locate and map marine outfalls. Walks not performed for stream outfalls.	NG	NG
10	Seattle, WA	IDDE Dry Weather Screening Procedure	NG	NG	Use once discharge source has been located or isolated to a smaller section of drainage system	NG	NG

NG = no guidance

ORI = Outfall Reconnaissance Inventory

Table B-4. Windshield Survey of Drainage Area.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	NG	NG	Small drainage areas, field crew is familiar business operations. Match pollutant with business operations	■ Fuel ■ Algae ■ Wash water	Vehicle
5	Wayne County, MI	Comparison Analysis of Alternatives for Finding Illicit Discharges to Storm Water Systems	NG	NG	Small drainage areas, field crew is familiar with business operations. Match pollutant with business operations.	NG	NG
12	Lake County, IL	Isolating and Fixing Illicit Discharges	NG	NG	Effective if illicit discharge has unique characteristics that allow the crew to quick determine the probably cause	NG	NG

NG = no guidance

Table B-5. IDDE Hotline/Staff or Citizen Complaint.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	Leads to early detection and correction, public stewardship, increases facilities sense of responsibility, increases chance of identifying intermittent or transitory discharges	Time and money to provide 24/7 service, marketing hotline number, establishing inter and intra-departmental process	Successful IDDE Hotline (see Table 24, page 71)	NG	NG
5	Wayne County, MI	Comparison Analysis of Alternatives for Finding Illicit Discharges to Storm Water Systems	Useful in identifying source of intermittent or transient illicit discharges. Most cost effective method of identifying illicit discharges. Engages the public, low cost.	NG	Use in large urban areas	NG	NG
9	Kitsap County, WA	Illicit Discharge Detection and Elimination Program	NG	NG	Used for non-emergency spills by County departments, agencies, citizens	Most reported: Vehicle fluids	NG
10	City of Auburn	City of Auburn Standard Operating Procedure: Locating Priority Areas	NG	NG	NG	NG	NG
12	Lake County, IL	Isolating and Fixing Illicit Discharges	Useful for intermittent or transitory discharges, follow up within 24 hours	NG	Transitory or intermittent discharges	NG	NG
13	Lake County, IL	Stormwater Management Program Plan	NG	NG	NG	NG	NG
16	Ohio	Illicit Discharge Detection and Elimination Manual	NG	NG	Transitory or intermittent discharges		
21	New Hampshire	Illicit Discharge Detection and Elimination and Pollution Prevention/ Good Housekeeping Guidelines and Standard Operating Procedures	Can help identify transitory or intermittent discharges	NG	Illicit Discharge Hotline Incident Tracking Sheet. Possible online forum on stormwater page for communities with active websites.	NG	NG
23	Town of Parker, CO	Illicit Discharge and Detection Elimination (IDDE) Manual	NG	NG	NG	NG	NG

NG = no guidance

Table B-6. Manhole/Catch Basin Inspections.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	NG	Safety considerations: potential for back or foot injury, toxic or flammable pollutants	Needed for visual observations or indicator sampling. Visual observations most effective for obvious illicit discharges, indicator sampling used when dry weather flow is observed in storm drain	■ Flow ■ Odor ■ Color ■ Stains/ deposits ■ Floatables ■ Ammonia	■ 2 crew members ■ Camera ■ Clipboards ■ Field sheets ■ Field vehicle ■ First aid kit ■ Flashlight ■ Gas monitor ■ Manhole hook ■ Mirror ■ Maps (storm drain, stream, street) ■ Reflective safety vest ■ Gloves ■ Sledgehammer ■ Spray paint ■ Tape measures ■ Traffic cones ■ Radios ■ Waterproof pen ■ GPS
10	Seattle, WA	IDDE Dry Weather Screening Procedure	NG	NG	The general approach to field screening is to begin at an accessible location at or near the discharge point of a drainage basin, such as a key maintenance hole. Key upstream maintenance holes representing major branches of the conveyance system are screened in larger basins in order to decrease the size of the area screened by an individual sample.	■ pH ■ Conductivity ■ Turbidity ■ Temperature ■ Odor ■ Color ■ Floatables ■ Surfactants ■ Ammonia ■ Dissolved oxygen ■ Flow ■ Fecal coliform bacteria ■ Fluoride ■ Potassium	NG
13	Lake County, IL	Stormwater Management Program Plan	NG	NG	Used after mapping evaluation to pinpoint the exact location of the discharge (location of dry weather flow)	NG	NG
14	Lower Charles River, MA	Lower Charles River Illicit Discharge Detection & Elimination (IDDE) Protocol	NG	NG	Begin at uppermost junction after 48 hours of dry weather	Flow	NG
16	Ohio	Illicit Discharge Detection and Elimination Manual	NG	NG	Conduct man hole/ MS4 inspection once dry weather flow has been observed at a MS4 outfall location.	■ Flow ■ Odor ■ Color ■ Stains/ deposits ■ Oil sheen, scum, foam	NG

Table B-6. Manhole/Catch Basin Inspections.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
17	New England	Illicit Discharge Detection and Elimination Manual	NG	NG	Follow flow upstream. Use after priority locations have been identified. Survey during dry weather flow. Combine with outfall inspections and/or sampling.	NG	NG
21	New Hampshire	Illicit Discharge Detection and Elimination and Pollution Prevention/ Good Housekeeping Guidelines and Standard Operating Procedures	Cost efficient method of tracing.	NG	Used when no suspected source site.	■ Color ■ Stains or deposits ■ Oil sheen	NG
23	Town of Parker, CO	Illicit Discharge Detection and Elimination (IDDE) Manual	NG	Time consuming	Use to trace dry-weather flows upstream to bracket the location of the source	NG	NG
24	King County, WA	Illicit Connection/Illicit Discharge Detection and Elimination (IC/IDDE) Field Screening, Sampling and Analysis Program Sampling and Analysis Plan	NG	NG	Lists specific field and laboratory indicators for different land use types (agricultural, commercial, and residential).	■ pH ■ Temperature ■ Conductivity ■ Dissolved oxygen ■ Alkalinity ■ Ammonia ■ Chlorine ■ Hardness ■ Surfactants ■ Fecal coliform bacteria ■ Total phosphorus ■ Potassium ■ TKN ■ Nitrate + nitrite ■ TPH ■ Total lead and zinc ■ SVOCs	■ Calibrated Hydrolab Multisonde ■ Hach Test Strips (ammonia single test strips and “5-in 1” strips) ■ CHEMetrics MBAS surfactant test ampoules ■ Nitrile gloves ■ Sample coolers ■ Ice ■ Tap water for preliminarily rinsing equipment ■ Distilled water for decontamination and equipment blank ■ Stainless steel sampling buckets for obtaining screening samples ■ Clean/sterile sample bottles and labels ■ Thomas Guide and reference mapbooks ■ Sample Sheets ■ Water Quality Sampling Data Sheets (field forms) ■ Pens, pencils ■ Personal protective equipment (orange vest, safety glasses, rain gear, boots, gloves) ■ Digital camera ■ Cell phone ■ Tape measure ■ First aid kit for cuts and scratches ■ Miscellaneous equipment (safety, other)

Table B-6. Manhole/Catch Basin Inspections.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
25	King County, WA	King County Dry Weather Outfall Reconnaissance Inventory (ORI) Standard Operating Procedures (SOP)	NG	NG	NG	■ Odor ■ Flow ■ Color ■ Turbidity ■ Floatables ■ Temperature ■ pH ■ Ammonia ■ Vegetation ■ Stains or deposits ■ Sewage fungus ■ Scum, film, foam	■ Laptop computer ■ Digital and paper versions of the ORI Field Forms ■ Key to Paper Field Form ■ Rite-in-the-Rain level notebook ■ Digital camera ■ Dry erase board and markers ■ Field mapbook ■ Cell phone with contact numbers ■ Flashlight ■ Personal protective equipment ■ Measuring tape ■ Dip cup/clear bottle on stick ■ Clear sample bottles ■ Nitrile surgical-type gloves ■ Heavy gloves ■ Alcohol hand cleaner ■ Paper towels ■ Machete

NG = no guidance
GPS= global positioning station
TKN = total Kjeldahl nitrogen
TPH = total petroleum hydrocarbons
SVOCs = semi volatile organic compounds

Table B-7. Business Inspections.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	NG	NG	NG	NG	NG
4	Wayne County, MI	Illicit Connection Control Program: Field Inspection Procedures	NG	NG	Inspect grounds and small businesses for contamination, improper storage or handling or hazardous and polluting materials.	NG	NG
10	Seattle, WA	IDDE Dry Weather Screening Procedure	NG	NG	Use once discharge source has been located or isolated to a smaller section of drainage system	NG	NG

NG = no guidance

Table B-8. Dye Testing.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment	Additional Forms
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	NG	May be difficult to gain access to some properties. Letter needed to document legal authority to enter industrial or commercial property. Communication with residential property owners may be challenging.	Drainage area less than 10 properties (very small), discharge caused by connection from individual property, commercial/ industrial land use	NG	■ 2 staff ■ Radios ■ Dye ■ High powered lamps or flashlights ■ Water hoses ■ Camera ■ Additional equipment needed to open manhole	NG
2	Galveston County, TX	A Guidance Manual for Identifying and Eliminating Illicit Connections to Municipal Separate Storm Sewer Systems (MS4)	Dye is water soluble, biodegradable, stable, low toxicity, highly used, inexpensive, highly detectable, can narrow down pollution source area to a street block or building	Time consuming, may require check backs	Residential property or commercial property	NG	■ 1 to 2 staff ■ Florescent dyes ■ Rubber gloves ■ Manhole hook or pick ax ■ Camera ■ High powered flashlight ■ Two-way radios ■ Charcoal packets	NG
3	Wayne County, MI	Summary of Illicit Connection Detection Programs in Michigan	Specifically locates illegal connection , used to identify pollutant source	Expensive	Should be used after drainage service area has been prioritized based on acreage, land use, water quality information, businesses present. Used in Wayne County for commercial, industrial and institutional facilities	NG	NG	NG
4	Wayne County, MI	Illicit Connection Control Program: Field Inspection Procedures	NG	NG	NG	NG	■ 2 staff ■ Dye (two colors) ■ High powered lamps/flashlights ■ Manhole hook and crow bars ■ Site plans ■ Building diagrams ■ Local sewer maps ■ Standard operating procedure ■ Site visit forms, ■ Log books ■ Name of contact at the facility ■ Camera ■ Safety equipment (hard hats, eye protection, gloves, safety vests, steel toes boots, traffic control equipment, protective clothing, gas monitor) ■ 2-way radio, phone numbers	■ Dye testing standard procedure ■ Manhole cover removal procedure ■ Dye testing information sheet
5	Wayne County, MI	Comparison analysis of Alternatives for Finding Illicit Discharges to Storm Water Systems	Less health and safety precautions than ORI	Locating manholes after snowfall may be difficult, need to cooperate with facility owners, safety issues, if flow in sewer is too high or too low observing dye can be difficult or slow	Select area to dye test by using broader watershed or stream assessments	NG	NG	NG
6	Wayne County, MI	"Shelocks of Stormwater" Effective Investigation Techniques for Illicit Connection and Discharge Detection	Inexpensive, easy to implement, points to specific source, does not require confined space entry	May be difficult to see dye in high flow or turbid conditions, time consuming in low flows, requires facility entry permission	Use to determine if illicit connection exists in a facility or between sewer systems	NG	NG	NG
8	Missouri	Detecting Illicit StormWater Discharges-Fact Sheet Series	NG	NG	Detects leaks throughout piped portion of sewer and storm drainage systems	NG	NG	NG
10	Seattle	IDDE Dry Weather Screening Procedure	NG	NG	Use once discharge source has been located or isolated to a smaller section of drainage system	NG	NG	NG
12	Lake County, IL	Isolating and Fixing Illicit Discharges	NG	NG	Small drainage area (<10 properties), source from individual property, commercial or industrial land use	NG	NG	NG
13	Lake County, IL	Stormwater Management Program Plan	NG	NG	Tracing method, used after manhole inspection has identified reach area	NG	NG	NG

Table B-8. Dye Testing.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment	Additional Forms
14	Lower Charles River, MA	Lower Charles River Illicit Discharge Detection & Elimination (IDDE) Protocol	NG	NG	Part of more detailed investigation. Used after field monitoring has identified storm segments influenced by sanitary wastewater.	NG	NG	NG
16	Ohio	Illicit Discharge Detection and Elimination Manual	NG	NG	Use once the area of the potential discharge has been located. Used to determine the exact location of illicit discharge. Effective in determining direct connections to sanitary sewer lines to storm drain.	NG	NG	NG
21	New Hampshire	Illicit Discharge Detection and Elimination and Pollution Prevention/ Good Housekeeping Guidelines and Standard Operating Procedures	NG	Permission to access a site must be obtained.	Effective for confirming direct connections into the storm drain system for short reaches. For longer pipe networks, use charcoal packets in selected structures and later analyze for the presence of dye. Use when a potential source site has been identified to determine whether the site has floor drains or other locations that connect to the storm drain system.	NG	NG	NG
22	North Central Texas	Illicit Discharge Detection & Elimination (IDDE) Field Investigation Guide	NG	Difficult to gain access to properties, may require prior notice	Very small drainage area (less than 10 properties); Discharge probably caused by individual connection; commercial or industrial landuse	NG	NG	NG
23	Town of Parker, CO	Illicit Discharge Detection and Elimination (IDDE) Manual	Quick (about 30 minutes per test), effective, cheap	NG	Used once the likely source of an illicit discharge has been narrowed down to a few specific houses or businesses	NG	2 or more staff	NG

NG = no guidance

Table B-9. Septic System Investigations.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	NG	NG	Rural or low density watersheds. Three types: Homeowner survey, surface condition analysis, and detailed system inspection (which may include Infrared Imagery, Thermography, or Aerial Photography)	NG	NG (see Infrared Imagery, Thermography, or Aerial Photography)
5	Wayne County, MI	Comparison analysis of Alternatives for Finding Illicit Discharges to Storm Water Systems	Low cost	NG	Large urban areas	*E. coli*	NG
9	Kitsap County, WA	Illicit Discharge Detection and Elimination Program	NG	NG	NG	NG	NG
12	Lake County, IL	Isolating and Fixing Illicit Discharges	NG	NG	Rural or low-density residential neighborhoods. Includes three types of investigations: Homeowner survey, surface conditions analysis, detailed system inspection	NG	NG
18	Minnesota	Homeowner Survey-Onsite Septic System	NG	NG	NG	NG	NG
19	New Hampshire	Anonymous Septic System Survey (Example)	NG	NG	Helps to understand the state of septic systems in the watershed	■ Odor ■ Surface discharge ■ Clogging	NG
21	New Hampshire	Illicit Discharge Detection and Elimination and Pollution Prevention/ Good Housekeeping Guidelines and Standard Operating Procedures	NG	NG	Older rural or low density areas that are prone to failed septic systems or areas surrounding populated lakes (especially susceptible to adverse effects of a failed septic system).	■ Wet areas on ground ■ Odor	NG

NG = no guidance

Table B-10. Smoke Testing.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	Finds improper connections or damage to the storm drain system	Must notify public 2 weeks prior to smoke testing	Most effective when discharge is confined to the upper reaches of the storm drain network, pipe diameters are too small for video testing and property access is not granted for dye testing	NG	■ Manhole safety equipment ■ Smoke source (smoke "candle" or liquid smoke) ■ Smoke blower (squirrel cage blower, direct drive propeller blower) ■ Sewer plugs (sand bags, beach balls, expandable plugs)
8	Missouri	Detecting Illicit StormWater Discharges-Fact Sheet Series	NG	NG	Used to detect leaks in piped portion of sewer and storm drainage systems	NG	NG
10	Seattle, WA	IDDE Dry Weather Screening Procedure	NG	NG	Use once discharge source has been isolated to a smaller section of the storm system.	NG	NG
12	Lake County, IL	Isolating and Fixing Illicit Discharges	Used when cross connection with sanitary sewer exists, can identify other underground sources caused by storm drain damage,	NG	Used when discharge is confined to upper reaches of storm drain network	NG	NG
13	Lake County, IL	Stormwater Management Program Plan	NG	NG	Tracing method, used after manhole inspection has identified reach area	NG	NG
16	Ohio	Illicit Discharge Detection and Elimination Manual	NG	NG	Use during special circumstances when good storm sewer map is not available for a location and there are known problems of connection issues.	NG	NG
17	New England	Illicit Discharge Detection and Elimination Manual	Quick (30 minutes), effective, cheap	NG	Most effective when specific source of discharge has been narrowed down to a few houses or businesses	NG	Crew of 2 or more
21	New Hampshir	Illicit Discharge Detection and Elimination and Pollution Prevention/ Good Housekeeping Guidelines and Standard Operating Procedures	NG	NG	Used for tracing intermittent discharges or continuous discharges that have no apparent source site. Works best for short reaches of pipe, or in situations where pip diameters are too small for video testing.	NG	■ Manhole safety equipment ■ Smoke source (smoke "candle" or liquid smoke) ■ Smoke blower (squirrel cage blower, direct drive propeller blower) ■ Sewer plugs (sand bags, beach balls, expandable plugs)
22	North Central T	Illicit Discharge Detection & Elimination (IDDE) Field Investigation Guide	NG	Can cause public alarm cannot detect illicit discharge	Cross connection with sanitary sewer; identifies other underground sources	NG	NG

Table B-10. Smoke Testing.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
23	Town of Parke	Illicit Discharge Detection and Elimination (IDDE) Manual	NG	More effective in infiltration/ inflow investigations of the sanitary sewer system than in detecting illegal connections to the storm sewer system. Need to inform building owners and occupants in the area. May cause irritation of respiratory passages.	Used to survey an area all at once (different than dye testing)	NG	NG

NG = no guidance

Table B-11. Video Inspections.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	NG	Expensive, does not detect all types of discharges	Used when access to properties is constrained	NG	■ Manhole inspection safety equipment ■ Closed-circuit television (CCTV) ■ Lamp ■Tractor or crawler unit for camera ■ Raft for camera (in case of ponded water)
2	Galveston County, TX	A Guidance Manual for Identifying and Eliminating Illicit Connections to Municipal Separate Storm Sewer Systems (MS4)	Pinpoints exact location of breaks, infiltration, cross connections, safer than confined space entry	Very expensive, requires crew training to operate equipment, requires line cleaning before equipment can be used, limited to size of pipes they can view, cameras cannot function if pipes are full	Used after area of possible pollution has been narrowed down.	NG	NG
6	Wayne County, MI	"Shelocks of Stormwater" Effective Investigation Techniques for Illicit Connection and Discharge Detection	Views active taps, provides a record of observations, can observe pipes between manholes	Expensive, ineffective in determining if inactive taps convey illicit discharges, time-consuming to interpret results, cannot function in water-filled or obstructed sewers.	NG	NG	NG
10	Seattle	IDDE Dry Weather Screening Procedure	NG	NG	Use once discharge source has been located or isolated to a smaller section of drainage system	NG	NG
12	Lake County, IL	Isolating and Fixing Illicit Discharges	NG	NG	Continuous discharge, discharge limited to single pipe segment, equipment already owned	NG	NG
13	Lake County, IL	Stormwater Management Program Plan	NG	NG	Tracing method, used after manhole inspection has identified reach area	NG	NG
16	Ohio	Illicit Discharge Detection and Elimination Manual	Provide detailed information as to location of infiltration or illicit connection in the sewer system	NG	NG	NG	NG
17	New England	Illicit Discharge Detection and Elimination Manual	Thorough and definitive, does not require intrusion on members of public	Time consuming, expensive	NG	NG	NG
21	New Hampshire	Illicit Discharge Detection and Elimination and Pollution Prevention/ Good Housekeeping Guidelines and Standard Operating Procedures	NG	NG	Use when an illicit connection or infiltration from a nearby sanitary sewer is suspected but little evidence of the illicit discharge remains behind.	NG	Two types of cameras available: ■ Small camera that can be manually pushed on a stiff cable through storm drains ■ Larger remote operated camera on treads or wheels that can be guided through storm drains
22	North Central Texas	Illicit Discharge Detection & Elimination (IDDE) Field Investigation Guide	NG	Expensive equipment, cannot capture non-flowing discharges; cannot capture discharges from submerged pipes	Continuous discharges, single pipe segment, entities that have their own equipment	NG	NG
23	Town of Parker, CO	Illicit Discharge Detection and Elimination (IDDE) Manual	Thorough and definitive, does not require intrusion on members of the public	Time-consuming, expensive	NG	NG	NG

NG = no guidance

Table B-12. Infrared Thermography or Infrared Aerial Photography.

Reference Number	Jurisdiction	Reference Title	Pros	Cons	Applications	Indicators	Equipment
1	Maryland	Illicit Discharge Detection and Elimination Guidance Manual	NG	Must be completed by certified professional. If police department equipment is used, the infrared imaging equipment may not be sensitive enough to detect the narrow range of temperature difference (only a few degrees) often expected for sewage flows.	Decribes three methodologies: Infrared Imagery, Infrared Thermography, and Color Infrared Aerial Photography. Can be used as a technique for detailed septic system investigations.	NG	Infrared thermography: ■ Aircraft (plane or helicopter) ■ High-resolution infrared camera with mount ■ GPS ■ Digital recording equipment
12	Lake County, IL	Isolating and Fixing Illicit Discharges	NG	NG	Describes two methodologies: Infrared Thermography and Color Infrared Aerial Photography. Used to locate sewage discharges.	NG	NG
17	New England	Illicit Discharge Detection and Elimination Manual	NG	Developing technology, not commonly used for IDDE programs. May require further testing to determine specific houses/ businesses with illegal connections.	Describes two methodologies: Aerial infrared and Thermal photography. Used to locate illicit discharges from outfalls and failing septic systems (mainly failing septic systems).	NG	NG
23	Town of Parker, CO	Illicit Discharge Detection and Elimination (IDDE) Manual	NG	Still a developing technology	Describes two methodologies: Aerial infrared and Thermal photography. Use to locate illicit discharges from outfalls and failing septic systems using temperature and vegetation as markers. Used primarily for the detection of failing septic systems.	NG	NG

NG = no guidance
GPS= global positioning station

Table B-14. Illicit Discharge Field Screening Indicators Matrix.

Reference Number	1	2	3-7	8	9	10	12-13	14	15	16	17	20	21	22	23	24-25
Indicator	Maryland	Galveston County, TX	Wayne County, MI	Missouri	Kitsap County, WA	Seattle, WA	Lake County, IL	Lower Charles River, MA	Snohomish County, WA	Ohio	New England	Pitt	New Hampshire	North Texas	Colorado	King County, WA
pH	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
Turbidity	●	●		●	●	●	●		●	●	●	●	●	●	●	
Chlorine	●	●	●				●		●	●	●	●	●	●		●
Fluoride	●					●	●	●	●	●	●	●	●	●		●
Ammonia	●	●	●		●	●	●	●	●	●	●	●	●			●
Potassium	●		●			●	●	●	●	●		●	●			●
Detergents/surfactants	●		●		●	●	●	●	●	●	●	●	●	●		●
Specific conductivity	●		●	●	●	●			●	●	●	●	●	●		●
Optical brighteners	●	●					●		●	●	●					
Fecal coliform bacteria		●		●	●	●	●		●	●	●	●	●	●		●
E. coli bacteria	●	●	●	●			●		●	●	●	●	●	●		
Temperature	●	●		●	●	●		●	●	●	●	●	●	●		●
Hardness	●			●	●				●	●	●	●	●			●
Dissolved oxygen		●	●	●	●	●			●	●				●		●
Color	●	●		●	●	●	●		●	●	●	●	●	●	●	●
Odor	●	●		●	●	●	●		●	●	●	●	●	●	●	●
Floatables	●	●				●	●		●	●	●	●	●		●	●
Flow	●	●		●	●	●	●		●	●			●	●	●	●
Phosphate		●		●	●				●	●				●		●
Glycol					●											
Debris		●									●					
Vegetation	●	●		●					●		●	●	●	●	●	●
Deposits and staining	●	●					●		●	●	●	●	●	●	●	●
Structural damage	●								●			●	●	●	●	●
Sewage fungus	●	●												●		●
Surface scum or sheen	●	●		●	●		●		●	●		●	●	●	●	●
Boron	●												●			
Tannins and lignins			●													
Phenol			●				●					●				
Copper			●				●					●		●		●
Metals				●					●			●		●		●
Nitrate and nitrite				●	●				●					●		●
Total dissolved solids												●				
Toxicity screening test												●				
Fish kills														●		
Alkalinity				●												
TKN																●
TPH																●
SVOCs																●

SVOCs = semi volatile organic compounds
TKN = total Kjeldahl nitrogen
TPH = total petroleum hydrocarbons

Table B-15. Illicit Discharge Field Screening Indicators Thresholds Matrix.

Reference Number		1		2			3-7	9					10	12-13					14	15	22	24
Jurisdiction		Maryland		Galveston County, TX			Wayne County, MI	Kitsap County, WA					Seattle, WA	Lake County, IL					Lower Charles River, MA	Snohomish County, WA	North Texas	King County, WA
Indicator	Units	Industrial	Residential	Industrial	Wastewater or grey water	Residential	General	Human/ animal waste	Washwater	Industrial Washwater	Irrigation Runoff	Vehicle Fluids	General	Wastewater	Industrial	Pesticides, fertilizers	Potable Water	Washwater	General	General	General	General
pH	std. units	≤5	--	--	--	--	--	--	--	≤4 or ≥11	--	--	< 5.5 or > 9		< 12 and > 3	--	--	--	Abnormal	<6.5 or > 8.5	< 6.0 or > 9.0	<6.0 or > 8.5
Turbidity	NTU	≥ 1,000	--	--	--	--	--	--	--	≥ 200	--	--	> 100	NG	NG	NG	NG	NG	--	visible, cloudy, opaque	NG	--
Chlorine	mg/L	--	--	--	--	--	> 0.3	--	--		--	--	--		--	--	--	--	--	> 0.25	0.2	> 0.5
Fluoride	mg/L	--	> 0.6	--	--	--	--	--	--	--	--	--	< 0.3 = natural water source > 0.3 and < 1.0 = sanitary wastewater, tap, or irrigation water > 1.0 = commercial/industrial	--	--	--	> 0.6	--	< 0.25 = natural water source > 0.25 = tap water/irrigation	< 0.25 = natural source > 0.25 = irrigation/potable water	0.5	< 0.3 = wastewater or animal waste > 0.3 = sanitary wastewater > 1.0 = commercial
Ammonia	mg/L	≥ 50	--	--	--	--	--	≥ 1.0	--	--	--	--	> 5	--	> 50	--	--	--	--	--	--	> 1.0
Potassium	mg/L	≥ 20	--	--	--	--	--	--	--	--	--	--	> 5	--	> 20	--	--	--	--	> 3	--	> 5
Ammonia/ potassium ratio	NA	--	≥ 1.0	--	--	--	--	--	--	--	--	--	> 1 = wastewater < 1 = washwater	>1	--	--	--	<1	> 1 = wastewater < 1 = washwater	> 1 = sewage < 1 = washwater	--	> 1 = wastewater < 1 = washwater
Detergents/ surfactants	mg/L	--	> 0.25	--	--	--	> 1.0	--	≥ 2	--	--	--	> 0.25 = wastewater or washwater < 0.25 = commercial/industrial, sanitary wastewater, tap, irrigation water, or natural water source	> 25	> 5	--	--	> 25	> 0.25 = wastewater or washwater < 0.25 = tap water/irrigation or natural water source	> 0.25 = sewage or washwater < 0.25 = irrigation/potable water or natural source	0.2	> 0.25
Specific conductivity	µS/cm	≥2,000	--	--	--	--	--	--	--	≥ 1,000		--	> 400		--	--	--	--	--	> 500	1,500	> 500
Fecal coliform bacteria	CFU/100 mL	--	--	--	--	--	--	≥ 2,000	--	--	--	--	> 5,000 = wastewater < 5,000 = washwater, commercial/industrial, sanitary wastewater, tap, irrigation water, or natural water source	> 400	--	--	--	--	--	> 5,000	400	> 5,000
E. coli bacteria	col/100 mL	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	> 5,000	394	--
Temperature	deg. C	--	--	--	--	Warm	--	--	--	≥ 30	--	--	> 26.7	--	--	--	--	--	Abnormal	Greater than ambient air temperature	Unusual variations, warm	Greater than ambient air temperature
Hardness	mg/L as $CaCO_3$	≤10 or ≥ 2,000	--	--	--	--	--	--	--	≥ 1,000	--	--	--	--	--	--	--	--	--	< 10 or > 2,000	--	< 10 or > 500
Dissolved oxygen	mg/L	--	--	--	--	--	--	--	--	--	--	--	NG	--	--	--	--	--	--	--	Exceptional - 4.0 High/ Intermediate - 3.0 Limited - 2.0 Minimal - 1.5	< 6.0
Color	varies	>500 Units	--	Dark red, purple, blue or black	Milky, dirty dishwater grey	Blue green/ brown green	--	--	--	--	--	--	Severity index of 3	Grey	Orange/ red (>500 units)	Green	NG	NG	--	--	Qualitative observations	--
Odor	varies	--	--	Chlorine, gasoline, spent petroleum	Musty, rotten egg, sewage/ fecal, chlorine	Chlorine	--	--	--	--	--	--	Severity index of 3	Sewage	Sulfide/ rotten eggs	Rancid/ sour	NG	Laundry	--	--	Qualitative observations	--
Floatables	varies	--	--	--	--	--	--	--	--	--	--	--	Severity Index of 3	Sewage, suds/foam, petroleum, grease					--	--	--	--
Phosphate	mg/L	--	--	--	--	--	--	--	--	--	≥ 5	--	--	--	--	--	--	--	--	--	0.5	> 1.5
Glycol	mg/L	--	--	--	--	--	--	--	--	--		≥ 5	--	--	--	--	--	--	--	--	--	
Boron	mg/L	--	> 0.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	> 0.35 = wastewater or washwater < 0.35 = tap water/irrigation or natural water source	> 0.35 = sewage or washwater < 0.35 = irrigation/potable water or natural source	--	--
Phenol	mg/L	--	--	--	--	--	> 1.0	--	--	--	--	--	--	0.1					--	--	--	--
Copper	mg/L	--	--	--	--	--	> 0.1	--	--	--	--	--	--	--	> 0.025	--	--	--	--	--	0.2	--
Nitrate and nitrite	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.0	> 1
TKN	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	> 3

-- = no guidance or not included in reference
NTU = Nephelometric Turbidity Units
TKN = total Kjeldahl nitrogen
mg/L = milligrams per liter
µS/cm = micro Siemens per centimeter
CFU/100 mL= colony foming units per 100 milliliters
col/100 mL=colonies per 100 milliliters
mg/L as CaCO3= milligrams per liter as calcium carbonate
NG for Missouri, Ohio, or New England on thresholds

Table B-16. Potential Discharges Detected by Indicators.

Reference Number	1	5	12-13	16	17	20	22	24
Indicator	**Maryland**	**Kitsap County, WA**	**Lake County, IL**	**Ohio**	**New England**	**Pitt**	**North Central Texas**	King County, WA
pH	Washwater, industrial or commercial liquid wastes	Industrial washwater	Industrial	Commercial or industrial flows, wash water	Commercial or Industrial	Industrial	Commercial or industrial flows	Agricultural, commercial, or residential
Turbidity	--	Industrial washwater	Failing septic systems, washwater, leaking USTs, sanitary sewer overflow	Sewage, washwater, industrial or commercial flows	--	Industrial, sanitary sewage	Soil erosion, construction	--
Chlorine	Industrial or commercial wastes	--	--	Potable water source	Potable water source	Drinking water	Potable water	Agricultural, commercial, or residential
Fluoride	Tap water, Industrial or commercial wastes	--	Potable water	Potable water source	Potable water source	Domestic water source	Potable water	Agricultural, commercial, or residential
Ammonia	Detects sewage, washwater , industrial or commercial liquid wastes	Human/ animal waste	Sewage or industrial	Sanitary wastewater	Sanitary wastewater	Sanitary sewage	Microbial decomposition (animal or plant protein, wastewater, sewage, petroleum, synthetic fibers and dyes, drugs, pesticides, fertilizers)	Agricultural, commercial, or residential
Potassium	Sewage, industrial or commercial wastes	--	Industrial, sewage	Sanitary wastewater	Sanitary wastewater	Sanitary sewage	--	Agricultural, commercial, or residential
Detergents/surfactants	Sewage, washwater, industrial or commercial wastes	Wash water	Industrial, commercial, sewage and washwater	Sewage, washwater, industrial or commercial flows	Laundry, car washing	Laundry washwater	Washwater or laundry	Commercial or residential; sanitary wastewater, washwater
Specific conductivity	Sewage, washwater, industrial or commercial wastes	Industrial washwater	--	Sewage, wash water, industrial or commercial flows	--	Sanitary sewage, septage water, industrial water, washwater	Wastewater, irrigation, fertilizer	Agricultural, commercial, or residential
Optical brighteners	--		--	Laundry detergents, sewage	--	--	--	--
Fecal coliform bacteria	Sewage	Human/ animal waste	Sewage, seepage discharges	Sewage	Sanitary wastewater	Sanitary sewage	Feces	Agricultural, commercial, or residential; sanitary wastewater or animal waste
***E. coli* bacteria**	Sewage	Human/ animal waste	Sewage, seepage discharges	Sewage	Sanitary wastewater		Feces	--
Temperature	--	Industrial washwater	--	Sanitary wastewater, industrial cooling water	Sanitary wastewater, industrial cooling water	Sanitary wastewater	--	Agricultural, commercial, or residential
Hardness	Sewage, washwater, tap water, liquid or industrial wastes	Industrial washwater	--	Treated water	Natural and treated waters	Natural water, clean treated water	--	Agricultural, commercial, or residential
Dissolved oxygen	--	--	--	Sewage	Sewage	--	Sewage or excessive nutrients	Agricultural, commercial, or residential
Color	Sewage, washwater, industrial or commercial wastes	--	Industrial liquid wastes and sewage	Sewage, washwater, industrial or commercial flows	--	Industrial	--	--
Odor	Intermittent flows	--	Municipal, industrial, natural sources, microbial activity	Sewage, laundry water, wash water	--	Sanitary water, septage water, industrial water, wash water	--	--
Floatables	--	--	--	--	Sewage, oil source, wash water	Industrial or sanitary wastewater	--	--
Phosphate	--	Irrigation runoff	--	Sewage or grey water connections	--	Irrigation runoff	Fertilizers, industrial waste	Agricultural
Glycol	--	Vehicle fluid	--	--	--	--	--	--
Debris	Sewage, washwater, industrial or commercial wastes	--	--	--	--	--	--	--
Vegetation	--	--	--	--	--	Sanitary sewage, septage water, industrial water, washwater, textile mill discharge, food waste	--	--
Deposits and staining	Intermittent flows	--	--	--	--	Sanitary sewage, Industrial water, wash water, rinse water	--	--
Structural damage	--	--	--	--	--	Industrial, acidic or basic discharge	--	--
Surface scum or sheen	--	--	--	--	--	Intermittent flow	--	--
Boron	Sewage, washwater	--	--	--	--	--	--	--
Phenol	--	--	--	--	--	Industrial production of synthetics	--	--
Copper	--	--	Industrial	--	--	--	Manufacture of electrical components, coins, bronze, brass	Commercial
Nitrate and nitrite	--	Irrigation runoff	--	--	--	Irrigation runoff	Biological waste, industrial runoff	Agricultural
TKN	--	--	--	--	--	--	--	Agricultural or residential
TPH	--	--	--	--	--	--	--	Commercial or residential
SVOCs	--	--	--	--	--	--	--	Agricultural or residential

-- = no guidance or not included in reference

SVOCs = semi volatile organic compounds

TKN = total Kjeldahl nitrogen

TPH = total petroleum hydrocarbons

UST = underground storage tank

Table B-17. Advantages of Indicator Tests.

Reference Number	2	12-13	24
Indicator	**Galveston County, TX**	**Lake County, IL**	**King County, WA**
pH	Excellent detector of chemical releases. pH paper is inexpensive, quick. pH colorimetric tests are inexpensive, accurate. pH meter is moderate in price, best results in shortest time.	Good indicator for industrial discharges Low cost Simple	
Turbidity	Type of turbidity may help identify source.	NG	
Chlorine	Quick and easy methods Able to identify water line breaks, can detect illegal pool, spa discharges and vehicular wash water	Can detect water line break Swimming pool discharge Industrial discharge from copper bleaching process	
Fluoride	NG	Excellent conservative indicator of tap water discharge or leaks	Good potential to indicate illicit connections
Ammonia	Test strips and kits easy to use in field Provide results in field to facilitate immediate tracking Good indicator of sanitary sewage	Simple Easy to analyze	Good potential to indicate illicit connections
Potassium	NG	Good first screen for industrial wastes Can be used in combination with ammonia to distinguish washwater from sanitary	Good potential to indicate illicit connections
Detergents/surfactants	NG	Excellent indicator	Good potential to indicate illicit connections
Optical brighteners	Inexpensive supplies Animal/ human waste differentiation Laboratory test not required to obtain results 1 person can complete all steps	NG	
Fecal coliform bacteria	Good indicator of pollution sources Inexpensive Easy sampling technique Fast results	Good supplemental indicator	Good potential to indicate illicit connections
***E. coli* bacteria**	Good indicator of pollution sources Inexpensive Easy sampling technique Fast results	Good supplemental indicator	
Temperature	Inexpensive Time efficient	NG	
Dissolved oxygen	Simple Easy to learn procedure Colorimetric kits are relatively inexpensive Meters produce fastest results	NG	Not considered a key parameter, but is easy to obtain and may provide useful information

Table B-17. Advantages of Indicator Tests.

Reference Number	2	12-13	24
Indicator	**Galveston County, TX**	**Lake County, IL**	**King County, WA**
Color	Easy to track colored water upstream through underground drainage system	NG	
Odor	Helpful in identifying source of flow and narrowing focus	NG	
Flow	Inexpensive and time efficient Can help prioritize outfall investigations	NG	
Phosphate	Test strips and kits are easy to use in field Provide results in field to help immediate tracking	NG	
Alkalinity	NG	NG	Not considered a key parameter, but is easy to obtain and may provide useful information

NG = no guidance

Table B-18. Disadvantages and Challenges of Indicator Tests.

Reference Number	1	2	12-13	16	24
Indicator	**Maryland**	**Galveston County, TX**	**Lake County, IL**	**Ohio**	**King County, WA**
pH	NG	Not a good indicator of sanitary discharges pH paper must be kept dry Not accurate for small changes pH meters require routine calibration and maintenance	Not conclusive by itself	Not useful in determining presence of sanitary wastewater	NG
Turbidity	NG	Cannot alone identify whether multiple sources are present No single meter is good for all conditions	NG	NG	Readings are often not informative Simple eyeball and nose observation and qualitative descriptions instead of meter
Chlorine	High chlorine demand in natural waters limits utility to flows with very high chlorine content	Test strips do not detect low concentrations Strips are expensive Few outfalls have significant amounts of chlorine Meters require routine calibration and maintenance	Extremely volatile, not reliable	Not useful in determining presence of sanitary wastewater	NG
Fluoride	Poor indicator when used alone, but when combined with additional parameters (detergents, ammonia, potassium), can almost always distinguish between sewage and washwater Reagent is a hazardous waste	NG	Not applicable in areas that do not add fluoride to drinking water	Only applicable where water supplies are fluorinated	NG
Ammonia	Can change into other nitrogen forms as flow travels to outfall	Time consuming Small concentrations too small to track Must take additional measures to negate interferences with saltwater, chlorine, iron, sulfides, hardness Regular calibration and maintenance for meters required	Potential generation of wastes from non-human sources	NG	NG
Potassium	Need to use two separate analytical techniques depending on the concentration	NG	NG	NG	NG
Detergents/surfactants	Reagent is a hazardous waste	NG	NG	NG	NG
Specific conductivity	Ineffective in saline waters	NG	NG	Ineffective in saline water	NG
Optical brighteners	NG	Can be time consuming Results not available for 1 week Heavy rains require longer deployment period	NG	NG	NG
Fecal coliform bacteria	24 hour wait for results Need to modify standard monitoring protocols for high concentrations	Sterile conditions necessary Samples must go to lab within 6 hours	NG	NG	NG
***E. coli* bacteria**	24 hour wait for results Need to modify standard monitoring protocols for high concentrations	Sterile conditions necessary Samples must go to lab within 6 hours	NG	NG	NG
Temperature	NG	Only helpful in cold weather when temperature difference is significant	NG	Only useful during cold weather	NG
Dissolved oxygen	NG	Low DO does not indicate pollution, may be due to high water temperature DO meters are expensive, requires regular calibration and maintenance	NG	NG	NG
Color	NG	Not every illicit discharge will have a color to trace	NG	NG	NG
Odor	NG	Not every illicit flow will have an odor Can become de-sensitized to a particular odor within a few minutes	NG	NG	NG
Flow	NG	Methods of estimating flow are not exact (bucket, stopwatch, tracing dye) Bucket method non functional if end of pipe is submerged	NG	NG	NG
Phosphate	NG	Test strips accurate for gross contamination only Can be time consuming Most of the time values too small to track Phosphate occurs naturally	NG	NG	Readings are often not informative Chemical indicator test strips are unreliable
Copper	NG	NG	NG	NG	Readings are often not informative

Table B-18. Disadvantages and Challenges of Indicator Tests.

Reference Number	1	2	12-13	16	24
Indicator	**Maryland**	**Galveston County, TX**	**Lake County, IL**	**Ohio**	**King County, WA**
Boron	Boron levels in tap and ground water can vary regionally, not always a strong indicator	NG	NG	NG	NG

NG = no guidance