ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM FIELD SCREENING AND INVESTIGATION MANUAL

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Acronyms and Abbreviations

COC	Chain of Custody
CFR	Code of Federal Regulations
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
EPD	Environmental Programs Division
GIS	Geographic Information System
HASP	Health and Safety Plan
IDDE	Illicit Discharge Detection and Elimination
MS4	municipal separate storm sewer system
NPDES	National Pollutant Discharge Elimination System
ODOT	Oklahoma Department of Transportation
OPDES	Oklahoma Pollutant Discharge Elimination System
ODEQ	Oklahoma Department of Environmental Quality
PPE	personal protective equipment
QA/QC	quality assurance/quality control
ROW	right-of-way
SWMP	Storm Water Management Plan

Executive Summary

This document provides detailed procedures to enable the ODOT staff and any consultants to collect field screening data and perform IDDE investigations and inspections on outfalls within the ODOT right-of-way ("ROW") in a consistent manner with ODOT's Oklahoma Pollution Discharge Elimination System ("OPDES") stormwater permits, and the Storm Water Management Plan ("SWMP"). The document also provides health and safety procedures and illicit discharge notification procedures.

1.0 INTRODUCTION

1.1 BACKGROUND

Under the Environmental Protection Agency ("EPA") regulations, ODOT drainage facilities are considered part of a municipal separate storm sewer system ("MS4"). EPA regulations found in Part 122 of Title 40 of the Code of Federal Regulations ("CFR") (40 CFR §122) require that three different types of MS4 dischargers obtain a National Pollutant Discharge Elimination System ("NPDES") permit authorizing the discharge of pollutants in stormwater runoff. The three types of MS4 dischargers include:

- Large MS4's, which are those serving more than 250,000 people
- Medium MS4's, which are those serving more than 100,000 and less than 250,000 people
- Small MS4's, which are those serving less than 100,000 and located in U.S. Census-defined urbanized areas or those designed by the permitting authority

The regulation of stormwater management activities associated with both large and medium MS4's is generally known as the "Phase I" stormwater program, while the regulations of activities associated with small MS4's is known as the "Phase II" stormwater program.

ODOT currently holds two Phase I stormwater permits and will soon have Phase II stormwater permits issued. The Phase I permit numbers are:

OPDES Phase I (with Oklahoma City) – OKS000101
OPDES Phase I (with Tulsa) – OKS000201

All ODOT roadways that are located inside of the Oklahoma and Tulsa city limits are considered regulated under Phase I coverage. Under Phase II, ODOT has permit compliance obligations to all of their roadways that are within urbanized areas defined by the 2000 U.S. Census and within ODEQ ("ODEQ") designated Phase II municipalities that are outside of urbanized areas.

1.2 STORMWATER PERMIT REQUIREMENTS

Both Phase I and Phase II stormwater permits require ODOT to develop and implement an SWMP. The SWMP must include specific provisions to address illicit discharges that discharge into ODOT's MS4. An illicit discharge is defined in EPA regulations to mean:

> *Any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for*

discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities (40 CFR §122(b)(2))

Phases I and II Illicit Discharge Detection and Elimination ("IDDE") programs generally follow the requirements found at 40 CFR §122.34(b)(3), which require MS4 operators to develop, implement, and enforce a program to detect and eliminate illicit discharges and to:

- *Develop, if not already completed, a storm sewer system map showing the location of all outfalls and the names and locations of all waters of the United States that receive discharges from those outfalls.*

- *To the extent allowable under state, tribal, or local law, effectively prohibit, through ordinance or other regulatory mechanism, non-stormwater discharges into [the operator's] storm sewer system and implement appropriate enforcement procedures and actions.*

- *Develop and implement a plan to detect and address non-stormwater discharges, including illegal dumping, to [the operator's] system.*

The Oklahoma Department of Environmental Quality now has delegation over all NDPES permits and issues an OPDES permit. Thus, to comply with their OPDES permits, ODOT must conduct inspections to identify and eliminate illicit discharges.

1.3 PURPOSE OF DOCUMENT

This document provides detailed procedures to enable the ODOT staff and any consultants to collect field screening data and perform IDDE investigations and inspections on outfalls within the ODOT ROW in a consistent manner with ODOT's OPDES stormwater permits and the SWMP during an OPDES five year permit term. Figure 1-1 shows the activities, personnel, and tools that will be used.

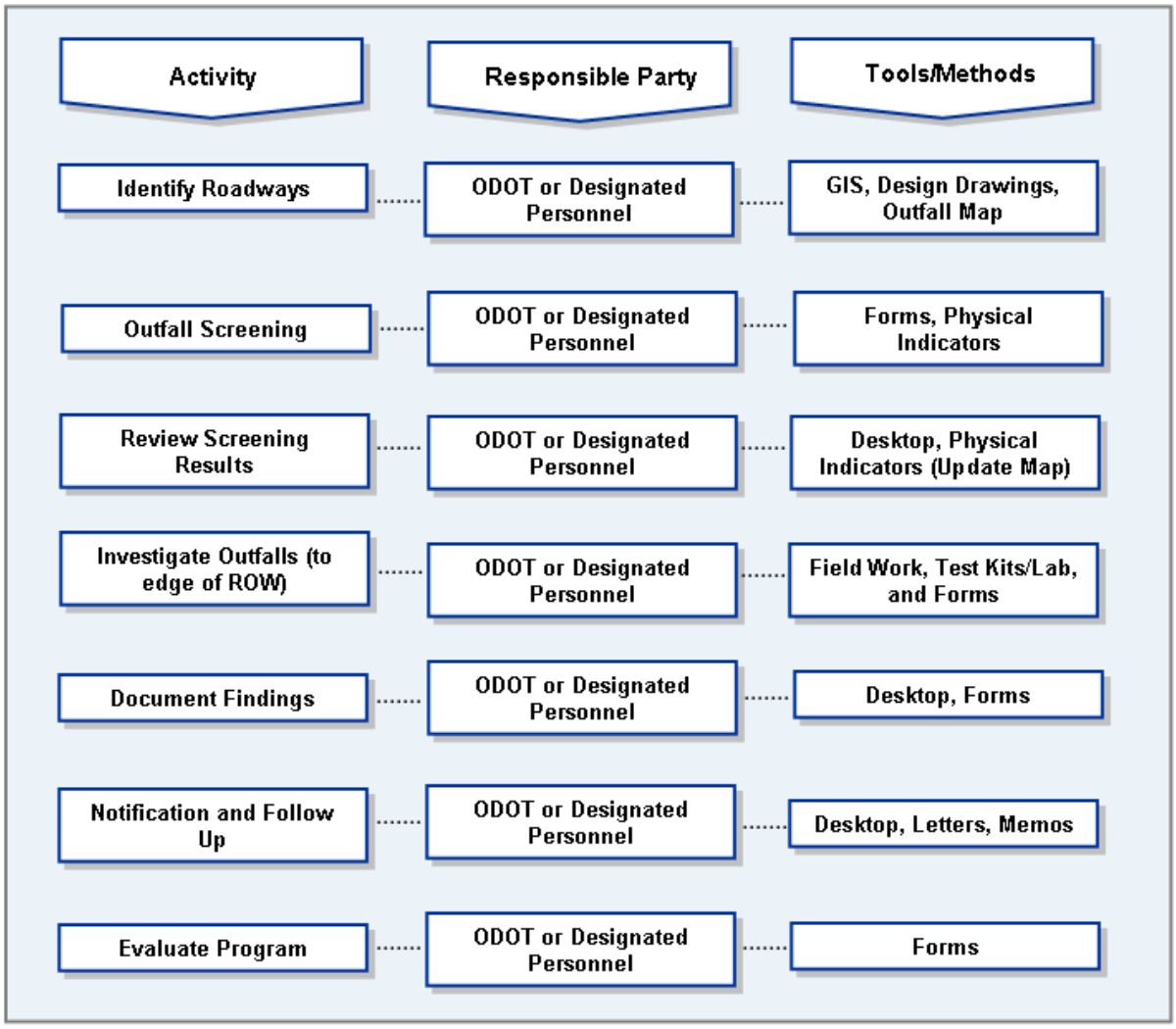


Figure 1-1
ODOT Illicit Discharge Detection Program Overview

1.4 DOCUMENT ORGANIZATION

This document is organized into Sections and Appendices. The contents of each section are described below:

- **Section 1.0 – Introduction:** Section 1.0 describes the contractual background, stormwater regulatory requirements, and IDDE Program requirements.

- **Section 2.0 – Identifying Roadways:** Section 2.0 describes various methods of identifying and prioritizing areas along the ODOT ROW that have the potential for illicit discharges and that should be screened more frequently.

- **Section 3.0 – Outfall Screening:** Section 3.0 describes the procedures, staffing and equipment needed for performing outfall screening.

- **Section 4.0 – Outfall Data Review, Investigation, and Notification Procedures:** Section 4.0 describes the procedures for reviewing data, determining when to perform an investigation for illicit discharges, staffing, equipment, and techniques, and sending notifications.

- **Section 5.0 – Program Evaluation:** Section 5.0 describes the process of evaluating the effectiveness, costs, and effort of the IDDE program.

- **Section 6.0 – References:** Section 6.0 includes a list of references used to prepare this document.

In addition, there are three appendices to this document. Appendix A provides a Health and Safety Plan ("HASP"); Appendix B provides an Outfall Screening Form for field teams to use while in the field, and Appendix C provides an equipment checklist for illicit discharge detection and elimination investigations.

2.0 IDENTIFYING ROADWAYS

2.1 INTRODUCTION

The section covers the activities, staffing, and tools needed for identifying roadway segments for outfall screening and roadway segments that should be screened more frequently.

2.2 OUTFALL INVENTORY MAP

All outfalls that fall within the Phase I and Phase II permitted areas will be inventoried and screened at least once per OPDES five year permit term. Each MS4 permit will require ODOT to produce a map of their outfall locations. Outfall location maps will be produced by ODOT staff or ODOT consultants and may use Geographic Information System ("GIS") applications denoting outfall locations from previous field inspections, previous outfall location maps, and/or digitized drawings showing outfall locations. Updates from new outfall screenings will be made by ODOT MS4 staff or by consultants.

2.3 SOURCE CONTROL PLAN

ODOT may consider developing a Source Control Plan for areas along the roadway that have a higher potential for illicit discharges. Such a plan is also considered part of ODOT's public education requirement that is outlined in their stormwater permit(s). The plan would allow for ODOT to:

- Identify location and regulatory status of discharging sites.
- Screen for dischargers that have the potential for illicit discharges.
- Select appropriate outreach (public education) and enforcement efforts.

The source control plan should be pollutant-specific and all regulatory entities that may assist with enforcement should be identified up-front. The steps for developing and implementing a source control plan are as follows:

1. Select pollutant of concern.
2. Link pollutant to key roadway segment indicators.
3. Find specific pollutant source areas along the roadway.
4. Identify priority outreach targets.
5. Develop overall source control strategy.
6. Develop a clear message.

7. Select the most effective outreach techniques.

8. Select appropriate practices to recommend for source control.

9. Evaluate progress through implementation.

A source control plan may be effective by teaming with local partners, other MS4 permittees, area watershed groups, and OPDES regulatory agencies.

As an option, ODOT may consider the following data sources to assist with trying to locate potential illicit discharges:

- Generating sites
- Permitted dischargers
- ODOT ROW development age
- ODOT storm water outfall locations to impaired water bodies

Generating sites are areas that have higher levels of pollutants and/or present higher risks for spills, leaks or illicit discharges (CWP, 2005) to the MS4. Highly industrialized areas, large residential areas (multi-family or single family) and highly commercialized areas all may contain generating sites. Examples of generating sites in a residential area may include: the presence of septic systems, large concentrations of recreation vehicles (RVs), evidence of pet wastes, or presence of hobby farms (CWP, 2005).

3.0 OUTFALL SCREENING

3.1 INTRODUCTION

This section describes the staffing, equipment, and procedures for the field team to conduct the initial outfall field screening.

3.2 HEALTH AND SAFETY EQUIPMENT

At a minimum, ODOT personnel that participate in outfall screening should carry a basic first aid kit in their vehicle. The basic first aid kit should be sufficient to treat minor incidents in the field such as minor cuts and scrapes and minor insect bites. Personnel should also wear the personal protective equipment ("PPE") identified in the HASP (Appendix A) during all outfall screenings and inspections.

Field screening teams should conduct "tailgate" safety meetings before going out in the field each time. Tailgate safety meetings should include:

- Potential safety concerns for the area the field team is deploying to.
- Review of safety concerns from previous outfall screening activities.
- Review of vehicle safety.

3.3 TOOLS AND FIELD SCREENING EQUIPMENT

The ODOT field screening team should have the following equipment while performing outfall screening:

- Clipboard
- Outfall Screening Form (Appendix B)
- Pen
- Index cards
- Camera
- GPS

3.4 TEAM STRUCTURE AND COMMUNICATION

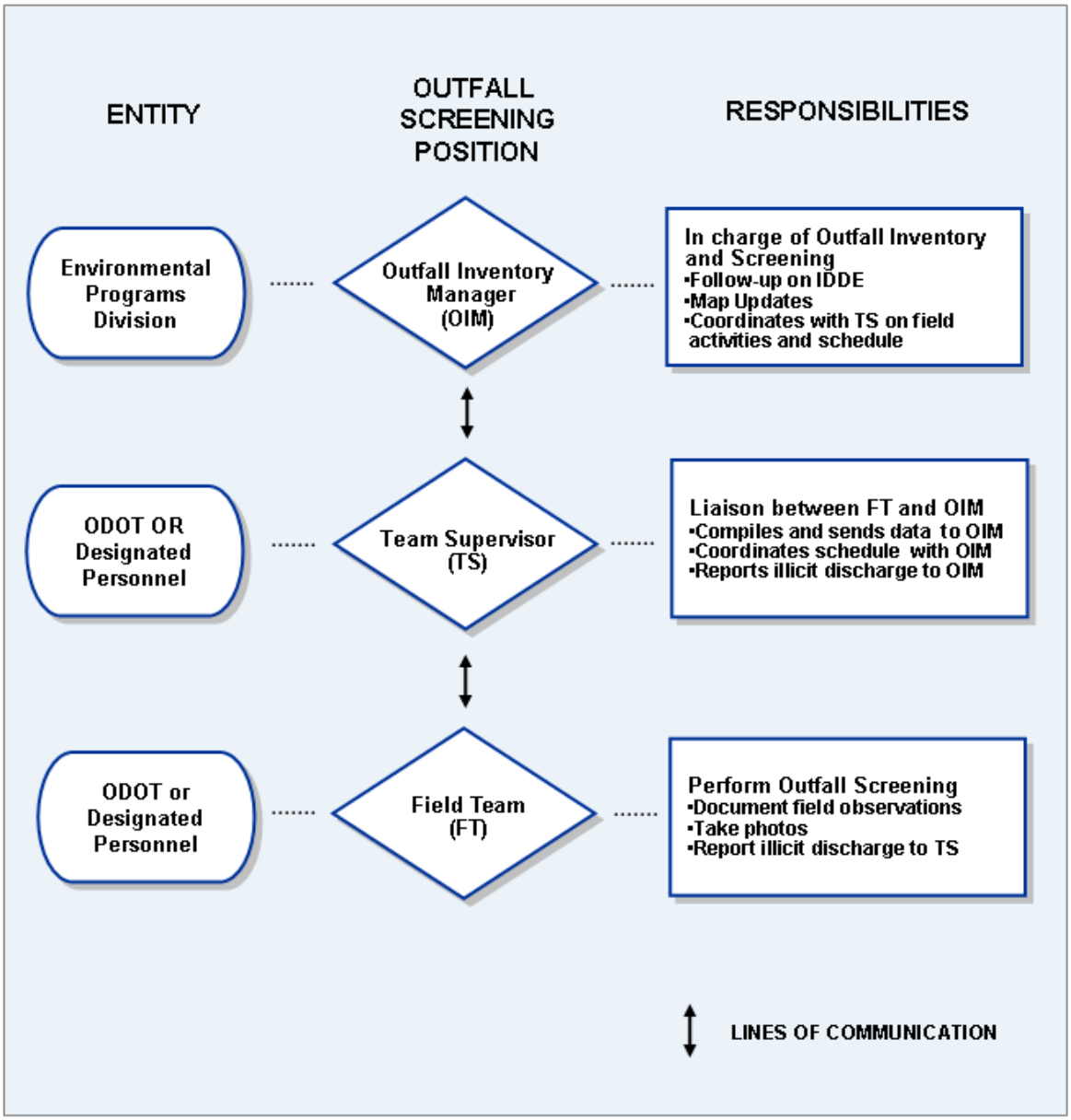
The team will consist of ODOT environmental and maintenance staff that are currently performing their normal work activities. The Outfall Inventory Manager will track which roadway segments are in the permitted areas and will coordinate with maintenance personnel on outfall inventory scheduling.

Outfalls may be screened at the same time the routine ODOT field activities may be occurring. The following are examples of routine field activities:

- ROW mowing
- Herbicide/pesticide applications
- Drainage system maintenance
- Litter pick-up and control
- Striping
- Sign/guardrail maintenance
- Sweeping

Figure 3-1 shows the appropriate communication path and responsibility for each individual.

Figure 3-1
Outfall Inventory Communication Path and Responsibility



The following are the positions and responsibilities for the initial outfall screening:

- **Outfall Inventory Manager (Environmental Programs Division)**

- Oversees execution of outfall screening.
- Coordinates with Team Supervisor for outfall screening activities, resources, schedule, and logistics.
- Selects sites for dry weather outfall screening.
- Makes changes to MS4 outfall map.
- Performs final quality assurance and quality control ("QA/QC"), checks on all field data collected.
- Conducts follow-up investigations on illicit discharges and notifies appropriate parties to resolve illicit discharges.

- **Team Supervisor**
  - Serves as liaison between the Outfall Inventory Manager and Field Team.
  - Reports data and illicit discharges to Outfall Inventory Manager.
  - Schedules and coordinates with Outfall Inventory Manager on segments identified for outfall screening.
  - Emergency contact for field team.

- **Field Team – Team Leader and Assistant**
  - Screens outfalls within ODOT ROW.
  - Informs Team Supervisor of any obvious illicit discharges, injuries, or environmental emergencies.
  - Documents outfall screening observations on Outfall Screening Form.
  - Photographs outfalls.
  - Provides Outfall Screening Forms to Team Supervisor.

3.5 FIELD DOCUMENTATION

The field team that initially identifies the illicit discharge will need to document the following:

- Location of outfall inventoried and site description
- Nearest Mileage Marker
- Time/Date/Team Names
- Physical Characteristics:
    - Presence of flow
    - Odors
    - Color of any discharges
    - Presence of a sheen
    - Presence of floatables
    - Stains/Algae
    - Vegetative conditions

This information will be documented on the Outfall Screening Form (Appendix B). Photos of the outfalls should be collected when possible.

Each outfall will need to have a unique identification number associated with it. The field teams will use the following naming convention:

AAAA-BB- CC-OF

Where:

- AAAA is the highway number.
- BB is the County number.
- CC is the initials of the field screener.

- OF represents “outfall”.

This information will be documented on the Outfall Screening Form under the “Outfall ID” section.

3.6 PHOTO DOCUMENTATION

The field team should strive to collect a photograph of all outfalls screened. The photograph should clearly show and support any observations (e.g., illegal dumping, high vegetation, colored discharge, etc.) and have the control section number written on either a white board (Figure 3-2) or on an index shown at the bottom of the picture. Additional photos may be taken if needed in order to fully document other observations.

Figure 3-2
Outfall Photography

3.7 PHYSICAL OBSERVATION DOCUMENTATION

Physical observations are key indicators to identifying illicit discharges and need to be documented during the initial outfall screening. Field observations will be made during each site visit whether or not a discharge is present. The field team should be downstream of the outfall and be looking straight at the outfall when making observations. These observations are intended to provide a general assessment of the site and possible signs of an illicit discharge. Variables such as odor, color, turbidity, presence of floatables, visible deposits, stains, and vegetative conditions are key indicators of potential illicit discharges. Below are potential physical characteristics that field screening teams should pay particular attention to when screening and should be documented on the Outfall Screening Form (Appendix B).

- **Odor** – Odors are strong indicators of identifying illicit discharges. Odors arising from the outfall or discharge may assist the field screening team in narrowing down the source of a potential illicit discharge. Typical odors may include sewage, sulfur, rancid (sour), petroleum, and natural gas. If the outfall area has a detectable odor of sewage, petroleum products, or fuel, the discharge must be investigated. If the discharge area has a musty, pungent, or rotten egg (sulfide) smell, the discharge must be investigated.

- **Color** – The color of a discharge is an important indicator in determining the presence of an illicit discharge. The presence or absence of natural or man-made substances may influence the color of a discharge (GCPC, 2002). Figure 3-3 shows an example of a white-colored discharge. If the discharge flow is black, blue, red, white, purple, orange, or yellow, it must be investigated.

- **Turbidity** – Turbidity is used as a supplemental observation for the presence of an illicit discharge. Turbidity is caused by suspended particles in the discharge and is usually classified into three categories: clear, cloudy, and opaque. In order to make an observation on turbidity, the field screening team should collect a sample of the water in a clear glass jar, hold against sunlight, and record the observations. When an opaque discharge is found, teams are encouraged to provide additional details in the comments field on the Outfall Screening Form.

- **Floatables** – Observations on floatable debris are documented on all outfalls, regardless of whether a flow is present. Typical floatable observations may include petroleum sheens, sewage, plastics, paper, suds, or paint. The presence of floatables will assist in determining the source of the discharge or indicate if illegal dumping has occurred. Other types of floatables should be classified as "Other" with details provided in the comments field. If significant amounts of trash or human debris are present in or near the outfall, the discharge should be investigated to determine if illegal dumping is occurring.

- **Sheens** – Hydrocarbons can appear on the surface of a discharge in various sheens. If an oil sheen is present on the discharge flow, it must be investigated.

- **Vegetation** – The health of the vegetation near the outfall is an excellent indicator for identifying potential illicit discharges. While normal growth can be expected downstream of an outfall, poor and over-flourishing vegetation could indicate the presence of elevated pollutant loads in a discharge. Over-flourishing vegetation could be an indication that the discharge contains nutrients or fertilizers, while poor vegetative conditions could indicate the discharge contains toxic substances. Excessive algae, grass, or weed growth around the outfall must be investigated. Dead or discolored or reduced growth must also be investigated.

- **Stains** – Unnatural stains on the interior of an outfall or downstream of the outfall can indicate the presence of an illicit discharge. Staining of black, blue, red, white, purple, orange, or yellow around the outfall must be investigated.

- **Field pH** – Field pH strips or a handheld pH meter may be used in the field as a tool to identify illicit discharges. If the field measured pH is less than 6 or greater than 9 Standard Units, the discharge must be investigated (Pitt, 1983).

Source: Center for Watershed Protection, 2005.

Figure 3-3
Field Observations – Discharge Color

3.8 DETERMINING DISCHARGE PRESENCE AND FLOW

Outfalls may have water standing in them without any flow. These conditions may occur under submerged or partially submerged conditions. The field teams will determine if flow is present by placing a floatable item, such as a piece of wood or grass, in the center of the conveyance and will watch for movement. For submerged outfalls, the first upstream manhole should be opened and viewed for flow. Figure 3-4 shows an example of trickle flow.

Figure 3-4
Trickle Flow

3.9 ADDING A NEW OUTFALL

During the field screening process, new outfalls may be found in the field. If a new outfall is found in the field, the field screening team will circle "NEW" under the "Outfall Status" question on the Outfall Screening Form (Appendix B).

4.0 OUTFALL DATA REVIEW, INVESTIGATION, AND NOTIFICATION PROCEDURES

4.1 INTRODUCTION

This section describes the procedures used by Environmental Programs Division staff to review data to determine when to perform an investigation of a suspect illicit discharge; the staffing and equipment needs; the investigation techniques; and the notification procedures.

4.2 DATA REVIEW

The Outfall Inventory Manager will review all completed and submitted Outfall Screening Forms (Appendix B) for potential illicit discharges. The reviewer should look for indicators such as the following:

- Presence of high flows discharging with no rain
- Abnormal discharge colors (blue, red, white, green, purple, etc.)
- Odors indicative of sewage, petroleum-based products, or chemicals
- Presence of oil sheen
- Signs of illegal dumping
- Excessive algae in the outfall

If the Outfall Screening Form indicates a potential illicit discharge, the Outfall Inventory Manager will schedule an investigation team to evaluate the discharge. If ODOT staff determines that the discharge may cause harm to human health or the environment, the investigation should be conducted as soon as possible. For discharges that do not pose an immediate threat to human health or the environment, investigations should be conducted no later than 30 days from the time the illicit discharge was identified.

4.3 INVESTIGATION

The investigation team will return to the site that was identified as a potential illicit discharge. The outfall investigated should typically have an antecedent dry period of at least 72 hours so that any discharges found from an outfall may not be mistaken for rainfall runoff and drainage. This information can usually be found on an Internet weather site (e.g. http://mesonet.org). If the investigation is considered a high priority, this may be waived.

4.3.1 Water Quality – Field Screening

Each illicit discharge investigation is unique. Some investigations will require the investigation team to collect water chemistry data in the field or "field water chemistry". A field water chemistry test is a rapid

evaluation performed in the field during a dry weather investigation on water discharging from the outfall. Investigative personnel may need to collect a sample of the discharge for field screening. Field screening can be performed using a field test kit or meter. Outfalls that have stagnant water are not recommended for field screening unless there is evidence of a previous illicit discharge. Figure 5-1 shows an example of an investigation team performing a field water chemistry analysis. Appendix C provides the equipment list for investigations.

Source: Center for Watershed Protection, 2005.

Figure 4-1
Testing Field Water Chemistry

4.3.2 Water Quality – Laboratory Analysis

The investigation team may need to collect water quality samples when evidence supports an illicit discharge is entering into their MS4. When an illicit discharge is suspected, investigation teams should collect water samples that are unique to the suspected discharge. As an example, for every outfall with an indication of a fuel spill, the investigation team should collect grab samples for total petroleum hydrocarbons and oil and grease and for outfalls with indications of sewage, the investigation team should collect grab samples for bacteria. If the E. Coli concentration is more than 1,000,000 MPN/100mL (Metcalf and Eddy, 2003), the discharge should be investigated. An equipment list for investigation work, which includes sampling equipment, may be found in Appendix C.

Grab samples will be collected using a sterile sampling bucket or sampling pole. Laboratory analysis for suspected pollutants will be run according to the methods allowed under 40 CFR §136.3. All samples should be iced immediately and be prepared for delivery to the contract laboratory for analysis as soon as possible.

4.3.2.1 General Sampling Methods

Investigation personnel should follow the instructions below regarding water quality sample collection:

1. Collect flows directly into sample containers using a bucket or sampling pole.
2. Pour samples into appropriate sample containers.
3. Add sample preservative, if necessary.
4. Label sample containers with a unique identification number for the outfall being inventoried. If multiple containers are used on one site, all bottles will contain the same ID number for that site.
5. Place sample containers on ice.
6. Fill out Chain of Custody form.
7. Submit to laboratory.

The investigation team should wear latex gloves during all sample collection methods. Not all flowing discharges will be eligible for sample collection. Very low flow discharges (such as a "trickle") may not be suitable for sample collection due to collection difficulties. In some cases, the decision to sample will ultimately depend on the investigation team's judgment.

4.3.2.2 Holding Times

For each pollutant analysis, a holding time will be prescribed. The holding time refers to the maximum amount of time with which a sample must be analyzed by the laboratory from the time it was collected. The investigation team will need to coordinate with the laboratory to make sure sample delivery does not exceed the holding times. As an example, bacteria samples (e.g., E. coli and fecal coliform) usually require a six-hour holding time. The investigation team will need to be conscious of their location in respect to the laboratory once a bacteria sample has been collected.

4.3.2.3 Chain of Custody Forms

A Chain of Custody ("COC") form is a legal manifest that must accompany each sample. The COC must accompany the samples until they are submitted to the laboratory. Samples are considered under custody of someone who: (1) has the samples in their possession, (2) has the samples in their view after being in their possession, (3) had the samples in their possession and has locked them up, or (4) has the samples in a designated secure area.

The individual receiving or relinquishing custody of the samples must sign and date the COC when custody is transferred. A COC form should include the following information:

- Sample identification.
- Date and time of sample collection.
- Sampler names.
- Sample matrix (water, soil, etc.).
- Number of sample containers.
- Sample container type.
- Type of analysis requested.
- Turnaround time requested.
- Preservative used.
- Signatures and dates of custody transfers.

Figure 4-2 shows an example of a COC form.

Page ____ of _____

Chain of Custody

ODOT Illicit Discharge Detection And Elimination Program

Contact Person: _____
Phone Number: _____
Fax Number: _____

Lab Log Number: _____
Due Date: _____
Turn Around Time: _____

Delivered By: _____
Custody Seal (Y/N): _____
Temperature: _____

Sampled By: _____
Please Print

Log Number	Sample Matrix	Date/Time Collected	Number of Containers	Type of Container	Ontrak Local Name/ Report Code	Sample ID	Type of Analysis Requested											Remarks

Relinquished By:	Date:	Time:	Relinquished By:	Date:	Time:
Relinquished By:	Date:	Time:	Relinquished By:	Date:	Time:
Relinquished By:	Date:	Time:	Relinquished By:	Date:	Time:
Relinquished By:	Date:	Time:	Relinquished By:	Date:	Time:

Figure 4-2
Example Chain of Custody Form

4.3.3 Flow Measurement Equipment

If an outfall has a discharge, the investigation team should strive to measure the flow when safe. Below is a list of the equipment that may be used for flow measurement.

- Measuring tape (time of travel)
- Stop watch (fill time/time of travel)
- 5-gallon bucket (fill time) or graduated cylinder (fill time)
- Flow meter

A measuring tape and stopwatch may be used to calculate the rate of flow by measuring the time a floating object travels over a measured distance and multiplying the ratio of distance over time to the cross-sectional area of flow.

4.4 DECISION CRITERIA

The criteria identified in Section 3.7, Physical Observation Documentation, and Section 4.3, Investigation, will be used to determine if a suspect discharge should be deemed an illicit discharge and if the discharge should be investigated and traced to its origin or to the edge of the ODOT ROW.

These criteria may not account for all situations and observations. The investigation team must use professional judgment and discretion in evaluating observations to determine if an investigation is warranted. In general, if the discharge has characteristics that suggest a source other than rain water, the discharge should be investigated.

The decision-making process should be documented as a memorandum to the file which identifies the evaluated criteria and the data used to determine whether a follow-up was warranted.

4.5 SOURCE IDENTIFICATION

Through criteria listed in Section 4.4 or other means, once ODOT staff have made the decision that an illicit discharge is present and must be traced to the source or to the edge of the ODOT ROW, the staff will start a field investigation. The investigation will start at the outfall and trace the discharge back to the source or the edge of the ROW. Unless the investigator is certified in confined space safety, they should not enter into the storm sewer system. While ODOT are not permitted to inspect outside of the ODOT ROW, a "windshield" inspection of the drainage area within the ODOT ROW should be conducted first to find obvious sources. Sometimes the illicit discharges are not as easy to find and will require the investigators to perform an investigation of the storm sewer conveyance. This investigation

should narrow the sources to a single section of the trunk, where the investigators will be able to split the storm drain network and move throughout it to find the source.

If the investigation leads to a specific narrow area of the system, but all investigative measures above ground have been exhausted, manhole-to-manhole investigative measures should be considered in order to find the exact source or track to the edge of the ROW. A manhole-to-manhole investigation is a means of evaluating the trunk and stems of the storm sewer system by opening the manholes of the storm sewer and trying to observe differences in flow volume between two manholes or junctions. Considerations for this type of investigation are that it must be performed in a team of at least two, dry weather conditions must be present, and traffic control must be planned in advance.

4.6 NOTIFICATION, ELIMINATION, AND PREVENTION

Once the source of an illicit discharge has been confirmed, it must be eliminated or the appropriate agency or permit holder notified. There may be instances where the investigation team will track the illicit discharge to a point that leads to the edge of ODOT's ROW. At this point, the investigation team should stop their investigation and document where the illicit discharge enters their MS4 and at what point it is exiting another MS4. The owner of the appropriate MS4 will be contacted in writing, stating that an illicit discharge is entering the ODOT MS4 and must be eliminated.

If an illicit discharge is found within the ODOT MS4 and ODOT is found to be the responsible party, ODOT will immediately initiate mitigative measures.

Should the investigation find that a private property owner is illegally tied directly into ODOT's MS4, ODOT will contact the ODEQ immediately for enforcement and elimination.

In the event that an illicit discharge is tracked but the investigation(s) does not identify a source and it appears to have been a one-time event, ODOT should consider closing the investigation after appropriate measures have been taken to track the source. All steps of the investigation should be documented and a brief summary included in the annual report.

In order to prevent additional illicit discharges and connections into their MS4, ODOT may consider participating in public outreach activities that target generating sites that were identified in the source control plan and desktop assessment. Public education materials that ODOT uses for their OPDES permit should be distributed to those individuals.

All notifications, correspondence, and e-mails will be retained and filed for annual report and audit purposes.

5.0 PROGRAM EVALUATION

5.1 INTRODUCTION

The Environmental Programs Division ("EPD") will conduct illicit discharge program assessments once a year. The program assessment will be conducted to assess program adequacy, to refine program design, to evaluate training, and to assess implementation success. Results of the program assessment will be used to make adjustments to the program on a yearly basis. The program assessment is a required permit compliance obligation and the results of the assessment will be documented in ODOT's annual report to ODEQ. This section provides general guidelines for conducting the program assessment.

5.2 FREQUENCY

Program assessment should be conducted once a year, in the last two months of the permit year.

5.3 ASSESSMENT ELEMENTS

The following program elements should be evaluated as described in the subsections below.

5.3.1 Training

Training adequacy should be evaluated by conducting interviews with staff responsible for implementing the program. Interviews should be based on the training materials used to assess how well staff have retained the procedures and information they have learned. Interviews could be conducted in an informal, verbal manner, or written questionnaires could be used. All levels of program staff should be included in the interview or questionnaire process.

An opportune time to perform this evaluation is at the end of each training session, typically by means of a course evaluation form with questions designed to solicit feedback as well as provide insight as to whether the core concepts were grasped.

5.3.2 Field Inspection Forms and Photographs

While all forms and photographs submitted to EPD must be reviewed for possible follow-up action, at least once a year a separate review of these materials should be conducted for assessment purposes. A small fraction, perhaps 5 or 10 percent, of the field inspection forms and photographs prepared and submitted to EPD should be closely reviewed to assess how well they are being completed and communicate relevant information.

5.3.3 Detected Discharges and Follow-Up Status

EPD should record the number, location, date, and type of suspected discharges detected by field staff. This information should be maintained in a simple spreadsheet and should be updated as new information becomes available. As time and technology permits, this information could be linked to ODOT's GIS outfall inventory map. The information could also be used to update the GIS map with information on suspected discharges.

Once established, the list of detected discharges should be compared to prior years. This will allow historical trends to be tracked. It will also allow an assessment of how well ODOT is following up on found discharges as described below. ODOT must document a follow-up action for each found discharge. The follow up actions must be one of the following:

- Under investigation.
- Resolved – discharge was not illicit.
- Confirmed/Elimination Underway - efforts to eliminate the discharge are underway.
- Confirmed/Eliminated - efforts to eliminate the discharge are complete.
- Confirmed/Operator Notified - Discharge determined to be from a third-party MS4 operator and third party was notified.
- Confirmed/Owner and ODEQ Notified - Discharge determined to be from a private party and the private party and ODEQ were notified.

ODOT will track detected discharges and classify each found discharge into one of the above follow-up action categories. Each year ODOT should evaluate how many outfalls or discharges fall into each category. If found discharges are not being resolved at an appropriate pace, then additional resources should be devoted to the program.

5.4 DOCUMENTING ASSESSMENT RESULTS

Results of the annual assessment should be documented in a brief letter report. The report should include the following:

- Introduction and purpose
- Training evaluation, including interview or questionnaire results

- Inspection form evaluation, including a discussion of findings
- Evaluation of the number of found discharges and their follow-up status
- Findings of the evaluation
- Recommendations

The brief report should be included or summarized in ODOT's annual report to ODEQ.

6.0 REFERENCES

Center for Watershed Protection (CWP). November 17-18, 2005. Illicit Discharge Detection and Elimination Train-the-Trainers. Lansdowne, VA.

Metcalf and Eddy, Inc. 2003. Wastewater Engineering; Treatment and Reuse, Fourth Edition. McGraw Hill. New York, NY.

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Appendix A

ODOT Health and Safety Plan

STATE OF OKLAHOMA
DEPARTMENT OF TRANSPORTATION
ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM, FIELD SCREENING, AND INVESTIGATION MANUAL

APPENDIX A
HEALTH AND SAFETY PLAN

Oklahoma Department of Transportation
200 NE 21st Street
Oklahoma City, Oklahoma 73105-3204

October 2009

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Tables

Acronyms and Abbreviations

°C	degrees Celsius
CFR	Code of Federal Regulations
CPR	cardiopulmonary resuscitation
EPA	U.S. Environmental Protection Agency
°F	degrees Fahrenheit
HASP	Health and Safety Plan
IDDE	Illicit Discharge Detection and Elimination
MSDS	material safety data sheet
NIOSH	National Institute of Occupational Safety and Health
ODEQ	Oklahoma Department of Environmental Quality
ODOT	Oklahoma Department of Transportation
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
ROW	right-of-way

HEALTH AND SAFETY PLAN TRAINING ACKNOWLEDGMENT

This is to certify that the undersigned has successfully completed the Health and Safety Plan (HASP) Training Program on (date) _____ for the **OKLAHOMA DEPARTMENT OF TRANSPORTATION ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM ACTIVITIES.**

As part of this training, the Project Health and Safety Manager has conducted a general training class covering the contents of the project HASP document. The undersigned Project Health and Safety Manager has issued a copy of the written HASP.

_____
Employee Name, Printed

_____
Employee Signature Date

_____
Project Health and Safety Manager Signature Date

c: Employee (placed in manual)
Employee Health and Safety File (original)
Project Health and Safety Manager

1.0 INTRODUCTION

1.1 OBJECTIVE

This Health and Safety Plan ("HASP") establishes the work practices necessary to help ensure protection of ODOT personnel, subcontractors, and authorized visitors during Illicit Discharge Detection and Elimination ("IDDE") field activities. The activities will be conducted within the state right-of-way ("ROW") associated with Oklahoma Department of Transportation ("ODOT") roadways.

The objective of this plan is to provide a mechanism for the establishment of safe working conditions. The safety organization and procedures have been established following an analysis of potential hazards. Specific hazard control methodologies have been evaluated and selected in an effort to minimize the potential of accident or injury.

All site operations will be performed in accordance with applicable state, local, and consultant corporate regulations and procedures. ODOT specific regulations, procedures, and job-site specific requirements will be followed. All field personnel and subcontractors must comply with the requirements of this plan.

1.2 SITE/FACILITY DESCRIPTION

All of the operations will be conducted on ODOT property (herein referred to as "Sites"). The location of each drainage structure may or may not be an official "outfall" as described by the Oklahoma Department of Environmental Quality ("ODEQ").

1.3 POLICY STATEMENT

ODOT staff and contractors should promote safety and safe working conditions for employees. No phase of operations or administration should be of greater importance than prevention of injury and illness. Safety should take precedence over expediency or shortcuts. Every accident and every injury is avoidable and every reasonable step should be taken to reduce the possibility of injury, illness, or accident.

This HASP prescribes the procedures that must be followed by all site personnel. Operational changes, which could affect the health or safety of personnel, the community, or the environment, will not be made without prior approval of the Project Manager and the HASP Manager.

The provisions of this plan are mandatory to all ODOT staff and consultant personnel, and subcontractors assigned to the project. All visitors to any work site are required to abide by these procedures. Work conditions can change as operations progress; therefore, the HASP Manager will provide written addenda to this HASP Plan when changes warrant. No changes to the plan will be implemented without prior approval of the HASP Manager or his authorized representative.

1.4 REGULATORY GUIDELINES

This HASP complies with applicable ODOT, Occupational Safety and Health Administration ("OSHA"), and U.S. Environmental Protection Agency ("EPA") regulations. This plan generally follows the guidelines established in the following documents:

- Standard Operating Safety Guides (EPA, November 1984)
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (National Institute of Occupational Safety and Health [NIOSH] 85-115)
- Title 29 of the Code of Federal Regulations, Part 1910 (29 CFR §1910) (U.S. Department of Labor/OSHA)

2.0 RESPONSIBILITIES

2.1 ALL PERSONNEL

All personnel are responsible for continuous adherence to these HASP procedures during the performance of their work. No person may work in a manner that conflicts with the intent or the inherent safety and environmental precautions expressed in these procedures. After due warnings, any person who violates safety procedures will be dismissed from the site and potentially the project. ODOT staff, consultant employees, and subcontractors are subject to progressive discipline and may be terminated for continued violations. All on-site personnel will be trained in accordance with 29 CFR §1910.120, 1910 Subpart I and 1910.146, and this document.

The following are the main field personnel that will be conducting on-site work:

- Outfall Inventory Manager
- Team Supervisor
- Field Team Leader
- Field Assistant
- Investigation Team

The roles and responsibilities of field personnel are discussed in Sections 3 and 4 of the ODOT IDDE Field Screening and Investigation Manual.

The main management personnel involved with health and safety for ODOT are as follows:

- Project Health and Safety Plan Manager
- Project Manager
- Task Manager

2.2 PROJECT HEALTH AND SAFETY PLAN MANAGER

The HASP Manager is responsible for developing and coordinating the site-specific HASP and addenda as required. This plan complies with 29 CFR §1910.120, 1910 Subpart I, and 1910.146 and includes personal protective equipment ("PPE") specifications, field implementation procedures, and audits. The HASP Manager will issue addenda to the HASP if changed conditions warrant. The HASP Manager is the contact for regulatory agencies on matters of safety and health. The HASP Manager has the ultimate responsibility to stop any operation that threatens the health or safety of the team or surrounding populace, or that causes significant adverse impact to the environment. Other responsibilities include, but are not limited to:

- Implementing all safety procedures and operations on site
- Observing work party members for symptoms of on-site exposure or stress
- Upgrading or downgrading the levels of personal protection based upon site observations and monitoring results
- Reviewing significant changes in the site environment that require equipment or procedure changes
- Arranging for the availability of on-site emergency medical care and first aid, as necessary

The HASP Manager will have on-site health and safety coordinator responsibilities for all field work.

2.3 PROJECT MANAGER

The Project Manager is ultimately responsible for ensuring that all project activities are completed in accordance with the requirements set forth in this plan.

2.4 TASK MANAGER

The Task Manager supervises all activities at the site and is responsible for field implementation of the HASP. This includes communicating site requirements to all personnel, ensuring field supervisors and subcontractors enforce all provisions of the plan, and consulting with the HASP Manager regarding changes to the HASP. Other responsibilities include:

- Reading and becoming familiar with this HASP and ODOT Policies and Procedures
- Enforcing the HASP and other safety regulations
- Stopping work as required, ensuring personal and environmental safety and health
- Determining evacuation routes, establishing and posting local emergency telephone numbers, and arranging emergency transportation
- Ensuring that all site personnel have received the proper training and medical clearance prior to entering the site
- Establishing exclusion, decontamination, and clean zones
- Presenting tailgate safety meetings and maintaining attendance logs and records

- Discussing potential HASP hazards with the HASP Manager and the Project Manager
- Implementing changes as directed by the HASP Manager and Project Manager

2.5 SUBCONTRACTORS

On-site subcontractors and their personnel are responsible for understanding and complying with all site requirements. Subcontractors are required to follow the guidelines established in the HASP.

2.6 ON-SITE PERSONNEL AND VISITORS

All on-site personnel and visitors are required to comply with the provisions of this HASP and all applicable federal, state, and local regulations. Each person is responsible for their own safety and health, for completing tasks in a safe manner, and for reporting any unsafe acts or conditions to his supervisor. Personnel will monitor themselves and their fellow employees for signs and symptoms of heat/cold stress and chemical exposure.

29 CFR §1910 should be used as a reference for additional instruction and guidance on these topics.

3.0 JOB HAZARD ANALYSIS

3.1 SCOPE OF WORK

The Investigation Team will conduct field investigations at various sites located on the ODOT ROW, complete forms, take photographs, and collect samples of illicit discharges from the storm sewer infrastructure.

3.2 JOB HAZARD ASSESSMENT BY TASK

The hazard assessment identifies potential safety, health, and environmental hazards and provides for the protection of personnel, the community, and the environment. Because of the complexity and constant change of the sampling site locations, supervisors must continually inquire about the work sites to identify hazards that may harm site personnel, the community, or the environment. The Project Manager and Task Manager must be aware of these changing conditions and discuss them with the HASP Manager. The HASP Manager will write addenda to change Job Safety Analyses and associated hazard controls as necessary.

Drainage structure sites to be surveyed are located along the dedicated ROW for ODOT roadways. The physical hazards involved in the field survey task are related to the field work associated with surface water sampling and working near the roadway. Slip, trip, and fall hazards will be of concern during this task. Should the walking or working surfaces become wet, extra caution must be taken to avoid slipping. Splash hazards will be present during the sampling.

Site personnel will be made aware of this hazard and handle all surface water samples with appropriate care. Site personnel will follow proper lifting techniques when sampling. No personnel will be permitted to lift over 50 pounds without getting assistance. Site personnel will be required to utilize equipment appropriately.

3.3 TEMPORARY TRAFFIC CONTROL AND SAFETY

Road user and worker safety in temporary traffic control zones should be an integral and high-priority element of the field survey. The work should be planned and conducted with the safety of drivers, bicyclists, pedestrians, and workers being considered at all times. Temporary traffic control devices that should be used in this study include but are not limited to:

- Traffic cones
- Work zone warning signs
- Vehicle warning light

For a full list of approved traffic control devices and for the specifications of the devices listed above refer to Chapter 6F of the Manual on Uniform Traffic Control Devices (MUTCD, 2003). The temporary traffic control devices should be removed as soon as practical when they are no longer needed.

Each temporary traffic control zone is different with many variables affecting the safety needs of each zone. The key factor in promoting temporary traffic control safety is proper judgment. The duration of work for the field survey should be considered short-term stationary or short duration. The location of the work will be outside of the shoulder, on the shoulder with no encroachment, or within the median.

For guidance on the appropriate establishment of temporary control zones for the locations mentioned above, including the proper placement of traffic cones and signs, refer to Chapter 6G of the Manual on Uniform Traffic Control Devices (MUTCD, 2003).

3.4 HEAT STRESS SIGNS AND SYMPTOMS

Wearing PPE places a worker at increased risk of heat stress. Heat stress effects range from transient heat fatigue to serious illness and death. Heat stress is caused by several interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is the most common and potentially serious illness involved with this type of field data collection, preventive measures and alertness to the signs and symptoms are vital.

Heat Stress. Heat stress monitoring should begin at 85°F when impermeable garments are worn (i.e., cotton clothes or cloth coveralls).

Heat Rash. Heat rash is caused by continual exposure to heat and humid air and is aggravated by chaffing clothes. Heat rash decreases a person's ability to tolerate heat.

Heat Cramps. Heat cramps are caused by heavy sweating and inadequate electrolyte replacement. Signs and symptoms include muscle spasms and pain in the hands, feet, and abdomen.

Heat Exhaustion. Heat exhaustion occurs from increased stress on various body organs, including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

- Pale, cool, moist skin
- Heavy sweating
- Dizziness
- Nausea
- Fainting

Heat Stroke. Heat stroke is the most serious form of heat stress; temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Competent medical help must be obtained immediately. This is a true medical emergency. Signs and symptoms are:

- Red, hot, unusually dry skin
- Lack of or reduced perspiration
- Nausea
- Dizziness and confusion
- Strong, rapid pulse (initially)
- Coma

3.5 SIGNS AND SYMPTOMS OF COLD STRESS

Cold stress effects range from frostbite to serious illness and death. Cold stress is caused by the temperature of the body falling below its normal temperature, usually from exposure to cold weather, and is aggravated by wet clothes, wind, hunger, and exhaustion.

Hypothermia. Hypothermia is the most serious form of cold stress and can occur with air temperatures above 16ºC (60ºF) under wet and/or windy conditions. Signs and symptoms include uncontrollable fits of shivering, incoherence, listlessness, fumbling hands, frequent stumbling, drowsiness, and the inability to get up after resting. Immediate action must be taken to remove a person suffering from hypothermia from the cold to a dry warm place. Wet clothes should be removed and replaced with dry clothes. Care should be taken to warm the body slowly. Warm, non-alcoholic drinks may be given to the victim. These are temporary measures and competent medical help must be obtained immediately.

3.6 HAZARDOUS MATERIALS

There are no known hazardous or toxic materials existing along the ODOT ROW.

3.7 BIOLOGICAL HAZARDS

Depending upon site conditions, various biological hazards may be present at the site. These may include such things as poison oak; poison ivy; poison sumac; stinging nettles; wild bramble bushes; various ticks, chiggers, bees, and wasps; spiders; fire ants; scorpions; snakes; and vermin such as mice or rats. Tables 3-1 through 3-3 present a summary of general information on the most common plant and animal hazards encountered by field staff.

Table 3-1
Spiders, Scorpions, and Other Insects

Animals	Descriptions/Characteristics	Procedure
SPIDERS, SCORPIONS, AND OTHER INSECTS		
Black widow spider	Female (the only one that bites) is black and almost spherical, usually with red hourglass mark below or with two transverse red marks, separated by black. Inhabits fallen branches and under objects.	Take care when reaching into small dark spaces. If bitten by a black widow or brown recluse, seek medical attention as soon as possible. Scorpion stings may not require medical attention.
Brown recluse spider	Orange-yellow thorax with dark violin pattern. Bases of legs orange-yellow, rest of legs grayish to dark brown. Abdomen grayish to dark brown with no obvious pattern. Frequents areas of human habitation and prefers dark spaces. Found outdoors in sheltered corners, among loose debris; indoors on the floor and behind furniture.	
Scorpion	Lobster-like pincers with a long up-curved "tail" that ends in a poisonous stinger. Nocturnal, sensitive to vibrations. Frequents the desert. Not easily seen in the wild. Field boots are a favorite hiding place. Most scorpions are not dangerous and do not attack. Poison of most North American species is not lethal to humans but they do inflict a painful sting.	
Tick	Small, less than 3 mm (<1/8 inch). Clamps to host using dart-like anchor located just below the mouth. Wear long pants and tuck pants legs into socks and use a repellent containing the compound DEET (N-diethyl-meta-toluamide).	Check for ticks during and after field work. Remove with tweezers within 24 hours. Wash and disinfect the bite.
Bees	Bees vary in size from 2 mm (0.08 inch) to 4 cm (1.6 inches) long. Locations vary from ground nests to trees and man-made structures.	Avoid beehives and wasp nests. If stung, scrape off the stinger with a knife or other flat object (e.g., credit card). Wash well with soap and water. A cold pack may be used to reduce swelling. Use an over-the-counter sting ointment or solution of water and baking soda. If a member of the field team is allergic to insect bites or stings, this should be made known to the rest of team. That person should carry a sting kit for use in emergencies. Symptoms of an allergic reaction include: pain, swelling of the throat, redness or discoloration in the area of the sting, itching, hives, decreased consciousness, or difficult or noisy breathing.
Wasps	Wasps vary in size from minute to 5 cm (2 inches) long. Adults have a narrow waist between the first and second abdominal segments. Locations vary from ground nests to trees and man-made structures.	
Fire ants	Fire ants vary in size but are all small. Bodies are red with dark abdomens. Mounds are typically visible above grade elevation and most common in sunny, warm locations with few disturbances. When disturbed, fire ants will swarm and bite/sting in unison. Venom is painful but not a health concern unless many bites/stings received.	Avoid disturbing mounds. Wear long pants and tuck pants legs into socks. Wipe off swarming ants quickly to prevent multiple bites.

Table 3-2
Snakes

Animals	Descriptions/Characteristics	Procedure
	SNAKES	
Copperhead	**Description**: Stout body; copper, orange, or pink tinged with bold chestnut or reddish brown crossbands narrowing in the middle of the back. Top of head unmarked. **Habitat**: Wooded hillsides with rock outcrops above streams or ponds, and edges of swamps. Seen basking during fall and winter months but more nocturnal during warm weather. Favorite warm weather habitats include stonewalls, piles of debris, rotting logs, and large flat stones near streams. **Hazard**: Copperhead bites are painful but rarely life threatening.	Best defense is to avoid them. Most snakes will go the other way unless unusually agitated or disturbed.
Western cottonmouth (water moccasin)	**Description**: A dark, heavy-bodied water snake. Broad-based head noticeably wider than neck. Olive, brown or black above; patternless or with jagged-edged dark crossbands. Top of head is flat; eyes not visible from directly above as in other harmless water snakes. Unlike other water snakes, it swims with head well out of water. Never far from water. Most active at night although may be seen sunning during the day. **Habitat**: Lowland swamps, lakes, rivers, bayheads, irrigation ditches, canals, rice fields, to small clear rocky mountain streams. Do not disturb. **Hazard**: Bite more serious than that of a copperhead and can be fatal. When disturbed, tends to stand its ground exposing the light "cotton" lining of its mouth.	If bitten: **Do** Reassure the victim. Treat for shock. Keep victim lying down; elevate feet 10 to 12 inches. Seek medical attention as soon as possible. **Do Not** Cut and suck bite area. Apply ice or a tourniquet. Leave victim unattended.
Rattlesnake	**Description**: Heavy-bodied with head distinctly wider than the neck. Most have blotches or crossband patterns on the back. (The diamondback has black-bordered diamond patterns or hexagonal blotches. Two diagonal lines on side of face. Tail encircled by broad black and white rings.) They have recurved, retractable, hollow fangs near the front of the upper jaw. Rattlesnakes have a distinctive rattle on the tail. **Habitat**: Arid and semiarid area from plains to mountains; brushy desert, rocky canyons, bluffs along rivers, sparsely-vegetated rocky foothills. **Hazard**: Western diamondback rattlesnake is capable of delivering a fatal bite. When disturbed it normally stands its ground, lifting its head well above the coils. The warning is a buzzing sound.	

Table 3-3
Plants

Plants	Descriptions/Characteristics	Procedure
PLANTS		
Poison Ivy	Climbing poison ivy has alternate, trifoliate leaves with aerial roots that grow straight and are fuzzy. Found in most environments. Non-climbing poison ivy lacks aerial roots. The leaves are the same shape as the climbing poison ivy but are larger and broader. Vines without leaves can still cause a case of poison ivy. If a piece of vine is used as fire wood, the oily resins can be released into the air. The resin can also remain on unwashed clothing and equipment.	**Do** Flood the affected area with lots of cold water as soon as possible. Since the oily resin is only slightly soluble in water, a little water will only spread the poison. Use anti-itch cream. People allergic to poison ivy may require medical attention. Consider using pre-exposure lotion that creates a barrier against poison ivy, oak, and sumac oils. Poison oak and ivy cleansers are available that can be used up to 8 hours after exposure. **Do Not** Use hot water or soap. These help increase the effects of poison ivy.

The presence of these hazards and the need for control measures should be determined prior to working in areas where these hazards may exist. Particular attention should be given to any area that may support these various biological hazards in which personnel may have to work. If any biological hazard is located, the hazard shall be removed, if possible, before work can continue. If the area is not near a chemical sampling point, insect repellants may be used. Persistent insect problems (e.g., fire ants) may be addressed with the use of insecticides on a case-by-case basis. In areas where personnel cannot visually inspect but must place their hands, work gloves will be worn in an effort to protect personnel from insect bites.

4.0 HAZARD CONTROL PROGRAM

All personnel will follow the following procedures during field screening activities.

4.1 GENERAL PRACTICES

All information regarding the work to be performed, emergency procedures, and HASP hazards will be reviewed before the work begins during a daily tailgate safety meeting. No work will be performed before this meeting has taken place. At least one copy of this plan will be available at the job work site.

Only authorized personnel will be permitted in the work area. All personnel entering the site will be thoroughly briefed on the hazards, equipment requirements, safety practices, emergency procedures, and communication methods.

Protective clothing will be used for various stages of the operation as needed.

No food, beverages, or tobacco products will be present, consumed, or used in contaminated areas or potentially contaminated areas. Taking medication, smoking, or applying cosmetics are also prohibited.

Emergency equipment will be located in readily accessible uncontaminated locations. A complete first-aid kit and a fire extinguisher will be readily available on-site for the team's use in the event of an emergency. The first aid kit should include, at a minimum, a snake bite kit, potable distilled water, bandages, scissors or knife, antiseptic, bee sting kit, and allergic reaction to insect bite kit. In addition, eyewash should be readily available via a distilled water bath.

Personnel should also consider carrying the following safety items: flashlight and spare batteries, cellular phone, rain gear, hat, sunscreen, sunglasses, hand cleaner, and protective goggles.

When working around heavy equipment or materials, employees and visitors will adhere to the following precautions:

- Hardhats must be worn at all times on the site.
- Pay attention at all times.
- Maintain visual contact at all times.
- Establish hand signal communication when verbal communication is difficult. Determine one person per work group to give hand signals to equipment operators.
- Be aware of footing at all times.

- Use proper personal lifting techniques. Use your legs, not your back.

- Get help whenever you are in doubt about a material's weight.

4.1.1 Buddy System

All on-site personnel will use the buddy system. Buddies will maintain visual contact with each other. Personnel must observe each other for signs of heat stress or toxic exposure, such as:

- Changes in complexion and skin discoloration
- Changes in coordination or demeanor
- Excessive salivation and pupillary response
- Changes in speech pattern

Personnel will inform their supervisor of non-visual effects of toxic exposure such as:

- Headaches, dizziness, blurred vision
- Nausea
- Cramps
- Irritation of eyes, skin, or respiratory tract

4.1.2 Fall Protection

The walking and working surfaces may be wet and slippery. Use extra caution when working on these surfaces. In addition, any open excavations will be avoided and the location noted to the HASP Manager to prevent other personnel from falling into these areas.

4.2 PROJECT-SPECIFIC PRACTICES

The work area must be marked in such a way as to prevent traffic from passing within 10 feet of the work area. Cones, caution tape, barricades, or other means must be used to define the work area. Refer to Chapter 6 of the Manual on Uniform Traffic Control Devices (MUTCD, 2003) for guidance on establishment of temporary traffic control zones.

All on-site personnel must wear steel-toed safety shoes, reflective safety vests, and hard hats. Long pants or trousers and shirts covering the upper body and upper arms must also be worn when the vegetative conditions warrant the protection. To prevent personnel exposure to heat and cold stress during all tasks, the practices outlined below will be followed.

Heat Stress. Heat stress due to protective clothing decreasing body ventilation is an important factor. Heat stress of employees on-site will be monitored by the American Red Cross method of monitoring heart rates and oral temperatures as personnel come out for rest and cooling off.

Ambient temperature and other environmental factors provide basic guidelines to implement work/rest periods. However, since individuals vary in their susceptibility to heat stress, the Field Team Leader will also utilize physiological monitoring to regulate each individual's response to heat stress using the temperature criteria in Section 3.4. The two physiological parameters that each individual will monitor are:

Heart Rate. Each individual will count his/her radial (wrist) pulse for 30 seconds as early as possible in the first rest period. If the heart rate of any individual in the sampling team exceeds 100 beats per minute at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same.

Oral Temperature. Each individual will monitor his/her oral temperature in the first rest period. If the oral temperature exceeds 99.6°F at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same. One or more of the following control measures can be used to help control heat stress and are mandatory if heat stress is detected by elevated heart rate or oral temperature:

- Employees should drink plenty of water throughout the day and should increase their salt intake slightly by salting their food a little heavier.
- On-site drinking water will be kept cool (50 to 60°F) to encourage personnel to drink often.
- A work regimen that will provide adequate rest periods for cooling down will be established as required.
- All personnel will be advised of the dangers and symptoms of heat stroke and exhaustion.
- Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments.
- Employees will be cautioned to monitor themselves and their co-workers for the effects of heat disorders and to take additional breaks as needed.
- All breaks are to be taken in a shaded rest area.
- Employees will not do other tasks during rest periods.
- Employees will remove impermeable garments during rest periods.

- All employees will be informed of the importance of adequate rest, acclimatization, and proper diet in the prevention of heat stress.

Cold Stress. Employees will be encouraged to stay warm and dry and to put on rain gear before it rains. Employees will also be encouraged to dress in layers and to add more clothing during cold periods. One or more of the following control measures can be used to help control cold stress:

- All personnel will be trained to recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries.

- All personnel will be trained to learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help a co-worker.

- Employees will select proper clothing for cold, wet, and windy conditions. Employees will layer clothing to adjust to changing environmental temperatures. A hat and gloves, in addition to undergarments that will keep water away from the skin (polypropylene) will also be worn.

- Employees will take frequent short breaks in warm, dry shelters to allow their bodies to warm up.

- Employees will perform work during the warmest part of the day.

- Employees will avoid exhaustion or fatigue.

- Employees will use the buddy system (work in pairs).

Personnel should also be aware of changing weather conditions and the potential for storms, tornados, lightning, and other potential environmental hazards at the site. If lightening strikes are observed in the immediate vicinity, personnel should notify the HASP Manager and seek shelter within a vehicle or building. During periods of heavy rain, personnel should not enter low-lying areas and should remain aware of potential flooding hazards.

4.3 HEARING CONSERVATION

Since the ambient noise will be no more than that generated by standard highway traffic, no hearing protection (foam inserts or equivalent) will be recommended for this work activity unless on-site personnel feel they are warranted at certain sites due to unforeseen circumstances.

4.4 SANITATION

ODOT and consultant employees will keep the work and support areas neat, orderly, and free of trash and debris.

4.4.1 Break Area

Work breaks will be taken in or near the field vehicle.

4.4.2 Potable Water

If the facility does not have a water supply available, potable water will be carried to the site for use in decontamination and employee cleanup.

4.4.3 Trash Collection

All refuse will be deposited into designated containers while on-site. It is the responsibility of the Project Manager, Field Supervisor, and on-site Field Team Leader to ensure that the area is kept clean. All solid waste will be placed in an appropriate container.

4.5 CONFINED SPACE

The field personnel will not be allowed to make entry into any confined spaces during the execution of this field sampling effort.

29 CFR §1910 should be used as a reference for additional instruction and guidance on these topics.

5.0 PERSONAL PROTECTIVE EQUIPMENT

The PPE outlined below has been selected according to the site characterization and analysis, job tasks, site hazards, intended use, and duration of potential employee exposures. General requirements for PPE are outlined in 29 CFR §1910.132.

5.1 SELECTION OF PPE

The selection of the PPE will be done per-site/field activity and after a thorough evaluation of the hazards involved at the site during each phase of the operation.

The minimal level of protection that will be required of field personnel will comprise the following:

- Boots/shoes - with steel toes
- Hardhat
- Safety vest - reflective
- Coveralls or work clothing (long sleeves and long pants in thick underbrush)
- Work gloves (if necessary)
- Hearing protection (if necessary)

29 CFR §1910.133, 135, 136, and 138 should be used as a reference for additional instruction and guidance on these topics.

6.0 SITE CONTROL

Site control requires establishing specific measures to prevent unauthorized entry onto the site and to protect all personnel entering the site from recognized safety and health hazards. The following measures are mandatory:

- Authorization to Enter
- Hazard Briefing
- Entry Log
- Entry Requirements

6.1 AUTHORIZATION TO ENTER

No consultant employee or subcontractor will be admitted onto ODOT property without specific authorization from the appropriate ODOT representative.

Once ODOT access is received, the Project HASP Manager, Project Manager, or Task Manager may grant authorization to enter the consultant work areas. Representatives of the news media and other visitors must receive authorization from ODOT and the applicable consultant Project Management Team before entry.

6.2 HAZARD BRIEFING

The Project HASP Manager will brief this HASP Plan to personnel entering the site to inform them of potential site HASP hazards and procedures specific to this site. All personnel will acknowledge this briefing by signing the HASP Plan Acknowledgement Form. This briefing will be further documented in the site daily log.

6.3 ENTRY LOG

The Team Supervisor will keep a daily roster of all on-site personnel and record the time of entry into and exit from the sample sites for each person.

6.4 ENTRY REQUIREMENTS

All personnel entering or working at the sample sites will use the proper PPE.

7.0 EMPLOYEE TRAINING

All field personnel will be trained before their initial assignment to any project. All field employees should receive a minimum of four hours of training off-site and a minimum of one day of actual field experience under the direct supervision of a trained, experience supervisor.

For non-hazardous construction work and some non-intrusive actions, this training may not be required. Only the HASP Manager can exempt personnel and contractors from training requirements.

7.1 PRE-ENTRY BRIEFINGS

The following training sessions and informational materials will be provided for each project site:

- Tailgate Safety Meetings and Site HASP Form
- Material Safety Data Sheets ("MSDS")
- HASP's

7.1.1 Tailgate Safety Meetings

The Site Manager or a designee conducts a tailgate safety meeting at the beginning of each shift or whenever new employees arrive at the job site once the job commences. The topics discussed at the tailgate safety meeting include HASP considerations for the day's activities, necessary protective equipment, problems encountered, and new operations. Attendance records and meeting notes are maintained with the project files.

7.1.2 Material Safety Data Sheets

MSDS's will be provided with the field test kits for all the chemicals used in the field. This information will be made readily available to all employees upon request and stored in a central location.

7.1.3 Health and Safety Plans

The HASP Manager prepares a site-specific HASP for each project falling within the scope and application of 29 CFR §1910. The HASP Manager presents the HASP and discusses it with everybody assigned to the project. All workers and visitors must read and sign the HASP, acknowledging acceptance of site rules and understanding of site hazards before entering.

7.2 SITE WORKERS BASIC COURSE

The following is a general list of topics covered in the office-training course:

- General site safety
- Physical hazards (fall protection, noise, heat stress, cold stress)
- Names and titles of key personnel responsible for site safety and health
- Safety, health, and other hazards present at the site
- Use of PPE
- Work practices by which employees can minimize risks from hazards
- Safe use of engineering controls and equipment on-site
- Medical surveillance requirements, including recognition of symptoms and signs that might indicate over-exposure to hazards
- Worker Right-to-Know (Hazard Communication)
- Engineering controls and safe work practices
- Components of the site HASP Program

7.3 FIRST AID

It is recommended that employees receive instruction in American Red Cross first aid and cardiopulmonary resuscitation ("CPR") techniques from qualified instructors.

29 CFR §1910 should be used as a reference for additional instruction and guidance on these topics.

8.0 EMERGENCY PROCEDURES

8.1 GENERAL

The HASP Manager will provide daily the Emergency Contingency Plan form for completion before leaving the office for field work activities. This form will be completed by the Field Team Leader and checked and signed by a senior project staff person or the HASP manager.

The Emergency Contingency Plan will establish general evacuation routes and assembly areas for the site. All personnel entering the site are informed of these routes and assembly areas. If the evacuation routes are not clear, a site plan will be prepared marking the evacuation routes and will be posted at conspicuous locations. If road construction activities interfere with the normal evacuation route, the Emergency Contingency Plan should indicate this and notify workers of alternative routes.

The HASP Manager will provide direction to the field personnel to allow them to determine the potential for fire, explosion, chemical release, or other catastrophic events. As part of the training, site workers are instructed to report unusual events, activities, chemicals, and conditions to the HASP Manager.

8.2 EMERGENCY RESPONSE

The objective of emergency response actions is to minimize adverse health risks to site workers, the environment, and the local community.

Responsibilities: The site emergency coordinator will have the responsibility of directing the response activity in the event of an emergency. The responsibilities are described below:

- Assess the emergency situation and notify site security personnel.
- Determine the required response measures and inform the client contact.
- Notify the appropriate response teams of the specific action that will be taken upon request.
- Determine and coordinate the on-site personnel actions for the particular emergency situation.
- Contact and coordinate with appropriate governmental or regulatory agency.
- Act as liaison between responding agencies and site personnel.

- Immediately complete an appropriate Supervisor Injury Report per the contracting entity's safety program upon the occurrence of an accident or incident.

- The site emergency coordinator will notify the Project Manager of any incident.

The site emergency coordinator has the authority to commit resources as needed to contain and control released material and to prevent its spread to off-site areas.

8.3 SAFETY SIGNALS

Vehicle, tractor, and portable gas-operated horns are used for safety signals as follows:

- 1 Long Blast: Warning alarm - prepare for Emergency Response

- 2 Short Blasts: Activation alarm - initiate Emergency Response activities as directed by Site Emergency Coordinator

- 3 Short Blasts: All clear - return to normal activities

8.4 MEDICAL EMERGENCY

Before leaving the office, the field personnel will have a list of the medical facilities in that day's specific sampling area. Emergency medical personnel will be summoned without delay in the event of a medical emergency. The emergency coordinator will stay on the line with the 9-1-1 Operator until the 9-1-1 Operator hangs up.

Worker Injury - If a person working in an area is physically injured, American Red Cross first-aid procedures will be followed. Depending upon the severity of the injury or illness, emergency medical response may be obtained accordingly. If the person can be moved, that person will be taken to a location where emergency first aid treatment can be administered. The local emergency medical facility should be contacted along with an ambulance.

If the injury to the worker is of chemical nature, the following first-aid procedures will be instituted as soon as possible:

Eye Exposure. If contaminated material gets into the eyes, the eyes will be flushed immediately at the eyewash station using copious amounts of water while lifting up the lower and upper eyelids.

Skin Exposure. If contaminated sludge or corrosive liquid material gets on the skin, the affected area will be washed with soap or mild detergent.

Inhalation. If an individual inhales a volume of toxic or corrosive vapors, the employee will be removed to fresh air at once. If breathing has stopped, artificial respiration will be performed on the affected individual until medical attention can arrive on scene and transport the patient to the nearest medical facility.

Ingestion. In the event a person ingests a toxic liquid or solid material, medical attention will be obtained at once.

8.5 REPORTING INJURIES AND ILLNESSES

Project staff and employees will report all injuries to their supervisor immediately and report illnesses as soon as the employee knows he/she is sick. Supervisors will submit a completed "Supervisor's Report of Injury" to the HASP Manager within 24 hours of the occurrence. If there is any indication that the illness is work-related, the supervisor will submit a completed "Supervisor's Report of Injury" to the Project Manager within 24 hours after notification by the employee.

8.6 VEHICLE SAFETY – INCIDENT REPORTING

Since the vast majority of the work will be conducted within the ODOT ROW, traffic safety is of key importance. ODOT's policies, procedures, and guidelines should be used to report incidents and near-miss events involving the consultant or subcontractor personnel, equipment, and ODOT property.

8.7 EMERGENCY INFORMATION

8.7.1 Public Agencies

FIRE*	9-1-1
POLICE*	9-1-1
NATIONAL SPILL RESPONSE CENTER	(800) 424-8802
HOSPITAL	Varies. Form to be completed each day.
AMBULANCE*	9-1-1
OKLAHOMA POISON CONTROL CENTER	(800) 222-1222

*Local area police and fire will respond to a 9-1-1 call.

8.7.2 Key Personnel

A list that identifies the position, name, and contact phone number for key personnel who will need to be contacted during an emergency should be developed and inserted into the document here.

9.0 REFERENCES

MUTCD. 2003. *Manual on Uniform Traffic Control Devices for Streets and Highways*. U.S Department of Transportation, Federal Highway Administration.

Title 29 of the Code of Federal Regulations, Part 1910 (29 CFR §1910) (U.S. Department of Labor/ OSHA).

Appendix B

Outfall Screening Form

OKLAHOMA DEPARTMENT OF TRANSPORTATION
OUTFALL SCREENING FORM

Site Description:_____

Site Location:_____

Time/Date:_____

Outfall ID:_____

Nearest Mile Marker:_____

Outfall Status: New/Existing

Physical Characteristics
Is flow present from outfall? *Yes/No*

Flow description: *High flow/Trickle/Standing Water/Not-Applicable*

Odor: *sewage/rancid/sour/sulfide/petroleum/fuel/musty/pungent/none/other* _____

Color of discharge: _____ or *Not-Applicable*

Turbidity: *Turbid/Clear/Opaque/Not-Applicable*

Presence of oil sheen: *Yes/No*

Floatables: *Plastics/paper/unprocessed wood/paint/sewage/petroleum/suds/signs of illegal dumping/none/other*_____

Stains:
Excessive algae/fuel/Oil residue/paint/red/orange/yellow/green/blue/purple/brown/black/grey/white/clear/none/other _____

Vegetative conditions: *Normal growth/Over-flourishing/Poor Growth/Not-Applicable*

Additional comments:

Outfall Inventory team names:_____

Appendix C

Illicit Discharge Investigation Equipment Checklist

Oklahoma Department of Transportation
Illicit Discharge Investigation Equipment Checklist

	Personal Protective Equipment	
		Latex gloves
		Protective eyeglasses or goggles
		Raingear
		Rubber boots
		Reflective and fluorescent vest
		Hard hat
		Hand sanitizer
		Steel-toed boots
	Sampling Equipment	
		Bucket
		Sampling pole
		Field chlorine water chemistry test kit
		pH probe or test strips
		COC forms
		Sampling bottles with preservatives
		Plastic Ziplock bags
		Writing utensils
		Cooler
	Navigational Equipment	
		Compass
		GPS unit (optional)
	Flow Measuring Equipment	
		Measuring tape
		Stop watch
		Cylinder or bucket with volume amounts marked
	Miscellaneous Supplies	
		Cell phone
		Blank white index cards
		Manhole hook
		Camera
		Extra batteries for all equipment
		First aid kit