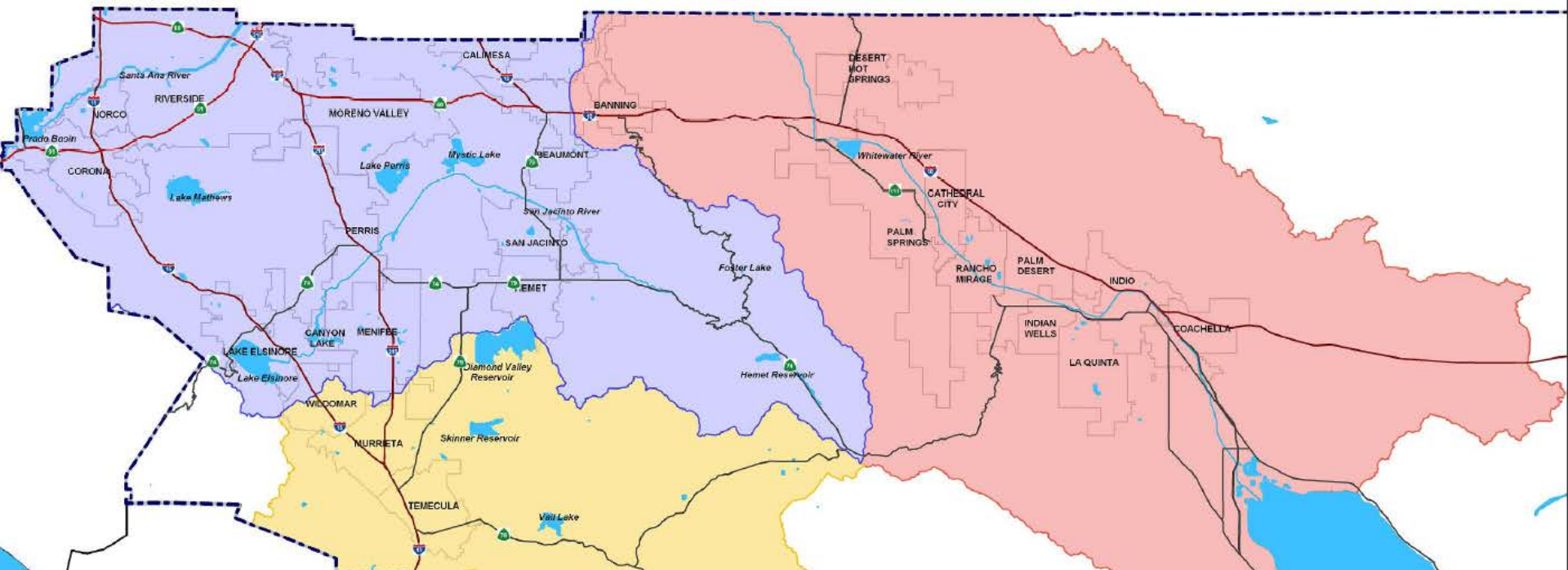
Illicit Connection / Illegal Discharge (IC/ID) Investigation and Safety Training

May | 2020



Introductions

- **Your Presenter**
  - Daniel Secrist CPESC, CESSWI, QSD/QSP, ToR, QISP

    Environmental Project Manager

    CASC Engineering and Consulting

    909-783-0101

Agenda

- Monitoring Program Overview
  - Monitoring Plan Objective
  - Period of Performance
  - Responsible Parties
  - Method to Track Illegal Dischargers
- Pre-Inspection Preparation
  - Communication
  - Equipment Inventory
- Procedures
  - Health and Safety
  - Monitoring

Agenda

- Field Event Procedures
  - Health and Safety
  - Field Equipment Use
  - Oakton Meter Calibration – General Maintenance
  - Practice Flow Estimation Procedures
  - Practice Grab Sampling Procedures
  - Sample Handling, Preservation and Transport
  - Estimate Volume Spill

Agenda

- Post-Event Procedures
  - Health and Safety
  - Confirmation of Records

What does IC/ID Monitoring involve?

What is an Illicit Discharge?

What is an “Illicit Discharge”?

- Federal regulations define an illicit discharge as

“…any discharge to an MS4 that is not composed entirely of stormwater…” with some exceptions

Permitted or allowed discharges (Permit Section IV)

- Air conditioning condensate
- Irrigation water from agricultural sources

- Discharge covered by a NPDES Permit or waivers by the RWQCB

Permitted or allowed discharges (Permit Section IV)

- Landscape irrigation
- Lawn/garden watering
- Other irrigation waters

These shall be shall be minimized through public education and water conservation efforts as prescribed under Order Section XI.E Residential Program

A concern is that the irrigation water flow could create an indirect mode of transport for pollutants.

Permitted or allowed discharges (Permit Section IV)

- Passive foundation drains
  - If the source water is stormwater or uncontaminated groundwater.
  - Discharges from contaminated ground water may require coverage under the DE Minimus Permit
  - or General Groundwater Cleanup Permit
- Passive footing drains
- Water from crawl space pumps
  - If the discharge is uncontaminated
  - Otherwise permit coverage under the De Minus Permit, or
  - General NPDES Permit for Discharges from Utility Vaults and Underground Structures to Surfacte Waeres (General Permit-Utility Vaults)

Permitted or allowed discharges (Permit Section IV)

- Non-commercial vehicle washing (residential)
- Car washing fundraisers by non-profit organization
- Dechlorinated swimming pool discharges

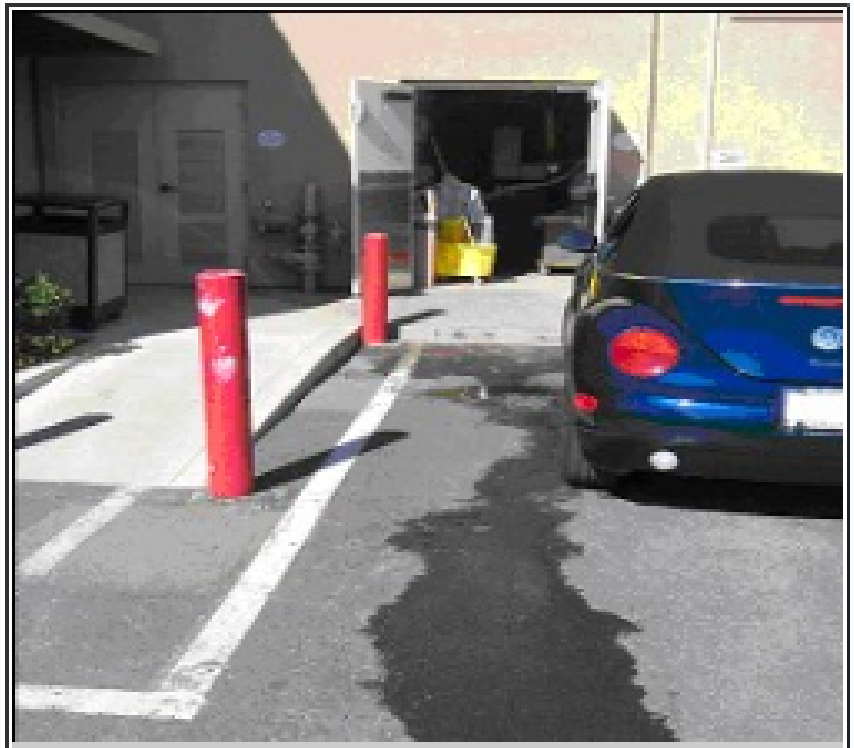
  (cleaning wastewater and filter backwash shall not be discharge into the MS4 or to Waters of the US.)
- Diverted stream flows
- Rising groundwater and natural springs

Discharge of rising groundwater and natural springs into surface water is only allowed if groundwater is uncontaminated. Otherwise, coverage under the General Groundwater Cleanup Permit, Order No. R8-2007-0008 may be required.

Permitted or allowed discharges (Permit Section IV)

- Flows from riparian habitats and wetlands
- Emergency fire fighting flows
  - Flows necessary for the protection of life and property do not require BMPs and need not be prohibited
  - However appropriate BMPs to reduce the discharge of pollutants to the MEP must be implemented when they do interfere with health and safety issues (Appendix K of the DAMP.
- Waters not otherwise containing wastes

What is an “Illicit Discharge”?



Illicit discharges are prevalent in urban areas, especially in industrial and commercial areas, such as this incident where mop water was dumped in a parking lot behind a motel.

Wash water from a commercial car wash discharging down a storm drain is an example of an illicit discharge.

Photos taken from NPDES website: Illicit Discharge Detection and Elimination Program Development

What is an “Illicit Discharge”?

Washwater flows are generated from a wide variety of activities and operations.

Examples include:

- Discharges of gray water (laundry) from homes
- Commercial carwash wastewater,
- Fleet washing
- Commercial laundry wastewater
- Floor washing to shop drains.

What is an “Illicit Discharge”?

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Power / pressure washing.
- Hosing off individual sidewalks and driveways
- Routine washing of fueling areas, outdoor storage areas, and parking lots,
- Construction equipment cleanouts

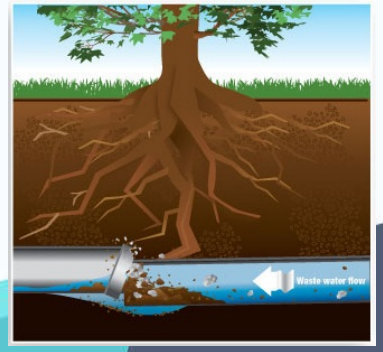
What is an “Illicit Discharge”?

Sewage and **septage** flows are produced from sewer pipes and septic systems.

Sewage has the greatest potential to produce direct illicit discharges within any urban subwatershed, regardless of the diverse land uses that it comprises.

The most commonly reported sewage related direct discharges

- broken sanitary sewer lines
- cross-connections
- straight pipe discharges.
- Indirect sources include failing septic systems



What is an “Illicit Discharge”?

Sewage and **septage** flows are produced from sewer pipes and septic systems.

Sewage can also be linked to significant indirect illicit discharges

- sanitary sewer overflows
- septic system failure
- sewage dumping from recreational vehicles.

What is an “Illicit Discharge”?

Liquid wastes refers to a wide variety of flows, such as

- **oil,**
- **paint,**
- **process water (radiator flushing water, plating bath wastewater, etc.)**

Improperly dispose of rinse water and wash water during maintenance and cleanup operations.

A common example is **cleaning deep fryers in the parking lot of fast food operations**

What is an “Illicit Discharge”?

Accident spills are a significant source of illicit discharges to the storm drain system.

These transitory discharges occur when a spill travels across an impervious surface and enters a storm drain inlet.

A common example is an oil or gas spill from an accident that then travels across the road and into the storm drain system

Discharge Flow Types

Tap water flows are derived from leaks and losses that occur during the distribution of drinking water in the water supply system.

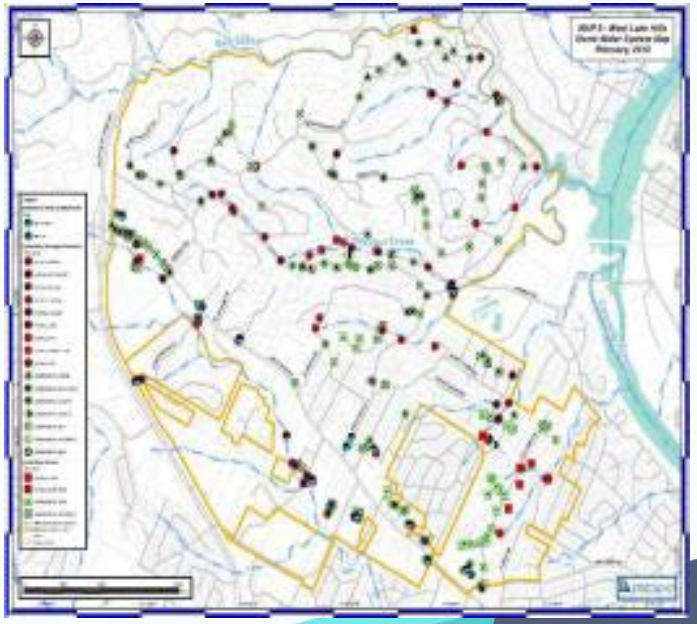
Tap water discharges in the storm drain system may be more prevalent in communities with high loss rates in their water distribution system.

The main worry is that these relatively clean waters can mask other illicit discharges due to intermingling. Additionally, **the tap water flow could create an indirect mode of transport for pollutants.**

Field Reconnaissance

Period of Performance

- Santa Ana River (SAR)
  - Each Permittee investigate all Major Outfalls within its jurisdiction within the term of the MS4 Permit (i.e. by January 29, 2015).



Period of Performance

- In general, field reconnaissance should be conducted at least 72 hours after the last runoff-producing rain event.
  - This reduces the chance of storm water discharge influencing visual and water quality observations.

- Likewise, extended dry periods and low groundwater levels are also optimal conditions for performing field reconnaissance.
  - Extended dry periods allow for more days of consecutive field work and low groundwater levels also reduce the chance of an influencing source.

Responsible Parties

- Riverside County Flood Control
  - Annual Training Seminar
- Permittees
  - Preparation and Monitoring within Jurisdiction
  - Field Reconnaissance Personnel
- Analytical Laboratory
  - Sample Bottle Re-Supply
  - COC Form – Preparation
  - Analytical Water Quality Measurements

Typical Field Reconnaissance Duties

- Mobilization / Preparation
- Health and Safety
- Observation and Field Measurements
- Communication
- Potential Sample Handling and Delivery to Lab

Mobilization / Preparation

Basic Elements of Mobilization Preparation

- Mobilization of Field Crew
  - Pre-Reconnaissance Safety Considerations
  - Lines of Communication
  - Roles and Responsibilities

- Field Equipment Inventory
  - Health and Safety – Per Person
  - Health and Safety – Per Team
  - Monitoring Devices
  - General and Disposable Inventory

Pre-Reconnaissance Safety Considerations

- Personnel has appropriate training for upcoming activity.
  - Ability to track discharges to probable sources,
  - Identify probable sources,
  - Knowledge of drainage system,
  - Identify field indicators,
  - Complete field forms,
  - General safety and vehicle use.

- A crew of at least two people

- Vaccinating for Hepatitis B if field personnel will be accessing waters suspected to be contaminated with sewage discharges.

- Field Personnel – Always let someone else at the office know where you are going and when you intend to return.

Lines of Communication

- All lines of communication are to be pre-arranged on a summary sheet(s). This contact list must be with Field Personnel at all times.
- Office Personnel – Management
  - Best Contact Number

  For when (not if) field personnel have Questions / Decision Direction / Notification
- Field Personnel communication list
  - Best Contact Number
  - Emergency Contact Number

City of Canyon Lake
Ms. Lori Moss, City Manager
31516 Railroad Canyon Road, Suite 101
Canyon Lake, CA 92587
951.244.2955, Fax: 951.246.2022
lmoss@cityofcanyonlake.com

City of Eastvale
Mr. Jon Crawford
6080 Hammer Avenue Ste., 103
Eastvale, CA 91752
951.505.1068
jcrawford@ci.eastvale.ca.us

City of Jurupa Valley
Ms. Lori Wolfe
8304 Limonite Avenue, Suite M
Jurupa Valley, CA 92509
loriwolfe@wolfe-engineering.com

City of Corona
Mr. Dale Lesinski
730 Corporation Yard Way, 2nd Floor
Corona, CA 92880
951.739.4820, 951.903.9187, Fax: 951.279.3613
DaleL@ci.corona.ca.us

City of Hemet
Ms. Linda Nixon
510 E. Florida Avenue
Hemet, CA 92543
951.765.3880, Fax: 951.765.3878
lnixon@cityofhemet.org

City of Lake Elsinore
Mr. Ken Seumalo
130 South Main Street
Lake Elsinore, CA 92530
951.674.3124 ext. 244, Fax: 951.674.8761
kseumalo@lake-elsinore.org

Roles and Responsibility of Management

- Management
  - Roles are defined in the desktop assessment.
  - There are additional guidance roles, but field personnel must first provide their observations.
  - What to do if the field personnel don’t come back at the appointed time.

Roles and Responsibility of Field Staff

- Field personnel
  - Field Observation
  - Water Quality Measurements
  - Photograph
  - Field Form Record

Field Equipment Inventory

PPE Equipment Inventory (Per Person)

- Ankle Supportive, High Traction Footwear
  - (i.e., hiking boots)
- High Visibility Vest – Reflective
- Warm / Cold Weather clothing
- Hand protection
  - Leather – Lifting or tripping hazard
  - Chemical – Nitrile gloves
- First Aid Kit
- Mobile Phone – **Charged**
- Hand Cleaner / Disinfectant
- Oakton pH/Temp/Conductivity Meter – Calibrated
- Digital camera
  - Charged / Spare Batteries
  - Date / Time is correct
  - Plenty of Storage space
- Mobile Phone – Charged

Field Equipment Inventory (Per Team)

- Vehicle – **Plenty of Gas**
- Employee Identification – ID, Business Card, Hard Hat
- IC/ID Field Binder – Health and Safety Plan, Monitoring Plan and Observation Forms (i.e. Field Data Sheets)
- Tool Kit – Flashlight, Extra batteries, paper towels, zip ties, screwdriver, utility knife, wire cutter, electrical tape, tape measure
- Box of 1-gallon Plastic bags
- Permanent Pens, pencils and/or waterproof pens
- Cups
- DI water

Check Oakton Meter

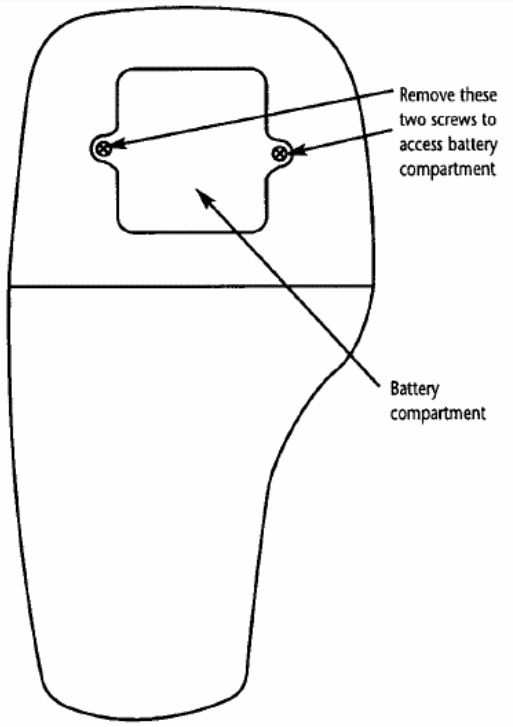
Prior to taking meter in the field, confirm that the meter and probe are working properly.

- Storage solution is present in the probe cap. It is normal to see potassium chloride (KCl) crystals around the cap. They are easily removed when rinsing the probe will distilled water.
- For best accuracy, soak the pH probe in electrode storage solution, pH 4.0 buffer solution or tap water for at least 5 to 10 minutes before use or calibration.
- If pH electrode has dehydrated (perhaps due to long storage), soak for at least 30 minutes in tap water.

Check Oakton Meter

Prior to taking meter in the field, confirm that the meter and probe are working properly.

- Storage solution is present in the probe cap. It is normal to see potassium chloride (KCl) crystals around the cap. They are easily removed when rinsing the probe will distilled water.
- For best accuracy, soak the pH probe in electrode storage solution, pH 4.0 buffer solution or tap water for at least 5 to 10 minutes before use or calibration.
- If pH electrode has dehydrated (perhaps due to long storage), soak for at least 30 minutes in tap water.
- Sufficient battery life is left. In the back of unit are two screws to access the battery compartment. Uses four (4) AAA alkaline batteries



Calibration of Equipment

- Per the QAPP (Volume II, Section 16) of the CMP:

  Calibration of field meters will be performed no more than seven (7) days prior to a sampling event.

  - Calibration shall be done in a dry environment
  - Calibration shall be recorded

Proper calibration is essential to obtaining accurate and representative results.

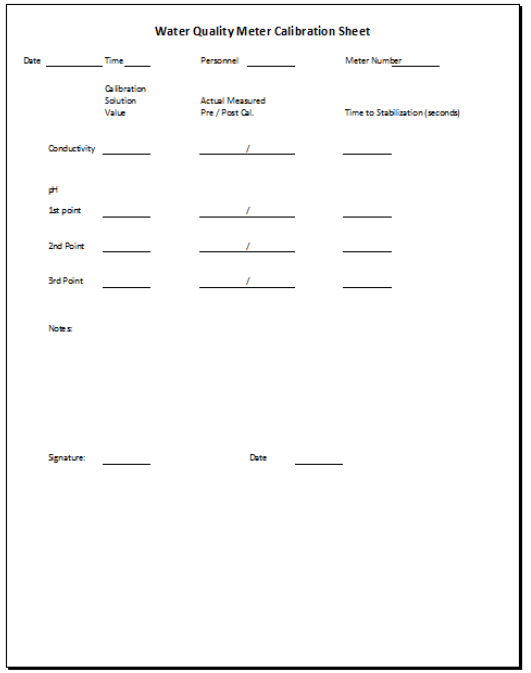
Calibration of Equipment Record Log

- Per the QAPP (Volume II, Section 16) of the CMP:

  Calibration of field meters will be performed no more than seven (7) days prior to a sampling event.

  - Calibration shall be done in a dry environment
  - Calibration shall be recorded

- A calibration log will be maintained for all meters used in the field. Keep the calibration log with the meter. It will be used to verify the meter meets SWAMP requirements, and also as a way to verify maintenance of meter.
- Calibration logs are part of Record Keeping (i.e., keep for a minimum of 5 years).



Water Quality Meter Calibration Sheet

Date _____ Time____ Personnel _____ Meter Number_____

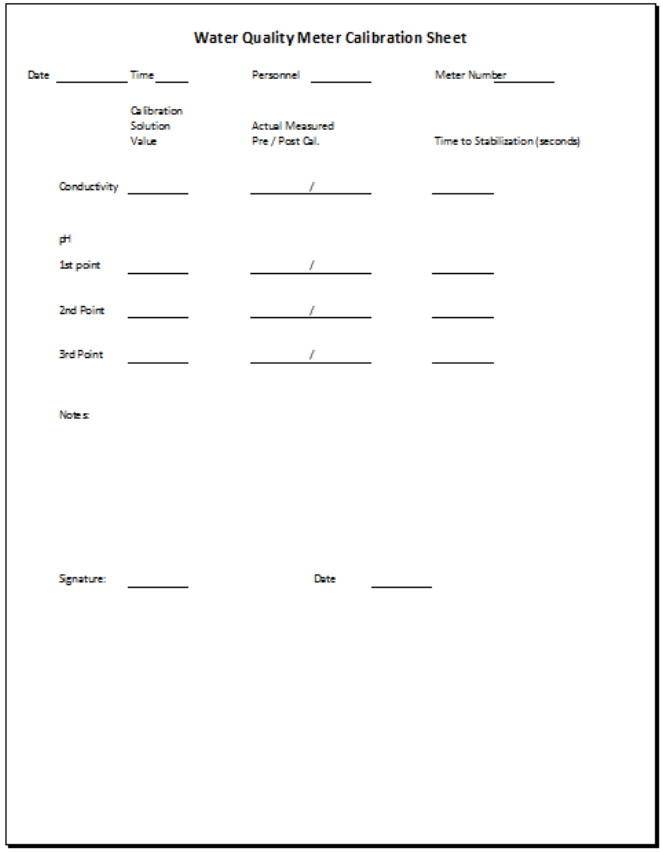
	Calibration Solution Value	Actual Measured Pre / Post Cal.	Time to Stabilization (seconds)
Conductivity	_____	_____/_____	_____
pH			
1st point	_____	_____/_____	_____
2nd Point	_____	_____/_____	_____
3rd Point	_____	_____/_____	_____

Notes:

Signature: _____ Date _____

Calibration of Equipment

- The log needs to be signed and dated.
- The first step of calibration is using the meter to measure the known water quality unit from the calibration supplies.
- If results are continually skewed, this can be a sign that the meter's probe needs to be cleaned or replaced.



Water Quality Meter Calibration Sheet

Date _____ Time ____ Personnel _____ Meter Number _____

	Calibration Solution Value	Actual Measured Pre / Post Cal.	Time to Stabilization (seconds)
Conductivity	_____	_____ / _____	_____
pH			
1st point	_____	_____ / _____	_____
2nd Point	_____	_____ / _____	_____
3rd Point	_____	_____ / _____	_____

Notes:

Signature: _____ Date _____

Proper calibration is essential to obtaining accurate and representative results.

Calibration of Equipment

- Parameters to Calibrate are:
  - pH
  - Conductivity
- Parameter that does not require frequent calibration:
  - Temperature
- Per the QAPP (Volume II, Section 16) of the CMP:

  Any parameters that do not require frequent calibration per manufacturer recommendation will be checked in a known standard for verification and documentation purposes.

Calibration of Equipment

- Each meter has an instruction manual that provides calibration directions.
  - For purposes of this training, we will practice a calibration test for pH and Conductivity.

- Each meter includes two (2) sets of calibration solution pouches for pH and Conductivity.

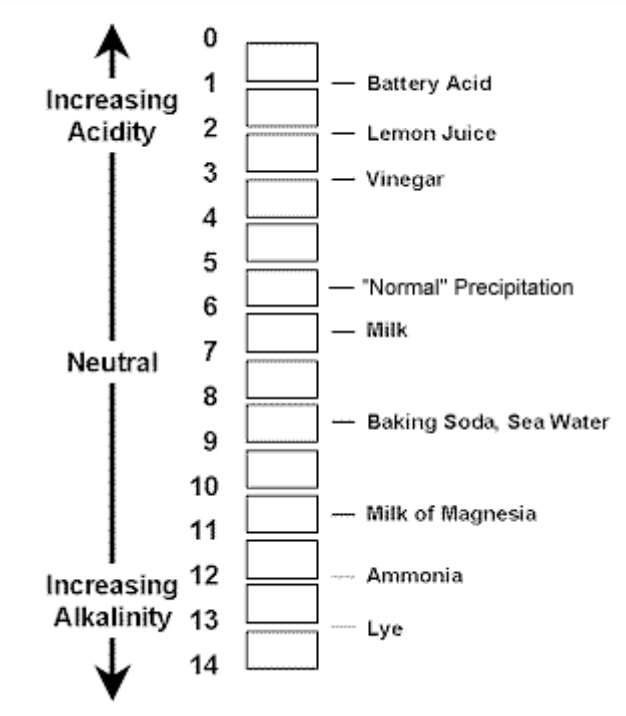
You will need more!

Cost can be lowered by purchasing bulk instead of pouches.

- Buffer or standard solutions should be labeled with the date that they were opened and replaced according to the schedule specified by the manufacturer.
  - Example: pH buffer solutions should be replaced every 3 to 6 months once opened. Unopened pH buffer solutions can be stored for up to 2 years.

1, 2 or 3 Point Calibration?

- General Rule
  - Field meters shall be calibrated to cover the expected sample range.
- The expected range for an illicit discharge is quite large for pH.
  - As such, recommendation is a 3-point pH calibration.



Health and Safety

Health and Safety

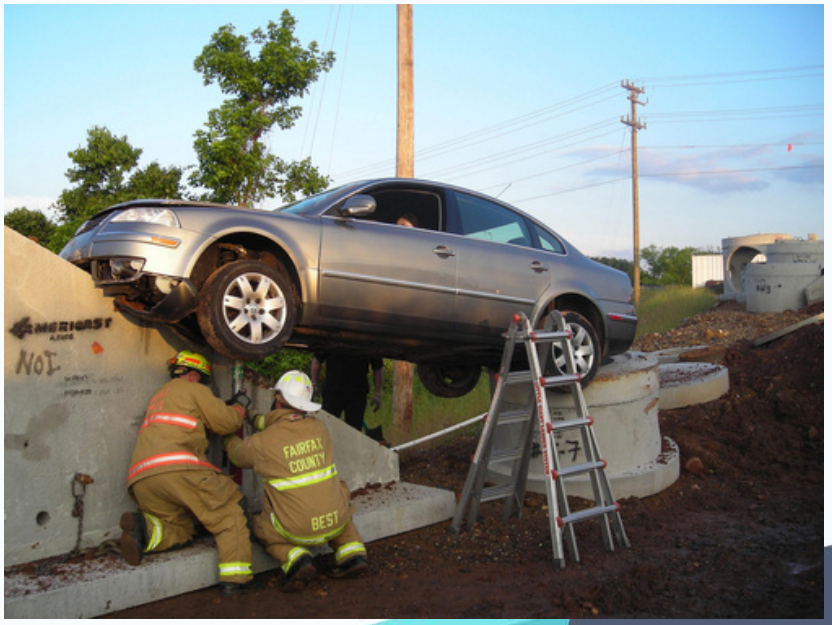
- Safety is more important than the data.

Health and Safety – Travel to the Site

- Approach a safe parking area slowly.
  - A safe parking area is preferably off the roadway.
  - Use your vehicle as a hazard block.

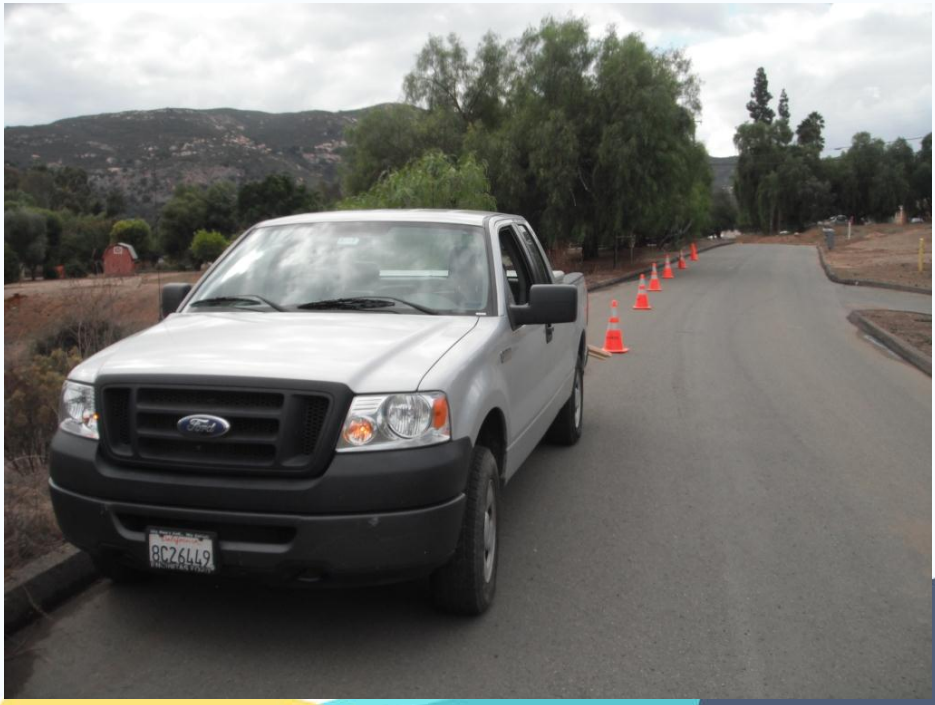
- Use Hazard Lights and turn signal to indicate path of travel

- Activate Hazard Lights Once parked



Health and Safety – Travel to the Site

- If in an active traffic area, cones should be placed and personnel should have reflective clothing for passing traffic
  - Never use hand signals to direct traffic



Health and Safety – Travel to the Site

Private Property

- Driveways, parking lots, lawns, etc..

- Need permission of the landowner!
  - Use a form of identification, preferably an ID.

Health and Safety – Once Onsite…

- Look around, confirm it is safe before exiting the vehicle

California Vehicle Code Section 22517

The driver of a parked car must wait until it is reasonably safe before opening a door that is on the side of moving traffic.

Health and Safety – Once Onsite…

- Look around, confirm it is safe before exiting the vehicle
- Proceed to the site while being aware of surroundings

Health and Safety – Once Onsite…

- Look around, confirm it is safe before exiting the vehicle
- Proceed to the site while being aware of surroundings

Slips, Trips and Falls

Probably the most common health and safety risk

- Dirt slope
- Wet or broken pavement

Health and Safety – Once Onsite…

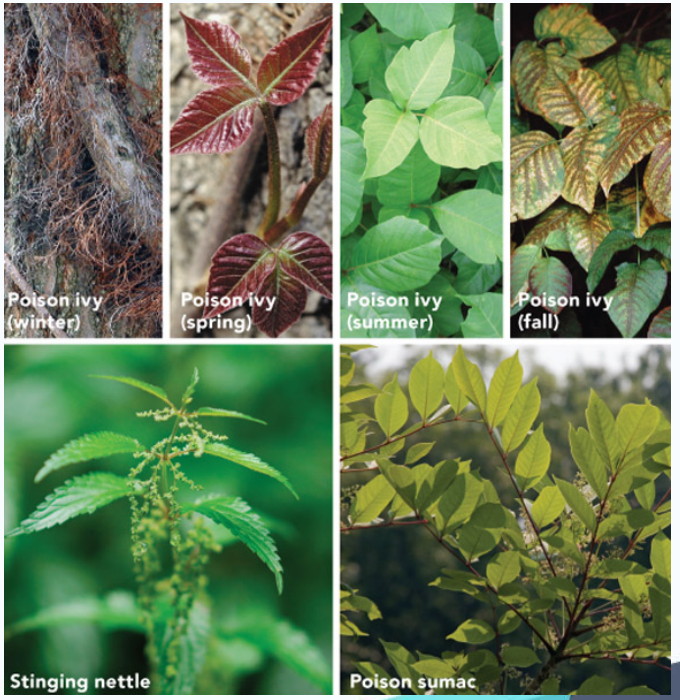
- Look around, confirm it is safe before exiting the vehicle
- Proceed to the site while being aware of surroundings
- Never enter an enclosed or confined space

Health and Safety – Once Onsite…

- Look around, confirm it is safe before exiting the vehicle
- Proceed to the site while being aware of surroundings
- Never enter an enclosed or confined space
- Harmful Creatures

Health and Safety – Once Onsite…

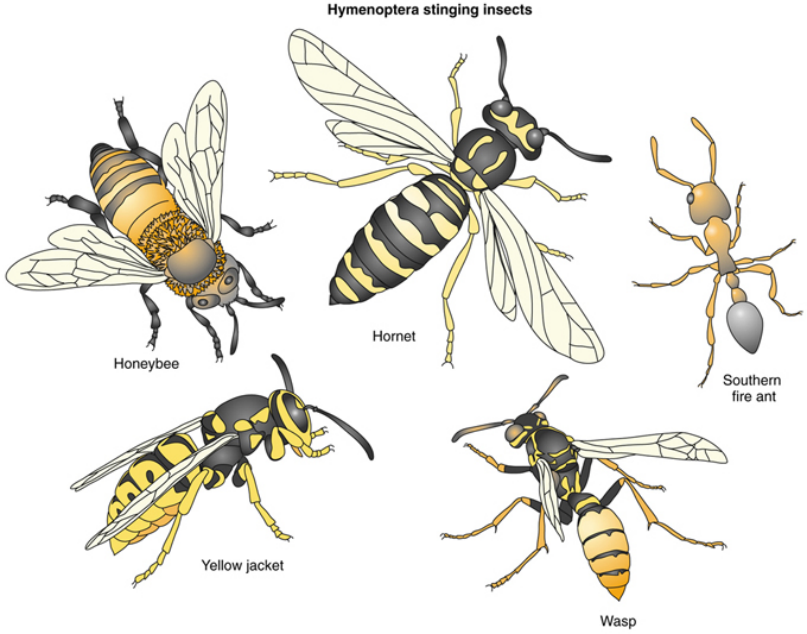
- Look around, confirm it is safe before exiting the vehicle
- Proceed to the site while being aware of surroundings
- <u>Never</u> enter an enclosed or confined space
- Harmful Creatures
  - **Plant Variety**



Health and Safety – Once Onsite…

- Look around, confirm it is safe before exiting the vehicle
- Proceed to the site while being aware of surroundings

- <u>Never</u> enter an enclosed or confined space
- Harmful Creatures
  - **Stinging Variety**



Health and Safety – Once Onsite…

- Look around, confirm it is safe before exiting the vehicle
- Proceed to the site while being aware of surroundings

- Never enter an enclosed or confined space
- Harmful Creatures
  - **Venomous Variety**

Health and Safety – Once Onsite…

- Look around, confirm it is safe before exiting the vehicle
- Proceed to the site while being aware of surroundings

- Never enter an enclosed or confined space
- Harmful Creatures
  - **Domesticated Variety**

Health and Safety – Once Onsite…

- Look around, confirm it is safe before exiting the vehicle
- Proceed to the site while being aware of surroundings

- Never enter an enclosed or confined space
- Harmful Creatures
  - **Non - Domesticated Variety**

Health and Safety – Once Onsite…

- Look around, confirm it is safe before exiting the vehicle
- Proceed to the site while being aware of surroundings

- Never enter an enclosed or confined space
- Harmful Creatures

Record all hazardous conditions in the Field Data Sheet

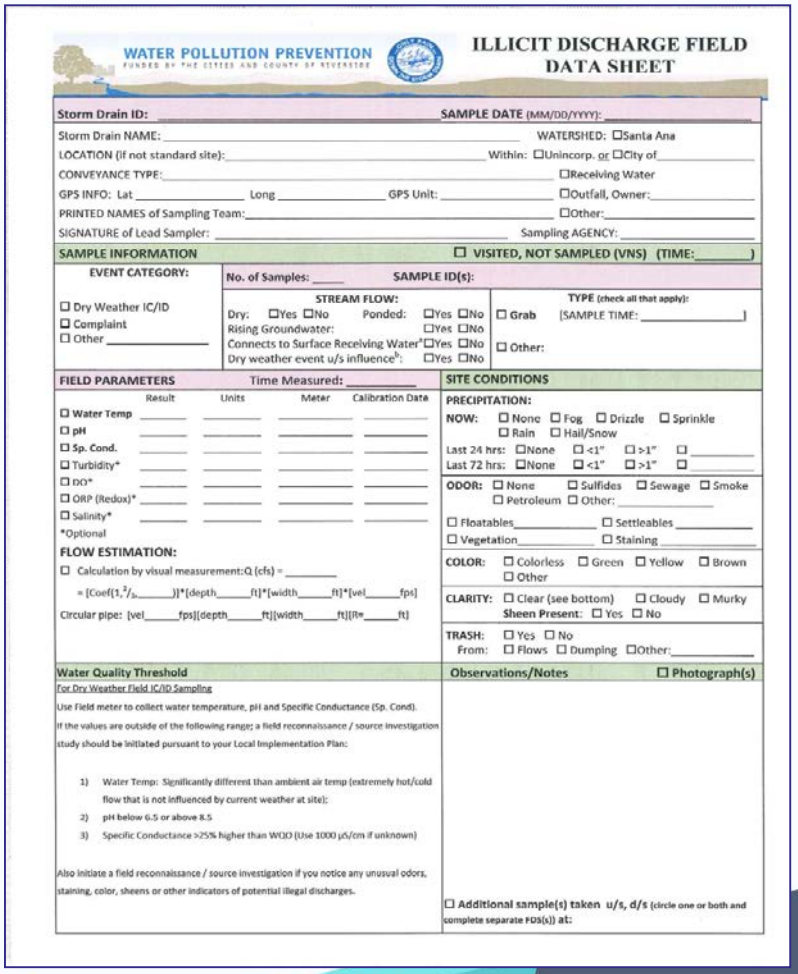
Health and Safety
Site Inaccessibility

- All sites should be accessible by foot and vehicle; however, some conditions may render a site inaccessible

Observation and Field Measurements

Field Data Sheet

- Field Data Sheets will be completed at each location, for each event.
- Field Data Sheets ensure that the data collected are SWAMP comparable.
- Records of all
  - visual observations,
  - personnel performing observations,
  - dates,
  - locations observed
  - and corrective action taken in response to observations.
- Maintain records of any grab sampling.



WATER POLLUTION PREVENTION
FUNDED BY THE CITIES AND COUNTY OF RIVERSIDE

ILLICIT DISCHARGE FIELD DATA SHEET

Storm Drain ID: _____ SAMPLE DATE (MM/DD/YYYY): _____

Storm Drain NAME: _____ WATERSHED: ☐Santa Ana

LOCATION (if not standard site): _____ Within: ☐Unincorp. or ☐City of _____

CONVEYANCE TYPE: _____ ☐Receiving Water

GPS INFO: Lat _____ Long _____ GPS Unit: _____ ☐Outfall, Owner: _____

PRINTED NAMES of Sampling Team: _____ ☐Other: _____

SIGNATURE of Lead Sampler: _____ Sampling AGENCY: _____

SAMPLE INFORMATION ☐ VISITED, NOT SAMPLED (VNS) (TIME: _____)

EVENT CATEGORY:
☐ Dry Weather IC/ID
☐ Complaint
☐ Other _____

No. of Samples: ____ SAMPLE ID(s):

STREAM FLOW:
Dry: ☐Yes ☐No Ponded: ☐Yes ☐No
Rising Groundwater: ☐Yes ☐No
Connects to Surface Receiving Water[a] ☐Yes ☐No
Dry weather event u/s influence[b]: ☐Yes ☐No

TYPE (check all that apply):
☐ Grab [SAMPLE TIME: _____]
☐ Other:

FIELD PARAMETERS Time Measured: _____

	Result	Units	Meter	Calibration Date
☐ Water Temp				
☐ pH				
☐ Sp. Cond.				
☐ Turbidity*				
☐ DO*				
☐ ORP (Redox)*				
☐ Salinity*				

*Optional

FLOW ESTIMATION:
☐ Calculation by visual measurement: Q (cfs) = _____
= [Coef(1.2/s_____)]*[depth_____ft]*[width_____ft]*[vel_____fps]
Circular pipe: [vel_____fps][depth_____ft][width_____ft][R=_____ft]

SITE CONDITIONS

PRECIPITATION:
NOW: ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow
Last 24 hrs: ☐None ☐<1" ☐>1" ☐ _____
Last 72 hrs: ☐None ☐<1" ☐>1" ☐ _____

ODOR: ☐ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____
☐ Floatables _____ ☐ Settleables _____
☐ Vegetation _____ ☐ Staining _____

COLOR: ☐ Colorless ☐ Green ☐ Yellow ☐ Brown ☐ Other

CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☐ Murky
Sheen Present: ☐ Yes ☐ No

TRASH: ☐ Yes ☐ No
From: ☐ Flows ☐ Dumping ☐Other: _____

Water Quality Threshold
For Dry Weather Field IC/ID Sampling
Use Field meter to collect water temperature, pH and Specific Conductance (Sp. Cond).
If the values are outside of the following range; a field reconnaissance / source investigation study should be initiated pursuant to your Local Implementation Plan:

1) Water Temp: Significantly different than ambient air temp (extremely hot/cold flow that is not influenced by current weather at site);
2) pH below 6.5 or above 8.5
3) Specific Conductance >25% higher than WQO (Use 1000 µS/cm if unknown)

Also initiate a field reconnaissance / source investigation if you notice any unusual odors, staining, color, sheens or other indicators of potential illegal discharges.

Observations/Notes ☐ Photograph(s)

☐ Additional sample(s) taken u/s, d/s (circle one or both and complete separate FDS(s)) at:

Bring out your blank form for practice

Field Data Sheet

- Location and Team information

WATER POLLUTION PREVENTION
FUNDED BY THE CITIES AND COUNTY OF RIVERSIDE

ILLICIT DISCHARGE FIELD DATA SHEET

Storm Drain ID: _____ **SAMPLE DATE** (MM/DD/YYYY): _____

Storm Drain NAME: **Click and choose Station Name** WATERSHED: ☐Santa Ana

LOCATION (if not standard site): _____ Within: ☐Unincorp. or ☐City of _____

CONVEYANCE TYPE: _____ ☐Receiving Water ☐Within IAH

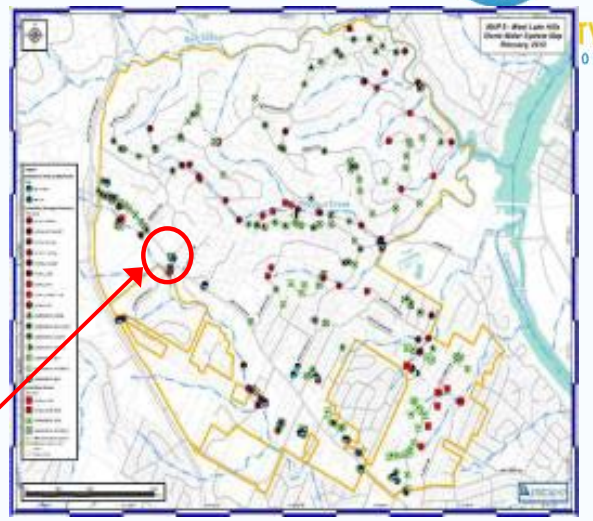
GPS INFO: Lat _____ Long _____ GPS Unit: _____ ☐Outfall, Owner: _____

PRINTED NAMES of Sampling Team: _____ ☐Other: _____

SIGNATURE of lead sampler: _____ Sampling AGENCY: _____

Field Data Sheet

- Location and Team information
- Station ID should match the MS4 Major Outfalls Map
  - If Station ID is not set, provide location information such as Road intersections, mile markers, business name / address



WATER POLLUTION PREVENTION
FUNDED BY THE CITIES AND COUNTY OF RIVERSIDE

ONLY RAIN DOWN THE STORM DRAIN

ILLICIT DISCHARGE FIELD DATA SHEET

Storm Drain ID: _____ **SAMPLE DATE** (MM/DD/YYYY): _____

Storm Drain NAME: **Click and choose Station Name** WATERSHED: ☐Santa Ana

LOCATION (if not standard site): _____ Within: ☐Unincorp. or ☐City of _____

CONVEYANCE TYPE: _____ ☐Receiving Water ☐Within IAH

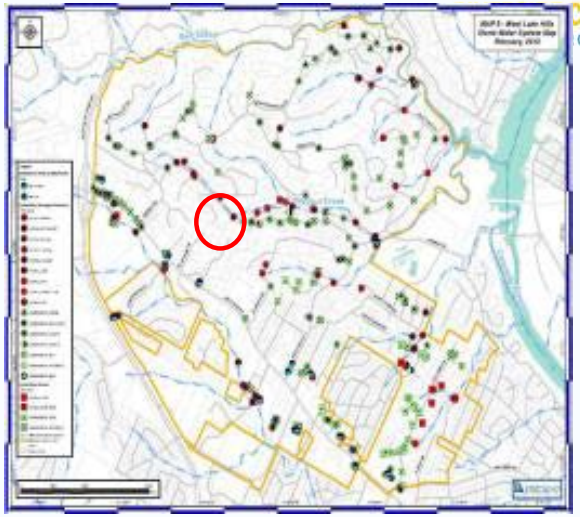
GPS INFO: Lat _____ Long _____ GPS Unit: _____ ☐Outfall, Owner: _____

PRINTED NAMES of Sampling Team: _____ ☐Other: _____

SIGNATURE of lead sampler: _____ Sampling AGENCY: _____

Field Data Sheet

- Location and Team information
- Station ID should match the MS4 Major Outfalls Map
  - If Station ID is not set, provide location information such as Road intersections, mile markers, business name / address



Storm Drain ID will need to match sampling information

WATER POLLUTION PREVENTION
FUNDED BY THE CITIES AND COUNTY OF RIVERSIDE

ONLY RAIN DOWN THE STORM DRAIN

ILLICIT DISCHARGE FIELD DATA SHEET

Storm Drain ID: _____ **SAMPLE DATE** (MM/DD/YYYY): _____

Storm Drain NAME: **Click and choose Station Name** WATERSHED: ☐Santa Ana

LOCATION (if not standard site): _____ Within: ☐Unincorp. or ☐City of _____

CONVEYANCE TYPE: _____ ☐Receiving Water ☐Within IAH

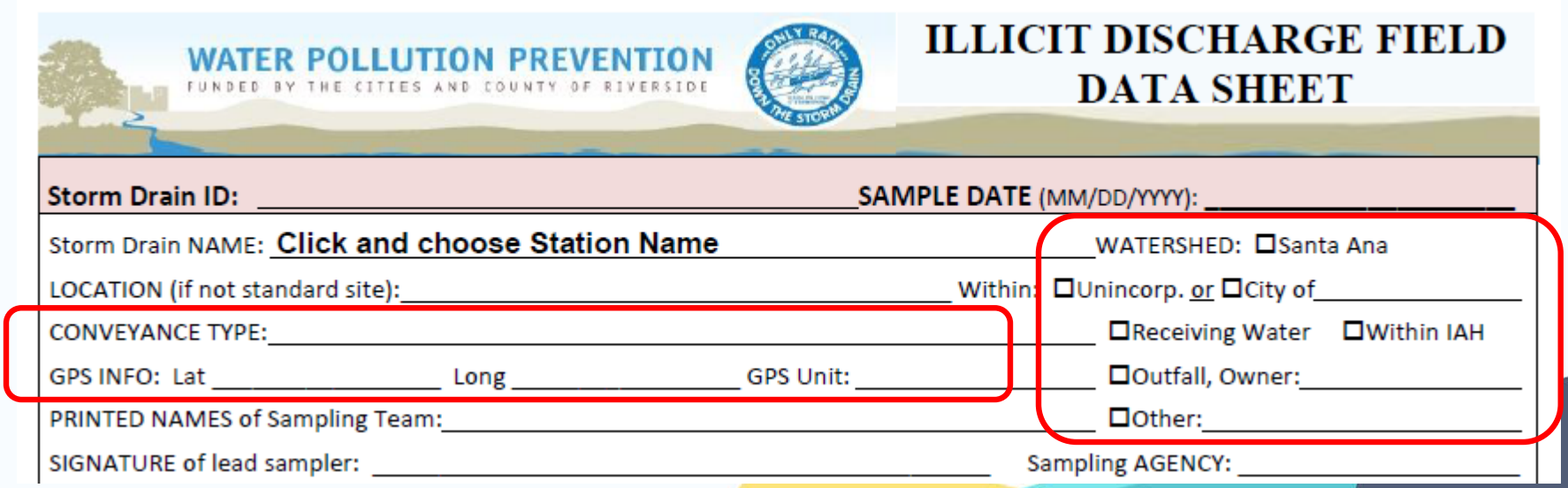
GPS INFO: Lat _____ Long _____ GPS Unit: _____ ☐Outfall, Owner: _____

PRINTED NAMES of Sampling Team: _____ ☐Other: _____

SIGNATURE of lead sampler: _____ Sampling AGENCY: _____

Field Data Sheet

- Location and Team information
- GPS and Watershed info can be estimated (especially with proper photo records) once back in the office.



WATER POLLUTION PREVENTION
FUNDED BY THE CITIES AND COUNTY OF RIVERSIDE

ILLICIT DISCHARGE FIELD DATA SHEET

Storm Drain ID: _____ **SAMPLE DATE** (MM/DD/YYYY): _____

Storm Drain NAME: **Click and choose Station Name** WATERSHED: ☐Santa Ana

LOCATION (if not standard site): _____ Within: ☐Unincorp. or ☐City of _____

CONVEYANCE TYPE: _____ ☐Receiving Water ☐Within IAH

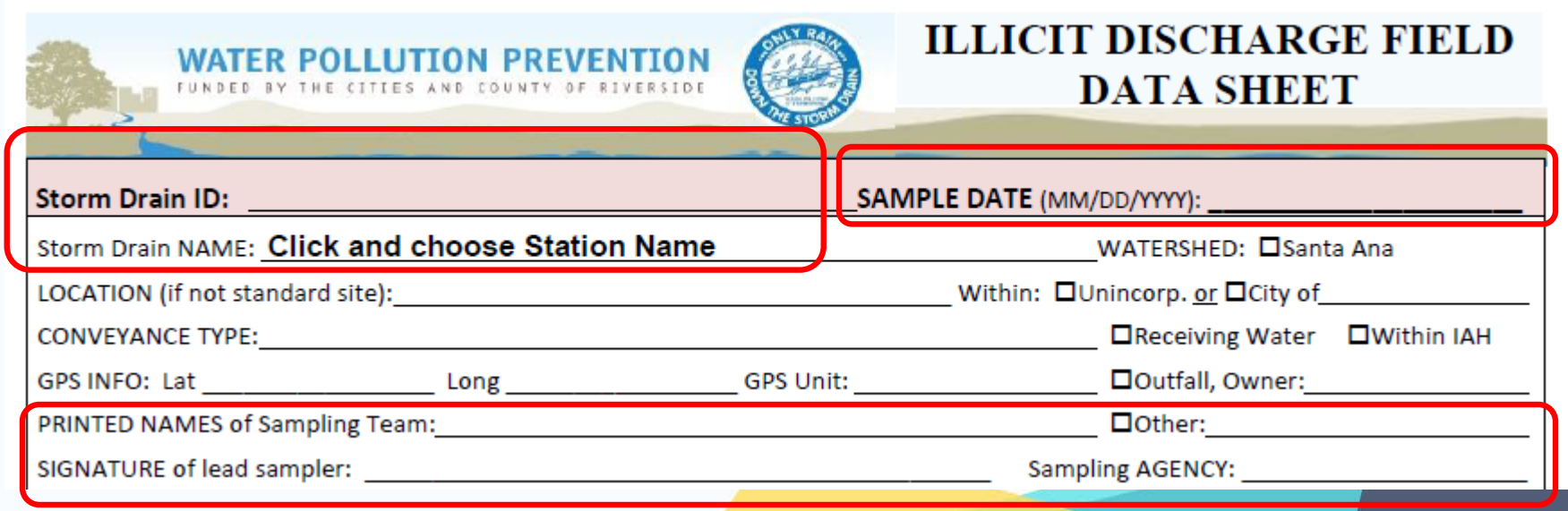
GPS INFO: Lat _____ Long _____ GPS Unit: _____ ☐Outfall, Owner: _____

PRINTED NAMES of Sampling Team: _____ ☐Other: _____

SIGNATURE of lead sampler: _____ Sampling AGENCY: _____

Field Data Sheet

- Location and Team information
- The Key Information that every field data sheet should have, at minimum are:
  - Storm Drain ID
  - Sample Date
  - Sample Team



WATER POLLUTION PREVENTION
FUNDED BY THE CITIES AND COUNTY OF RIVERSIDE

ILLICIT DISCHARGE FIELD DATA SHEET

Storm Drain ID: _____ **SAMPLE DATE** (MM/DD/YYYY): _____

Storm Drain NAME: **Click and choose Station Name** WATERSHED: ☐Santa Ana

LOCATION (if not standard site): _____ Within: ☐Unincorp. or ☐City of _____

CONVEYANCE TYPE: _____ ☐Receiving Water ☐Within IAH

GPS INFO: Lat _____ Long _____ GPS Unit: _____ ☐Outfall, Owner: _____

PRINTED NAMES of Sampling Team: _____ ☐Other: _____

SIGNATURE of lead sampler: _____ Sampling AGENCY: _____

Field Data Sheet

- Sample Information

SAMPLE INFORMATION	☐ VISITED, NOT SAMPLED (VNS) (TIME:_____)	
EVENT CATEGORY: ☐ Dry Weather IC/ID ☐ Complaint ☐ Other _____	**No. of Samples:** _____ **SAMPLE ID(s):** **STREAM FLOW:** Dry: ☐Yes ☐No Ponded: ☐Yes ☐No Rising Groundwater: ☐Yes ☐No Connects to Surface Receiving Water[a] ☐Yes ☐No Dry weather event u/s influence[b]: ☐Yes ☐No	**TYPE** (check all that apply): ☐ **Grab** [SAMPLE TIME: _____] ☐ Other:

Field Data Sheet

- Sample Information
- IC/ID Monitoring is initially about Observation

SAMPLE INFORMATION	☒ VISITED, NOT SAMPLED (VNS) (TIME: 10:12)
EVENT CATEGORY: ☐ Dry Weather IC/ID ☐ Complaint ☐ Other _____	**No. of Samples:** _____ **SAMPLE ID(s):** **STREAM FLOW:** Dry: ☐Yes ☐No Ponded: ☐Yes ☐No Rising Groundwater: ☐Yes ☐No Connects to Surface Receiving Water[a] ☐Yes ☐No Dry weather event u/s influence[b]: ☐Yes ☐No
	TYPE (check all that apply): ☐ Grab [SAMPLE TIME: _____] ☐ Other:

Field Data Sheet

- Sample Information

- IC/ID Monitoring is initially about Observation
- However, certain illicit discharges may require sampling.

SAMPLE INFORMATION	☐ VISITED, NOT SAMPLED (VNS) (TIME:_____)	
EVENT CATEGORY: ☒ Dry Weather IC/ID ☐ Complaint ☐ Other _____	**No. of Samples:** 2 **SAMPLE ID(s):** **2013 – IC – 397 - 01** **STREAM FLOW:** Dry: ☐Yes ☒No Ponded: ☐Yes ☒No Rising Groundwater: ☐Yes ☒No Connects to Surface Receiving Water[a] ☐Yes ☒No Dry weather event u/s influence[b]: ☐Yes ☒No	**TYPE** (check all that apply): ☒ **Grab** [SAMPLE TIME: 6/8/13 1512] ☐ Other:

Field Data Sheet

- Sample Information

- IC/ID Monitoring is initially about Observation
- However, certain illicit discharges may require sampling.

SAMPLE INFORMATION	☐ VISITED, NOT SAMPLED (VNS) (TIME:_____)	
EVENT CATEGORY:	**No. of Samples:** 2 **SAMPLE ID(s):** **2013 – IC – 397 - 01**	
☒ Dry Weather IC/ID ☐ Complaint ☐ Other _____	**STREAM FLOW:** Dry: ☐Yes ☒No Ponded: ☐Yes ☒No Rising Groundwater: ☐Yes ☒No Connects to Surface Receiving Water[a] ☐Yes ☒No Dry weather event u/s influence[b]: ☐Yes ☒No	**TYPE** (check all that apply): ☒ **Grab** [SAMPLE TIME: 6/8/13 1512] ☐ Other:

- General Sample ID Format is per the District CMP.

  [Sample Year] – [Event Code] – [Station Code] – [Sample Code]
- Each Permittee has their own format to be followed. The format must be done in a way that meets database requirements, and can be later linked to the mapping effort.

Field Data Sheet

- Site Conditions

FIELD PARAMETERS Time Measured: _____

	Result	Units	Meter	Calibration Date
☐ **Water Temp**				
☐ **pH**				
☐ **Sp. Cond.**				
☐ Turbidity*				
☐ DO*				
☐ ORP (Redox)*				
☐ Salinity*				

*Optional

FLOW ESTIMATION:

☐ Calculation by visual measurement: Q (cfs) = _____

= [Coef(1, $^2/_3$, _____)]*[depth_____ft]*[width_____ft]*[vel_____fps]

Circular pipe: [vel_____fps][depth_____ft][width_____ft][R=_____ft]

SITE CONDITIONS

PRECIPITATION:

NOW: ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow

Last 24 hrs: ☐None ☐ <1" ☐ >1" ☐ _____

Last 72 hrs: ☐None ☐ <1" ☐ >1" ☐ _____

ODOR: ☐ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____

☐ Floatables_____ ☐ Settleables _____

☐ Vegetation_____ ☐ Staining _____

COLOR: ☐ Colorless ☐ Green ☐ Yellow ☐ Brown ☐ Other

CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☐ Murky

Sheen Present: ☐ Yes ☐ No

TRASH: ☐ Yes ☐ No

From: ☐ Flows ☐ Dumping ☐Other:_____

Field Data Sheet

- Site Conditions

First observation to perform is whether there is an active discharge, or evidence of a prior discharge.

SITE CONDITIONS
PRECIPITATION: **NOW:** ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow Last 24 hrs: ☐None ☐ <1" ☐ >1" ☐ _____ Last 72 hrs: ☐None ☐ <1" ☐ >1" ☐ _____
ODOR: ☐ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____ ☐ Floatables_____ ☐ Settleables _____ ☐ Vegetation_____ ☐ Staining _____
COLOR: ☐ Colorless ☐ Green ☐ Yellow ☐ Brown ☐ Other
CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☐ Murky **Sheen Present:** ☐ Yes ☐ No
TRASH: ☐ Yes ☐ No From: ☐ Flows ☐ Dumping ☐Other:_____

Field Data Sheet

- Site Conditions

First observation to perform is whether there is an active discharge, or evidence of a prior discharge.

If there is no active discharge, standing water or other evidence of a prior and recent discharge (stains), then observations are complete at this location.

Be sure to record this on the Field Data Sheet!

Take picture of the Dry location!

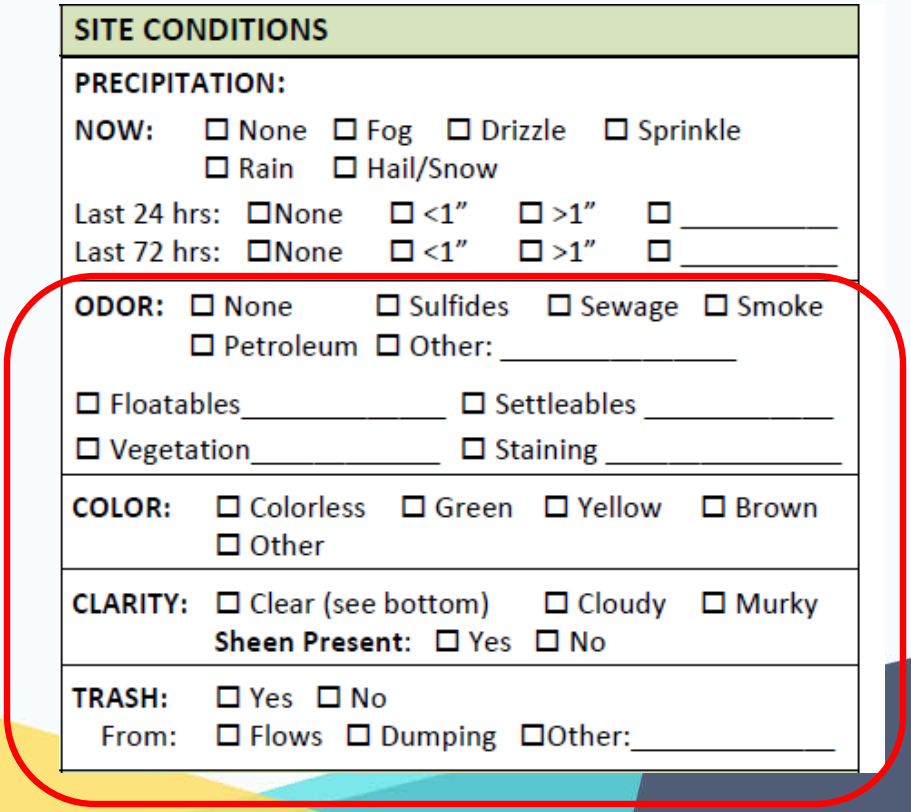
SITE CONDITIONS
PRECIPITATION: **NOW:** ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow Last 24 hrs: ☐None ☐ <1" ☐ >1" ☐ _____ Last 72 hrs: ☐None ☐ <1" ☐ >1" ☐ _____
ODOR: ☐ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____ ☐ Floatables_____ ☐ Settleables _____ ☐ Vegetation_____ ☐ Staining _____
COLOR: ☐ Colorless ☐ Green ☐ Yellow ☐ Brown ☐ Other
CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☐ Murky **Sheen Present:** ☐ Yes ☐ No
TRASH: ☐ Yes ☐ No From: ☐ Flows ☐ Dumping ☐Other:_____

Field Data Sheet

- Site Conditions

First observation to perform is whether there is an active discharge, or evidence of a prior discharge.

Further observation is necessary if
- there is an active discharge,
- standing water
- or other evidence of recent discharges (stains).



SITE CONDITIONS

PRECIPITATION:

NOW: ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow

Last 24 hrs: ☐None ☐ <1" ☐ >1" ☐ _____

Last 72 hrs: ☐None ☐ <1" ☐ >1" ☐ _____

ODOR: ☐ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____

☐ Floatables_____ ☐ Settleables _____

☐ Vegetation_____ ☐ Staining _____

COLOR: ☐ Colorless ☐ Green ☐ Yellow ☐ Brown ☐ Other

CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☐ Murky
Sheen Present: ☐ Yes ☐ No

TRASH: ☐ Yes ☐ No
From: ☐ Flows ☐ Dumping ☐Other:_____

Field Data Sheet

- Site Conditions – **Sensory Indicator**

First observation to perform is whether there is an active discharge, or evidence of a prior discharge.

Further observation is necessary if
- •there is an active discharge,
- •standing water
- •or other evidence of recent discharges (stains).

Sensory Indicators can justify the escalation of Field Reconnaissance to Follow-Up Procedures

SITE CONDITIONS
PRECIPITATION:
NOW: ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow
Last 24 hrs: ☐None ☐ <1" ☐ >1" ☐ _____
Last 72 hrs: ☐None ☐ <1" ☐ >1" ☐ _____
ODOR: ☒ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____
☐ Floatables_____ ☐ Settleables _____
☐ Vegetation_____ ☐ Staining _____
COLOR: ☐ Colorless ☒ Green ☐ Yellow ☐ Brown ☒ Other Fluorescent
CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☒ Murky **Sheen Present:** ☐ Yes ☒ No
TRASH: ☐ Yes ☒ No From: ☐ Flows ☐ Dumping ☐Other:_____

Field Data Sheet

- Site Conditions – Sensory Indicator

Sensory Indicators can justify the escalation of Field Reconnaissance to Follow-Up Procedures

Odor – Confirm the odor is from the outfall and not nearby environment

SITE CONDITIONS
PRECIPITATION:
NOW: ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow
Last 24 hrs: ☐None ☐ <1" ☐ >1" ☐ _____
Last 72 hrs: ☐None ☐ <1" ☐ >1" ☐ _____
ODOR: ☐ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____
☐ Floatables_____ ☐ Settleables _____
☐ Vegetation_____ ☐ Staining _____
COLOR: ☐ Colorless ☐ Green ☐ Yellow ☐ Brown ☐ Other
CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☐ Murky **Sheen Present:** ☐ Yes ☐ No
TRASH: ☐ Yes ☐ No From: ☐ Flows ☐ Dumping ☐Other:_____

Field Data Sheet

- Site Conditions – Sensory Indicator

Odor

Clarity – Cloudy vs. Murky

- Cloudy: Can see side walls, not bottom
- Murky: Can't see side walls or bottom

Low flow conditions? Use a sample bottle

Sensory Indicators can justify the escalation of Field Reconnaissance to Follow-Up Procedures

SITE CONDITIONS
PRECIPITATION: **NOW:** ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow Last 24 hrs: ☐None ☐ <1" ☐ >1" ☐ _____ Last 72 hrs: ☐None ☐ <1" ☐ >1" ☐ _____
ODOR: ☐ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____ ☐ Floatables_____ ☐ Settleables _____ ☐ Vegetation_____ ☐ Staining _____
COLOR: ☐ Colorless ☐ Green ☐ Yellow ☐ Brown ☐ Other
CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☐ Murky **Sheen Present:** ☐ Yes ☐ No
TRASH: ☐ Yes ☐ No From: ☐ Flows ☐ Dumping ☐Other:_____

Field Data Sheet

- Site Conditions – Sensory Indicator

Odor

Clarity

Floatables – Suds and Sheens

- In some cases, surface sheens may not be related to oil discharges, but instead are created by in-stream processes.
- Suds that break up quickly may simply reflect water turbulence, and do not necessarily have an illicit origin.

Sensory Indicators can justify the escalation of Field Reconnaissance to Follow-Up Procedures

SITE CONDITIONS
PRECIPITATION: **NOW:** ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow Last 24 hrs: ☐None ☐ <1" ☐ >1" ☐ _____ Last 72 hrs: ☐None ☐ <1" ☐ >1" ☐ _____
ODOR: ☐ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____ ☐ Floatables_____ ☐ Settleables _____ ☐ Vegetation_____ ☐ Staining _____
COLOR: ☐ Colorless ☐ Green ☐ Yellow ☐ Brown ☐ Other
CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☐ Murky **Sheen Present:** ☐ Yes ☐ No
TRASH: ☐ Yes ☐ No From: ☐ Flows ☐ Dumping ☐Other:_____

Field Data Sheet

- Site Conditions – Sensory Indicator

Floatables – Suds and Sheens

Sensory Indicators can justify the escalation of Field Reconnaissance to Follow-Up Procedures

Natural Sheen (left) from bacteria such as iron floc forms a sheet-like film that cracks if disturbed.

Synthetic oil (right) forms a swirling pattern

Field Data Sheet

- Site Conditions – Sensory Indicator

Odor

Clarity

Floatables – Suds and Sheens

Color

- Field crews should also look for downstream plumes of color that appear to be associated with the outfall
- Often helps identify industrial and construction discharges.

Sensory Indicators can justify the escalation of Field Reconnaissance to Follow-Up Procedures

SITE CONDITIONS
PRECIPITATION: **NOW:** ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow Last 24 hrs: ☐None ☐ <1" ☐ >1" ☐ _____ Last 72 hrs: ☐None ☐ <1" ☐ >1" ☐ _____
ODOR: ☐ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____ ☐ Floatables_____ ☐ Settleables _____ ☐ Vegetation_____ ☐ Staining _____
COLOR: ☐ Colorless ☐ Green ☐ Yellow ☐ Brown ☐ Other
CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☐ Murky **Sheen Present:** ☐ Yes ☐ No
TRASH: ☐ Yes ☐ No From: ☐ Flows ☐ Dumping ☐Other:_____

Field Data Sheet

- Site Conditions – Sensory Indicator

Odor

Clarity

Floatables – Suds and Sheens

Color

- The four sensory indicators are most reliable in detecting the most severe or obvious discharges.
- Sensory indicators are not an end all, as senses can be fooled.

Sensory Indicators can justify the escalation of Field Reconnaissance to Follow-Up Procedures

SITE CONDITIONS
PRECIPITATION:
NOW: ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow
Last 24 hrs: ☐None ☐ <1" ☐ >1" ☐ _____
Last 72 hrs: ☐None ☐ <1" ☐ >1" ☐ _____
ODOR: ☐ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____
☐ Floatables_____ ☐ Settleables _____ ☐ Vegetation_____ ☐ Staining _____
COLOR: ☐ Colorless ☐ Green ☐ Yellow ☐ Brown ☐ Other
CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☐ Murky **Sheen Present:** ☐ Yes ☐ No
TRASH: ☐ Yes ☐ No From: ☐ Flows ☐ Dumping ☐Other:_____

Field Data Sheet

- Site Conditions – Physical Indicator

Physical indicators include outfall damage, outfall deposits or stains, abnormal vegetation growth, poor pool quality and benthic growth on pipe surfaces.

Physical conditions can indicate that an intermittent or transitory discharge has occurred in the past, even if the pipe is not currently flowing.

Physical indicators are often subtle and are best interpreted when combined with other observations.

SITE CONDITIONS

PRECIPITATION:

NOW: ☐ None ☐ Fog ☐ Drizzle ☐ Sprinkle ☐ Rain ☐ Hail/Snow

Last 24 hrs: ☐None ☐ <1" ☐ >1" ☐ _____

Last 72 hrs: ☐None ☐ <1" ☐ >1" ☐ _____

ODOR: ☐ None ☐ Sulfides ☐ Sewage ☐ Smoke ☐ Petroleum ☐ Other: _____

☐ Floatables_____ ☐ Settleables _____

☐ Vegetation_____ ☐ Staining _____

COLOR: ☐ Colorless ☐ Green ☐ Yellow ☐ Brown ☐ Other

CLARITY: ☐ Clear (see bottom) ☐ Cloudy ☐ Murky

Sheen Present: ☐ Yes ☐ No

TRASH: ☐ Yes ☐ No

From: ☐ Flows ☐ Dumping ☐Other:_____

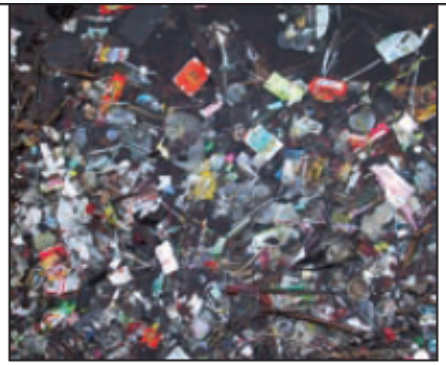
Field Data Sheet

- Site Conditions – Physical Indicator

 Bacterial growth at this outfall indicates nutrient enrichment and a likely sewage source.	 This bright red bacterial growth often indicates high manganese and iron concentrations. Surprisingly, it is not typically associated with illicit discharges.	 Sporalitis filamentous bacteria, also known as "sewage fungus" can be used to track down sanitary sewer leaks.
 Algal mats on lakes indicate eutrophication. Several sources can cause this problem. Investigate potential illicit sources.	 Illicit discharges or excessive nutrient application can lead to extreme algal growth on stream beds.	 The drainage to this outfall most likely has a high nutrient concentration. The cause may be an illicit discharge, but may be excessive use of lawn chemicals.

Field Data Sheet

- Site Conditions – Physical Indicator

 Trash is not an indicator of illicit discharges, but should be noted.	 Staining at the base of the outfall may indicate a persistent, intermittent discharge.	 Excessive vegetation may indicate enriched flows associated with sewage.
 Brownish stain of unclear origin. May be from degradation of the brick infrastructure.	 Cracked rock below the outfall may indicate an intermittent discharge.	 Poor pool quality. Consider sampling from the pool to determine origin.

Field Data Sheet

- Site Conditions
- Field Parameters – Oakton meter or In-Situ Measurements

FIELD PARAMETERS Time Measured: _____

	Result	Units	Meter	Calibration Date
☐ Water Temp	_____	_____	_____	_____
☐ pH	_____	_____	_____	_____
☐ Sp. Cond.	_____	_____	_____	_____
☐ Turbidity*	_____	_____	_____	_____
☐ DO*	_____	_____	_____	_____
☐ ORP (Redox)*	_____	_____	_____	_____
☐ Salinity*	_____	_____	_____	_____

*Optional

FLOW ESTIMATION:

☐ Calculation by visual measurement: Q (cfs) = _____

= [Coef(1, $^2/_3$, _____)]*[depth_____ft]*[width_____ft]*[vel_____fps]

Circular pipe: [vel_____fps][depth_____ft][width_____ft][R=_____ft]

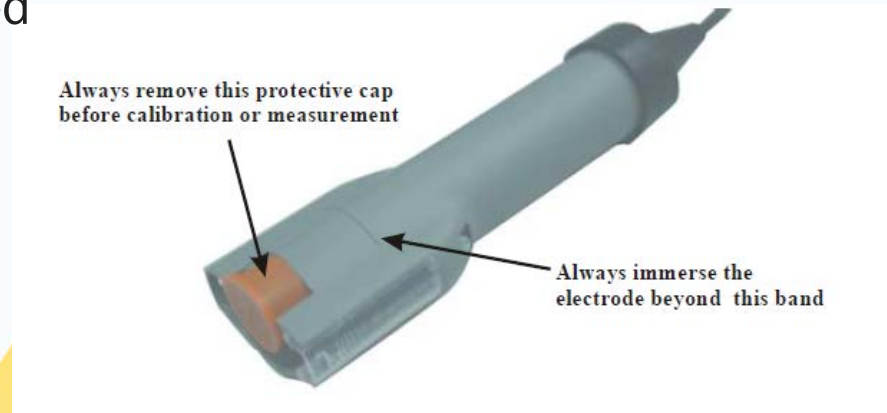
Please Highlight these areas.

Field Data Sheet

- Site Conditions
- Field Parameters – Oakton meter or In-Situ Measurements

Field Measurements

- Wear nitrile gloves to avoid sample contamination and protect yourself from potential contaminants.
- Remove red protective probe cap before measurement.
- Rinse the probe with a pouch of DI water or spray with DI water before use.
- Meter must always be immersed beyond the electrode band.



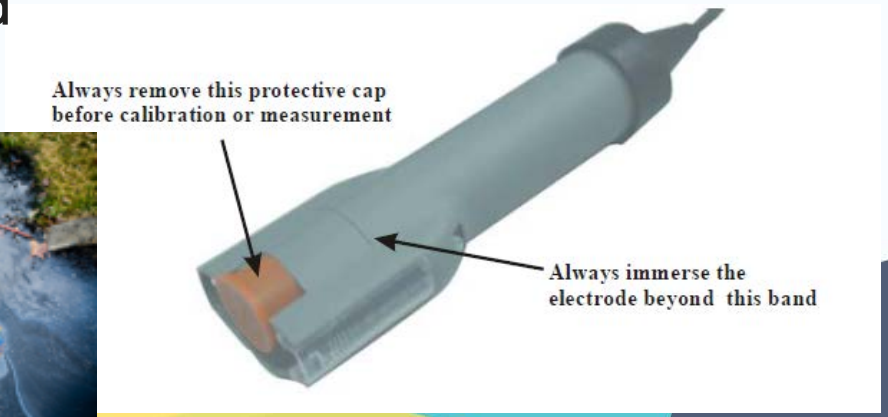
Field Data Sheet

- Site Conditions
- Field Parameters – Oakton meter or In-Situ Measurements

Field Measurements

- Wear nitrile gloves to avoid sample contamination and protect yourself from potential contaminants.
- Remove red protective probe cap before measurement.
- Rinse the probe with a pouch of DI water or spray with DI water before use.
- **Meter must always be immersed beyond the electrode band.**

Low Flow or Sheet Flow Conditions?



Field Data Sheet

- Site Conditions
- Field Parameters – Oakton meter or In-Situ Measurements

Field Measurements

- Turning the meter on automatically sets the meter into measurement as shown by the MEAS title.
- Readings are stable and can be recorded when the READY title appears.
- To toggle between pH and Conductivity readings, simply press the **MODE** key.

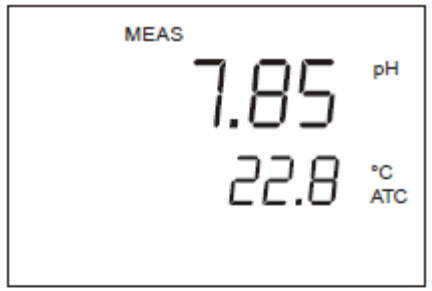


Figure 19: Measurement mode

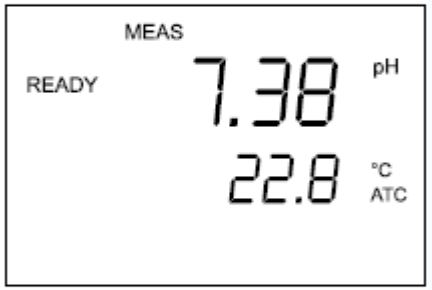
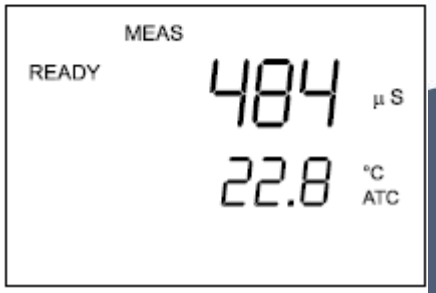
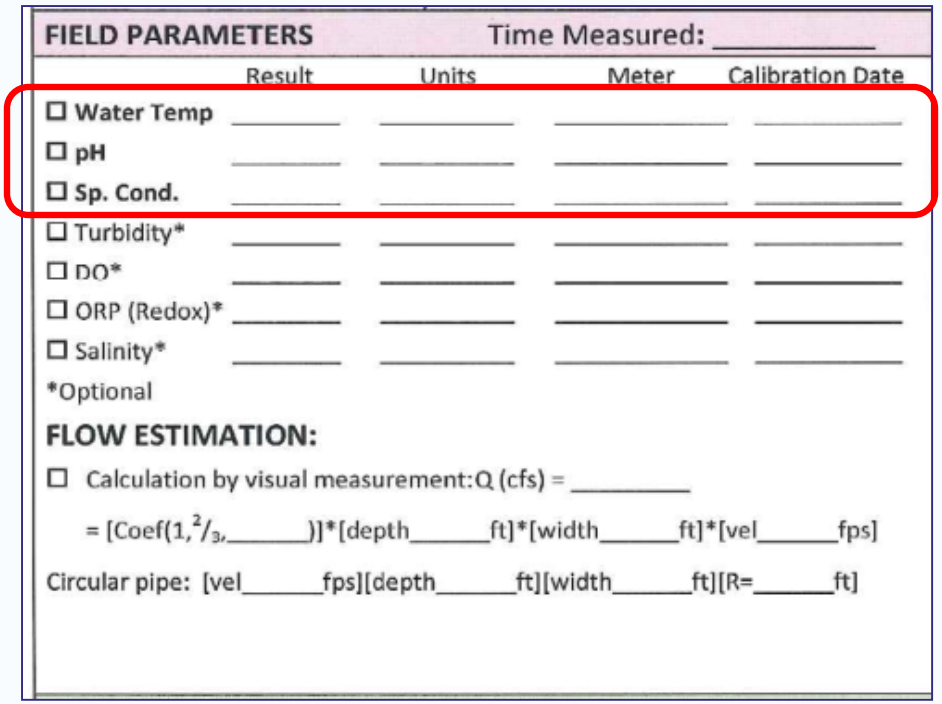


Figure 20: READY



Field Data Sheet

- Site Conditions
- Field Parameters – Oakton meter



FIELD PARAMETERS Time Measured: _____

	Result	Units	Meter	Calibration Date
☐ Water Temp				
☐ pH				
☐ Sp. Cond.				
☐ Turbidity*				
☐ DO*				
☐ ORP (Redox)*				
☐ Salinity*				

*Optional

FLOW ESTIMATION:

☐ Calculation by visual measurement: Q (cfs) = _____

= [Coef(1, $^{2}/_{3}$, _____)]*[depth_____ft]*[width_____ft]*[vel_____fps]

Circular pipe: [vel_____fps][depth_____ft][width_____ft][R=_____ft]

Water Quality Parameters outside guidance values can justify the escalation of Field Reconnaissance to Follow-Up Procedures

Minimum Water Quality Thresholds

- Temperature that is significantly different than ambient air temperature.
- pH below 6.0 or above 8.5
- EC that is 25% higher than WQO, or 1250 µS.

Currently, there are no WQO for conductivity in the Santa Ana Region. As such, WQO = 1,000 µS.

Field Data Sheet

- Site Conditions
- Field Parameters – Flow Estimation

FIELD PARAMETERS Time Measured: _____

	Result	Units	Meter	Calibration Date
☐ Water Temp				
☐ pH				
☐ Sp. Cond.				
☐ Turbidity*				
☐ DO*				
☐ ORP (Redox)*				
☐ Salinity*				

*Optional

FLOW ESTIMATION:

☐ Calculation by visual measurement: Q (cfs) = _____

= [Coef($1,^{2}/_{3}$,_____)]*[depth_____ft]*[width_____ft]*[vel_____fps]

Circular pipe: [vel_____fps][depth_____ft][width_____ft][R=_____ft]

Field Data Sheet

- Site Conditions
- Field Parameters – Flow Estimation

FIELD PARAMETERS Time Measured: _____

	Result	Units	Meter	Calibration Date
☐ Water Temp				
☐ pH				
☐ Sp. Cond.				
☐ Turbidity*				
☐ DO*				
☐ ORP (Redox)*				
☐ Salinity*				

*Optional

FLOW ESTIMATION:

☐ Calculation by visual measurement: Q (cfs) = _____

= [Coef(1, $^{2}/_{3}$, _____)]*[depth_____ft]*[width_____ft]*[vel_____fps]

Circular pipe: [vel_____fps][depth_____ft][width_____ft][R=_____ft]

Per the QAPP (Volume II, Section 11)

IC/ID monitoring will capture an instantaneous flow measurement.

- Area-Velocity Method

This method requires the physical measurement of the depth (ft), width (ft) and an estimate the velocity (vel, fps).

- Coefficient =

1 (straight wall / rectangular channel),

$^{2}/_{3}$ (trapezoidal channel),

½ (triangular channel)

Useful for low flows, not sheet flow.

Not required to estimate flow but if significant it should be noted.

Field Data Sheet

- Site Conditions
- Field Parameters – Flow Estimation

FIELD PARAMETERS Time Measured: _____

	Result	Units	Meter	Calibration Date
☐ Water Temp				
☐ pH				
☐ Sp. Cond.				
☐ Turbidity*				
☐ DO*				
☐ ORP (Redox)*				
☐ Salinity*				

*Optional

FLOW ESTIMATION:

☐ Calculation by visual measurement: Q (cfs) = _____

= [Coef(1, $^2/_3$, _____)]*[depth_____ft]*[width_____ft]*[vel_____fps]

Circular pipe: [vel_____fps][depth_____ft][width_____ft][R=_____ft]

Per the QAPP (Volume II, Section 11)

IC/ID monitoring will capture an instantaneous flow measurement.

- Partially-Filled Pipe Method

Estimate velocity (vel, fps), depth of flow @ center of pipe (ft), top width of flow (ft) and Radius of pipe (R, ft)

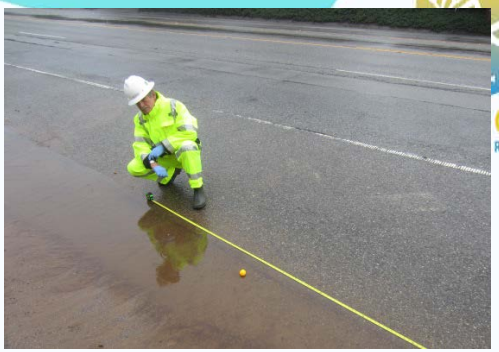
Useful for stable pipe flows.

Not useful if pipe is flooded or submerged, partially collapsed or partially clogged from debris.

Not required to estimate flow but if significant it should be noted.

Field Data Sheet

- Site Conditions
- Field Parameters – Flow Estimation



FIELD PARAMETERS Time Measured: _____

	Result	Units	Meter	Calibration Date
☐ Water Temp				
☐ pH				
☐ Sp. Cond.				
☐ Turbidity*				
☐ DO*				
☐ ORP (Redox)*				
☐ Salinity*				

*Optional

FLOW ESTIMATION:

☐ Calculation by visual measurement: Q (cfs) = _____

= [Coef($1, ^2/_3$, _____)]*[depth_____ft]*[width_____ft]*[vel_____fps]

Circular pipe: [vel_____fps][depth_____ft][width_____ft][R=_____ft]

Per the QAPP (Volume II, Section 11)

IC/ID monitoring will capture an instantaneous flow measurement.

- Timed Object Method

Estimate velocity (vel, fps) by dropping a floatable object such as a leaf or twig in the water, and measuring how long it takes to move a measured distance.

- Crumbled dry leaves and peanuts.
- Do not use trash as a floatable in estimating velocity!
- Not required to estimate flow but if significant it should be noted.

Field Data Sheet

- Site Conditions
- Field Parameters – Flow Estimation

- Known Volume Method

Estimate flow (Q, cfs) by recording the amount of time it takes to fill a container of known volume. Cut a plastic container to create a flexible tool.

Great for easily accessible flow, including sheet flow.

DO NOT disturb sediment, algae or other bedrock / bottom.

Field Data Sheet

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Site Conditions
- Overall Observations – Note any observations regarding the sampling location, *including any sampling procedural variances* that occurred (i.e., sampling upstream, instrument malfunction, wildlife in area, safety, etc.).
- Make note of normal or excessive site conditions: ***Sediments*** [None, Normal, Excessive], ***Structural*** [Normal, Cracking, Spauling], ***Biological*** [Algal Bloom, Larvae, Crawfish, Frogs, Fish, Water Fowl]

Water Quality Threshold	**Observations/Notes** ☐ **Photograph(s)**
For Dry Weather Field IC/ID Sampling Use Field meter to collect water temperature, pH and Specific Conductance (Sp. Cond). If the values are outside of the following range; a field reconnaissance / source investigation study should be initiated pursuant to your Local Implementation Plan: 1) Water Temp: Significantly different than ambient air temp (extremely hot/cold flow that is not influenced by current weather at site); 2) pH below 6.5 or above 8.5 3) Specific Conductance >25% higher than WQO (Use 1000 µS/cm if unknown) Also initiate a field reconnaissance / source investigation if you notice any unusual odors, staining, color, sheens or other indicators of potential illegal discharges.	☐ **Additional sample(s) taken u/s, d/s** (circle one or both and complete separate FDS(s)) **at:**

Field Data Sheet

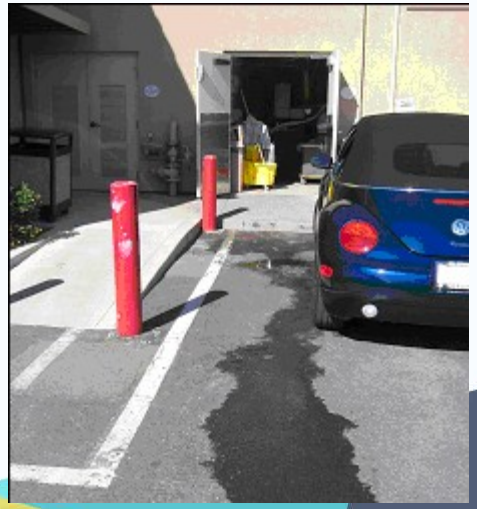
- Site Conditions
- Overall Observations
- Check box if photographs were taken

Water Quality Threshold	Observations/Notes	☒ Photograph(s)
For Dry Weather Field IC/ID Sampling Use Field meter to collect water temperature, pH and Specific Conductance (Sp. Cond). If the values are outside of the following range; a field reconnaissance / source investigation study should be initiated pursuant to your Local Implementation Plan: 1) Water Temp: Significantly different than ambient air temp (extremely hot/cold flow that is not influenced by current weather at site); 2) pH below 6.5 or above 8.5 3) Specific Conductance >25% higher than WQO (Use 1000 µS/cm if unknown) Also initiate a field reconnaissance / source investigation if you notice any unusual odors, staining, color, sheens or other indicators of potential illegal discharges.	No sediment buildup along stream edge or culvert entrance/outlet. Culvert structure had minor vandalism – spray painting. Water fowl and fish observed. Between 50 – 100 minor trash items. Large trash item (hot tub) wedged at side of culvert structure. Not interfering with flow. Performed sample measurements upstream. ☐ Additional sample(s) taken u/s, d/s (circle one or both and complete separate FDS(s)) at:	

Photograph Record Expectations

- Photographs will be taken
  - upon site arrival,
  - prior to leaving the site,
  - during any specific site changes or other items of importance, and at least every 30-45 minutes while at the site.

- Photograph the following:
  - Wide upstream and downstream shot,
  - Close up of Sampling and Oakton Meter measurement locations,
  - Any other appropriate information deemed by field personnel.



Follow-Up Procedures

The Following has been Confirmed

Field Reconnaissance	An Obvious discharge: High Turbidity, Strong Odors or Color, Oil Sheen, etc. Or Water Quality Thresholds Exceeded
Complaint	Member of Public Field staff – Maintenance Crew
Outside Agency	Neighboring City, County or even State

Follow-Up Procedure

The following are general procedures for following up on non-stormwater discharges for which a complaint has been reported.

These may vary between Permittee jurisdictions; please refer to the respective Permittee's LIP for specific procedures.

- **Neighbor disputes involving non-stormwater issues**
  - are a civil matter– Complaints are referred to appropriate Permittee or Code Enforcement department (QAPP Appendix K).
- **Health hazards with no MS4 connectivity**
  - refer complaint to Department of Environmental Health. QAPP Appendix K provides contact information.
- **Flooding issue with no Pollutant issue**
  - Complaints are referred to the District Project Planning Section at (951) 955-1200. The Project Planning Section has implemented internal procedures for handling flooding complaint issues.

Follow-Up Procedure

The following are general procedures for following up on non-stormwater discharges for which a complaint has been reported.

These may vary between Permittee jurisdictions; please refer to the respective Permittee's LIP for specific procedures.

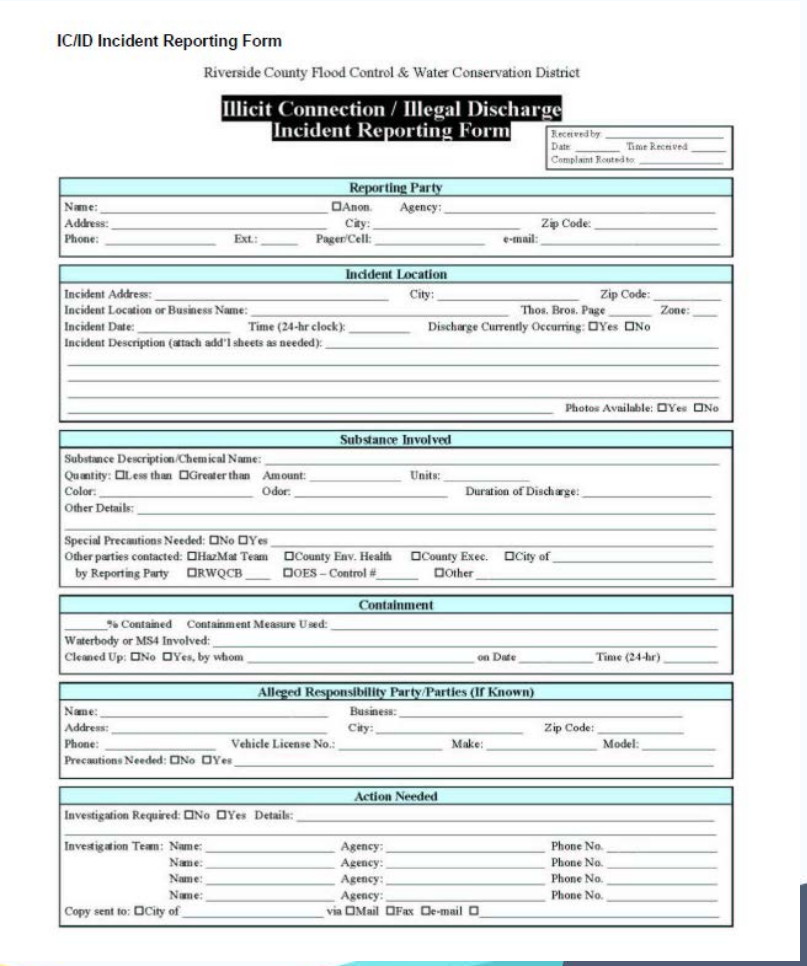
- **Complaints occurring on private property where the owner of the property is in violation,** e.g., accumulated rubbish, construction without permits, junk yard, abandoned vehicles
  - The appropriate Permittee or Code Enforcement Department is contacted. See QAPP Appendix K for a list of contacts by community and the local Code Enforcement office that handles these complaints.

- **If sewage or treated effluent is involved**
  - the Unified Sanitary Sewer Spill Response Procedure (DAMP Appendix I) is implemented.
- See LIP Section 4.3 – IC/ID Response Reporting and DAMP 4.7 – IC/ID Response and Reporting for more information

Reporting Requirements

- For incoming complaints
- The appropriate jurisdiction of the potential discharge is identified.
- The incident is categorized according to the location and type of discharge.

- Example form.
  - Each permittee has different logging method.



IC/ID Incident Reporting Form

Riverside County Flood Control & Water Conservation District

Illicit Connection / Illegal Discharge Incident Reporting Form

Received by: _____
Date: _____ Time Received: _____
Complaint Routed to: _____

Reporting Party

Name: _____ ☐Anon. Agency: _____
Address: _____ City: _____ Zip Code: _____
Phone: _____ Ext.: _____ Pager/Cell: _____ e-mail: _____

Incident Location

Incident Address: _____ City: _____ Zip Code: _____
Incident Location or Business Name: _____ Thos. Bros. Page _____ Zone: ____
Incident Date: _____ Time (24-hr clock): _____ Discharge Currently Occurring: ☐Yes ☐No
Incident Description (attach add'l sheets as needed): _____

Photos Available: ☐Yes ☐No

Substance Involved

Substance Description/Chemical Name: _____
Quantity: ☐Less than ☐Greater than Amount: _____ Units: _____
Color: _____ Odor: _____ Duration of Discharge: _____
Other Details: _____
Special Precautions Needed: ☐No ☐Yes _____
Other parties contacted: ☐HazMat Team ☐County Env. Health ☐County Exec. ☐City of _____
by Reporting Party ☐RWQCB ____ ☐OES – Control #_____ ☐Other _____

Containment

_____% Contained Containment Measure Used: _____
Waterbody or MS4 Involved: _____
Cleaned Up: ☐No ☐Yes, by whom _____ on Date _____ Time (24-hr) _____

Alleged Responsibility Party/Parties (If Known)

Name: _____ Business: _____
Address: _____ City: _____ Zip Code: _____
Phone: _____ Vehicle License No.: _____ Make: _____ Model: _____
Precautions Needed: ☐No ☐Yes _____

Action Needed

Investigation Required: ☐No ☐Yes Details: _____
Investigation Team: Name: _____ Agency: _____ Phone No. _____
Name: _____ Agency: _____ Phone No. _____
Name: _____ Agency: _____ Phone No. _____
Name: _____ Agency: _____ Phone No. _____
Copy sent to: ☐City of _____ via ☐Mail ☐Fax ☐e-mail ☐ _____

IC/IDs that are Threats to Human Health and Environment (Emergency Situation)

- Refers to any sewage spill over 1,000 gallons
  - or that could impact water contact recreation,
  - any spill that could impact wildlife,
  - any hazardous materials spill where residents are evacuated,
  - any spill of reportable quantities of hazardous waste,
  - or any spill reportable to CAL-EMA.
- Follow reporting procedure in DAMP Section 4.7
- Immediately investigate situation
- Lead or coordinate other agencies (DAMP Section 3.4)

IC/IDs that are Threats to Human Health and Environment (Emergency Situation)

- Individuals actively in the process of introducing possible illegal substances or material to a storm drain.
- Very strong chemical odor emanating from site area / MS4 system
- Presence of fumes or smoke emanating from site area / MS4 system
- Visible significant stream of controlled chemical or petroleum product flowing in from storm system or downstream waters
- Large chemical plume
- Waste / Trash items can cause an immediate threat to property, human health or safety, and or aquatic life
  - Medical waste, abandoned 55 gallon drums, vehicle batteries, hazardous waste in general

Non-Threatening IC/IDs (Non-Emergency Situation)

- If outside of jurisdiction, refer to appropriate agency and/or Regional Board within 2 days
- Respond to IC/IDs in own jurisdiction within 10 days
- Document inspections
- Collect samples when appropriate

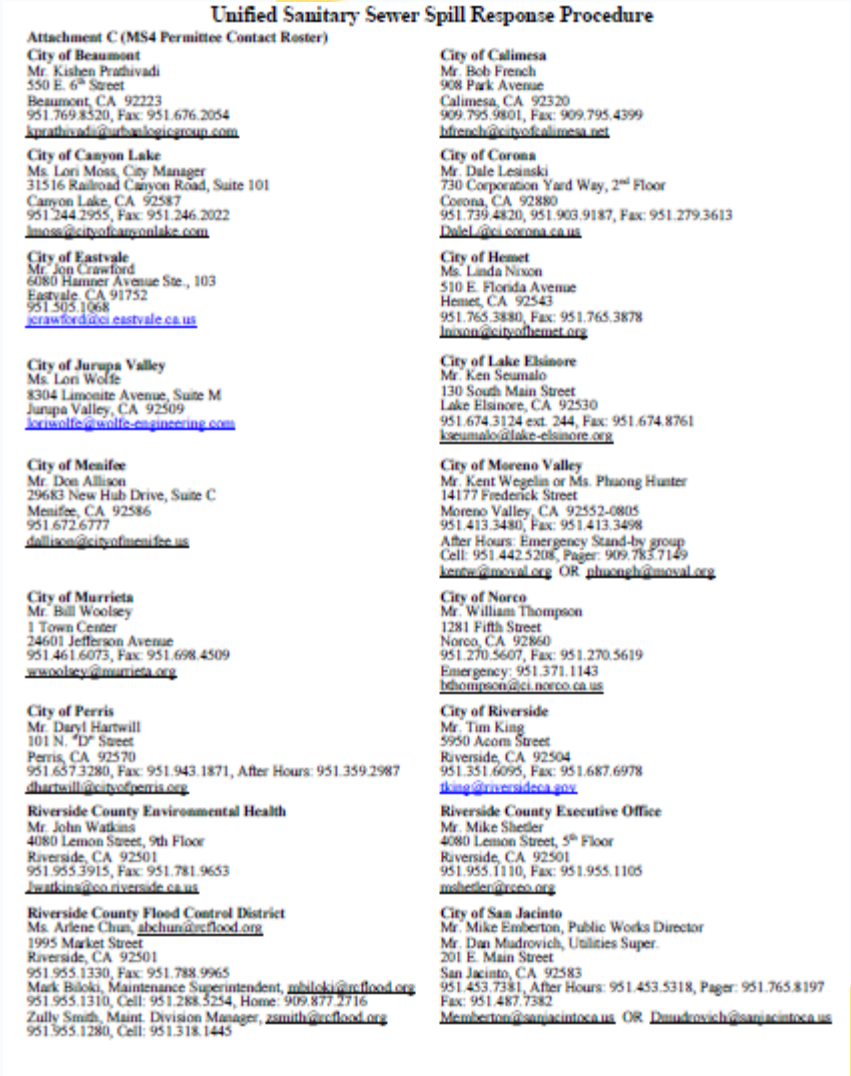
Regional Response

- District utilizes funds received through Implementation Agreements with Permittees and from Benefit Assessment Areas
- Household Hazardous Waste (HHW) collection program facilitates the proper management and disposal of used oil, toxic materials and other HHWs

Reporting

- Permittees with jurisdiction of portion of MS4 affected by the ID, upon notification, must immediately (within 24 hours) investigate the circumstances of potential IC/IDs
- As stated previously, IC/IDs that endanger human health or environment must contact Cal-EMA and the Executive Officer of the SARWQCB
- See DAMP Section 4.7 for more information
- Contact numbers in Attachment C
  - Cal-EMA (800-852-7550)
  - SARWQCB (951-782-4130)

Attachment C



Unified Sanitary Sewer Spill Response Procedure

Attachment C (MS4 Permittee Contact Roster)

City of Beaumont
Mr. Kishen Prathivadi
550 E. 6th Street
Beaumont, CA 92223
951.769.8520, Fax: 951.676.2054
kprathivadi@urbanlogicgroup.com

City of Calimesa
Mr. Bob French
908 Park Avenue
Calimesa, CA 92320
909.795.9801, Fax: 909.795.4399
bfrench@cityofcalimesa.net

City of Canyon Lake
Ms. Lori Moss, City Manager
31516 Railroad Canyon Road, Suite 101
Canyon Lake, CA 92587
951.244.2955, Fax: 951.246.2022
lmoss@cityofcanyonlake.com

City of Corona
Mr. Dale Lesinski
730 Corporation Yard Way, 2nd Floor
Corona, CA 92880
951.739.4820, 951.903.9187, Fax: 951.279.3613
DaleL@ci.corona.ca.us

City of Eastvale
Mr. Jon Crawford
6080 Hamner Avenue Ste., 103
Eastvale, CA 91752
951.505.1068
jcrawford@ci.eastvale.ca.us

City of Hemet
Ms. Linda Nixon
510 E. Florida Avenue
Hemet, CA 92543
951.765.3880, Fax: 951.765.3878
lnixon@cityofhemet.org

City of Jurupa Valley
Ms. Lori Wolfe
8304 Limonite Avenue, Suite M
Jurupa Valley, CA 92509
lorriwolfe@wolfe-engineering.com

City of Lake Elsinore
Mr. Ken Seumalo
130 South Main Street
Lake Elsinore, CA 92530
951.674.3124 ext. 244, Fax: 951.674.8761
kseumalo@lake-elsinore.org

City of Menifee
Mr. Don Allison
29683 New Hub Drive, Suite C
Menifee, CA 92586
951.672.6777
dallison@cityofmenifee.us

City of Moreno Valley
Mr. Kent Wegelin or Ms. Phuong Hunter
14177 Frederick Street
Moreno Valley, CA 92552-0805
951.413.3480, Fax: 951.413.3498
After Hours: Emergency Stand-by group
Cell: 951.442.5208, Pager: 909.783.7149
kentw@moval.org OR phuongh@moval.org

City of Murrieta
Mr. Bill Woolsey
1 Town Center
24601 Jefferson Avenue
951.461.6073, Fax: 951.698.4509
wwoolsey@murrieta.org

City of Norco
Mr. William Thompson
1281 Fifth Street
Norco, CA 92860
951.270.5607, Fax: 951.270.5619
Emergency: 951.371.1143
bthompson@ci.norco.ca.us

City of Perris
Mr. Daryl Hartwill
101 N. "D" Street
Perris, CA 92570
951.657.3280, Fax: 951.943.1871, After Hours: 951.359.2987
dhartwill@cityofperris.org

City of Riverside
Mr. Tim King
5950 Acorn Street
Riverside, CA 92504
951.351.6095, Fax: 951.687.6978
tking@riversideca.gov

Riverside County Environmental Health
Mr. John Watkins
4080 Lemon Street, 9th Floor
Riverside, CA 92501
951.955.3915, Fax: 951.781.9653
jwatkins@co.riverside.ca.us

Riverside County Executive Office
Mr. Mike Shetler
4080 Lemon Street, 5th Floor
Riverside, CA 92501
951.955.1110, Fax: 951.955.1105
mshetler@rceo.org

Riverside County Flood Control District
Ms. Arlene Chun, abchun@rcflood.org
1995 Market Street
Riverside, CA 92501
951.955.1330, Fax: 951.788.9965
Mark Biloki, Maintenance Superintendent, mbiloki@rcflood.org
951.955.1310, Cell: 951.288.5254, Home: 909.877.2716
Zully Smith, Maint. Division Manager, zsmith@rcflood.org
951.955.1280, Cell: 951.318.1445

City of San Jacinto
Mr. Mike Emberton, Public Works Director
Mr. Dan Mudrovich, Utilities Super.
201 E. Main Street
San Jacinto, CA 92583
951.453.7381, After Hours: 951.453.5318, Pager: 951.765.8197
Fax: 951.487.7382
Memberton@sanjacintoca.us OR Dmudrovich@sanjacintoca.us

District will be updating Attachment C information for the DAMP soon and will be sending an official request to the Permittees for updated information.

Contact information also available in the QAPP.

Source Identification

Source Identification

- Once an illicit discharge is identified, a combination of methods is used to isolate its specific source.

Source Identification

- Once an illicit discharge is identified, a combination of methods is used to isolate its specific source.

Storm Drain Network Investigation

- Field crews strategically inspect manholes within the storm drain network system to measure chemical or physical indicators that can isolate discharges to a specific segment of the network.
- Once the pipe segment has been identified, on-site investigations are used to find the specific discharge or improper connection.

Source Identification

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Once an illicit discharge is identified, a combination of methods is used to isolate its specific source.

Storm Drain Network Investigation

- Field crews strategically inspect manholes within the storm drain network system to measure chemical or physical indicators that can isolate discharges to a specific segment of the network.
- Once the pipe segment has been identified, on-site investigations are used to find the specific discharge or improper connection.

  - **Option 1: Move up the Trunk**
  - **Option 2: Split the storm drain network**
  - **Option 3: Move down the storm drain network**

Source Identification

- Once an illicit discharge is identified, a combination of methods is used to isolate its specific source.

Drainage Area Investigation

- This method relies on an analysis of land use or other characteristics of the drainage area that is producing the illicit discharge.
- The investigation can be as simple as a "**windshield**" survey of the drainage area or a more complex mapping analysis of the storm drain network and potential generating sites.
- Drainage area investigations work best when prior indicator monitoring reveals strong clues as to the likely generating site producing the discharge.

  - **Option 1: Rapid Windshield Survey**
  - **Option 2: GIS Data**

Source Identification

- Once an illicit discharge is identified, a combination of methods is used to isolate its specific source.

On-site Investigation

- On-site methods are used to trace the source of an illicit discharge in a pipe segment, and may involve dye, video or smoke testing within isolated segments of the storm drain network.

Source Identification

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Once an illicit discharge is identified, a combination of methods is used to isolate its specific source.

On-site Investigation

- On-site methods are used to trace the source of an illicit discharge in a pipe segment, and may involve dye, video or smoke testing within isolated segments of the storm drain network.

  - **Option 1: Dye Testing**
  - **Option 2: Video Testing**
  - **Option 3: Smoke Testing**

Source Identification

- Once an illicit discharge is identified, a combination of methods is used to isolate its specific source.

Septic System Investigation

- Low-density residential watersheds may require special investigation methods if they are not served by sanitary sewers and/ or storm water is conveyed in ditches or swales.
- The major illicit discharges found in low-density development are failing septic systems and illegal dumping.

Source Identification

- Once an illicit discharge is identified, a combination of methods is used to isolate its specific source.

Septic System Investigation

- Low-density residential watersheds may require special investigation methods if they are not served by sanitary sewers and/ or storm water is conveyed in ditches or swales.
- The major illicit discharges found in low-density development are failing septic systems and illegal dumping.

  - **Option 1: Homeowner Survey**
  - **Option 2: Surface Condition Assessment**
  - **Option 3: Infrared Imagery**

Source Identification

If the source cannot be identified:

Active discharge with flow…

- Field measurements are collected and documented (outlined above) where there is no other evidence of the IC/ID source.
- Provide appropriate public education material in area of IC/ID or complaint.

No active discharge but evidence of IC/ID is present at time of investigation…

- Mark location for future follow-up.
- Follow-up visit(s) will confirm if the IC/ID has recurred and will attempt to locate source.
- If IC/ID has not recurred or has been eliminated, note on IC/ID Incident Reporting form (or similar) and close complaint/investigation.
- Provide appropriate public education material in area of IC/ID or complaint

Source Identification

If the source is identified:

- Determine if the discharge is permitted or allowable.
- Discussions with property owners and others near the source if the discharge will be necessary.
  - If a permitted discharge is exposed to a source of Pollutants (e.g., recently-applied fertilizers or pesticides), it will be treated as an Illegal Discharge. Refer incident to Regional Board.

- If discharge is permitted, request copy of regulatory permit, District Encroachment Permit, or any other document authorizing the discharge. No further action is required where the source is determined to be a permitted.
  - Permitted discharges that are perceived to be a threat to human health or the environment will be reported to the Regional Board/California Emergency Management Agency.

Source Identification

If the source is identified:

- If discharge is not clearly permitted or allowable, implement Permittee Enforcement and Compliance Strategy procedures as described in the Permittee's LIP.

- If the incident is part of a HazMat incident, report to the Incident Commander upon arrival.
- Coordinate with the HazMat team and only collect samples with approval of the Incident Commander as samples may be done in conjunction with future legal action.
- ***Under no circumstances should a site be entered or field measurements collected if conditions are unsafe.***

Sampling Strategy

Sampling Strategy

A consistent field sampling protocol ensures reliable, accurate and defensible data toward identifying a potential illicit discharge.

Sampling Strategy

A consistent field sampling protocol ensures reliable, accurate and defensible data toward identifying a potential illicit discharge.

Sample Techniques

- Which indicator parameters to select for testing
- Where to collect samples
- When to collect samples
- Safety Considerations

Sample Handling and Transport

- Sample labeling and chain of custody (COC) plan

Quality Assurance / Control Samples

Sampling Techniques
Choosing Parameters

- In addition to the collecting physical indicators, sensory indicators and in-situ measurements by the Oakton field meter, monitoring efforts can also consist of manually collecting a discrete grab sample.
- No single indicator parameter is perfect. **There are a wide range of indicator parameters and analytical methods to choose from toward confirming the presence and identifying the source of an illici**

Sampling Techniques
Choosing Parameters

- Per the Center for Watershed Protection's IDDE: *A Guidance Manual for Program Development and Technical Assessments*, there are at least **fifteen distinguishable water quality parameters that are either key identifie**rs or provide supplemental information to identifying an illicit discharge.

- Ammonia
- Boron
- Chlorine
- Color
- Conductivity
- Detergents
- *E. coli*, enterococci, and total coliform
- Fluorescence
- Fluoride
- Hardness
- pH
- Potassium
- Surface Tension
- Surfactants
- Turbidity

Sampling Techniques
Choosing Parameters

- It is not cost effective, nor appropriate to test samples for the this entire list of constituents.
- In most cases, only a three to five indicator parameters are required to adequately characterize an illicit discharge.
- The list to the right is not an end all. **Other parameters include pesticides, toxicity, Dissolved Oxygen, Total Nitrogen, Total Prosperous, a full suite metals (total)**.

- Ammonia
- Boron
- Chlorine
- Color
- Conductivity
- Detergents
- *E. coli*, enterococci, and total coliform
- Fluorescence
- Fluoride
- Hardness
- pH
- Potassium
- Surface Tension
- Surfactants
- Turbidity

Sampling Techniques
Choosing Parameters

- Of prime importance, samples are to be representative of the illicit discharge event.

- Ammonia
- Boron
- Chlorine
- Color
- Conductivity
- Detergents
- *E. coli*, enterococci, and total coliform
- Fluorescence
- Fluoride
- Hardness
- pH
- Potassium
- Surface Tension
- Surfactants
- Turbidity

Sampling Techniques
Choosing Parameters

- Of prime importance, samples are to be representative of the illicit discharge event.
- Per the Center for Watershed Protection's IDDE: *A Guidance Manual for Program Development and Technical Assessments,*
- **Table 39 provides typical indicator parameters per discharge source type.**

Table 39: Indicator Parameters Used to Detect Illicit Discharges

Parameter	Discharge Types It Can Detect				
	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes	Laboratory/Analytical Challenges
Ammonia	●	◉	○	◉	Can change into other nitrogen forms as the flow travels to the outfall
Boron	◉	◉	○	N/A	
Chlorine	○	○	○	◉	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	◉	◉	○	◉	
Conductivity	◉	◉	○	◉	Ineffective in saline waters
Detergents – Surfactants	●	●	○	◉	Reagent is a hazardous waste
E. coli Enterococci Total Coliform	◉	○	○	○	24-hour wait for results Need to modify standard monitoring protocols to measure high bacteria concentrations
Fluoride*	○	○	●	◉	Reagent is a hazardous waste Exception for communities that do not fluoridate their tap water
Hardness	◉	◉	◉	◉	
pH	○	◉	○	◉	
Potassium	◉	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	◉	◉	○	◉	

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.
◉ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter
○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water
N/A: Data are not available to assess the utility of this parameter for this purpose.
Data sources: Pitt (this study)
*Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.

Sampling Techniques
Choosing Parameters

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Of prime importance, samples are to be representative of the illicit discharge event.
- The desktop assessment, complaint, field assessment are all also ways of selecting water quality parameters.
- **Example: Bacteria testing due to a complaint of sewage smell in a subdivision channel.**

Table 39: Indicator Parameters Used to Detect Illicit Discharges

Parameter	Discharge Types It Can Detect				Laboratory/Analytical Challenges
	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes	
Ammonia	●	◉	○	◉	Can change into other nitrogen forms as the flow travels to the outfall
Boron	◉	◉	○	N/A	
Chlorine	○	○	○	◉	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	◉	◉	○	◉	
Conductivity	◉	◉	○	◉	Ineffective in saline waters
Detergents – Surfactants	●	●	○	◉	Reagent is a hazardous waste
E. coli Enterococci Total Coliform	◉	○	○	○	24-hour wait for results Need to modify standard monitoring protocols to measure high bacteria concentrations
Fluoride*	○	○	●	◉	Reagent is a hazardous waste Exception for communities that do not fluoridate their tap water
Hardness	◉	◉	◉	◉	
pH	○	◉	○	◉	
Potassium	◉	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	◉	◉	○	◉	

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.
◉ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter
○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water
N/A: Data are not available to assess the utility of this parameter for this purpose.
Data sources: Pitt (this study)
*Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.

Sampling Techniques
Choosing Parameters

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Of prime importance, samples are to be representative of the illicit discharge event.
- The desktop assessment, complaint, field assessment are all also ways of selecting water quality parameters.
- **Example: Bacteria testing due to toilet paper, floatables and algae buildup at outfall.**

Table 39: Indicator Parameters Used to Detect Illicit Discharges

Parameter	Discharge Types It Can Detect				
	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes	Laboratory/Analytical Challenges
Ammonia	●	◉	○	◉	Can change into other nitrogen forms as the flow travels to the outfall
Boron	◉	◉	○	N/A	
Chlorine	○	○	○	◉	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	◉	◉	○	◉	
Conductivity	◉	◉	○	◉	Ineffective in saline waters
Detergents – Surfactants	●	●	○	◉	Reagent is a hazardous waste
E. coli Enterococci Total Coliform	◉	○	○	○	24-hour wait for results Need to modify standard monitoring protocols to measure high bacteria concentrations
Fluoride*	○	○	●	◉	Reagent is a hazardous waste Exception for communities that do not fluoridate their tap water
Hardness	◉	◉	◉	◉	
pH	○	◉	○	◉	
Potassium	◉	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	◉	◉	○	◉	

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.
◉ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter
○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water
N/A: Data are not available to assess the utility of this parameter for this purpose.
Data sources: Pitt (this study)
*Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.

Sampling Techniques
Choosing Parameters

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Of prime importance, samples are to be representative of the illicit discharge event.
- The desktop assessment, complaint, field assessment are all also ways of selecting water quality parameters.
- **Example: Ammonia testing from a strong fertilizer smell.**

Table 39: Indicator Parameters Used to Detect Illicit Discharges

Parameter	Discharge Types It Can Detect				Laboratory/Analytical Challenges
	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes	
Ammonia	●	◉	○	◉	Can change into other nitrogen forms as the flow travels to the outfall
Boron	◉	◉	○	N/A	
Chlorine	○	○	○	◉	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	◉	◉	○	◉	
Conductivity	◉	◉	○	◉	Ineffective in saline waters
Detergents – Surfactants	●	●	○	◉	Reagent is a hazardous waste
E. coli Enterococci Total Coliform	◉	○	○	○	24-hour wait for results Need to modify standard monitoring protocols to measure high bacteria concentrations
Fluoride*	○	○	●	◉	Reagent is a hazardous waste Exception for communities that do not fluoridate their tap water
Hardness	◉	◉	◉	◉	
pH	○	◉	○	◉	
Potassium	◉	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	◉	◉	○	◉	

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.
◉ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter
○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water
N/A: Data are not available to assess the utility of this parameter for this purpose.
Data sources: Pitt (this study)
*Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.

Sampling Techniques
Choosing Parameters

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Of prime importance, samples are to be representative of the illicit discharge event.
- The desktop assessment, complaint, field assessment are all also ways of selecting water quality parameters.
- **Example: A full suite of Metals (total) testing due to a nearby industrial complex.**

Table 39: Indicator Parameters Used to Detect Illicit Discharges

Parameter	Discharge Types It Can Detect				Laboratory/Analytical Challenges
	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes	
Ammonia	●	◉	○	◉	Can change into other nitrogen forms as the flow travels to the outfall
Boron	◉	◉	○	N/A	
Chlorine	○	○	○	◉	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	◉	◉	○	◉	
Conductivity	◉	◉	○	◉	Ineffective in saline waters
Detergents – Surfactants	●	●	○	◉	Reagent is a hazardous waste
E. coli Enterococci Total Coliform	◉	○	○	○	24-hour wait for results Need to modify standard monitoring protocols to measure high bacteria concentrations
Fluoride*	○	○	●	◉	Reagent is a hazardous waste Exception for communities that do not fluoridate their tap water
Hardness	◉	◉	◉	◉	
pH	○	◉	○	◉	
Potassium	◉	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	◉	◉	○	◉	

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.
◉ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter
○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water
N/A: Data are not available to assess the utility of this parameter for this purpose.
Data sources: Pitt (this study)
*Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.

Sampling Techniques
Choosing Parameters

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Of prime importance, samples are to be representative of the illicit discharge event.
- The desktop assessment, complaint, field assessment are all also ways of selecting water quality parameters.
- **Example: Total Chlorine testing due to source tracking.**

Table 39: Indicator Parameters Used to Detect Illicit Discharges

Parameter	Discharge Types It Can Detect				Laboratory/Analytical Challenges
	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes	
Ammonia	●	◉	○	◉	Can change into other nitrogen forms as the flow travels to the outfall
Boron	◉	◉	○	N/A	
Chlorine	○	○	○	◉	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	◉	◉	○	◉	
Conductivity	◉	◉	○	◉	Ineffective in saline waters
Detergents – Surfactants	●	●	○	◉	Reagent is a hazardous waste
E. coli Enterococci Total Coliform	◉	○	○	○	24-hour wait for results Need to modify standard monitoring protocols to measure high bacteria concentrations
Fluoride*	○	○	●	◉	Reagent is a hazardous waste Exception for communities that do not fluoridate their tap water
Hardness	◉	◉	◉	◉	
pH	○	◉	○	◉	
Potassium	◉	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	◉	◉	○	◉	

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.
◉ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter
○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water
N/A: Data are not available to assess the utility of this parameter for this purpose.
Data sources: Pitt (this study)
*Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.

Sampling Techniques
Choosing Parameters

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Of prime importance, samples are to be representative of the illicit discharge event.
- The desktop assessment, complaint, field assessment are all also ways of selecting water quality parameters.
- **Example: Pesticides tested due to nearby construction area and a strong chemical odor.**

Table 39: Indicator Parameters Used to Detect Illicit Discharges

Parameter	Discharge Types It Can Detect				Laboratory/Analytical Challenges
	Sewage	Washwater	Tap Water	Industrial or Commercial Liquid Wastes	
Ammonia	●	◉	○	◉	Can change into other nitrogen forms as the flow travels to the outfall
Boron	◉	◉	○	N/A	
Chlorine	○	○	○	◉	High chlorine demand in natural waters limits utility to flows with very high chlorine concentrations
Color	◉	◉	○	◉	
Conductivity	◉	◉	○	◉	Ineffective in saline waters
Detergents – Surfactants	●	●	○	◉	Reagent is a hazardous waste
E. coli Enterococci Total Coliform	◉	○	○	○	24-hour wait for results Need to modify standard monitoring protocols to measure high bacteria concentrations
Fluoride*	○	○	●	◉	Reagent is a hazardous waste Exception for communities that do not fluoridate their tap water
Hardness	◉	◉	◉	◉	
pH	○	◉	○	◉	
Potassium	◉	○	○	●	May need to use two separate analytical techniques, depending on the concentration
Turbidity	◉	◉	○	◉	

● Can almost always (>80% of samples) distinguish this discharge from clean flow types (e.g., tap water or natural water). For tap water, can distinguish from natural water.
◉ Can sometimes (>50% of samples) distinguish this discharge from clean flow types depending on regional characteristics, or can be helpful in combination with another parameter
○ Poor indicator. Cannot reliably detect illicit discharges, or cannot detect tap water
N/A: Data are not available to assess the utility of this parameter for this purpose.
Data sources: Pitt (this study)
*Fluoride is a poor indicator when used as a single parameter, but when combined with additional parameters (such as detergents, ammonia and potassium), it can almost always distinguish between sewage and washwater.

Sampling Techniques
Choosing Parameters

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Stream monitoring should reflect local water quality goals and objectives.
- **Quick caveat: A violation of bacteria standards does not necessarily indicate an illicit connection. Urban and native wildlife can cause a stream to violate bacteria standards.**

Parameter	Potential Problem Level*	Possible Cause of Water Quality Problem
Total Nitrogen (TN)	3.5 mg/l	High nutrients in ground water from agriculture, lawn practices, or sewage contamination from illicit connection, sanitary line break or failing septic system.
Total Phosphorus (TP)	0.4 mg/l	Contamination from lawn practices, agriculture, sewage or washwater.
Ammonia (NH_3)	0.3 mg/l	Sewage or washwater contamination from illicit connection, sanitary line break or failing septic system.

**Nutrient parameters are based on USGS NAWQA data with 85% of flow weighted samples being less than these values in urban watersheds (Note: data from Nevada were not used, due to climatic differences and for some parameters they were an order of magnitude higher). Communities can modify these benchmarks to reflect local data and experience.*

Sampling Techniques

RIVERSIDE COUNTY
WATERSHED PROTECTION

- Of prime importance, samples are to be representative of the illicit discharge event, **with care being taken to prevent contamination.**

Sampling Techniques
Clean Sample Grab

Clean Sampling is defined per the QAPP (Volume II, Section 11 & Appendix D).

- Always wear gloves
- Use disposable sampling equipment when possible to avoid cross-contamination (or proper decontamination)

Do Not List

- Do not introduce sediment or floatable material into bottles
- Do not put fingers inside bottles or lids
- Do not eat, drink or smoke while sampling
- Do not sneeze or cough in direction of an open sample bottle
- Do not enter the stream – Health and Safety!
- Do not perform water quality measurements upstream of sample site

Sampling Techniques
Clean Sample Grab

RIVERSIDE COUNTY
WATERSHED PROTECTION

Samples will be collected using one of the following methods:

- Place sample bottle directly into discharge flow by sampling personnel
- Place decontaminated or ‘sterile’ bailer or other ‘sterile’ collection device in or near discharge

Sampling Techniques
Clean Sample Grab

Samples will be collected using one of the following methods:

- Place sample bottle directly into discharge flow by sampling personnel

- **Can't use this technique if sample bottles contain a preservative.**

- General Note: Do not overfill bottles which contain preservatives

- Place decontaminated or 'sterile' bailer or other 'sterile' collection device in or near discharge
- Use the unpreserved poly sample bottle as the 'sterile' collection device

Sampling Techniques
Collection Location

- The location of the where to perform a grab is defined by the constituent parameters to be measured.

Sampling Techniques
Collection Location

- The location of the where to perform a grab is defined by the constituent parameters to be measured.

- Suspected potential pollutants that include **Oil & Grease, VOC, surfactants (MBAS) and other petroleum / hydrocarbon** require sampling at the surface of the stream.

- Stagnant pools or edges of a stream are excellent places to discover this type of discharge.

Sampling Techniques
Collection Location

- The location of the where to perform a grab is defined by the constituent parameters to be measured.

- For all other parameters, collect the sample at about 60% of stream depth in an area of maximum turbulence.

- Stagnant pools or edges of a stream should be avoided.

Sampling Techniques
Hard to Reach

- Less accessible sampling points may require the use of grab poles to collect grab samples.

- The grab pole would need to be rinsed with DI before use to avoid contamination.

Sampling Techniques
Low Flow Collection

Cut a plastic container to create a flexible tool.

Great for easily accessible flow, including sheet flow.

DO NOT disturb sediment, algae or other bedrock / bottom.

- Meter must always be immersed beyond the electrode band.

Low Flow or Sheet Flow Conditions?

Sampling Techniques
Low Flow Collection

- Apply a plastic bag mat along the bottom channel / pavement area. This is done so as not to disturb sediment, algae or other bedrock.
- Set two sand / dirt filled plastic bags to concentrate the flow, without introducing contamination.
- Use a final plastic bag to slowly gather the sample.

Sampling Techniques
Intermittent Collection

RIVERSIDE COUNTY
WATERSHED PROTECTION

- An outfall may be suspected of having an intermittent discharge based on physical indicators (e.g., staining), but there is no volume of water for sampling.
- These are the hardest discharges to detect, as the intermittent discharge can have an indirect mode of entry and have odd hours or an irregular schedule.
  - As an example, some generating sites discharge only over the weekend, or 1st of the month, or during evening hours.
- Often, these intermittent discharges are found by the result of hotline complaints or large spill events.

Sampling Techniques
Intermittent Collection

RIVERSIDE COUNTY
WATERSHED PROTECTION

- The only way to be sure would be to camp out at the outfall for a long period of time, which is obviously not very cost-effective or feasible.
- As an alternative, there are special monitoring techniques used to help track these elusive conditions:
  - Odd Hours Monitoring
  - Optical Brightener monitoring traps
  - Caulk Dams
  - Pool Sampling

Sampling Techniques
Intermittent Collection

Odd Hours Monitoring

- Very simple, but also requires some luck

Consider rescheduling normal field observations to “odd hours”

- Repeat a field assessment in morning and afternoon
- Weekday evenings
- Weekend morning and evenings

Not recommended without more information. A quick interview of someone in the surrounding area can assist.

Sampling Techniques
Intermittent Collection

Optical Brightener Monitoring Traps (OBM)

- Very simple, limited to major discharges of detergents
- All configurations involve an absorbent, unbleached cotton pad or fabric swatch and a holding or anchoring device such as a wire mesh or a section of small diameter PVC pipe.
- Field crews anchor /secure the trap at the outfall and retrieve the OBM trap after several days of DRY weather.
- A fluorescent light will indicate if they have been expose to detergents.
- Discharge needs to be strong enough to “hit” the trap.

Figure 48: OBM Equipment includes a black light and an OBM Trap that can be placed at an outfall

Sampling Techniques
Intermittent Collection

Caulk Dam

- Very simple, limited to field conditions
- Use caulk, plumber's putty or some other inactive substance to create a dam about two inches high within the bottom of an storm drain pipe.
- Any water pooled behind the dam can be observed and sampled.

Sampling Techniques
Intermittent Collection

RIVERSIDE COUNTY
WATERSHED PROTECTION

Pool sampling

- Very simple, limited to field conditions
- Field crews collect samples from a plunge pool below an outfall.
- Field crews place a containment device below an outfall to create a pool structure.

Pool sampling results should be taken with a grain of salt!

- Results can be constrained by stream dilution, storm water flow, deposition and normal chemical reactions that occur within the pool.

Sample Handling

- Continue to wear nitrile gloves while handling a sample
- Avoid contamination from inside of sample bottle by not allowing it to come into contact with any material other than water sample
- Discard sample bottles or sample lids that have been dropped onto ground prior to sample collection
- Once you collect the sample, close bottle tight and fill out sample label
  - Initial of sampler name
  - Date and time sample collected
  - Optional: Place clear plastic packing tape over sample label to prevent smudging of label
  - Optional: Pre-label bottles before taking sample
- Place sample inside a Ziploc bag

Sample Transport

- Main form of sample transport is the insulated cooler

Sample Transport

- Main form of sample transport is the insulated cooler

  - Coolers should be clean of dust or sediment.
  - Dirty coolers should be tap water rinsed and left in the sun to dry (lid open).
  - Containers should never be stored near the presence of oil, gas, tar or other petroleum product.

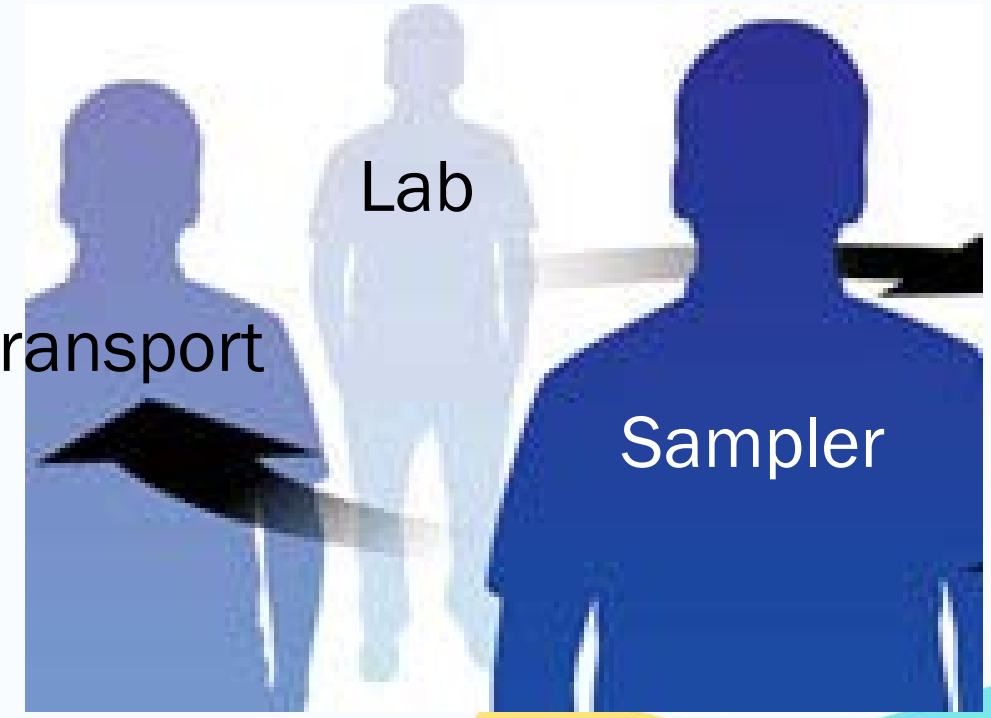
Sample Transport

- Secure zip locked samples inside cooler so bottles do not break
  - Use bubble wrap as padding
  - Ice around/on top/below the bottles
  - Per SWAMP, ice needs to bagged
- Do not leave cooler lid open for extended period of time once samples are inside
- Minimize exposure of samples to direct sunlight, sunlight may cause biochemical transformation of sample

Do All of these Activities in the Field, As Soon as Possible!
Samples need to be kept cold, not in a vehicle with a toasty heater

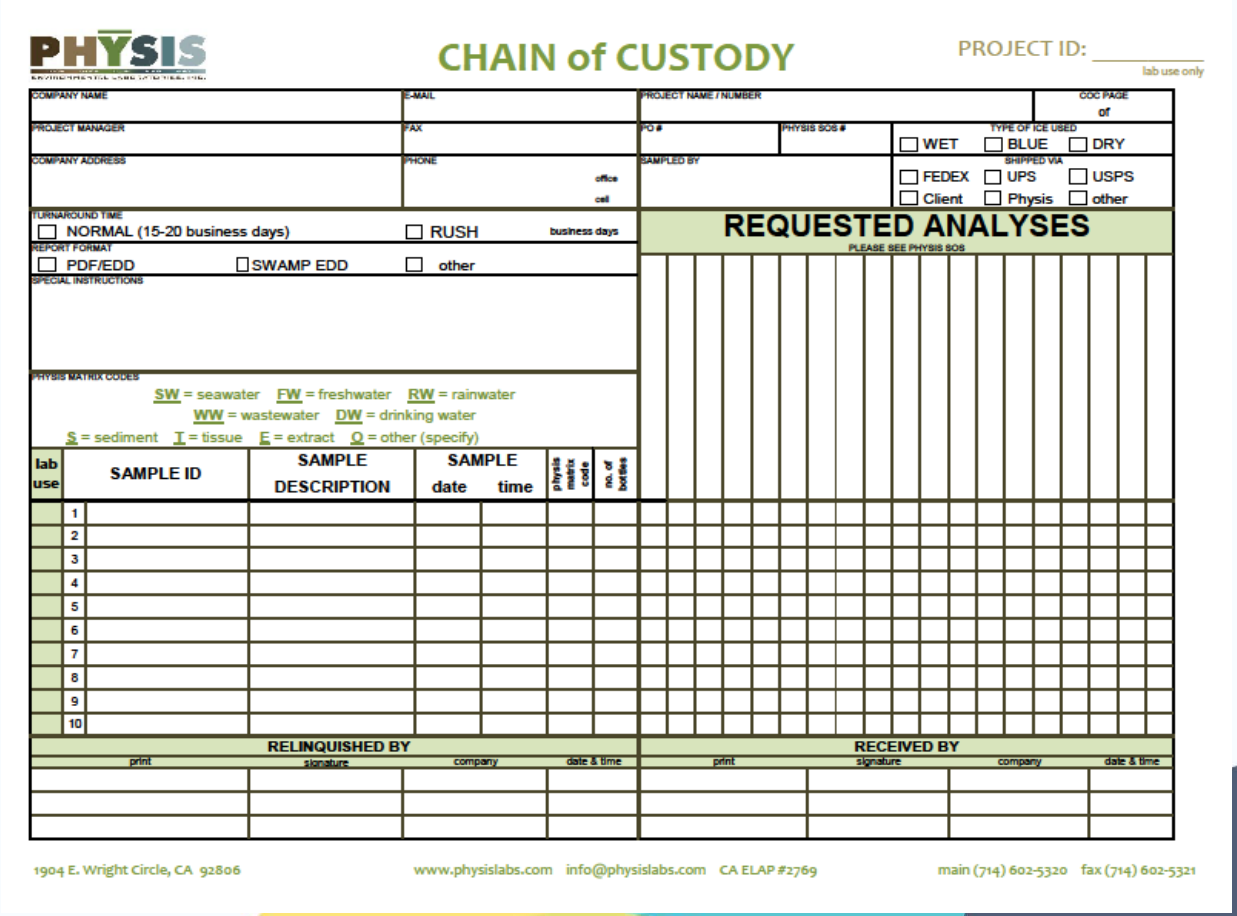
Sample Handling and Transport

- Chain of Custody
  - Always begins with the sampler



Sample Handling and Transport

- Chain of Custody Forms



PHYSIS

CHAIN of CUSTODY

PROJECT ID: _____ lab use only

COMPANY NAME | E-MAIL | PROJECT NAME / NUMBER | COC PAGE of

PROJECT MANAGER | FAX | PO # | PHYSIS SOS # | TYPE OF ICE USED: ☐ WET ☐ BLUE ☐ DRY

COMPANY ADDRESS | PHONE: office / cell | SAMPLED BY | SHIPPED VIA: ☐ FEDEX ☐ UPS ☐ USPS ☐ Client ☐ Physis ☐ other

TURNAROUND TIME: ☐ NORMAL (15-20 business days) ☐ RUSH business days

REPORT FORMAT: ☐ PDF/EDD ☐ SWAMP EDD ☐ other

SPECIAL INSTRUCTIONS

PHYSIS MATRIX CODES

SW = seawater FW = freshwater RW = rainwater

WW = wastewater DW = drinking water

S = sediment T = tissue E = extract O = other (specify)

REQUESTED ANALYSES

PLEASE SEE PHYSIS SOS

lab use		SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE date	SAMPLE time	physis matrix code	no. of bottles
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						

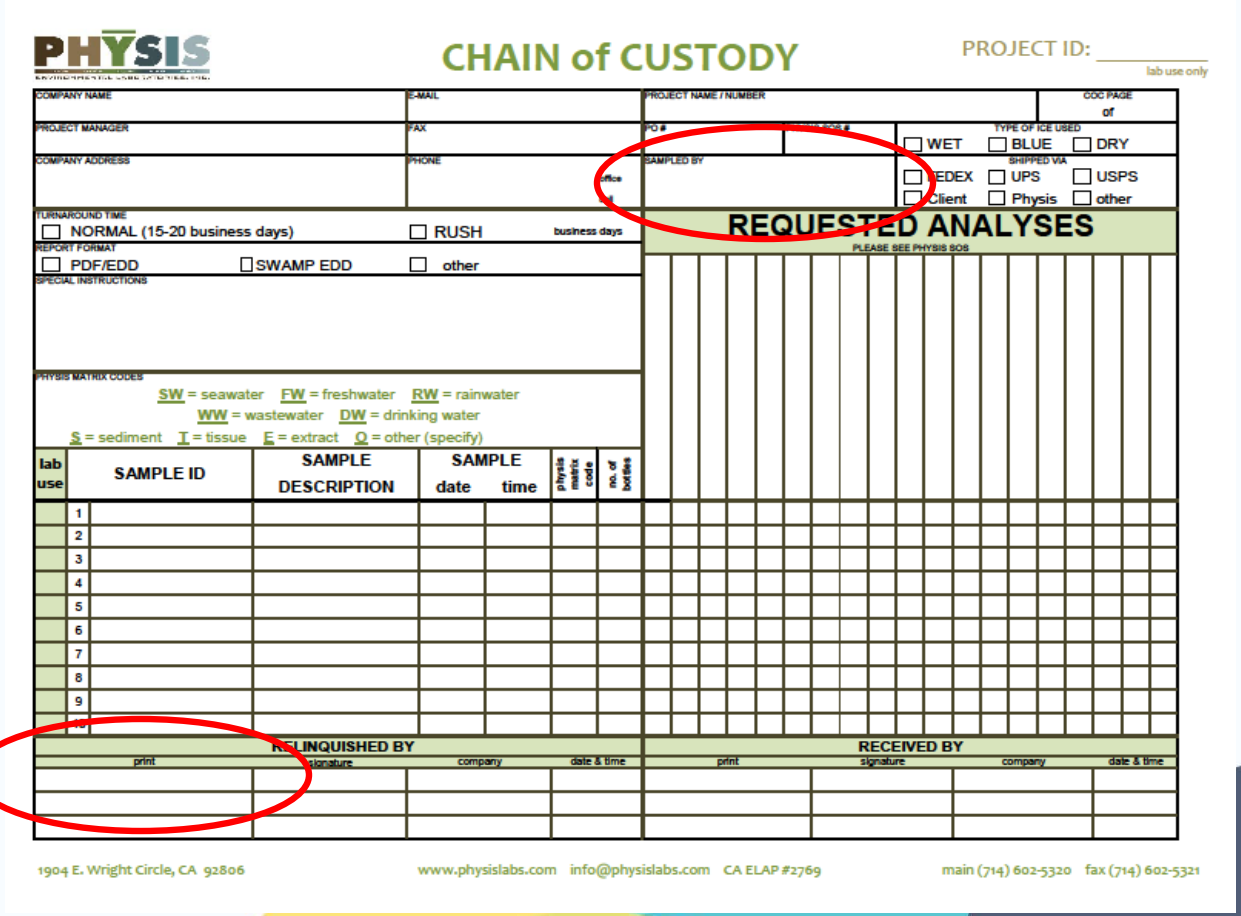
RELINQUISHED BY				RECEIVED BY			
print	signature	company	date & time	print	signature	company	date & time

1904 E. Wright Circle, CA 92806 www.physislabs.com info@physislabs.com CA ELAP #2769 main (714) 602-5320 fax (714) 602-5321

Sample Handling and Transport

- Chain of Custody Forms

- Sampler Name must match first turnover



PHYSIS

CHAIN of CUSTODY

PROJECT ID: _____ lab use only

COMPANY NAME | E-MAIL | PROJECT NAME / NUMBER | COC PAGE of

PROJECT MANAGER | FAX | PO # | TYPE OF ICE USED: ☐ WET ☐ BLUE ☐ DRY

COMPANY ADDRESS | PHONE | SAMPLED BY | SHIPPED VIA: ☐ FEDEX ☐ UPS ☐ USPS ☐ Client ☐ Physis ☐ other

TURNAROUND TIME: ☐ NORMAL (15-20 business days) ☐ RUSH business days

REPORT FORMAT: ☐ PDF/EDD ☐ SWAMP EDD ☐ other

SPECIAL INSTRUCTIONS

PHYSIS MATRIX CODES

SW = seawater FW = freshwater RW = rainwater

WW = wastewater DW = drinking water

S = sediment T = tissue E = extract O = other (specify)

REQUESTED ANALYSES

PLEASE SEE PHYSIS SOS

lab use	SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE date	SAMPLE time	physis matrix code	no. of bottles
	1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					

RELINQUISHED BY print	signature	company	date & time	RECEIVED BY print	signature	company	date & time

1904 E. Wright Circle, CA 92806 www.physislabs.com info@physislabs.com CA ELAP #2769 main (714) 602-5320 fax (714) 602-5321

Quality Assurance / Control Samples

- Contract lab should have current California Environmental Laboratory Accreditation Program (ELAP) certification for the constituent parameters being tested.
- As a rule, a lab should be able to produce results within 48 hours. Standard turnaround time is seven business days, but a short turn-around time is needed for possible continuous streams of illicit discharge.
- Electric reporting of sample results.
- Lab must provide their QA/QC procedures, which include lab spikes, lab blanks and split samples. Procedures for cleaning lab equipment and calibrating instruments should also be provided.

Post Field Procedures

Health and Safety

- All field personnel shall contact field task leader to confirm they returned safely.

Health and Safety

- All field personnel shall contact field task leader to confirm they returned safely.

Confirmation of Records

- All field personnel shall review field data sheets and observation forms for completeness before ending the day.
- Pictures should be downloaded to a secure hard drive for proper storage. Personnel could also file name each photo to match Station ID and site conditions.

Health and Safety

- All field personnel shall contact field task leader to confirm they returned safely

Confirmation of Records

- All field personnel shall review field data sheets and observation forms for completeness before ending the day.
- Pictures should be downloaded to a secure hard drive for proper storage. Personnel could also file name each photo to match Station ID and site conditions.

Notification of Sample Transport to Lab

- Confirm Holding times and setup a meeting between sample transporters.

Storage of Equipment

Store the probe in its cap filled with electrode storage solution.

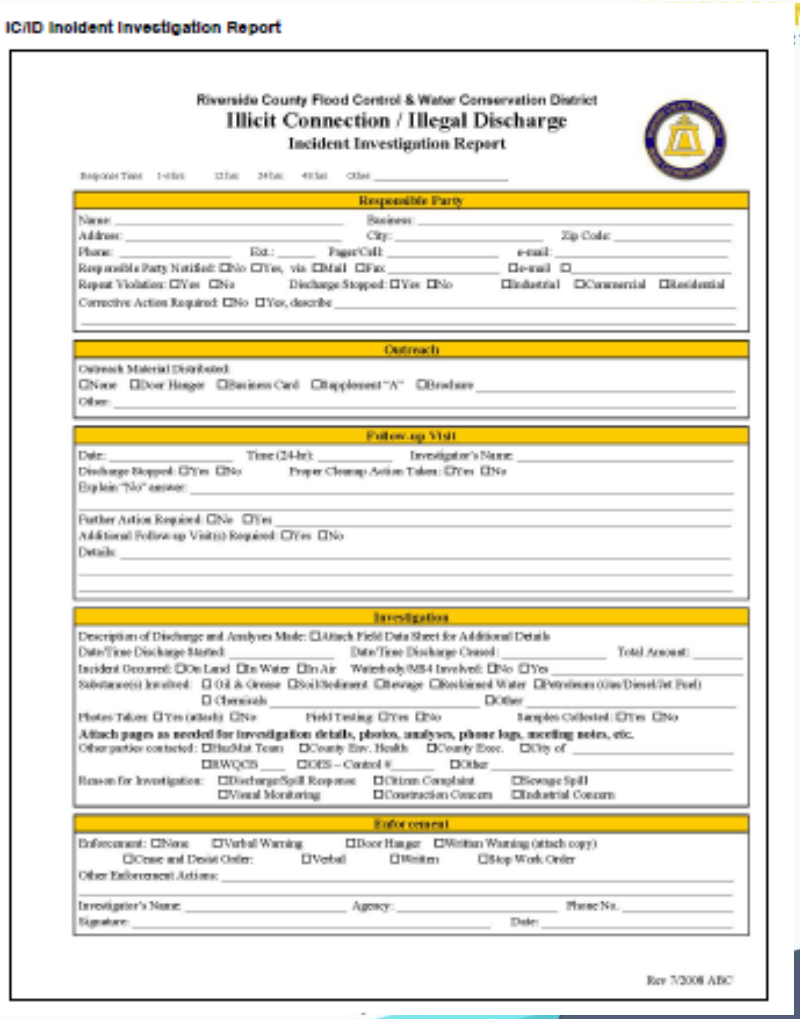
When necessary, use cleaning procedures:

- Clean the pH and Temperature probes by immersing in an agitated mild detergent bath.
- Clean the conductivity cell by removing the side plastic sleeve and using a cotton swab soaked with isopropyl alcohol to clean the steel pins. Replace sleeve once complete.
- DO NOT wipe the pH bulb. Use a squeeze bottle if probe is particularly dirty.
- Rinse all probes after cleaning and recalibrate meter.

Proper storage and care will help maximize probe life and ensure accurate readings

Reporting Requirements

- Similar to the IC/ID Incident reporting form, this simply summarizes all event information, including final enforcement action.
- The information is used for annual reporting reasons.



IC/ID Incident Investigation Report

Riverside County Flood Control & Water Conservation District

Illicit Connection / Illegal Discharge

Incident Investigation Report

Request Time: 1-Hour 12-Hour 24-Hour 48-Hour Other _____

Responsible Party

Name: _____ Business: _____

Address: _____ City: _____ Zip Code: _____

Phone: _____ Ext.: _____ Pager/Cell: _____ e-mail: _____

Responsible Party Notified: ☐No ☐Yes, via: ☐Mail ☐Fax: _____ ☐e-mail ☐_____

Repeat Violation: ☐Yes ☐No Discharge Stopped: ☐Yes ☐No ☐Industrial ☐Commercial ☐Residential

Corrective Action Required: ☐No ☐Yes, describe: _____

Outreach

Outreach Material Distributed:

☐None ☐Door Hanger ☐Business Card ☐Supplement "A" ☐Brochure _____

Other: _____

Follow-up Visit

Date: _____ Time (24-hr): _____ Investigator's Name: _____

Discharge Stopped: ☐Yes ☐No Proper Cleanup Action Taken: ☐Yes ☐No

Explain "No" answer: _____

Further Action Required: ☐No ☐Yes _____

Additional Follow-up Visit(s) Required: ☐Yes ☐No

Details: _____

Investigation

Description of Discharge and Analyses Made: ☐Attach Field Data Sheet for Additional Details

Date/Time Discharge Started: _____ Date/Time Discharge Ceased: _____ Total Amount: _____

Incident Occurred: ☐On Land ☐In Water ☐In Air Waterbody/MS4 Involved: ☐No ☐Yes _____

Substance(s) Involved: ☐ Oil & Grease ☐Soil/Sediment ☐Sewage ☐Reclaimed Water ☐Petroleum (Gas/Diesel/Jet Fuel)

☐ Chemicals _____ ☐Other _____

Photos Taken: ☐Yes (attach) ☐No Field Testing: ☐Yes ☐No Samples Collected: ☐Yes ☐No

Attach pages as needed for investigation details, photos, analyses, phone logs, meeting notes, etc.

Other parties contacted: ☐HazMat Team ☐County Env. Health ☐County Exec. ☐City of _____

☐RWQCB ____ ☐OES – Control #_____ ☐Other _____

Reason for Investigation: ☐Discharge/Spill Response ☐Citizen Complaint ☐Sewage Spill

☐Visual Monitoring ☐Construction Concern ☐Industrial Concern

Enforcement

Enforcement: ☐None ☐Verbal Warning ☐Door Hanger ☐Written Warning (attach copy)

☐Cease and Desist Order: ☐Verbal ☐Written ☐Stop Work Order

Other Enforcement Actions: _____

Investigator's Name: _____ Agency: _____ Phone No. _____

Signature: _____ Date: _____

Rev 7/2008 ABC

Public Education

Public Education

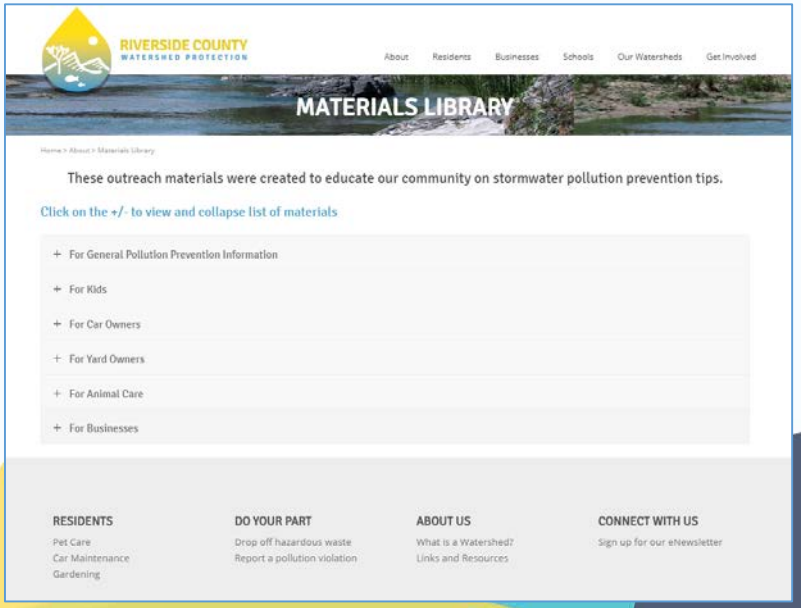
- Education material is provided to business and property owners in the course of IC/ID source investigations, including areas where problems have been identified and/or where complaints have been made.

- Individual contact with business and property owners has proven to be an effective method of educating potential dischargers.

- Education is also provided to commercial and industrial businesses and developers and contractors during the course of business stormwater inspections (i.e., County's Compliance Assistance Program) and as part of the construction permitting process, respectively.

Public Education

- Permittees participate in and contribute to the "Only Rain Down the Storm Drain" Water Pollution Prevention Program. "Only Rain Down the Storm Drain" provides educational materials on the subject of water quality, Urban Runoff, and both storm and non-stormwater discharges to residents, businesses, developers, contractors, and schools through public events and online sources.
- The website https://www.rcwatershed.org/about/materials-library/has brochures.



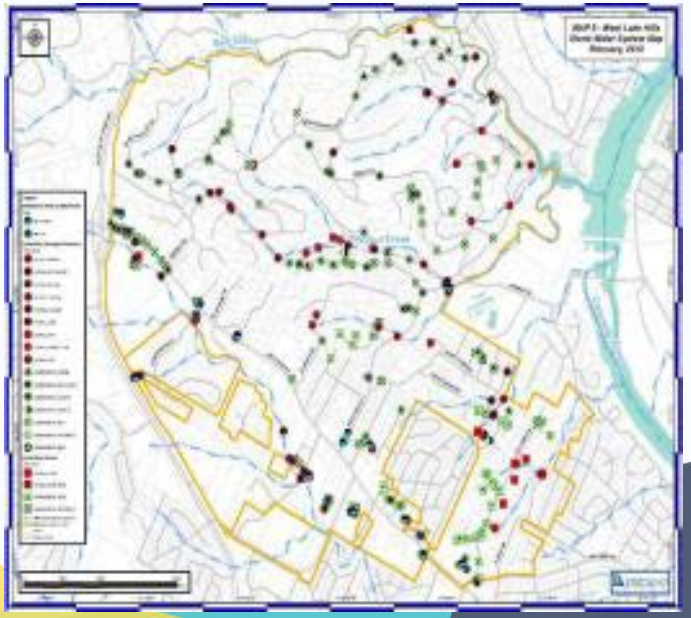
IC/ID Monitoring Results Database

IC/ID Monitoring Results Database

- All sampling data collected as part of the IC/ID monitoring program, including incident response information are tracked individually by each Permittee and included in their Annual Report.
- Data is also provided to the District and tracked in the District's Hydstra database for regional analyses and assessments that may be requested by the Permittees.
- See LIP Section 4.4 for more info

An effective geospatial tracking system for each outfall allows program managers to utilize it as an evaluation and reporting tool.

Each outfall stores information on its location, site characteristics, observation / photos, complaints and water quality monitoring data.



Record Keeping

Per the SAR Permit and the SAR Monitoring Plan (Section IV), all records need to be retained for 5 years by each Permittee.

- Calibration log
- Field Data Form
- Photographs
- IC/ID Incident Reporting Form
- IC/ID Incident Investigation Report

Questions and Answers?

Please Contact:

- Your NPDES Coordinator
- Charlene Warren at RCFC & WCD, cwarren@rivco.org
- The CASC presenter: Daniel Secrist at dsecrist@cascinc.com