Sanitary Sewer Overflow Response
Standard Operating Procedures

March 2018
ADMINISTRATIVE

A. Introduction

1. This SOP is a set of guidelines to aid Operations & Maintenance staff responding to sanitary sewer overflows (SSOs). All activities shall be conducted safely, in accordance with all CalOSHA and City of Hayward regulations to minimize the chance of personnel injury, or adverse impact on the environment, in compliance with all regulatory agency standards, and in a way that maximizes operational and production requirements.

B. References

7. City of Hayward Sewer System Management Plan (SSMP).

C. Objectives

1. Provide Operations & Maintenance staff with a set of formal instructions to be utilized to:
   a. Correctly respond to a Sanitary Sewer Overflow (SSO).
   b. Accurately estimate the volume of an SSO.
   c. Implement best management practices (BMPs) to stop an overflow, and remediate and control the effects of an SSO.
   d. Sample waters that may be affected or impacted by an SSO.
   e. Clean up an SSO.

D. Equipment/Personnel Required

1. Personnel – Two Collection System Utility Workers (minimum), but as many as required to safely and effectively stop the SSO, prevent the SSO from impacting
surface waters or storm drains, mitigate the effects of the SSO, including sampling surface waters that may be impacted, and clean up effects of the SSO.

2. PPE – Hard hat, gloves, steel-toe safety shoes, respiratory protection, eye protection, face shield, hearing protection, safety vest.

3. Equipment – Emergency Response Equipment: Combo-truck, pumps, hoses, generator, lights, traffic control, safety equipment, etc.

E. Definitions

1. BACWA – Bay Area Clean Water Agencies.

2. BMP – Best Management Practices for responding to, mitigating, and cleaning up spills. Refers to procedures for responding to an SSO that minimize damage and impact of SSO. For details of these procedures, refer to the following manuals.


4. CalOES (formerly CalEMA) – California Office of Emergency Services

5. Cal OSHA – California Occupational Health and Safety Agency


7. CWQCB – California Water Quality Control Board or Water Board

8. SSO – Sanitary Sewer Overflow

9. WQMP – SSO Water Quality Monitoring Plan, instructions on water sampling, required if spill volume equals or exceeds 50,000 gallons.

F. Terminology

1. NOTE is used when information is available that can assist the Operator in accomplishing his or her task. Information is advisory in nature.

2. CAUTION is used when special cautions must be taken by the Operator. Failure to following prescribed steps may cause serious bodily injury and damage equipment.

3. WARNING is used when special cautions must be taken by the Operator. Failure to follow prescribed steps will cause loss of life or limb and severely damage equipment.
1. SSO Response

**NOTE**
Detailed steps for activities listed in PROCEDURES are in following sections. Refer to these sections for detailed descriptions of activities.

1.1 Determine source of the SSO.
   
   Step 1: Contact caller and get info on spill; location, start time, etc.
   
   Step 2: Determine if spill caused by blockage, equipment failure, or damage to sewer system.

1.2 Take action to stop the SSO.

   Step 1: Locate the point of discharge.
   
   Step 2: Determine cause of spill.
   
   Step 3: Develop plan to and take action necessary to stop the SSO.
   
   Step 4: If necessary, call out enough personnel to control spill.

1.3 Take action to contain spill.

   Step 1: Determine extent of spill and containment necessary.
   
   Step 2: Block all entry points to storm drain, creeks, lakes, or any other access to waters of the state.
   
   Step 3: If necessary, use pneumatic plugs to block storm drain system and prevent spill from traveling any further in the storm drain system.
   
   Step 4: Use combo-truck to rinse and clean storm drain system and return captured sewage to the sanitary sewer system.

1.4 Document Activity

   Step 1: Estimate volume of spill.
   
   Step 2: Determine percentage of spill recovered.
   
   Step 3: **It is important to take photos throughout the response process to document the event. Photograph any evidence of spill volume, extent or severity.**

1.5 Report

   Step 1: Fill out the Sanitary Sewer Overflow Data Form as completely as possible.
Step 2: Notify Wastewater Collections System Supervisor of spill and any mitigation activities taken.

Step 3: For Category 1 & 2 SSO, notify CalOES (800-852-7550) of spill within two (2) hours of being notified of SSO.

Step 4: Wastewater Collections System Supervisor: Report spill in CIWQS Online SSO Reporting Database.
**Effective date:**

March 2018

**SANITARY SEWER OVERFLOW REPONSE SOP**

**SSO RESPONSE PLAN**

**START**

- **Is there an SSO?**
  - NO
    - Verify CoH’s mains are flowing normal
  - YES
    - Note on Service Request that there is no SSO.

- **Is the SSO a result of a problem in CoH system?**
  - NO
    - **Follow the “INDUSTRIAL SPILL PLAN” Procedure**
  - YES
    - **Follow the “PRIVATE SSO PLAN” Procedure**

First responder will identify location of problem structure. After locating problem structure, first responder will initiate additional support needed for:
- Relieving stoppage ASAP
- Securing area for public protection
- SSO classification (Category 1, 2, or 3) & reporting.
- SSO containment
- SSO clean up

Establish Containment: (Containment is to be established by responder while additional crew members mobilize, this should be done simultaneously with the above steps to minimize SSO area and total gallons spilled.)
- Protect public with signs, caution tape, barricades, etc.
- Plug or rubber-mat any storm drain inlets or catch basins in the affected area.
- If upon arrival neighboring storm drain have been contaminated by the SSO, plug downstream to prevent further contamination. After containment, call CA Office of Emergency Services (800 852-7550) and if Category 1 or 2 to report spill. Get SSO number at this time.

- If building is flooded, start clean-up, take pictures and call Sewer Collections Supervisor ASAP.

- **Is the SSO a result of a blockage in the sewer line?**
  - NO
    - **Use appropriate method to establish bypass. Use CCTV to determine next steps. Proceed with rectifying cause and clean up.**
  - YES
    - Use appropriate method to clear stoppage. Estimate SSO rate and identify affected areas.

If you haven’t already, use appropriate method to clear stoppage.
- Estimate SSO rate and identify affected areas.
- Secure area and contact Supervisor or Manager immediately
- After clearing stoppage and cleaning up area, fill out Sanitary Sewer Overflow Data form.

Did SSO:
- Substantially endanger human health? or Result in property damage? or Discharge to drainage channel and/or surface water? or Exceed or equal 1000 gals? or Result in fish kill? or Enter storm drain and was not fully recovered?

Perform Final Volume Estimate:
- Use the appropriate method to calculate final SSO volume
- Estimate gallons recovered
- Complete and submit applicable paperwork to Sewer Collections Supervisor

Notify property owner.

Clean up:
- Vacuum all solids and liquids resulting from the SSO and dispose in sanitary sewer system.
- Clean any contaminated storm drains, contain and vacuum waters generated in the cleaning process.
- Estimate clean up water volume captured for reporting purposes,
- Wash down street and manhole.

- Contact Supervisor or Manager immediately.
- Sample surface water using sampling procedures to identify sampling points and pull appropriate samples

NO

YES

- Verify CoH’s mains are flowing normal

Clean up:
- Vacuum all solids and liquids resulting from the SSO and dispose in sanitary sewer system.
- Clean any contaminated storm drains, contain and vacuum waters generated in the cleaning process.
- Estimate clean up water volume captured for reporting purposes,
- Wash down street and manhole.

- Contact Supervisor or Manager immediately.
- Sample surface water using sampling procedures to identify sampling points and pull appropriate samples

- Verify CoH’s mains are flowing normal

After containment, call CA Office of Emergency Services (800 852-7550) and if Category 1 or 2 to report spill. Get SSO number at this time.

Did SSO:
- Substantially endanger human health? or Result in property damage? or Discharge to drainage channel and/or surface water? or Exceed or equal 1000 gals? or Result in fish kill? or Enter storm drain and was not fully recovered?

Perform Final Volume Estimate:
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- Vacuum all solids and liquids resulting from the SSO and dispose in sanitary sewer system.
- Clean any contaminated storm drains, contain and vacuum waters generated in the cleaning process.
- Estimate clean up water volume captured for reporting purposes,
- Wash down street and manhole.

- Contact Supervisor or Manager immediately.
- Sample surface water using sampling procedures to identify sampling points and pull appropriate samples

NO

YES
**SANITARY SEWER OVERFLOW RESPONSE SOP**

**Effective date:**
March 2018

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**DETERMINING SANITARY SEWER OVERFLOW CATEGORY**

For detailed instructions on reporting and and cleanup procedures, refer to CITY OF HAYWARD SANITARY SEWER OVERFLOW (SSO) STANDARD OPERATING PROCEDURES binder on bookshelf.

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**Diagram:****

- **Receive Sewer Service Call**
  - **Investigate Sewer Service Call & determine its origin.**
  - **Sanitary Sewer Overflow?**
    - **YES**
      - **Was spill volume greater than 1,000 gallons?**
        - **NO**
          - **CATEGORY 3 SSO**
            - FOLLOW PROCEDURES FOR REPORTING & MITIGATING CATEGORY 3 SSO.
            - Contain and clean up spill, implement BMPs to mitigate any impacts of spill.
          - **YES**
            - Report to CIWQS within 30 days of the end of the month. Additional information may be added to the certified report in the form of an attachment at any time.

    - **YES**
      - **Did spill enter a drainage channel or surface waters, or was any discharge to storm drain not fully captured and returned to sanitary sewer system?**
        - **NO**
          - **CATEGORY 2 SSO**
            - FOLLOW PROCEDURES FOR REPORTING & MITIGATING CATEGORY 2 SSO.
            - Report to CIWQS w/in 15 hours. Certify report w/in 15 calendar days after response activities. Additional info attached to report at any time.
        - **YES**
          - **Private Lateral SSO?**
            - **YES**
              - Notify WPSC, (510) 881-7900.
            - **NO**
              - **Water Leak/ Main Break?**
                - **YES**
                  - Notify Sewer Collections Supervisor 714-0622.
                - **NO**
                  - **Storm Drain?**
                    - **YES**
                      - Notify Streets Maintenance Manager (510) 677-0428.
                    - **NO**
                      - **Standing Water/ Puddle?**
                        - **YES**
                          - No action required.
                        - **NO**
                          - **Irrigation Runoff?**
                            - **YES**
                              - No action required.
                            - **NO**

  - **Contain and clean up spill, implement BMPs to mitigate any impacts of spill. Test receiving water as required.**

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**BMP**: Best Management Practices for responding to, mitigating, and cleaning up spills. Refers to procedures for responding to an SSO that minimize damage and impact of SSO. For details of these procedures, refer to the following manuals:

Effective date: March 2018

SANITARY SEWER OVERFLOW RESPONSE SOP

SANITARY SEWER OVERFLOW (SSO) RESPONSE PROCESS

WASTEWATER COLLECTIONS SYSTEM SUPERVISOR

Notify RWQCB using CIWQS and prepare online documentation when SSO is on private property.

Ensure all notification has been properly completed.

CATEGORY 3

Report spill information to CIWQS and prepare online documentation within 30 days at:
http://ciwqs.waterboards.co.gov/ciwqs/index.jsp

CATEGORY 2

Report spill information to CIWQS and prepare online documentation within 3 working days at:
http://ciwqs.waterboards.co.gov/ciwqs/index.jsp

CATEGORY 1

Report spill information to CIWQS and prepare online documentation within 3 working days at:
http://ciwqs.waterboards.co.gov/ciwqs/index.jsp

SENIOR UTILITY LEADER

Receive notification of possible SSO from HPD or Utilities Secretary.

Ensure all notification has been properly completed.

Notify Supervisor


Ensure cleanup effort is documented. Take pictures as required. Ensure Best Management Practices® are used.

If required, have receiving waterway tested for Dissolved Oxygen, Ammonia, and Coliform. Take pics to document condition of area.

Whether public notification required?

Prepare SSO Technical Report within 45 days.

Provide notification to required agencies. RWQCB & Alameda County Dept. of Env. Health

Complete cleanup and mitigation utilizing BMPs®. Ensure pics are taken of all areas after cleanup to document efforts.

Certify CIWQS report within 15 days. Attach after spill response report to CIWQS report.

SANDFIED CREW

Receive notification of possible SSO from HPD.

NO

Notify appropriate department or customer of problem.

YES

Private Lateral SSO

Property Owner's Responsibility

Notify Water Pollution Source Control (510) 881-7900

Private SSO

Contain SSO, mitigate SSO & implement BMPs®. Call CalOES 800 852-7550 & report spill within 2 hours of notification.

SSO?

SSO?

Category 1 SSO

Category 2 SSO

Category 3 SSO

Record SSO data on SSO Data Sheet as completely as possible.

Take pics of overflow, including if possible the actual overflow and any damage. Document flow as completely as possible.

Give the customer "BUILDING SEWER MAINTENANCE RESPONSIBILITIES" sheet.

Notify Sewer Collections Supervisor.

If tenant/owner won't stop overflow, contact supervisor.

Complete door hanger & attach "BUILDING SEWER MAINTENANCE RESPONSIBILITIES" sheet.

Attach after spill response.

DISPATCH

Receives call regarding SSO

Notifies Sewer Collections Standby

*BMP

Best Management Practice for responding to, mitigating, and cleaning up spills. Refers to procedures for responding to an SSO that minimize damage and impact of SSO. For details of these procedures, refer to the following manuals:


INDUSTRIAL SPILL PLAN

START

Stay clear of hazards.

Secure the area from the public.

Notify CA Office of Emergency Services
(800) 852-7550

Notify City of Hayward Water Pollution Source Control staff.

Notify Sewer Collections Supervisor.

If necessary, use all available resources to keep spill from entering storm drain system.

Before leaving the site, ensure CoH management has been informed of the situation and has started the process of getting the customer to correct the situation. Also ensure that the spill has been contained and is not threatening to enter the storm drain system.
**PRIVATE SSO PLAN**

**START**

Determine the source of the Private SSO. Notify the property owner to fix the problem ASAP.

**Is the property owner available and ready to fix the problem?**

**YES**

- Notify Water Pollution Source Control Administrator at (510) 881-7960 of the existence of the spill and the fact that it was “Private Lateral SSO”.
- Notify Senior Leader or Supervisor of Private Lateral SSO.
- Relieve the stoppage.
- Clean up the SSO.
- Clearly note on paperwork that the SSO is a private lateral.

**NO**

- Notify Water Pollution Source Control staff.
- Record property owner name and contact info.
- Notify property owner and instruct them to begin clean up of spill.
- Notify Senior Leader and Supervisor.
- Notify Water Pollution Source Control staff.
SSO CATEGORY DETERMINATION WORKSHEET

Category 1

**Definition:** Discharges of untreated or partially treated wastewater of any volume resulting from an enrollee’s sanitary sewer system failure or flow condition that:

1. Reach a surface water and/or reach a drainage channel tributary to a surface water; or
2. Reach a Municipal Separate Storm Sewer System (MS4) and are not fully captured and returned to the sanitary sewer system or not otherwise captured and disposed of properly. Any volume of wastewater not recovered from the MS4 is considered to have reached surface water unless the storm drain system discharges to a dedicated storm water or groundwater infiltration basin (e.g., infiltration pit, percolation pond).

**Notification Requirements:** Category 1 SSOs require notification to CalOES (800-852-7550) within 2 hrs.

**Reporting Requirements:** All Category 1 SSOs shall be reported to the CIWQS online reporting database as soon as possible, but never later than three (3) business days after becoming aware of the SSO. A final certification of the report shall be completed within 15 calendar days of the conclusion of the SSO response and remediation.

For **Category 1 SSOs with volume greater than or equal to 50,000 gallons, the following shall also be required:**

1. **Technical Report** – to include detailed description of:
   a. Causes and circumstances of the SSO
   b. Enrollee’s Response to the SSO
   c. Water Quality Monitoring
2. **Sampling Requirements** – the receiving water shall be sampled and tested for the following constituencies per the Section 3 of this document, SSO Water Quality Monitoring Plan.
   a. Ammonia
   b. Bacteriological contamination

Category 2

**Definition:** Discharges of untreated or partially treated wastewater greater than or equal to 1,000 gallons (applies to unrecovered volume) resulting from an enrollee’s sanitary sewer system failure or flow condition that does not reach a surface water, a drainage channel or the MS4 unless the entire SSO volume discharged to the storm drain system is fully recovered and disposed of properly.

**Notification Requirements:** All Category 2 SSOs require notification to CalOES (800-852-7550) within 2 hours.

**Reporting Requirements:** All Category 2 SSOs shall be reported to the CIWQS online reporting database as soon as possible, but never later than three (3) business days after becoming aware of the SSO. A final certification of the report shall be completed within 15 calendar days of the conclusion of the SSO response and remediation.

Category 3

**Definition:** All other discharges of untreated or partially treated wastewater resulting from an enrollee’s sanitary sewer system failure or flow condition.

**Notification Requirements:** Category 3 SSOs do not require CalOES notification.

**Reporting Requirements:** All Category 3 SSOs shall be reported to the CIWQS online reporting database no later than thirty (30) days after the end of the calendar month in which the SSO occurred.
2. SSO Estimation

Regardless of which method is used to estimate the volume of the SSO, take photos to document activities.

2.1 Eyeball Estimate Method

NOTE
This method is useful for contained SSOs up to approximately 200 gallons. Take photos to document activities.

Step 1: Imagine the amount of water that would spill from a bucket or a barrel.
- A bucket contains 5 gallons and a barrel contains 55 gallons.
Step 2: If the SSO is larger than 55 gallons, try to break the standing water into barrels
- Multiply this barrel estimation by 55 gallons
Step 3: Proceed to use other estimation methods if the SSO looks to be more than four (4) barrels

2.2 Measured Volume Method

NOTE
The volume of most small SSOs that have been contained can be estimated using this method. The shape, dimensions, & depth of the contained wastewater are needed. The shape & dimensions are used to calculate the area of the SSO and the depths is used to calculate volume. Take photos to document activities.

Step 1: Sketch the shape of the contained sewage
Step 2: Measure or pace off the dimensions
Step 3: Measure the depth at several locations and select an average
Step 4: Convert the dimensions, including depth, to feet
Step 5: Calculate the area in square feet using the following formulas

NOTE
Rectangle: Area = length (feet) x width (feet)
Circle: Area = radius (feet) x radius (feet) x 3.14
Triangle: Area = base (feet) x height (feet) x 0.5

Step 6: Multiply the area (square feet) times the average depth (in feet) to obtain the volume in cubic feet
Step 7: Multiply the volume in cubic feet by 7.48 to convert it to gallons
2.3 Duration and Flow Rate Method

**NOTE**
Calculating the volume of larger SSOs, where it is difficult to measure area & depth requires a different approach. In this method, the separate estimates are made of the duration & flow of the SSO.

- **Duration**
  - The duration is the elapsed time from the time the SSOs started to the time flow is restored.

- **Start Time**
  
  Step 1: Establish start time; use any of the following approaches
  
  Step 2: Inquire observations from local residents
  
  - SSOs that occur in rights-of-way are usually observed and reported promptly.
  
  - SSOs occurring out of public view can go longer.
  
  Step 3: Sometimes observations like odors or sounds (e.g. water running in a normally dry creek bed) can be used to estimate the start time.

**NOTE**
Conditions at the SSO site change over time. Initially there will be limited deposits of solids. After a few days to a week, the solids form a light-colored residue. After a few weeks to a month, the solids turn dark. The quantity of toilet paper and other materials of sewage origin increase over time.

Step 4: The observations above can be used to estimate the start time in the absence of other information.

Step 5: Take photographs to document the observations
  
  - They can be helpful if questions arise later.

**NOTE**
SSOs may not be continuous. Blockages are not usually complete (some flow continues). In this case the SSO may occur during the peak flow periods (typically 10:00 to 12:00 and 13:00 to 16:00 each day). SSOs that occur due to peak flows in excess of capacity will occur only during, and for a short period after, heavy rainfall.

- **End time**
  
  Step 1: Field crews on-site observe the “blow down” that occurs when the blockage has been removed.
The “blow down” can also be observed in downstream flow meters, if installed

2.4 Flow Rate

☐ **Remember to take photos to document activities.**

Step 1: The flow rate is the average flow that left the sewer system during the time of the SSO.

Step 2: There are at least four acceptable methods to estimate the flow rate. Regardless of which method is utilized, **Take photos to document your conclusions.**

- **The City of Hayward Manhole Flow Rate Charts:** This is the preferred method, as these charts were done by City staff with the assistance of Union Sanitary District personnel. The observation of the field crew can be used to select the appropriate flow rate from the chart. If possible, photos are useful in documenting basis for the estimate. (See Appendix A)

- **The San Diego Manhole Flow Rate Chart:** This chart shows sewage flowing from the manhole covers at a variety of flow rates. The observation of the field crew can be used to select the appropriate flow rate from the chart. If possible, photos are useful in documenting basis for the estimate. (See Appendix B)

- **Pick & Vent Hole Wallet Card:** The wallet card has different vent and pick hole diameters with water height, GPM, and GPH calculations (See Appendix C Tables)

- **Counting Connections:** Once the location of the SSO is known, the number of upstream connections can be determined from the sewer maps. Multiply the number of connections by 200 to 250 gallons per day per connection or 8 to 10 gallons per hour per connection.

☐ **Example**

Step 1: SSO Volume

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once duration and flow rate have been estimated, the volume of the SSO is the product of the duration in hours or days and the flow rate in gallons per hour or gallons per day.</td>
</tr>
</tbody>
</table>

- SSO start time = 11:00
- SSO end time = 14:00
- SSO duration = 3 hours
- SSO duration in minutes = 3 hours x 60 minutes = 180 minutes

Step 2: 3.3 gallons per minute x 180 minutes = 594 gallons. Remember to **take photos to document your conclusions.**
3. SSO Water Quality Monitoring Plan

NOTE
Required within 48 hours of initial SSO notification if the SSO volume is equal to or greater than 50,000 gallons and has reached surface waters.
Take photos of sample points, and point where spill entered waterway.

3.1 Pre-Sampling
Step 1: Determine point SSO entered waterway.

CAUTION
Use Personal Protective Equipment (PPE) while performing sampling

Step 2: Photograph, map and mark the location for future sampling.
Step 3: Follow the instructions inside the kit and sample for Ammonia.
Step 4: Record the testing results.

3.2 Downstream Sampling
☐ Conduct downstream sampling first to avoid allowing pollutants to dissipate before sample can be obtained.
Step 1: Move 50’-200’ upstream of point where SSO entered waterway.
Step 2: Photograph, map and mark the location for future sampling.
Step 3: Follow the instructions inside the kit and sample for Ammonia.
Step 4: Record the testing results.

3.3 Upstream Sampling
Step 1: Move 50’-200’ upstream of point where SSO entered waterway.
Step 2: Photograph, map and mark the location for future sampling.
Step 3: Follow the instructions inside the kit and sample for Ammonia.
Step 4: Record the testing results.

3.4 Coliform Sampling
Step 1: Using the specific coliform sampling bottles, take a coliform sample upstream and downstream of the SSO area well away from the bank, preferably where water is visibly flowing.
- Follow the sampling points detailed in “3.2 Upstream Sampling” and “3.3 Downstream Sampling” of this SOP.
- There are two sets (each of six) of sampling bottles stored in the collection system crew room and another set is stored in the service van.
- The bottles are sealed and contain an agent to deactivate the disinfectant in the water (white powder).

**Step 2:** Label the sample as a Coliform sample with the date, time, location and initials

**Step 3:** Place coliform grab sample in cooler, to be transported to City of Hayward Water Pollution Control Facility Laboratory.

**Step 4:** Take the samples to CoH’s lab and refrigerate as soon as possible.

- The coliform test must be performed within six hours after the samples have been taken.

**Step 5:** You or your supervisor must notify the lab that a coliform sample test needs to be performed.

- Use the CoH Emergency Procedure Call List to notify lab personnel.

### 3.5 Deliver Samples to Lab

**Step 1:** Transport the cooler containing the samples and the completed form the WPCF lab.

**NOTE**

Laboratory Service hours are:
Monday: 08:00-16:30, Tuesday – Friday: 06:30 a. m. to 16:30 p.m.
Saturday, Sunday, Holidays and afterhours: Call Steve De Carolis (408) 829-2017 or Lin Dan (925) 285-9439

**Step 2:** Give samples to the lab personnel or operator on duty for placement into the lab refrigerator for analysis.

**NOTE**

Depending on the magnitude of the SSO, continue sampling the downstream location until lab has declared the downstream results are consistent with the upstream results.
Remember to **take photos to document activities.**

**Step 3:** Lab personnel will send notification to supervisor if a coliform violation is found.

**Step 4:** Results of the water quality testing will be uploaded to the CIWQS online spill reporting database.

### 4. SSO Clean Up

**WARNING:** Ensure all safety procedures are strictly adhered to, including traffic control,
PPE (visibility vests, hard hats, safety glasses, gloves, etc.) and if required, confined space entry procedures.

**NOTE**

To minimize health hazards to the public and to protect the environment, start cleaning the SSO area as soon as possible or immediately after the overflow stops.

*Take photographs to document cleanup efforts.*

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Step 1:  Install air plugs on storm lines whenever possible to contain the SSO.

Step 2:  Remove all debris found in the SSO surface area.
  - Place back into the sanitary sewer system or dispose of properly.

Step 3:  Wash SSO area with fresh water
  - Do NOT add chlorine solution.

Step 4:  If plugs are used in the storm lines to contain SSO, pump wastewater back into the collection system and remove plugs from storm lines.
  - If plugs are not used, visually inspect the storm drain system and determine if additional cleaning is needed.
  - If additional cleaning is needed, use the hydro flush vacuum to flush and vacuum all water generated during cleaning. Return water to sanitary system.

Step 5:  Inspect the collections system and SSO areas before you leave.

Step 6:  Immediately notify management in the following events:
  - Human health endangerment
  - Property damage
  - If there is a discharge to a drainage channel and/or a surface water.
  - There is a discharge to a storm that was not fully captured and returned to the sanitary sewer system
  - SSO volume is ≥ 1000 gallons.
  - Fish kill

Step 7:  If SSO has come in contact with creek, pond, body of water or flood control channel, see “Section 3 SSO Sampling” of this SOP to conduct sampling.

Step 8:  Task Complete

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5. **SSO Notification and Reporting Requirements**

5.1 **Notification Requirements.**

- Category 1 & Category 2 SSO – Initial notification to Cal OES (800) 852-7550 within 2
hours of becoming aware of the SSO.

- **Category 3 SSO** does not require notification of CalOES.

5.2 CIWQS Online SSO Reporting Database Reporting Requirements:

- **Category 1 & Category 2** – Draft reports shall be reported to the CIWQS Online SSO Reporting Database within three (3) business days after becoming aware of the SSO. The final report shall be certified within fifteen (15) calendar days of the end of the SSO.

- **Category 3** – Draft reports shall be reported to the CIWQS online reporting database within thirty (30) calendar days after the end of the calendar month in which the SSO occurred (e.g. all SSOs occurring in the month of January must be entered into the database by March 1st).

5.3 In addition to required CIWQS reporting, any Category 1 SSO in which 50,000 gallons or greater reaches a surface water shall require a Technical Report consisting of the following elements be entered into the CIWQS Online Database within 45 calendar days of the end of the SSO:

- Causes and Circumstances of the SSO:
  - Complete and detailed explanation of how and when the SSO was discovered.
  - Diagram showing the SSO failure point, appearance point(s), and final destination(s).
  - Detailed description of the methodology employed and available data used to calculate the volume of the SSO and, if applicable, the SSO volume recovered.
  - Detailed description of the cause(s) of the SSO.
  - Copies of original field crew records used to document the SSO.
  - Historical maintenance records for the failure location.

- Enrollee’s Response to SSO:
  - Chronological narrative description of all actions taken by enrollee to terminate the spill.
  - Explanation of how the SSMP Overflow Emergency Response Plan was implemented to respond to and mitigate the SSO.
  - Final corrective action(s) completed and/or planned to be completed, including a schedule for actions not yet completed.

- Water Quality Monitoring (for detailed procedures, see Section 3 of this document):
  - Description of all water quality sampling activities conducted including analytical results and evaluation of the results.
5.4 **Ensure the Field Sanitary Sewer Overflow Data form is completed, with all fields filled in.**

Step 1: SSO Initial Responder: After SSO has been contained, if spill is Category 1 or 2 notify CalOES. Record SSO Event ID # on Sanitary Sewer Overflow Data form. Also record date, time and if possible name and contact information of person contacted.

- If the spill enters the storm drain system, any public waterways or is in any way a public health issue, the Alameda County Department of Environmental Health shall also be notified.

Step 2: After containment and cleanup is complete, fill out as completely as possible the Sanitary Sewer Overflow Data form.

- Forward this completed form to the Sewer Collections Supervisor.

Step 3: Sewer Collections Supervisor: For Category 1 & 2 SSO, as soon as possible after being made aware of the SSO, but no later than 3 business days after becoming aware of the spill, log into the CWICS site and report the spill;

- For Category 3 SSO, the CIWQS report shall be completed within 30 days of the end of the calendar month that the SSO occurred.

Step 4: For Category 1 SSO, within 15 days of completion of remediation activities, certify online spill report.

Step 5: Task Complete
APPENDIX A: City of Hayward Spill Estimation Representative Photographs

FIVE (5) GALLONS TOTAL SPILLED:

TEN (10) GALLONS TOTAL SPILLED:
TEN (10) GALLONS FLOWING DOWN CURB & GUTTER

Note: Water traveled 110’ in the curb & gutter.
Appendix B: San Diego Manhole Flow Rate and Chart

Reference Sheet for Estimating Sewer Spills from Overflowing Sewer Manholes
All estimates are calculated in gallons per minute (gpm)

Wastewater Collection Division
(619) 654-4160

City of San Diego
Metropolitan Wastewater Department

All photos were taken during a demonstration using metered water from a hydrant in cooperation with the City of San Diego’s Water Department.
Appendix C: Pick and Vent Hole Wallet Card

<table>
<thead>
<tr>
<th>Hole Dia. inches</th>
<th>Water Ht inches</th>
<th>Q cfs</th>
<th>Q gpm</th>
<th>Q gph</th>
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<td>0.0015</td>
<td>0.66</td>
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<td></td>
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<tr>
<td>0.50 3/4 ths</td>
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<td>0.81</td>
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<td></td>
</tr>
<tr>
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<tr>
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Appendix C: Sample Templates for SSO Volume Estimation

TABLE 'A'
ESTIMATED SSO FLOW OUT OF M/H WITH COVER IN PLACE

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<th>36&quot; COVER</th>
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<td>Q in gpm</td>
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<tr>
<td></td>
<td>in MGD</td>
<td>in MGD</td>
</tr>
<tr>
<td></td>
<td>are possible</td>
<td>are possible</td>
</tr>
<tr>
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<td>1</td>
<td>1/4</td>
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<tr>
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<td>3</td>
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<td>1</td>
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<tr>
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<td>25</td>
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<td>502</td>
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</tr>
<tr>
<td>9</td>
<td>529</td>
<td>9</td>
</tr>
</tbody>
</table>

Disclaimer:
This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example.
The formula used to develop Table A measures the maximum height of the water coming out of the maintenance hole above the rim. The formula was taken from hydraulics and its application by A.H. Gibson (Constable & Co. Limited).

Example Overflow Estimation:

The maintenance hole cover is unseated and slightly elevated on a 24” casting. The maximum height of the discharge above the rim is 5 ¼ inches. According to Table A, these conditions would yield an SSO of 185 gallons per minute.

FLOW OUT OF M/H WITH COVER IN PLACE

This sanitary sewer overflow drawing was developed by Debbie Myers, Principal Engineering Technician, for Ed Euyen, Civil Engineer, P.E. No. 33955, California, of County Sanitation District 1.

Disclaimer:
This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example.

The formula used to develop Table B for estimating SSOs out of maintenance holes without covers is based on discharge over curved weir – bell mouth spillways for 2” to 12” diameter pipes. The formula is taken from Hydraulics and its application by A.H. Gibson (Constable & Co. Limited).
Example Overflow Estimation:

The maintenance hole cover is off and the flow coming out of a 36” frame maintenance hole at one inch (1”) height will be approximately 660 gallons per minute.

<table>
<thead>
<tr>
<th>TABLE 'B'</th>
<th>ESTIMATED SSO FLOW OUT OF M/H WITH COVER REMOVED</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Water Height above M/H frame</th>
<th>SSO Flow Q</th>
<th>Min. Sewer size in which these flows are possible</th>
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<td>in gpm</td>
<td>in MGD</td>
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<td>0.04</td>
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<tr>
<td>1/4</td>
<td>62</td>
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FLOW OUT OF M/H WITH COVER REMOVED (TABLE "B")

Height to be measured

This sanitary sewer overflow drawing was developed by Debbie Myers, Principal Engineering Technician, for Ed Euyen, Civil Engineer, P.E. No. 33955, California, of County Sanitation District 1.
**Table 'C'**

**Estimated SSO Flow Out of M/H Pick Hole**

<table>
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<th>SSO flow Q in gpm</th>
<th>Height of spout above M/H cover H in inches</th>
<th>SSO flow Q in gpm</th>
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**Note:** This chart is based on a 7/8 inch diameter pick hole

**Disclaimer:** This sanitary sewer overflow table was developed by Ed Euyen, Civil Engineer, P.E. No. 33955, California, for County Sanitation District 1. This table is provided as an example.

The formula used to develop Table C is \( Q = C_c V A \), where \( Q \) is equal to the quantity of the flow in gallons per minute, \( C_c \) is equal to the coefficient of contraction (.63), \( V \) is equal...
to the velocity of the overflow, and $A$ is equal to the area of the pick hole.\(^1\) If all units are in feet, the quantity will be calculated in cubic feet per second, which when multiplied by 448.8 will give the answer in gallons per minute. (One cubic foot per second is equal to 448.8 gallons per minute, hence this conversion method).

Example Overflow Estimation:

The maintenance hole cover is in place and the height of water coming out of the pick hole seven-eighths of an inch in diameter (7/8") is 3 inches (3"). This will produce an SSO flow of approximately 4.7 gallons per minute.

FLOW OUT OF VENT OR PICK HOLE (TABLE "C")

This sanitary sewer overflow drawing was developed by Debbie Myers, Principal Engineering Technician, for Ed Euyen, Civil Engineer, P.E. No. 33955, California, of County Sanitation District 1.

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\(^1\) Velocity for the purposes of this formula is calculated by using the formula $h = v^2 / 2G$, where $h$ is equal to the height of the overflow, $v$ is equal to velocity, and $G$ is equal to the acceleration of gravity.