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TERMS AND DEFINITIONS

The following definitions are used for the purpose of providing consistent use of the terms throughout this Sewer Overflow Response Plan (SORP). These definitions may or may not be consistent with definitions used elsewhere, e.g., National Pollutant Discharge Elimination System (NPDES) Permits for Johnson County Wastewater’s (JCW’s) wastewater treatment plants (WWTPs).

Backup – A wastewater release that occurs within the privately owned sewer system. Backups may be caused by blockages, malfunctions, or flow conditions within the private sewer service lateral or public sewer system. Also referred to as “basement backups” or “private property backups”.

Bypass – A wastewater release that occurs within or at a WWTP after the headworks facilities.

Discharge – Release of wastewater from permitted outfalls in accordance with effluent limitations and monitoring requirements defined in JCW’s NPDES permits.

Outfall – Structures where discharges are authorized as defined in JCW’s NPDES permits.

Overflow – See Collection System Release.

Privately Owned Sewer System – The sewer system, including private sewer service lateral and the connection to the public sewer system, that conveys wastewater from a home, business, or building structure to the public sewer system. The privately owned sewer system is owned, operated, and maintained by the property owner served by the system.

Pump Station – A facility within the sanitary sewer system that conveys wastewater from a lower to higher elevation.

Collection System Release (CSR) – A wastewater release that occurs within or from the sanitary sewer system, i.e., before the headworks facilities at the WWTP and not including backups. Also referred to as a “release” or “overflow”.

Sanitary Sewer System – The network of infrastructure, including manholes, pipes, pump stations, force mains, and gravity sewers that collect and convey residential, commercial, and industrial wastewater. The sanitary sewer system does not include WWTPs, private sewer service laterals, or connections to private sewer service laterals. The sanitary sewer system is owned, operated, and maintained by JCW. Also referred to as the “collection system” or “public sewer system”.

Supervisory Control and Data Acquisition (SCADA) – A computer system for gathering and analyzing real-time data.
**Wastewater Treatment Plant (WWTP)** – A facility that treats wastewater received from the sanitary sewer system through a combination of physical, chemical, and biological processes prior to discharge through an outfall.
ABBREVIATIONS

BUPP – Backup Prevention Program

CCTV – Closed Circuit Television

CIPP – Cured-in-Place Pipe

CMMS – Computerized Maintenance Management System

CSR – Collection System Release

EPA – Environmental Protection Agency

FOG – Fats, Oils, and Grease

I&I – Inflow and Infiltration

JCDHE – Johnson County Department of Health and Environment

JCW – Johnson County Wastewater

KDHE – Kansas Department of Health and Environment

LPS – Low Pressure Sewer

NPDES – National Pollutant Discharge Elimination System

O&M – Operations and Maintenance

PIO – Public Information Officer

SCADA – Supervisory Control and Data Acquisition

SORP – Sewer Overflow Response Plan

SWPPP – Storm Water Pollution Prevention Plan

WWTP – Wastewater Treatment Plant
CHAPTER 1  INTRODUCTION

A. JOHNSON COUNTY WASTEWATER

Johnson County Wastewater (JCW) is a regional wastewater service provider responsible for the collection, transportation, and treatment of wastewater generated by residential, industrial, and commercial customers in Johnson County, Kansas. JCW has been serving Johnson County since the creation of the Mission Township Main Sewer District No. 1 in 1945. JCW owns and operates over 2,200 miles of sewer pipe, over 30 pump stations, and seven wastewater treatment plants (WWTPs).

Additional details regarding JCW, including JCW’s mission statement, core values, levels of service, and asset statistics, are provided in the JCW Annual Report published each year and made available at http://www.jcw.org. Contact information for personnel with sewer overflow response responsibilities is provided in Appendix A. A detailed JCW organization chart with individual contact information can be found on the JCW Enterprise network at \\jcws\file\1\Data\JCWEnterprise\Published\JCW OrgCharts\JCW Working Org pics_current.pdf

B. PURPOSE AND OBJECTIVES

JCW places a high priority on the prevention of untreated wastewater being released into the environment. Extensive rehabilitation projects and regular maintenance of the sanitary sewer system and WWTPs are performed to help prevent the release of untreated wastewater; however, overflows, bypasses, and backups from the collection system, pump stations, WWTPs, or privately owned sewer systems inevitably occur.

The Sewer Overflow Response Plan (SORP) is intended to assist JCW in achieving the ideal goal of responding to every report of a wastewater overflow, bypass, or backup incident quickly to minimize the event and its effects. The SORP also includes reporting protocols to meet regulatory requirements. This SORP documents the response procedures to be followed after a possible overflow, bypass, or backup has been reported. The document will also be used by JCW staff as a training tool for new employees and as a reference and educational tool for current employees. The document will also be available to stakeholders and regulatory agencies, such as the Kansas Department of Health and Environment (KDHE) and the United States Environmental Protection Agency (EPA).

C. OVERVIEW

The SORP details the procedures that JCW has in place to respond to, document, and report a wastewater overflow, backup, or bypass incident. The SORP also includes a process for reviewing each incident with the goal of minimizing future occurrences. The procedures are provided in a simplified flow chart at the beginning of this document.
Each step in the flow chart can be referenced back to a narrative description of the step(s) in Chapter 2.

The SORP provides specific steps in response to the most common incidents, but is not intended to give specific response details for responding to every incident. JCW staff knowledge and experience will be relied on in the multitude of unique situations not covered specifically in this document.

The SORP follows the general guiding principles listed below:

- all incidents reported to JCW result in a response by JCW and are addressed as rapidly as practicable;
- to the maximum extent practicable, impacts to the public and environment are prevented or minimized;
- corrective actions to prevent and/or minimize any recurrence are implemented; and
- all incidents reported to JCW are documented for regulatory reporting and system operation improvement purposes.

Responsibility for compliance with the SORP is divided among various divisions and groups within JCW, but primarily within the Operations and Maintenance (O&M) Collections Division.
A. INTRODUCTION

This chapter presents procedures to be followed when a possible overflow, backup, or bypass of untreated wastewater has been reported. The procedures are necessary to minimize potential impacts to human health and the environment and comply with regulatory requirements.

This chapter and the flow chart provided at the beginning of this document are divided into the following sections:

- Initial Notification
- Response
- Investigation, Mitigation, and Cleanup
- Assessment Notifications
- Regulatory Reporting and Evaluation

B. INITIAL NOTIFICATION

Notification of a possible overflow, bypass, or backup initiates the SORP. An overflow, bypass, or backup may be detected by JCW employees, customers or other outside parties or agencies, or the supervisory control and data acquisition (SCADA) system. Upon notification, JCW acts and provides immediate response to investigate and/or correct the reported situation. Notification can occur via:

- phone call (during business hours),
- phone call (after business hours),
- JCW staff field observation, or
- SCADA system alarm.

1. Phone Call Notification (During Business Hours)

During business hours (8:00 am to 3:30 pm Monday through Friday), calls from customers or other outside parties or agencies are typically received by the JCW Customer Service Department (913.715.8600). This is the most common type of possible overflow/backup notification. When the customer service representative receives a call regarding a possible overflow or backup, the representative obtains and records the following information from the caller:
2. Phone Call Notification (After Business Hours)

After business hours, customer calls are received by an answering service. When the answering service receives a call regarding a possible overflow or backup, the following information is obtained and recorded from the caller by the answering service personnel:

- time and date call was received,
- caller name,
- caller phone number,
- address of the overflow/backup situation, and
- description of the overflow/backup situation.

An alert is then sent via pager by the answering service to the Cleaning and Inspection crew standby person. Upon receipt of the page from the answering service, the customer service representative informs the caller that they will be contacted shortly by the JCW O&M Division to discuss the situation. Then, the representative emails the notification information to the Customer Service Supervisor and the O&M Division, specifically the O&M Director, O&M Assistant Director of Collections, and O&M Collections - Cleaning and Inspection Superintendent. The O&M Collections - Cleaning and Inspection Superintendent has significant responsibilities in a sewer overflow response. Due to the Cleaning and Inspection Superintendent’s level of involvement, his responsibilities are assigned to another O&M Division collection system supervisor or other designee during his absence and after business hours.

Upon receipt of the email from the Customer Service Department, the Cleaning and Inspection Superintendent replies to the email to confirm receipt (copying all recipients of the original email). The Cleaning and Inspection Superintendent then logs the notification information onto a Problem Response Form (Appendix B) and initiates the response. If a response is not received by the Customer Service Department within 15 minutes, the customer service representative will call the individuals listed in the emergency call list (Appendix C) sequentially until a response is received.
Cleaning and Inspection crew standby person contacts the answering service and requests the notification information. If confirmation of receipt of the page is not received within 15 minutes, the answering service will call the individuals listed in the emergency call list (Appendix C) sequentially until a response is received. The person confirming receipt of the page logs the notification information onto a Problem Response Form (Appendix B) and initiates the response. The customer information on the Problem Response Form is then logged into JCW’s collection system computerized maintenance management system (CMMS). This is typically done during the next business day.

3. **JCW Staff Field Observation Notification**
   If any JCW staff observes or becomes aware of a possible overflow, bypass, or backup during the course of their normal duties, it is immediately reported to the Cleaning and Inspection Superintendent. After gathering the pertinent information related to the situation, the Cleaning and Inspection Superintendent logs the notification information onto a Problem Response Form (Appendix B) and initiates the response.

4. **SCADA System Alarm Notification**
   There are several alarms throughout the collection and treatment systems capable of notifying JCW staff of conditions that warrant investigation due to the possibility of an overflow or bypass. These alarms include pump station power failure, pump station high water level, or an equipment or power failure at a WWTP or pump station. If an alarm is activated, the Collection Maintenance Superintendent or appropriate Treatment Superintendent is notified and the response is initiated.

C. **RESPONSE**
   Once notification of a possible overflow, bypass, or backup is received, an appropriate response crew is dispatched to the site for investigation. JCW strives to arrive at the site for investigation as quickly as possible in response to an overflow. Upon arrival at the site, the investigation effort begins.

1. **Business Hours Response**
   After notification of a possible overflow or backup during business hours from the Customer Service Department, the Cleaning and Inspection Superintendent initiates the response by contacting the caller to discuss the situation in more detail and obtain additional information to determine whether the situation is related to an actual overflow or backup situation. If the Cleaning and Inspection Superintendent cannot make contact with the caller, a message is left with the caller and the appropriate response crew is contacted and dispatched to the site for investigation.

   If the Cleaning and Inspection Superintendent determines that the situation is related to an actual overflow or backup situation, the customer’s information is logged into JCW’s CMMS which will automatically create a work request. JCW’s CMMS software is used to track the overflow throughout the response process.
Based on the nature of the situation, the Cleaning and Inspection Superintendent will then contact the appropriate response crew and dispatch them to the site for investigation. If the Cleaning and Inspection Superintendent determines that the situation is not related to an actual overflow or backup situation, the caller is notified of such and the superintendent notifies the Customer Service Department that the issue has been resolved.

2. **After Business Hours Response**
   After notification of a possible overflow or backup after business hours, the Cleaning and Inspection crew standby person initiates the response by contacting the caller to discuss the situation in more detail and obtain additional information to determine whether the situation is related to an actual overflow or backup situation. If the Cleaning and Inspection crew standby person cannot make contact with the caller, a message is left with the caller and the appropriate response crew is contacted and dispatched to the site for investigation.

   If the Cleaning and Inspection crew standby person determines that the situation is related to an actual overflow or backup situation, the customer’s information is noted on the Problem Response Form (Appendix B). These notes are provided to the Cleaning and Inspection Superintendent the following day and logged into the CMMS which will automatically create a work request. Based on the nature of the situation, the Cleaning and Inspection crew standby person will then contact the appropriate response crew and dispatch them to the site for investigation.

   If the Cleaning and Inspection crew standby person determines that the situation is not related to an actual overflow or backup situation, the caller is notified of such and the standby person notifies the Customer Service Department that the issue has been resolved.

3. **SCADA System Alarm Response**
   After the appropriate O&M superintendent is notified of the SCADA system alarm, they initiate the response by contacting the appropriate response crew and dispatching them to the site for investigation.

4. **Response Crew Dispatch**
   After confirming the SCADA system alarm or overflow/backup situation with the caller, the Cleaning and Inspection Superintendent (or Cleaning and Inspection crew standby person after business hours) contacts the appropriate response crew and dispatches them to the site for investigation. The appropriate response crew is dependent on the anticipated or confirmed nature of the incident. Generally, the following O&M Division crews are dispatched as first responders to address the situations listed:
   
   - O&M Collections Cleaning/Inspection – sanitary sewer overflows, building backups
   - O&M Collections Pumps – pump station overflows
• O&M Treatment – WWTP bypasses

Once the response crew arrives onsite and determines the cause of the situation, the following groups may be contacted for additional assistance and support for the situations listed:

• O&M Engineering Backup Prevention Program (BUPP) / Inflow and Infiltration (I&I) Engineering Technician – building backups

• O&M Engineering – construction related overflows

• O&M Collections Line Repair/Construction – pipe breaks

The collection system response crews typically include three members that are trained and experienced in overflow and backup response. Each crew is outfitted with a jet truck and the necessary equipment to relieve most overflows. The O&M Treatment crews and O&M Collections Pumps crews are similarly equipped to address any bypasses that may occur at the WWTPs and overflows or bypasses that may occur at the pump stations, respectively.

Upon arrival at the site, the response crew records their arrival time, notifies the caller that they have arrived, and begins their investigation. Specifics related to WWTP and pump station response are provided in Chapters 4 and 5, respectively.

The response crews receive training in public relations and customer service. It is standard practice that only the field crew leaders talk with customers during an overflow response. They are trained to remain calm and professional. Members of the response crew are also not to enter private residences.

If the situation results in media attention, the response crew members respond to reporters with “no comment” and refer the reporter to the Cleaning and Inspection Superintendent.

D. INVESTIGATION, MITIGATION, AND CLEANUP

Upon responding and arriving at the site, an investigation will be performed to determine the cause and appropriate mitigation methods to stop the overflow, backup, or bypass. After the incident is controlled and the situation is assessed, numerous notifications as described in the following sections are made and the site is then cleaned up.

1. Site Assessment and Control

The response crew initiates their investigation by locating the address of the incident and confirming that an overflow, backup, or bypass is occurring or has occurred. The response crew assesses the impacts of the incident and establishes a control zone if necessary for safety and to limit public access to the affected surface area. Property
owners are also notified by door knocking if wastewater is on the ground and has reached their property.

For overflows occurring in the street, traffic control will be utilized to set up a control zone and to assist in the investigation process. Each response crew is equipped with traffic control devices adequate for side streets. If the response crew is not equipped to set up adequate traffic control, the Cleaning and Inspection Superintendent will contact the traffic control contractor used by JCW (Appendix D) to provide additional assistance. Cones may also be set up to limit public access to the overflow area and equipment.

Upon arrival at the scene, if a suspicious substance (e.g., oil sheen, foamy residue) is witnessed on the ground surface, or if a suspicious odor (e.g., gasoline) not common to the sewer system is detected, the response crew will request that the Cleaning and Inspection Superintendent or a collection system supervisor alert the appropriate authorities, e.g., fire department, gas utility, Johnson County Department of Health and Environment (JCDHE), and hazardous materials response team. The response crew will await the arrival of the authorities to take over the scene. The response crew will keep a safe distance and observe caution until the assistance arrives. Once assistance arrives the response crew will take direction from the person with the lead authority. Only when that authority determines it is safe and appropriate may the response crew proceed with their investigation activities.

2. Investigation

After controlling access to the site, the response crew determines whether the incident is related to the public sewer system or the privately owned sewer system.

If the incident is occurring during a rain event, the response crew will investigate to determine if there is a blockage in the system or if the sewer system is being overloaded due to the rain event. This determination is done by observing flow in at least three manholes to confirm whether wastewater is flowing. This type of observation typically results in the determination of the likely cause of the overflow or backup:

- If the manhole(s) is not surcharging and there does not appear to be a flow restriction after cleaning the sewer, a basement backup is likely the result of a blockage in the private service lateral.

- If the manhole(s) is surcharged and the wastewater does not appear to be flowing, a basement backup or overflow is likely the result of a blockage in the public sewer system or an issue at a downstream pump station.

- If the manhole(s) is surcharged and the wastewater appears to be flowing, a basement backup or overflow is likely the result of the public sewer system being overloaded.
Less investigation is typically required during dry weather because the cause of the overflow or backup is more easily identified and isolated. After determining the cause of the incident, the Cleaning and Inspection Superintendent is notified of the investigation results and JCW crews are then to proceed with any corrective action that is necessary. The O&M Director will then also be notified of an incident if it was caused by an issue within the public sewer system so the necessary notifications and reporting can be initiated.

3. **Rain Event Procedure Determination**

After notification of a confirmed overflow or backup caused by the public sewer system, the Cleaning and Inspection Superintendent and/or Assistant Director of Collections will determine whether rain event procedures should be initiated.

During business hours, rain event procedures are initiated if during wet weather a response crew confirms that a manhole or main sewer pipe has surcharged not due to a blockage.

After business hours, rain event procedures are initiated if during wet weather four or more overflow/backup calls are received within a 30 minute period. If this occurs, the answering service is contacted and instructed not to page; staff then contacts the answering service every 15 minutes to retrieve overflow/backup calls.

4. **Rain Event Procedures**

After initiating rain event procedures during business hours, all cleaning and inspection crews will be on standby to respond to overflow and backup notification calls. After initiating rain event procedures after business hours, at least two cleaning and inspection crews are called in to respond to overflow and backup notification calls.

During rain event procedures, cleaning and inspection crews are on alert and equipped for an overflow response. The crews look for surcharging and high flows in manholes. Indication of these situations is reported back to the Cleaning and Inspection Superintendent. When reporting back to the Cleaning and Inspection Superintendent, the watershed, basin, line segment, map number, and surcharge levels should be reported.

Cleaning and inspection crews are typically dispatched on a first come first served basis when multiple calls are being received unless the investigation efficiency can be increased by responding to multiple calls in an area. Additional crews may be utilized depending on the number of customer calls. The rain event procedures do not end until the last overflow/backup call has been addressed. Staff is rotated such that they do not work more than 16 hours straight without rest.
5. Overflow Mitigation

After notifying the Cleaning and Inspection Superintendent of the overflow/backup investigation results, the primary responsibility of the response crew is to alleviate the problem causing the overflow/backup.

If based on the investigation it appears that the overflow/backup is caused by a blockage in the public sewer system, the response crew will clean the sewer segment where the blockage is from the downstream end with a jetter hose. The investigation crew is experienced and trained in the use of the jetter hose. If a blockage is discovered, the approximate location, size, and blockage description will be noted.

If the jetter hose is not adequate to remove the blockage, the Cleaning and Inspection Superintendent is notified and asked to approve the use of a root saw to remove the blockage. If the sewer segment has been rehabilitated via cured-in-place pipe (CIPP) lining, use of a root saw will not be allowed without authorization. If the blockage still cannot be removed, the response crew will again contact the Cleaning and Inspection Superintendent to receive further direction.

A closed circuit television (CCTV) crew may then be dispatched to the site to investigate and determine the cause of the overflow/backup. The CCTV crew will televise the sewer and determine the nature of the blockage or pipe failure. If necessary, an excavation and rehabilitation crew may be dispatched to excavate the pipe to remove the blockage. If the excavation is too difficult for the JCW crew to handle, an emergency contractor will be contacted for assistance (this contract is administered by the O&M Engineering Division).

If based on the investigation it appears the overflow/backup is caused by insufficient capacity in the public sewer system (or pump station equipment failure or power outages), the only mitigation method may be waiting for the condition to subside. In this case, attention is focused on containment.

6. Containment

After mitigating the overflow/backup, the next step is to contain the wastewater as much as possible. Containment can be done in several ways including sand bagging and damming the area, bypass pumping, excavating a hole to contain the wastewater, or pumping the wastewater with a tank truck or vacuum truck. In many overflow situations, it may not be feasible to totally contain the wastewater due to the amount, location, or the duration of the discharge, but reducing the impact should be attempted.

If the volume of untreated wastewater being discharged to an impact area can be reduced without causing additional overflows upstream or downstream, the following measures may be utilized to reduce the overflow impacts:

- Manually control pump stations that discharge upstream of the impacted area by storing wastewater in the wet well and tributary sewers.
• Install bypass pumps to remove wastewater from upstream sewers or pump station wet wells and transport it to operational sewers downstream of the cause of the overflow.

• Utilize tank trucks or vacuum trucks to remove wastewater from upstream sewers or pump station wet wells and transport the wastewater to operational sewers downstream of the cause of the overflow.

If an overflow has entered or is entering a storm drain during dry weather, steps should be evaluated to prevent additional wastewater from entering. The impacted portion of the storm drain system should be isolated if feasible to prevent or minimize the wastewater from reaching a water body. If wastewater is contained in an area, it can then be collected and discharged back into the sanitary sewer system. Once an overflow reaches surface water, the focus should shift to limiting the amount entering the surface waters and removing any visible debris.

During containment, additional information regarding the overflow should be collected and the volume of wastewater released should be estimated. The Cleaning and Inspection Superintendent will log this information in the CMMS along with exact location and cause of the overflow, the estimated time the overflow began and was stopped, and details of the response.

The best professional judgment of the response crew is used to estimate the flow volume released during the overflow. JCW is evaluating the use of several methods to further refine overflow volume estimates, such as those developed by others that are provided in Appendix E. If the volume of the overflow is not observed, it should be reported as “unknown”.

7. Releases to Surface Water
After containing the overflow, the response crew determines whether the overflow has reached a surface water body. Surface water bodies include bodies of water, creeks, storm ditches, and for purposes of this SORP only, storm sewer drains. If an overflow or release reaches a surface water body, the Cleaning and Inspection Superintendent is immediately notified to confirm the overflow or release has reached a surface water body. After confirmation, the Cleaning and Inspection Superintendent then makes the necessary notifications, including notifying the O&M Director and the O&M Assistant Director of Collections.

8. Cleanup
Once the overflow has stopped and the caller has been notified of the resolution, the response crew begins cleanup of the affected area. After business hours, the cleanup effort may be delayed until the following day. KDHE may direct the cleanup of the overflow in certain circumstances depending on the nature of the overflow. If KDHE or other officials not affiliated with JCW arrive at the site, the JCW response crew is to
notify the Cleaning and Inspection Superintendent or a collection system supervisor to handle any coordination issues.

The response crew will clean the overflow site thoroughly with rakes and shovels such that no readily identified residue (e.g., sewage solids, papers, rags, plastics, and rubber products) or wastewater pools remain. Solids and debris are to be flushed, swept, raked, picked up, and transported offsite for proper disposal.

If the overflow was above ground on paved areas, the response crew will:

- protect the public from the area,
- collect overflowing/overflowed material with a vacuum truck,
- wash down the impacted area,
- collect all wash water, and
- dispose of wash water into the sanitary sewer.

If the overflow was above ground on unpaved areas, the response crew will:

- protect the public from the area,
- collect any debris,
- remove or decontaminate contaminated soil/plants,
- wash down the impacted area, and
- collect wash down water and dispose of into the sanitary sewer.

If the overflow entered the storm drain collection system, the response crew will:

- protect the public from the area,
- if feasible, install pipe plugs at the downstream location,
- if feasible, collect all material contained within the impacted storm drain collection system,
- collect overflow debris with a vacuum truck,
- wash down the impacted area,
- collect all wash water with a vacuum truck, and
• remove plugs.

Once the cleanup is complete, the Cleaning and Inspection Superintendent is notified.

E. ASSESSMENT NOTIFICATIONS

After assessing the overflow, backup, or bypass situation and containing the overflow, several notifications are necessary to respond to the initial calls and notify other potentially impacted parties. After these notifications are made, the necessary regulatory reporting and overflow evaluation steps are performed.

1. Private System Issue Notification
   If the response crew investigates the overflow/backup and determines that the cause of the backup was within the privately owned sewer system, the Cleaning and Inspection Superintendent will be notified. The Cleaning and Inspection Superintendent (or Cleaning and Inspection crew standby person after business hours) will contact the caller and inform them that the backup was not due to the public sewer system and that they should contact their local plumber.

2. Release to Surface Water Notification
   After determining that untreated wastewater has or may reach surface water, the response crew immediately notifies the Cleaning and Inspection Superintendent who notifies the O&M Assistant Director of Collections and the O&M Director. The O&M Director will then notify KDHE along with the JCDHE Director, Deputy Director, and Health Education Division Director / Public Information Officer (PIO) in accordance with the Johnson County Kansas Procedure for Issuing Health Advisories Associated with Wastewater Releases document (Appendix F). These personnel will determine if a public health advisory is warranted.

3. Laboratory Notification
   The O&M Director will direct the JCW Laboratory to begin sampling of the water body after a significant collection system release has occurred that has reached a surface water body. Water sampling will begin at locations specified by the O&M Director. The typical minimum sampling locations will include a site upstream of the release, a site at the point of release, and a site downstream of the release. The sampling sites may be moved depending on the circumstances and sampling results. Additional sampling may be done by KDHE. KDHE may also request to split samples collected by JCW.

The initial sampling information will be used along with the location of the contamination, time of year, and other considerations to evaluate the likelihood of public contact and whether a public health advisory is warranted. The results from the initial sampling will be used to assess the extent of any contamination from the release while future samples will provide information to determine when the stream returns to
normal bacteria levels. This information will be used to evaluate when any public health advisory may be lifted.

4. **Drinking Water Provider Notification**
   In the event of an untreated wastewater discharge to surface water, the O&M Director will determine whether drinking water supplies downstream of the discharge may be impacted. If so, the O&M Director will contact the appropriate water providers (Appendix G) and provide them with details regarding the discharge.

5. **Health Advisory Determination**
   The determination of a public health advisory will be coordinated between JCW, KDHE, and JCDHE as described in the Johnson County Kansas Procedure for Issuing Health Advisories Associated with Wastewater Releases document (Appendix F). Factors such as degree and extent of contamination, time of year, and location of contaminated water with respect to probable public contact will be considered when determining whether a public health advisory is warranted.

6. **Health Advisory Issuance**
   Once it has been decided to issue a public health advisory, the JCW PIO will transmit the advisory to the media release list and officials of the city or cities where the release occurred and/or the advisory is in effect. The JCW PIO and O&M Director will be the official contacts for the public health advisory; any requests for information regarding the public health advisory will be referred to them. Detailed procedures of the public health advisory issuance process are provided in Appendix F.

   Any instream sample results will be reviewed by the O&M Director who will forward the results along with recommendations to KDHE and JCDHE to determine the appropriate actions. They will continue to review the sample results until the bacterial counts at the release site and downstream of the release site return to normal. JCDHE is the official agency to lift the public health advisory and the JCW PIO will transmit the notice to their normal media release list and officials of the city or cities where the release occurred and/or the advisory is in effect.

7. **Caller Overflow/Backup Resolution Notification**
   Once the overflow/backup has been mitigated and contained, the Cleaning and Inspection Superintendent (or the Cleaning and Inspection crew standby person after business hours) will contact the caller and inform them that the overflow/backup issue has been resolved.

   If the caller experienced property damage related to the overflow/backup and requests reimbursement, the Cleaning and Inspection Superintendent will refer the caller to the Johnson County Risk Management Department. If the customer ultimately files a claim, JCW will assist by providing information as requested by the Risk Management Department. The caller may also be referred to the JCW BUPP at this time, if appropriate.
8. Customer Service Resolution Notification
Once the overflow/backup has been mitigated and contained, the Cleaning and Inspection Superintendent will notify the Customer Service Department that the overflow/backup issue has been resolved.

F. REGULATORY REPORTING AND EVALUATION
After an overflow has been contained and the assessment notifications are made, JCW shall comply with the appropriate regulatory reporting requirements. Finally, the overflow response procedures conclude with documentation and an evaluation of the situation with the goal of minimizing or preventing future overflows.

1. Initial KDHE Notification
Once confirmation of an overflow is received, an initial report to KDHE must be submitted within 24 hours. This initial report is prepared and submitted via email by the O&M Director or his designee. The initial report includes a description of the overflow and serves as an initial notification to KDHE that an overflow has occurred.

2. KDHE Wastewater Incident Report Form
After confirmation of an overflow, the Assistant Director of Collections will prepare a KDHE Wastewater Incident Report Form (Appendix H). The report is then reviewed and submitted to KDHE by the O&M Director via email. The KDHE Wastewater Incident Report Form must be submitted within five days of confirmation of an overflow. Paper copies of all submitted KDHE Wastewater Incident Report Forms are maintained in a file cabinet in the O&M Director’s office.

3. Extended Overflow Resolution
If the confirmed overflow cannot be resolved within five days, the O&M Director will keep KDHE updated on the status and remediation of the overflow. During these instances, KDHE will typically be involved in the remediation plan.

4. Cleanup Confirmation
After the response crew notifies the Cleaning and Inspection Superintendent that cleanup of the overflow site is complete, a collection system supervisor (Cleaning and Inspection Superintendent, O&M Assistant Director Collections, or O&M Director) may visit the overflow site if warranted. The purpose of the site visit is to confirm that the site was cleaned up and no additional action by JCW is required.

5. CMMS Complaint Form Closeout
After confirming that the cleanup effort is complete, the Cleaning and Inspection Superintendent updates the complaint form in the CMMS and attaches any additional information such as the internal CCTV inspection videos (if performed) and the method of mitigation, including any pipe or manhole repairs. The work request is closed out at this time.
If it was determined that the overflow/backup was caused by root intrusion in the main sewer, the segment with the roots will be added to the list to be rehabilitated via CIPP lining. If the overflow/backup was caused by grease, the JCW Environmental Compliance Manager responsible for overseeing the Johnson County fats, oils, and grease (FOG) management program will be notified so future grease discharges at the location can be addressed.

6. **Evaluation and Prevention Plan**
   After the overflow has been fully documented in the CMMS, the Cleaning and Inspection Superintendent reviews the overflow location and any internal CCTV inspection videos to determine if the particular asset has had a history of similar problems. If it has, a rehabilitation and/or maintenance plan is developed with the goal of preventing future overflows at that location.

7. **Internal Discussion**
   The O&M Division, including the O&M Director, group superintendents and Engineering Division, has a goal to meet bi-monthly to review recent events, work activities, areas for improvement for sewer maintenance crews, and selected safety topics. Problem reports from the previous work period, including overflow and backup events, are also discussed. During these meetings, any rehabilitation and/or maintenance plans developed to minimize/prevent future overflows will be reviewed. Responsive projects will be developed by the Engineering Division to resolve any remaining issues.

8. **Monthly Reports**
   The Assistant Director of Collections and Assistant Director of Treatment report work activity on a monthly report that is submitted to the O&M Director. The monthly report summarizes metrics for common and critical tasks, such as number of calls received during the month and number of dry and wet weather overflows. The reports are summarized by the O&M Director and submitted to the General Manager.
A. INTRODUCTION
The most common complaint received by JCW related to wastewater discharges is from property owners who have experienced a basement backup. As a result, JCW developed specific policies and procedures for responding to and preventing basement backups during wet weather events called the Backup Prevention Program (BUPP). Despite the fact that 80 to 90 percent of basement backups are due to issues with the private sewer service lateral, out of an abundance of caution, JCW assumes that a basement backup is attributable to a problem with the public sewer system and the response typically follows the sewer overflow response plan presented in Chapter 2 with minor differences as noted in the sections that follow.

B. INITIAL NOTIFICATION
Notification of a basement backup typically occurs from a call through the JCW Customer Service Department. The notification procedures are the same as those previously described because it is initially assumed that the basement backup occurred due to an issue within the public sewer system.

C. RESPONSE
Response to a basement backup is the same as those previously described because it is initially assumed that the basement backup occurred due to an issue within the public sewer system.

D. INVESTIGATION, MITIGATION, AND CLEANUP
Determination of whether the backup is a result of an issue with the public sewer system or the privately owned sewer system is described in Chapter 2.

Cleanup expenses and damages resulting from backups caused by blockages in the private service lateral are the responsibility of the property owner. If a property owner feels they are entitled to reimbursement for cleanup expenses and damages resulting from backups caused by issues in the public sewer system, the property owner is referred to the Johnson County Risk Management Department if the property owner wishes to file a claim for damages.

E. ASSESSMENT NOTIFICATIONS
Assessment notifications as a result of a basement backup are described in Chapter 2.
F. REGULATORY REPORTING AND EVALUATION

If after a thorough response and investigation by the JCW response team, the basement backup is confirmed to be the result of an issue within the public sewer system, KDHE is notified as described in Chapter 2.

G. ASSISTANCE

JCW has developed a voluntary program coordinated by the O&M Engineering Division to aid eligible homeowners in the prevention of basement backups known as the BUPP. Property owners that have experienced basement backups as a result of an intense rain event are referred to the BUPP. The program provides funding for the installation of a backup prevention device to alleviate backups resulting from intense rain events.

The property owner is initially directed to complete the BUPP questionnaire (http://bupp.jocogov.org). JCW staff then reviews the completed questionnaire and determines if the property is eligible for the program. JCW staff then notifies the property owner if they are eligible for the program and may move forward with installation of backup prevention device. Additional details regarding the BUPP can be found in Appendix I.
A. INTRODUCTION
Bypasses and overflows at WWTPs typically occur due to power outages or equipment failures. Overflows can also result from wastewater overflowing structures such as splitter boxes. A WWTP bypass/overflow response generally follows the sewer overflow response plan presented in Chapter 2 with minor differences as noted in the sections that follow. Also, the Assistant Director of Treatment has similar responsibilities as the Cleaning and Inspection Superintendent for sewer overflow response at a WWTP.

B. INITIAL NOTIFICATION
Notification of a bypass or overflow is received from either a staff member visually witnessing the event or a SCADA system alarm. SCADA system alarms include equipment failures and high wet well level alarms that can notify the staff of a potential problem. During business hours, WWTP staff is alerted of SCADA system alarms.

The Middle Basin WWTP is the only facility manned full-time. Thus, SCADA system alarms are sent via page to on-call staff for each facility (and also to the Middle Basin WWTP). After receiving the page, the operator contacts the Middle Basin WWTP operator and confirms the page. If the Middle Basin WWTP operator does not receive a confirmation response within 15 minutes, calls are made to on-call personnel until a response is received.

C. RESPONSE
After receiving notification of a SCADA system alarm, an O&M Treatment staff member will respond to the site or equipment causing the alarm condition. Equipment failures are logged in JCW’s equipment asset CMMS.

D. INVESTIGATION, MITIGATION, AND CLEANUP
Typically, there is adequate redundancy at the WWTPs such that equipment problems do not result in a bypass or overflow. The WWTPs are also equipped with dual power feeds and backup generators. However, during some power outages the facility may experience bypasses or overflows.

Some facilities can allow high flow to be directed to lagoons that can then be brought back into the treatment train as capacity allows. Thus, bypasses can be prevented during some wet weather events and equipment and power failures.
During containment of overflows at WWTPs, priority is given to protecting any storm drains.

E. ASSESSMENT NOTIFICATIONS

Issuance of a health advisory associated with WWTP overflows and bypasses follows the same procedures presented in Chapter 2 and Appendix F.

F. REGULATORY REPORTING AND EVALUATION

WWTP overflows and bypasses are reported to KDHE in the same manner as sewer overflows. Paper copies of all submitted KDHE Wastewater Incident Report Forms for WWTP overflows and bypasses are maintained by the O&M Director.

In addition to documenting asset information in the CMMS, spills are recorded in the Storm Water Pollution Prevention Plans (SWPPPs) that have been developed for each WWTP. Specifically, each overflow at a WWTP is documented on that facility’s Report Log of Exposed Significant Material (Worksheet #4) and on the Non-Storm Water Discharge Assessment (Worksheet No. 5); these worksheets are provided in Appendix J. Copies of completed worksheets are maintained with the SWPPP at each facility. Annually, the worksheets from all the facility SWPPPs are updated and collected by the Assistant Director of Treatment. Copies are then distributed to the Training and Safety Officer and each treatment plant superintendent.
CHAPTER 5  PUMP STATION OVERFLOW RESPONSE PLAN

A. INTRODUCTION
Overflows at pump stations typically occur due to power outages or equipment failures. A pump station overflow response generally follows the sewer overflow response plan presented in Chapter 2 with minor differences as noted in the sections that follow. Also, the Collection Maintenance Superintendent has similar responsibilities as the Cleaning and Inspection Superintendent for sewer overflow response at a pump station.

B. INITIAL NOTIFICATION
Notification of a potential overflow is received from either a staff member visually witnessing the event, a customer call, or from a SCADA alarm. SCADA system alarms are designed to notify the staff of a potential problem and include equipment failures and high wet well level alarms. During business hours, Pump Group staff is alerted of SCADA system alarms.

C. RESPONSE
After receiving notification of a potential overflow, a Pump Group staff member will respond to the site or equipment causing the alarm condition. In case of power failures, an industrial electrician is also dispatched to the site. Equipment failures are logged into JCW’s equipment asset CMMS.

If the initial notification is related to a low pressure sewer (LPS) system, the call is directed to the LPS system service provider (contact information provided in Appendix A) who is responsible for addressing issues associated with the LPS system. JCW may respond during an LPS system power outage as described in the protocol in Appendix K.

D. INVESTIGATION, MITIGATION, AND CLEANUP
Typically, there is adequate redundancy at the pump stations such that minor or routine equipment problems do not result in an overflow. The pump stations are also equipped with dual power feeds, backup generators, or portable generators. However, during some power outages the facility may experience overflows.

To assist in the response, investigation, and mitigation of overflows at pump stations, the Pump Group has prepared knowledge transfer documentation that can be found on the JCW Intranet at: http://jocowiki/jcw/JCWord/PS/Wiki%20Pages/Home.aspx. This document includes specific details of each pump station, including equipment and operation details, special facility features, wet weather response procedures, and equipment failure response procedures.
E. ASSESSMENT NOTIFICATIONS

Issue of a health advisory associated with pump station overflows follows the same procedures presented in Chapter 2 and Appendix F.

F. REGULATORY REPORTING AND EVALUATION

Pump station overflows are reported to KDHE in the same manner as sewer overflows. Paper copies of all KDHE Wastewater Incident Report Forms for pump station overflows are maintained by the O&M Director.
A. SORP REVIEW

This SORP is designed to be a working document that will be reviewed and updated routinely due to updates in regulatory requirements, procedural improvements from lessons learned, and changes in staffing. As a result, this SORP will be reviewed periodically and updates will be made to reflect changes in policies, procedures, and contacts as may be required to achieve the objectives of this plan.

The primary reviewers of the SORP are the JCW Director of Business Operations and Planning and the JCW Managing Engineer – Collection System. These two reviewers will be the facilitators of the review process and include other staff members as considered necessary. The periodic reviews may include conducting a workshop with superintendents and key personnel to review response activities and gather suggestions for new or revised procedures, review all contact lists and update as necessary, and update the SORP when new or revised requirements are imposed in applicable National Pollutant Discharge Elimination System (NPDES) Permits. Space is provided at the end of this chapter for users of this document to make notes and suggestions for future SORP improvements to be considered during the periodic reviews.

Updated SORP versions will be tracked using the version number of the SORP in the footer of each page of the document. The original SORP will be documented as version 1.0. Future minor revisions to the contact information or forms in the appendices will be tracked by increasing the tenth place by 0.1 (e.g., 1.1, 1.2, 1.3). Future major revisions that include procedural changes will be tracked by increasing the integer by 1 (e.g., 2.0, 3.0, 4.0).

B. PLAN DISTRIBUTION AND ACCESS

To ensure that JCW staff involved with overflow response are aware of the latest procedures, copies of updated versions of the SORP shall be distributed to the following personnel by the Director of Business Operations and Planning:

- Operations and Maintenance Director
- Assistant Director of Collections
- Assistant Director of Treatment
- Engineering Manager – Existing Infrastructure
- Managing Engineer – Collection System
- Cleaning and Inspection Superintendent
- Collection Maintenance Superintendent

These personnel are responsible for distributing hard copies to employees directly responsible for responding to overflows. A hard copy should be provided for each field
vehicle (along with extra copies of the appropriate forms) and an electronic copy should be saved to each field laptop.

An electronic version of the SORP is stored on the JCW Enterprise network at W:\JCWEnterprise\Published\JCW Internal Controls\2013 JCW Procedures\O & M\ and also on the JCW Intranet at:
http://jococonnect/dept/jcw/divisions/om/Pages/default.aspx.

C. TRAINING
The Assistant Director of Collections and Assistant Director of Treatment are responsible for ensuring that their personnel are prepared to respond effectively to overflow situations. Initial training should be provided to all appropriate existing personnel and new hires that will have responsibility for any aspect of overflow response. Refresher training should be provided periodically as needed or whenever there is a major update to the SORP. Training shall include a thorough review of the SORP and clarification of responsibilities.
FUTURE RECOMMENDED SORP IMPROVEMENTS AND ENHANCEMENTS

- Pump station emergency bypass pumping procedure
- Collection system emergency bypass pumping procedure
- Force main repair form
- Resources JCW staff can provide to customers for private property clean-up.
APPENDIX A SEWER OVERFLOW RESPONSE CONTACTS

Updated JCW Organization Chart available at:
\%/jcwfill01/Data/JCWE/Enterprise/Published/JCW OrgCharts/JCW Working Org pics_current.pdf

JCW Emergency 24 Hour: 913.715.8600
JCW Customer Service: 913.715.8590

Operations and Maintenance Director
Kurt Winters
Cell: 913.220.6785
Office: 913.715.8608

Assistant Director of Collections
Darrell Thombrugh
Cell: 913.207.2302
Office: 913.715.8629

Cleaning and Inspection Superintendent
Vernon Schrock
Cell: 816.726.4678
Office: 913.715.8657

Assistant Superintendent Collections
Fred Preusch
Cell: 913.649.9061
Office: 913.715.8660

Collection Maintenance Superintendent
Ed Unrein
Cell: 913.207.2300
Office: 913.715.8630

Assistant Superintendent Collections
Vincent Feden
Cell: 913.744.8074
Office: 913.715.8632

Assistant Director of Treatment
Kenny Kellison
Cell: 913.378.3566
Office: 913.715.8604

Engineering Technician Collection System
Troy Young
Cell: 913.207.5227
Office: 913.715.8554

Low Pressure Sewer Emergency Contact
913.715.1777

Wastewater Treatment Plants
Mill Creek: 913.715.8617
Nelson: 913.715.8629
Airport: 913.715.8750
Blue River: 913.715.8750
Blue River No. 4: 913.715.8750
Middle Basin: 913.715.8701
Tomahawk: 913.715.8615

General Manager
John O’Neil
Cell: 913.207.2276
Office: 913.715.8570

Training and Safety
Frank Manners
Cell: 913.207.2282
Office: 913.715.8606

Environmental Compliance Manager (FOG)
Shane Burnett
Office: 913.715.6937

Laboratory Director
Tony Holt
Cell: 913.238.6891
Office: 913.715.6951

Engineer Manager-Existing Infrastructure
Aaron Witt
Office: 913.715.8546

Managing Engineer - Collection System
Dan Ott
Office: 913.715.8544

Manager Customer Service
Cynthia Williams
Office: 913.715.8511
# Problem Response Form

## 1.0 Sanitary Sewer Overflow Information

<table>
<thead>
<tr>
<th>Date</th>
<th>Regular Hours</th>
<th>Overtime Call</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**Name of Complainant**

**Address**

**City**

**Action**

- [ ] Call to Plant or Pager:  
  - AM  
  - PM

- [ ] Call Back to Complainant:  
  - AM  
  - PM

- [ ] Call Out of Crew Members:  
  - AM  
  - PM

- [ ] Crew Arrived at Nelson Complex:  
  - AM  
  - PM

- [ ] Crew Arrived at Complainant’s Address:  
  - AM  
  - PM

- [ ] Crew Departed Complainant’s Address:  
  - AM  
  - PM

- [ ] Crew Arrived Back at Nelson Complex:  
  - AM  
  - PM

- [ ] Crew Disbanded:  
  - AM  
  - PM

**Call Received From:**  

- NC  
- Southcreek  
- Page  
- Other: ____________________

## 2.0 Location Information

- Watershed Line Designation:  
  - Upstream  
  - Downstream

**Map Number:**

**Cause of Problem:**  

- District Line  
- House Connection  
- NSR

## 3.0 Problem Description

- ____________________________________________
- ____________________________________________
- ____________________________________________
- ____________________________________________

## 4.0 Response Team

**Crew Leader**

**Crew Member**

**Crew Member**

**Crew Member**

**Work Order #**

**Service #**
APPENDIX C  EMERGENCY CALL LIST

1. Beeper
913.283.5798

2. Cleaning and Inspection Superintendent
Vernon Schrock
Cell: 816.726.4678
Office: 913.715.8657

3. Assistant Superintendent Collections
Fred Preusch
Cell: 913.649.9061
Office: 913.715.8660

4. Assistant Director of Collections
Darrell Thornbrugh
Cell: 913.207.2302
Office: 913.715.8629

5. Operations and Maintenance Director
Kurt Winters
Cell: 913.220.6785
Office: 913.715.8608

6. Collection Maintenance Superintendent
Ed Unrein
Cell: 913.207.2300
Office: 913.715.8630
APPENDIX D TRAFFIC CONTROL CONTRACTOR CONTACT

Road Runner Safety Services, Inc.

SUB CONTRACTING, SALES AND RENTALS
CALL FOR ALL YOUR EQUIPMENT NEEDS

Road Runner Safety Services
816.472.5457
1224 E. 9th Street
Kansas City, MO 64106
Spill/SSO Volume Calculation Guidance

Spill Volume Calculation

The following sections provide guidance for estimating spill/Sanitary Sewer Overflow (SSO) volume for manholes, broken pipes, wet weather, and pump station outage. This is provided as guidance only, however, if a different method is used to calculate spill volume, that method should be validated and described. If flow meter volumes are available for any of these type of events the metered data should always be utilized, unless there is concern the data is not reflective.

Broken Lines

Table 1 provides Spill Volume Calculation by Flow Rate for different size pipes.

| TABLE 1 | Sanitary Sewer Flow Rates For Spill Determinations | City of Evansville Sewer Overflow Response Plan |
|-----------------------------------------------|-----------------------------------------------|
| Depth of Flow (inches) | Pipe Size | 6 | 8 | 10 | 12 | 15 | 18 | 21 | 24 | 30 |
| 1 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 100 |
| 2 | 50 | 60 | 70 | 80 | 85 | 95 | 105 | 125 | 145 |
| 3 | 90 | 110 | 125 | 135 | 150 | 175 | 185 | 210 | 230 |
| 4 | 125 | 160 | 180 | 200 | 235 | 260 | 285 | 320 | 350 |
| 5 | 155 | 190 | 240 | 280 | 315 | 360 | 380 | 445 | 470 |
| 6 | 180 | 260 | 310 | 355 | 415 | 455 | 500 | 555 | 630 |
| 7 | 290 | 370 | 425 | 495 | 570 | 620 | 695 | 770 |  |
| 8 | 320 | 430 | 500 | 600 | 680 | 760 | 815 | 1010 |  |
| 9 | 465 | 575 | 690 | 800 | 890 | 965 | 1260 |  |
| 10 | 490 | 625 | 775 | 905 | 1005 | 1120 | 1360 |  |
| 11 | 685 | 870 | 1020 | 1135 | 1275 | 1490 |  |
| 12 | 715 | 935 | 1130 | 1260 | 1410 | 1630 |  |
| 13 | 1020 | 1240 | 1415 | 1580 | 1870 |  |
| 14 | 1070 | 1345 | 1520 | 1690 | 2110 |  |
| 15 | 1105 | 1425 | 1650 | 1850 | 2220 |  |
| 16 | 1495 | 1760 | 1990 | 2560 |  |
| 17 | 1550 | 1880 | 2110 | 2730 |  |
TABLE 1
Sanitary Sewer Flow Rates For Spill Determinations
City of Evansville Sewer Overflow Response Plan

<table>
<thead>
<tr>
<th>Depth of Flow (inches)</th>
<th>Pipe Size</th>
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<tbody>
<tr>
<td></td>
<td>1595</td>
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<tr>
<td>18</td>
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<tr>
<td>19</td>
<td>2050</td>
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</tbody>
</table>

Gallons per Minute @ V=2.0 feet per second (ft/sec) and n=0.013; Adjust accordingly for flat or steep sloped sewers.

Spill Calculation Procedures

1. Determine and record the time of initial caller notification of sewer spill. (Note time from initial call to estimate start time)

2. Measure and record the flow in inches immediately downstream of spill or blockage and determine flow rate in gallons per minute (gpm) using table above. Record the pipe size in inches.

3. Clear obstacles from blocked sewer; allow free and steady flow to stabilize. Note time the flow stabilizes.

4. Measure the depth of flow in inches in the previously blocked sewer and determine flow rate from table above.

5. Subtract the flow rate from the downstream sewer determined in 2 above from the flow rate from the previously blocked sewer determined in 4 above and multiply the result by the elapsed minutes from notification to clearance.

6. Report total amount spilled pursuant to SORP.
Manhole Overflows (Adapted from Guidance from GA EPD)

The following guidance can be used in estimating the rate of loss of flow out of manholes. As this is an estimate, judgment by the observing person and/or estimator must always be used. The following manhole SSO quantification methods are provided as guidance.

Estimating Spill Flow Rates For Overflowing Manholes

This is a visual estimating method. Please see the Reference Sheet on the following page.

Source: City of San Diego Metropolitan Wastewater Department.
City of San Diego
Metropolitan Wastewater Department

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

5 gpm

25 gpm

50 gpm

100 gpm

125 gpm

200 gpm

225 gpm

250 gpm

275 gpm

All photos were taken during a demonstration using metered water from a hydrant in cooperation with the City of San Diego's Water Department.
Volume of SSO at Manhole

Length x Width x Depth x 7.48 = gallons

Spill area = 20 feet by 30 feet = 600 sq. ft.

Depths of spill = 3 inches = 0.25 feet

Volume = 20 x 30 x 0.25 x 7.48 = 1,122 gallons

Wet Weather Overflow Calculation

The following can be used to help in estimating the rate of loss of flow out of manholes. As this is an estimate, judgment by the observing person and/or estimator must always be used.

All calculations are based on an estimate of the size of the opening involved, the velocity of flow through the opening, and the duration of time the overflow occurred. In most all occurrences, the opening size and velocity will change over an event from low to high back to low. Judgment on an average condition must thus be attempted to reach a realistic rate of loss.

Loss through vent holes

Size of opening:

Assume holes at 1-inch diameter

Area = (number of holes) (π) (D²/4) (1ft²/144)

Area = (number of holes) (3.14) (1/4) (1/144)

Area = (number of holes) (0.0055ft²/hole)

<table>
<thead>
<tr>
<th>TABLE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Velocity Plume Guide</td>
</tr>
<tr>
<td>Velocity through holes, based on Velocity Head = (Velocity/2g)</td>
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</table>

<table>
<thead>
<tr>
<th>Plume height</th>
<th>Velocity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-inch</td>
<td>2.0 ft/sec</td>
</tr>
<tr>
<td>2-inch</td>
<td>3.3 ft/sec</td>
</tr>
<tr>
<td>3-inch</td>
<td>4.0 ft/sec</td>
</tr>
<tr>
<td>4-inch</td>
<td>4.6 ft/sec</td>
</tr>
<tr>
<td>5-inch</td>
<td>5.2 ft/sec</td>
</tr>
<tr>
<td>6-inch</td>
<td>5.7 ft/sec</td>
</tr>
</tbody>
</table>

Time = convert to minutes

Volume (Gal.) = (Area) (Velocity) (Time) (448 gpm/cfs)

Example: Top with 6 holes, flow through holes makes a 1-inch high plume, last for 4 hours, 15 minutes.

Volume = (6 holes x 0.0055 ft²/hole) (2 ft/sec) (255 min) (448 gpm/cfs)

Volume = (0.033) (2) (255) (448) = 7540 gallons
Loss around edge of non-vented cover

Size of opening:

As the weight of manhole lid will generally hold it in place until internal pressures exceed 0.4 pounds/sq. in., loss occurs through imperfections, grit, etc. between the lid and manhole frame. Observations are generally a vertical ring of water from side gap between the lid and frame of approximately ¼ inch width.

\[
\text{Area} = (\pi) (D) (\frac{1}{4} \text{ inch}) (1/12 \text{ in/ft})
\]
\[
= (3.14) (2\text{ft}) (1/4) (1/12)
\]
\[
\text{Area} = 0.131 \text{ ft}^2
\]

Velocity through gap

(see vertical plume guide above, D.3.A.2.)

Time – convert to minutes

Example: Manhole with 4-inch plume around edge for 2 hours, 15 minutes.

\[
\text{Volume (Gal.)} = (\text{Area}) (\text{Velocity}) (\text{Time}) (448 \text{ gpm/cfs})
\]
\[
= (0.131 \text{ ft}^2) (4.6 \text{ ft/sec}) (135) (448)
\]
\[
= 36,445 \text{ gallons}
\]

Loss from tilted cover

Size of opening:

Some estimate has to be made in the field concerning how much gap exists in order to do this calculation. For the following amounts of lift of one side, the areas are as follows:

\[
A = (\pi) (D) \text{ (in of lift)} (1/12 \text{ ft/in}) (1/2)
\]
\[
A = (3.14) (2\text{ft}) \text{ (in. of lift)} (1/12) (1/2)
\]
\[
A = 0.262 \text{ (in. of lift)}
\]

<table>
<thead>
<tr>
<th>Lift (inches)</th>
<th>Area (ft²)</th>
</tr>
</thead>
<tbody>
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<td>3</td>
<td>0.786</td>
</tr>
<tr>
<td>4</td>
<td>1.048</td>
</tr>
</tbody>
</table>

Velocity through opening

This must be estimated from visual observation. A low rate would be 2 ft/sec, moderate rate at 4 to 5 ft/sec, high rates up to 7 ft/sec. Over 7 ft/sec, the lid will probably blow off the manhole. The gap (lift) will generally increase with higher velocity as well.

Time – convert to minutes

\[
\text{Volume (Gal.)} = (\text{Area}) (\text{Velocity}) (\text{Time}) (448 \text{ gpm/cfs})
\]
**Example:** Field observation of 2-inch gap and velocity of 4 ft/sec for a period of 3 hours, 30 minutes.

\[
\text{Volume (Gal.)} = (0.524 \text{ ft}^2) (4 \text{ft/sec}) (210 \text{min}) (448)
\]
\[
= 197,192 \text{ gallons}
\]

**Loss from Manhole without a lid in place**

If no cover exists, an estimate of the average height the water column (plume) extends above the top of the manhole frame must be made. Use the height to velocity estimate from (A) above to estimate the velocity. Be sure to adjust the height estimate downward for the effects of debris around the edge of the rim, which will cause the height to be incorrectly high.

\[
\text{Area} = \pi (D^2/4) = (3.14) (2^2/4) = 3.14 \text{ ft}^2
\]

Velocity – from field observation of water column height

Time - convert to minutes

\[
\text{Volume (Gal.)} = \text{Area} \times \text{Velocity} \times \text{Time} \times 448 \text{ gpm/cfs}
\]

**Example:** A manhole without a lid was observed to have an overflow with a 3-inch high column of water for a period of 6 hours, 10 minutes

\[
\text{Volume (Gal.)} = (3.14) (4.0 \text{ ft/sec}) (370) (448)
\]
\[
\text{Volume} = 2,081,946 \text{ gallons}
\]

**Other**

Generally approach of estimating a cross sectional area where the flow is leaving and a velocity of flow can be used to determine a rate. This can be applied to any situation.

Several observations over an event to estimate the area and velocity are better than a single observation. The overflow examples above assume a constant rate over the period which will estimate volumes too high. As an example, if an hour at the beginning and end of each event is assumed for the flow to build up from zero to maximum and back to zero, a calculation could be done as follows:

**Example:** A manhole with a cover tilted open 2 inches with an estimated velocity of 4 ft/sec at its worst rate of loss for two hours and about 1-inch tilt with a velocity of 2 ft/sec observed at two other occasion over a 7-hour total event.

Worst case: 2 hours, 2 inch tilt, 4 ft/sec  
Other times: 1 inch tilt, 2 ft/sec, time unknown  
Total overflow time: 7 hours

Divide total of 7 hours into several periods

1st hour: Start to 1-inch tilt, 2 ft/sec  
Volume (Gal.) = Area \times Velocity \times Time \times 50%  
= (0.262) (2) (60) (448) (0.50)  
= 7,043 gallons  
7th hour: 1-inch tilt, 2 ft/sec down to end
Same as above situation:

Volume = 7,043 gallons
5 remaining hours:
2 hours at 2-inch tilt, 4 ft/sec
3 hours at 1-inch tilt, 2 ft. sec
Volume = (0.524) (4 ft/sec) (120 min) (448)
= 112,681 gallons
Volume = (0.262) (2 ft/sec) (180 min) (448)
= 42,255 gallons

Event Total = 7,043 + 7,043 + 112,681 + 42,255 = 169,022 gallons

END OF SPILL/SSO VOLUME CALCULATION GUIDELINE PROCEDURE
SSO Flow Estimation Methods

A variety of approaches exist for the estimation of the volume of a sanitary sewer overflow. This appendix documents four methods that are most often employed. Other methods are also possible. The person preparing the estimate shall use the method most appropriate to the SSO in question using their judgment. In any event, every effort shall be made to make the best possible estimate of the volume.

Method 1 Measured Volume

The volume of some small spills can be estimated using this method if it is not raining. In addition, the shape, dimensions, and depth of the spilled wastewater are needed. The shape and dimensions are used to calculate the area of the spills and the depth is used to calculate the volume.

Step 1 Sketch the shape of the contained sewage

Step 2 Measure or pace off the dimensions.

Step 3 Measure the depth in several locations

Step 4 Calculate an average depth for the entire area by adding all measured depths together and dividing by the number of measurements taken.

Step 5 Convert the dimensions, including depth to feet.

Step 6 Calculate the area using the following formulas:

- Rectangle Area = length x width
- Circle Area = diameter x diameter x 0.785
- Triangle Area = base x height x 0.5 (for a gutter see figure below)

![Diagram of SSO Flow Estimation Method](image-url)

Volume (gal) = length x width x depth x 3.74
Step 7 Multiply the area times the depth

Step 8 Multiply the volume by 7.5 to convert it from cubic feet to gallons

**Method 2 Duration and Flow Rate**

Calculating the volume of spills where it is difficult or impossible to measure the area and depth requires a different approach. In this method separate estimates are made of the duration of the spill and the flow rate. The methods of estimating duration and flow rate are:

Duration: The duration is the elapsed time from the start time to the time the spill stopped.

- **Start time** is sometimes difficult to establish. Here are two approaches:
  - For very large overflows, changes in flow on a downstream flow meter can be used to establish the start time. Typically the daily flow peaks are "cut off" or flattened by the loss of flow. This can be identified by comparing hourly flow data.
  - Conditions at the spill site change with time. Initially there will be limited deposits of grease and toilet paper. After a few days to a week, the grease forms a light colored residue. After a few weeks to a month the grease turns dark. In both cases the quantity of toilet paper and other materials of sewage origin increase in amount. These changes with time can be used to estimate the start time in the absence of other information.

- Sometimes it is simply not possible to estimate the start time.

- **End time** is usually much easier to establish. 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.

Flow Rate: The flow rate is the average flow left in the sewer system during the time the spill stopped. There are three ways to estimate the flow rate:

- **Open Channel Flow:** Often overflows run into nearby ditches, channels, gutters etc. Flow can be quantified by measuring the cross-sectional area and velocity of the flow. Measure the depth of water and dimensions the channel. Then measure the velocity by dropping a tennis ball or other floating object and measuring the time it takes to travel a set distance. The resulting velocity measurement will be in feet per second. Several measurements should be taken during the duration of the overflow as conditions are likely change. Calculate the formula using the following formula:

  \[
  \text{Flow (Q), ft}^3/\text{sec} = \text{Velocity (V), ft/sec} \times \text{Area (A), ft}^2
  \]

- **Pump Stations:** Stormwater and sewer pump stations often have flow or pump run time data available through a SCADA system. Pump curves may need to be obtained to determine the flow rates. The flow rates can be used to determine flow volumes.

- **SSO Flow Estimation Pictures:** Pictures presented in this appendix show the sewage flowing from a manhole cover for a variety of flow rates. The observations of the field crew are used to select the approximate flow rate from the chart.
Flow meter: Changes in flows in the downstream flow meters can be used to estimate the flow rate during the spill (better for large SSOs),

Estimate based on up-stream connections: Once the location of the spill is known, the number of upstream connections can be determined from the field books. Multiply the number of connection by 200 to 250 gallons per day per connection or 8-10 gallons per hour per connection, or other flow rates that are consistent with an agency's data for its connections.

The volume of small spills can be estimated by visualizing the amount of water in a bucket or a barrel. A bucket contains 5 gallons and a barrel contains 50 gallons. Observe the spill area and then estimate the total volume. If the spill is larger than 50 gallons, try to break the standing water into barrels and then multiply by 50 gallons.

Once duration and flow rate have been estimated, the volume of the spill is the product of the duration in hours or days times the flow rate in gallons per hour or gallons per day.
# SSO Flow Estimation Chart

## TABLE 1

### ESTIMATED SSO FLOW OUT OF MH WITH COVER IN PLACE

<table>
<thead>
<tr>
<th>Height of spout above M/H rim H in inches</th>
<th>24&quot; COVER</th>
<th>36&quot; COVER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S S O FLOW Q</td>
<td>Min. Sewer size in which these flows are possible</td>
</tr>
<tr>
<td>1/4</td>
<td>1 0.001</td>
<td>1/4 1 0.002</td>
</tr>
<tr>
<td>1/2</td>
<td>3 0.004</td>
<td>1/2 4 0.006</td>
</tr>
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<td>3/4</td>
<td>6 0.008</td>
<td>3/4 8 0.012</td>
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<tr>
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</tr>
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<td>16 0.024</td>
<td>1 1/2 24 0.035</td>
</tr>
<tr>
<td>1 3/4</td>
<td>21 0.030</td>
<td>1 3/4 31 0.044</td>
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<tr>
<td>2</td>
<td>25 0.037</td>
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<td>2 1/2 55 0.079</td>
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<td>45 0.065</td>
<td>2 3/4 66 0.095</td>
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<td>54 0.077</td>
<td>3 78 0.113</td>
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<td>146 0.214</td>
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<td>224 0.322</td>
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<td>7 483 0.696</td>
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<tr>
<td>9</td>
<td>529 0.761</td>
<td>9 773 1.113</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. Other Agencies may want to develop their own estimating tables.
The formula used to develop Table 1 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 1, these conditions would yield an SSO of 185 gallons per minute.

---

FLOW OUT OF MH WITH COVER IN PLACE

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 2
ESTIMATED SSO FLOW OUT OF MH WITH COVER REMOVED

#### 24" FRAME

<table>
<thead>
<tr>
<th>Water Height above M/H frame H in inches</th>
<th>S S O FLOW Q in gpm</th>
<th>Min. Sewer size in which these flows are possible</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>28</td>
<td>0.04</td>
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<td>1/4</td>
<td>62</td>
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</tr>
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<tr>
<td>5/8</td>
<td>215</td>
<td>0.31 6&quot;</td>
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#### 36" FRAME

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<th>Water Height above M/H frame H in inches</th>
<th>S S O FLOW Q in gpm</th>
<th>Min. Sewer size in which these flows are possible</th>
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<td>5,000</td>
<td>7.2 24&quot;</td>
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<tr>
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<td>5,556</td>
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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. Other Agencies may want to develop their own estimating tables.
The formula used to develop Table 2 for estimating SSO's out of maintenance holes without covers is based on discharge over curved weir — bell mouth spillways for 2” to 12” diameter pipes. The formula was 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.

FLOW OUT OF MH WITH COVER REMOVED (TABLE 2)

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 3
ESTIMATED SSO FLOW OUT OF MH PICK HOLE

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<th>SSO FLOW Q in gpm</th>
<th>Height of spout above M/H cover H in inches</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. Other Agencies may want to develop their own estimating tables.
The formula used to develop Table 3 is $Q = CcVA$, where $Q$ is equal to the quantity of the flow in gallons per minute, $Cc$ 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.\(^2\) 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 3)**

![Diagram of flow out of vent or pick hole]

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.

\(^2\) 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.
SSO Flow Estimation Pictures

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

County of Sacramento

SRCSD
SSO Response Plan for the Interceptor System
APPENDIX F

JOHNSON COUNTY KANSAS PROCEDURE FOR ISSUING HEALTH ADVISORIES ASSOCIATED WITH WASTEWATER RELEASES
Johnson County Kansas
Procedure for Issuing Health Advisories
Associated With Wastewater Releases

BACKGROUND

Johnson County Wastewater (JCW) operates over 2,200 miles of sanitary sewer lines in its service area. Some of these lines are more than 50 years old. There are also 31 pump stations associated with the collection system transport of wastewater to treatment facilities. JCW operates its collection system, pump stations, and treatment facilities in accordance with conditions in operating permits issued by the Kansas Department of Health and Environment (KDHE) in accordance with the federal Clean Water Act. While these systems function as intended most of the time, there are occasions when untreated wastewater is released to the environment. These releases may be caused by pump failure, line breakage, or line blockage from tree roots, grease or debris buildup, or vandalism. The release of untreated wastewater to the environment can cause environmental damage and increase the threat of transmission of water borne diseases.

With many of JCW’s facilities in heavily populated areas and with the recent increase in construction of streamway parks for recreation, there is a risk of human contact with surface water that has been contaminated by a release of untreated wastewater. Recognizing this, KDHE has indicated that health advisories should be issued after certain untreated wastewater releases. When a release of untreated wastewater occurs, there are environmental and health concerns which may arise. To address these concerns, JCW, KDHE, Johnson County Department of Health and Environment (JCDHE) representatives met to determine under what conditions a health advisory should be issued. The group concluded that when a dry weather release of untreated wastewater enters surface water where public access is likely, a health advisory should be issued.

PURPOSE

This document is developed to:

1. Define the procedure for determining when a health advisory is appropriate.
2. Identify who will make that determination.
3. Identify who should be notified that a health advisory will be issued and kept informed of efforts to mitigate the effects of the release.
4. Define the procedures for monitoring the situation.
5. Identify the conditions under which a health advisory can be lifted.

The following section describes the procedures for responding to a release of untreated wastewater from the JCW system.
PROCEDURES

Determining Whether Health Advisory Is Warranted

Any report of a discharge of untreated wastewater should be immediately reported to JCW collection system personnel at 913-715-8600, any time, day or night. During regular business hours dial "0" for the operator, who will handle the call and dispatch a crew to investigate the report. During non-business hours the answering service personnel will notify the JCW on-call personnel to initiate the investigation.

JCW personnel will notify the JCW Director of Operations and Maintenance (O&M Director) when they confirm a release of untreated wastewater from its system. The O&M Director will then notify representatives from KDHE that a non permitted discharge of wastewater has occurred. If the discharge has reached surface waters the O&M Director will notify the JCDHE Director and Deputy Director and JCDHE Health Education Division Director/Public Information Officer in addition to the KDHE representative. These four people will form the core group for the purpose of determining whether a health advisory should be issued.

Two additional groups are identified in these procedures. The water sampling and analysis group is made up of JCW Laboratory employees who will collect and analyze water samples to determine the extent of contamination. The extended contact group consists of other Johnson County personnel who could be expected to receive inquiries regarding a wastewater release and/or health advisory. Contact information for the core group, the water sampling & analysis group and the extended group is included at the back of these procedures. The O&M Director will notify the water sampling & analysis and extended groups that a release has occurred resulting in raw wastewater entering surface water.

If a local raw water intake for a drinking water supply is located downstream of the release, the O&M Director will notify the water supplier directly. The O&M Director will also coordinate with the JCW Laboratory Division Director to determine appropriate sampling locations and to collect appropriate samples to assess the degree and extent of impact the release has on the receiving stream.

The core group will consider factors such as degree and extent of contamination, location of contaminated water with respect to probable public contact and other factors in determining whether a health advisory is warranted.

Communication

The primary means of communication between the three groups during regular business hours will be by email. The core group will determine if conditions warrant immediate notification of the water sampling & analysis and extended groups. If immediate notification of others is warranted, alternate contact information (home phone, cellular phone, pager) listed on the attached contact sheet will be used.
Issuing the Health Advisory

When the core group has determined that a health advisory is warranted, the JCW Public Information Officer (PIO) or a designee will distribute the pertinent information about the release in the form of a draft advisory to the core group for review and comment. JCDHE shall be responsible for final approval and officially issuing the health advisory. The health advisory will contain the following information:

- Date of release
- Time of release, including duration
- Volume of release
- Date of advisory
- Address of release
- Nature of hazard
- Cause of release
- Impacted area description; addresses, major streets, landmarks
- Recommended action; what to do or not to do
- Who is issuing the advisory; JCDHE in collaboration with JCW
- Contact names and numbers for additional information; JCW O&M Director and JCW PIO, or designees
- JCW web site and public information line telephone number

When the final health advisory is approved and issued by JCDHE, the JCW PIO will transmit the advisory to:

- Their normal media release list
- Officials of the city(ies) where the release occurred or where the advisory will be in effect
- The core, water sampling & analysis, and extended groups

In the event the health advisory is issued during non-business hours, the JCW PIO will use emergency contacts at the affected city(ies) and the core group will notify the water sampling & analysis and extended groups by phone if they determine immediate notification is necessary.

In some cases it may also be necessary to directly contact other entities or organizations that are involved in outdoor activities near the affected waterway, such as parks and recreation groups or golf courses. The JCW O&M Director and PIO will determine whether any additional public notification is necessary by means of door hangars in the immediate area of the release, email, and/or facsimile.

The official contacts for information regarding any JCW related health advisories will be the JCW O&M Director and JCW PIO. All requests for information regarding the health advisory, why it was issued and the ongoing status of the advisory should be referred to one of them for response. Requests for information specific to environmental or health issues will be referred to JCDHE.
Monitoring the Situation

JCW personnel will collect and analyze water samples for bacterial counts, ammonia and dissolved oxygen as a minimum. Analytical results from initial samples will provide information about the degree and extent of stream contamination. Subsequent samples will indicate the change in degree and extent of contamination. The core group will use information from these samples to modify or lift the advisory. While bacterial counts in the receiving stream will be of primary concern, other parameters that may be of value in determining the degree of water contamination include ammonia, temperature, pH, and dissolved oxygen. Standard sample locations will include a site upstream and unaffected by the release, a site at the point of release and one or more sites downstream. The sample locations may change with time and will be determined by previous sample results. KDHE may elect to conduct their own sampling or to split samples with JCW for confirmation of analytical results.

As sample results are verified, the JCW Laboratory Director, or his designee, will forward them to the JCW O&M Director. After evaluating these results, the JCW O&M Director will forward the results, along with any recommended actions, to all people in the core, water sampling & analysis, and extended groups for feedback. The core group will determine the appropriate actions based on the sample results and other factors associated with the release.

Lifting the Health Advisory

The core group will determine when the health advisory should be lifted. This will generally occur when the stream bacterial counts at the release site and at downstream sites are essentially the same as the bacterial counts at the upstream site that is unaffected by the release. In some situations factors other than bacterial counts may influence the decision as to whether to lift the advisory. JCDHE will make the final determination on whether the health advisory should be lifted, taking into consideration any concerns KDHE may have.

JCDHE will officially lift the advisory. The JCW PIO will transmit the notice lifting the health advisory to their normal media release list and officials of the city(ies) where the release occurred or where the advisory was in effect as well as those people in the core, water sampling & analysis, and extended groups.
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<td>1</td>
<td>Kurt Winters</td>
<td>JCD</td>
<td>JCD</td>
<td>913.715.8608</td>
<td>913.220.6785</td>
<td><a href="mailto:kurt.winters@jcow.org">kurt.winters@jcow.org</a></td>
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<tr>
<td>2</td>
<td>Darrell Thornburgh</td>
<td>JCD</td>
<td>JCD</td>
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<td>913.207.2302</td>
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<td>913.461.3355</td>
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<tr>
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<td>JCD</td>
<td>JCD</td>
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<td>Barbara Mitchell</td>
<td>JCD</td>
<td>JCD</td>
<td>913.477.8364</td>
<td>913.649.9572</td>
<td><a href="mailto:barbara.mitchell@jcow.org">barbara.mitchell@jcow.org</a></td>
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<tr>
<td>7</td>
<td>Nancy Tausz</td>
<td>JCD</td>
<td>JCD</td>
<td>913.826.1222</td>
<td>913.645.3912</td>
<td><a href="mailto:nancy.tausz@jcow.org">nancy.tausz@jcow.org</a></td>
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<td>Julie Coleman</td>
<td>KOHE</td>
<td>KOHE</td>
<td>785.840.6203</td>
<td>785.840.6209</td>
<td><a href="mailto:julie.coleman@jcow.org">julie.coleman@jcow.org</a></td>
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<tr>
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<td>KOHE</td>
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<tr>
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**WATER SAMPLING AND ANALYSIS**

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<td>1</td>
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<td>JCD</td>
<td>JCD</td>
<td>913.715.6951</td>
<td>913.238.6891</td>
<td><a href="mailto:tony.holt@jcow.org">tony.holt@jcow.org</a></td>
</tr>
<tr>
<td>2</td>
<td>Pedro Calderon</td>
<td>JCD</td>
<td>JCD</td>
<td>913.205.8700</td>
<td>913.238.6899</td>
<td><a href="mailto:pedro.calderon@jcow.org">pedro.calderon@jcow.org</a></td>
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<tr>
<td>3</td>
<td>Sam Sedarsous</td>
<td>KOHE</td>
<td>KOHE</td>
<td>913.649.4048</td>
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<td><a href="mailto:sam.sedarsous@jcow.org">sam.sedarsous@jcow.org</a></td>
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**EXTENDED GROUP**

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<td>Cathy Sherwell</td>
<td>JCD</td>
<td>JCD</td>
<td>913.826.1208</td>
<td>913.961.8044</td>
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<td>Karen Harrington</td>
<td>JCD</td>
<td>JCD</td>
<td>913.715.8802</td>
<td>913.709.8151</td>
<td><a href="mailto:karen.harrington@jcow.org">karen.harrington@jcow.org</a></td>
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<td>JCD</td>
<td>913.715.8802</td>
<td>913.709.8151</td>
<td><a href="mailto:lori.sand@jcow.org">lori.sand@jcow.org</a></td>
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<tr>
<td>4</td>
<td>Penny Postak Ferguson</td>
<td>CMO</td>
<td>CMO</td>
<td>913.715.0733</td>
<td>913.742.2744</td>
<td><a href="mailto:penny.postak@jcow.org">penny.postak@jcow.org</a></td>
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<td>5</td>
<td>Maury Thompson</td>
<td>JCD</td>
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<td>913.238.6899</td>
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<td><a href="mailto:maury.thompson@jcow.org">maury.thompson@jcow.org</a></td>
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<td>john.o'<a href="mailto:neill@jcow.org">neill@jcow.org</a></td>
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<td>JCD</td>
<td>913.977.3441</td>
<td>913.895.5500</td>
<td><a href="mailto:susan.pelser@jcow.org">susan.pelser@jcow.org</a></td>
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<tr>
<td>8</td>
<td>WatersOne</td>
<td>JCD</td>
<td>JCD</td>
<td>913.438.7775</td>
<td>913.895.5500</td>
<td><a href="mailto:watersone@jcow.org">watersone@jcow.org</a></td>
</tr>
</tbody>
</table>

Updated: 5/14/2013
APPENDIX G   DRINKING WATER PROVIDERS CONTACT LIST

WaterOne
Customer Service
913.895.1800

City of Olathe, KS
Customer Service
913.971.5151

Unified Government of Wyandotte County, KS
Customer Service
913.573.5311

City of Kansas City, MO
Customer Service
816.513.1313

City of Gardner, KS
City Hall
913.856.7535
APPENDIX H       KDHE WASTEWATER INCIDENT REPORT FORM

Wastewater Incident Report Form:

Incident Definitions:
KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
WASTEWATER INCIDENT REPORT FORM

Definitions are available at http://www.kdheks.gov/water/tech.html

Collection In-Plant In-Plant
System Bypass Diversion Upset Flow Through Spill

1. FACILITY NAME: ___________________________ Kansas Permit # ________

2. Within 24 hours of discovery, notify the KDHE Central Office (email – cseeds@kdheks.gov), (fax 785.296.0086), (telephone 785.296.5517) or your local KDHE district office. Written notification is required within 5 days of discovery. If the incident is not corrected within 5 days, send a written notification to KDHE indicating the status. This form is to be sent to KDHE when the incident ends.

KDHE Person Contacted: ___________________________ Date: ____________ Time: ____________

3. Date Incident Discovered: ___________________________ Time: ____________

4. Date Incident Ended: ___________________________ Time: ____________

5. Total estimated gallons bypassed, spilled, or routed through failed equipment for all locations on this form: ___________________________

6. If rainfall induced event, approximate inches of rainfall ___________________________
   If multiple locations listed below due to rain event, check here ☐

7. Incident Location: (check all that apply)
   ☐ Plant ☐ Lift/Pump Station ☐ City Collection Line (Line Break / Joint)
   ☐ Peak Flow Basin ☐ Private Sewer Line ☐ Basement
   ☐ Manhole(s) ☐ Other (specify below)

Identify All Incident Locations by Name, Street Address or Manhole Number as appropriate.

8. Cause of Incident:
   ☐ Intentional Bypass for Repair/Construction ☐ Equipment Failure
   ☐ Excessive Rainfall, Snow Melt ☐ Control System Failure
   ☐ Unplanned Construction Related Break ☐ Power Related Failure
   ☐ City Line Break (Not Construction Related) ☐ Operations Related Failure
   ☐ City Line Blockage ☐ Maintenance Related Failure
   ☐ Private Line Break ☐ Vandalism
   ☐ Private Line Blockage ☐ Other
   ☐ Lagocn High Level

Additional explanation of reason for Incident: (use additional page if necessary)

9. Corrective Action, if any: (use additional page if necessary)

__________________________________________________________

Name: ___________________________ Date: ____________

Title: ___________________________ Phone ____________

When Completed, E-mail to: cseeds@kdheks.gov
Kansas Department of Health & Environment – Attn: Chris Seeds
Or Mail to: 1000 SW Jackson St., Suite 420, Topeka, KS 66612-1367
Fax 785.296.0086

REV 20120906
## Incident Definitions

"Incident" means bypasses in the collection system, in-plant diversions, in-plant flow through occurrences, upsets, and spills.

<table>
<thead>
<tr>
<th>Bypass</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-Plant Diversion</td>
<td>Routed the wastewater around any treatment unit in the treatment facility through which it would normally flow under the operating conditions at the facility at the time of the re-routing.</td>
</tr>
<tr>
<td>In-Plant Flow Through</td>
<td>An incident in which the wastewater continues to be routed through the plant equipment even through full treatment is not being accomplished because of equipment failure for any reason.</td>
</tr>
<tr>
<td>Spill</td>
<td>Any discharge of wastewater, sludge or other materials from the treatment facility other than effluent or any incident not more specifically described by other &quot;Incidents&quot; terms.</td>
</tr>
<tr>
<td>Upset</td>
<td>An exceptional incident in which there is unintentional and temporary noncompliance or anticipated noncompliance with permit effluent limits because of factors beyond the reasonable control of the permittee.</td>
</tr>
</tbody>
</table>

### Causes of Wastewater Bypass – Definitions

<table>
<thead>
<tr>
<th>Bypass for Repair/Construction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall</td>
<td>Excessive rainfall, snowmelt, etc.</td>
</tr>
<tr>
<td>Construction Related Failure</td>
<td>Unplanned bypass related to damage from construction activities</td>
</tr>
<tr>
<td>City Line Failure</td>
<td>Line failure not caused by construction activities</td>
</tr>
<tr>
<td>Private Line Failure</td>
<td>Private sewer line failure for any reason</td>
</tr>
<tr>
<td>City Line Blockage</td>
<td>Blockage in the city line causing a wastewater discharge</td>
</tr>
<tr>
<td>Private Line Blockage</td>
<td>Blockage in the private line causing a discharge from the private line</td>
</tr>
<tr>
<td>Equipment Failure</td>
<td>Equipment breakdown</td>
</tr>
<tr>
<td>Control System Failure</td>
<td>Control system failed to start equipment or indicate an alarm</td>
</tr>
<tr>
<td>Power Related Failure</td>
<td>Loss of power to equipment including control/alarm system</td>
</tr>
<tr>
<td>Maintenance Related Bypass</td>
<td>Failure to provide timely or proper maintenance</td>
</tr>
<tr>
<td>Vandalism</td>
<td>Intentional equipment damage/adding illicit materials to collection system leading to a bypass</td>
</tr>
<tr>
<td>Lagoon High Level</td>
<td>Overtopping the lagoon and/or backing wastewater up into the system due to high water level in the lagoon</td>
</tr>
<tr>
<td>Operations Related Bypass</td>
<td>Failure to provide timely and proper operations control - such as respond to alarms, failure to power up equipment, restrict controllable inflows, etc.</td>
</tr>
<tr>
<td>Spill</td>
<td>Spillage of waste, usually not directly from the system - such as during loading or hauling/disposing of wastewater or sludge</td>
</tr>
</tbody>
</table>
APPENDIX I  BACKUP PREVENTION PROGRAM (BUPP) FLYER

Flyer:
http://www.jcw.org/engbupp.htm

Questionnaire:
http://bupp.jocogov.org
A continuing partnership to help protect properties from sanitary sewer backups.

Owning your own home is a satisfying experience, and sometimes a challenge — especially when it comes to protecting the things you value. In the past, Johnson County homeowners have faced the frustrating challenge of basement flooding during extremely heavy rains. JCW wants to help you better protect your home during these rains by offering a Backup Prevention Program (BUPP).

BUPP provides funding to reduce the risk of sanitary sewer backups.

Why am I having sewer backups during heavy rains?

Johnson County's targeted level of service is to provide a 10-year storm level of protection in the sanitary sewer system. Periodically, our region experiences intense storm events larger than a 10-year storm. JCW has developed the Backup Prevention Program (BUPP) to reduce the number of sanitary sewer backups that may occur during these large rain events.

How will BUPP help?

BUPP provides funding to eligible homeowners in order to install a backup prevention device or make plumbing modifications on your property. There are many options available under this program. A contractor and JCW will work with you to determine the option that offers the best solution for your property. This program is intended to help protect your home from future backups during heavy rains. However, a backup device or these plumbing modifications will not resolve basement water problems caused by cracks in walls, floors, window well leakage and surface water flooding.

Who is eligible for BUPP?

To be eligible for the program, your home must have experienced a confirmed sanitary sewer basement backup as a result of an intense rain event. The backup must have been the direct result of capacity problems in the sanitary sewer system. JCW will be responsible for confirming whether you are a qualified homeowner and will determine eligibility by the following steps:

- Determine if your property is located in a flood-prone area.
- Review sanitary sewer backup questionnaire submitted by you.
- Determine if your neighbors are experiencing sewer backups.
- Check JCW's line cleaning and televised line history.
- Conduct on-site visits with you to determine the cause of flooding.

JCW serves most cities in Johnson County. Only residents served by JCW are eligible for BUPP assistance.

Responsibility and Liability

All work performed under the Backup Prevention Program will be warranted by the contractor for a period not less than one year following the date of installation. Any maintenance, repair or replacement of the backup prevention valve or any modifications of the plumbing shall be the responsibility of the property owner following the one year warranty period. Routine cleaning of the backup prevention valve will be the responsibility of the property owner from the date of installation.

Also, JCW shall not be responsible for any malfunction of the valve or plumbing modification which results in a sanitary sewer backup. Prior to the beginning of any work, an agreement must be signed by the property owner and returned to JCW. Following completion of work, the property owner must sign a release form and return it to JCW. No payment will be made to the property owner or the contractor until both forms have been submitted. JCW shall provide a copy of the release form to the property owner prior to the completion of any work. Any property owner refusing to sign an agreement or release will not be eligible for funding under JCW's Backup Prevention Program.

The BUPP funding covers only new devices and installations. Maintenance, repair, and replacement costs associated with the BUPP device are the responsibility of the property owner.
What steps will take place?

Step 1
Complete the BUPP questionnaire from JCW. All property owners who reported a sewer backup to JCW need to also request that a questionnaire be mailed to them. Or, complete the form online at www.jcw.org.

Step 2
JCW reviews each questionnaire and evaluates each property to determine whether basement flooding was the direct result of a sewer backup. You will receive a letter from JCW detailing your eligibility status. Participation in BUPP is voluntary.

If you do not qualify, you may write to JCW to discuss our decision in greater detail.

Step 3
If you are eligible for the program, you will receive an information packet:
- Details on BUPP procedures
- An agreement that must be signed before any work is begun by the contractor
- A copy of the release you will sign after the contractor completes the specified work on your property.

JCW has compiled a list of contractors. You will have opportunity to indicate, in writing, which contractor you prefer.

Step 4
After receiving the information packet, you will obtain two estimates for work to be performed on your property. Mail copies of the estimates, along with the signed agreement that will authorize the work. At this time, you may elect not to participate in the program, and you should indicate this on the bottom portion of the agreement.

Step 5
JCW will review estimates. For your protection, additional estimates may be required. JCW will notify you of the approved estimate.

Step 6
Schedule the work to be done on your property. Once the work is completed, notify JCW to schedule an inspection. JCW’s inspector will verify that the work outlined in the estimate was completed.

The contractor is responsible for all permits and city inspections.

Step 7
After JCW has confirmed installation, please sign and return the release form enclosed in your packet. Once this has been completed, JCW will make payment to you (we will need verification of your payment to the contractor) or to the contractor. You will be responsible for any additional costs not outlined in the estimates you submit.

What are the options available?
A contractor must inspect and determine the best solution to protect your property from future sewer backups. Since the plumbing system in each home is unique, the contractor must determine the best way to protect your property. This may include a combination of options recommended by JCW and the contractor.

Options under BUPP
Backup Prevention Valve
A contractor may recommend installation of a backup prevention valve on the sanitary sewer service line just before it exits your house. This will require that a small portion of the basement floor be removed and the service line exposed for installation of the valve. Due to the regular maintenance required by the valve, JCW recommends that the valve be installed in a location which is easily accessible on a regular basis.

Sump Pump
A contractor may recommend a sump pump when floor drains and laundry drains are the only basement plumbing fixtures. Sump pumps may be installed as an alternate to a backup prevention valve. If you have a sump pump system, a contractor may recommend it be used and should specify in the estimate if the existing pump should be replaced. JCW is available to meet with you and your contractor to discuss all options in deciding the best possible solution for your property.

Contractor Qualifications
JCW will provide a list of contractors for your convenience only. Contractors placed on the list will have confirmed interest in this program and have been to an informational meeting on BUPP.

Property owners are not obligated to employ a contractor on the list and have the right to obtain a bid from any contractor. Contractors performing work under this program shall maintain commercial general liability, including complete Operations coverage with a minimum limit of $500,000 combined single limit, property damage, and bodily injury liability, and Workers Compensation coverage, if required by the State of Kansas or Missouri, depending on the place of business. Missouri contractors who maintain Workers Compensation coverage shall have an "All States" endorsement included on their coverage.

JCW does not endorse or recommend contractors for the purpose of installing backup prevention devices or the installation of sump pump systems. Any contractor that generates numerous complaints from property owners or neglects to perform quality workmanship shall be removed from the list at the discretion of JCW.

In cases where there is an existing foundation drain sump pit or an outside drain, the drain will be disconnected from the sanitary sewer and a sump pump or gravity system will be installed.
REPORT LOG OF EXPOSED SIGNIFICANT MATERIAL (KDHE General Permit Section 2.4.2)

Worksheet #4
Completed by:________________________________________
Title:__________________________________________________
Date:___________________________________________________

Instructions: If significant materials are exposed, a report of this exposure must be logged here. Included in the report should be a description of what happened, a documentation of cleanup, procedures used for cleanup, and steps taken to minimize risk for future exposures. Attach a copy or original report behind this form.

<table>
<thead>
<tr>
<th>Date(s) of Exposure</th>
<th>Material Type and Quantity Exposed (Units)</th>
<th>Location (as indicated on the site map)</th>
<th>Corrective Measures (spill kit, oil dry, material moved, soil stabilization, etc.)</th>
<th>Date Corrective Measures Completed</th>
<th>Completed By</th>
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</tbody>
</table>
**NON-STORM WATER DISCHARGE ASSESSMENT**

<table>
<thead>
<tr>
<th>Date of Discharge</th>
<th>Outfall(s) Directly Affected</th>
<th>Identify Potential Discharge Source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

Worksheet #5  
Completed by:  
Title:  
Date:  

Is the discharge Authorized? (see See Section IV (G), page 19 for list of Authorized Discharges)

- If Yes, no further action is required.
- If No, an Unauthorized Non-Storm Water Discharge report is required to be completed and submitted to KDHE within 5 days. The report should include date of discharge, which outfall(s) is affected, source of the discharge, description of the discharge, and amount of material discharged (estimate if possible). The completed and submitted reports should be kept with this SWPPP.
LPS Power Outage Protocol

1. Haynes equipment will have an internal training once a year in September for their technicians on how to pump down the units as well the timeframe for their response. Each new employee will be trained immediately after they start on these procedures. Haynes will be instructed to inform JCW via emergency hotline number (715-8600) immediately if they are unable to respond within a two hour time frame to the outage. Before Thanksgiving and Christmas JCW will check with Haynes to determine who is on call over the holidays and have the cell phone number of that technician.

2. JCW will have a training meeting with O&M staff every year on how to pump down the units as well as defining the calling tree to determine who will respond. Keys for the control panel will be given to O&M as well.

3. JCW will respond to a power outage only when one of the following occurs.
   a. Haynes is unable to respond.
   b. The affected area is very large and cannot be covered in a timely fashion by Haynes.
   c. A large number of grinder pumps are down for an extended period of time.

4. If JCW’s O&M emergency hotline is called with a grinder pump outage issue, an immediate phone call should be made to the following people if the person listed first can’t be reached then try the next person and so forth.

   Shannon Mathes  office (913) 715-8556  cell (913) 207-3378  home (913) 744-1261
   Gordon Rames  office (913) 715-8532  cell (913) 522-9119  home (913) 768-8143
   Troy Young  office (913) 715-8542  cell (913) 207-5233  home (913) 687-3690

   If one of the above persons cannot be reached, the tech on call should immediately call the emergency maintenance number for Haynes Equipment Company. (913) 715-1777

   When the technician calls back, the status of the outage will be ascertained and appropriate measures will be taken.

5. The JCW response to the outage will be as follows:
   a. All field personnel will meet at the Nelson Plant.
   b. The generator will be loaded onto the 4 wheel utility vehicle (mule). (?)
   c. JCW will then proceed to the affected site and commence pumping units down. During an outage, the units must be pumped down twice within a 24 hour period.
   d. While units are being pumped down, communication must be continuous between JCW and Haynes.

LAST UPDATED 12/6/12