

# SANITARY SEWER COLLECTION SYSTEM CAPACITY, MANAGEMENT, OPERATION, AND MAINTENANCE (CMOM) PROGRAM

## CAPACITY

## MANAGEMENT



## OPERATION

## MAINTENANCE

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# **I. INTRODUCTION**

## **A. HISTORICAL BACKGROUND**

The Albemarle County Service Authority (ACSA) was created by a resolution of the Board of Supervisors (BOS) of Albemarle County, Virginia (the County) in April 1964. The ACSA was established and exists pursuant to the Virginia Water and Waste Authorities Act, Va. Code Section 15.2-5100, et seq. Va. Code Section 15.2-5102.A provides in relevant part that the “authority shall be a public body politic and corporate and a political subdivision of the Commonwealth.” The Authority is chartered by the State Corporation Commission and is an independent public body responsible for undertaking projects as may be specified for the distribution and sale of potable water to retail customers and for the collection of wastewater from retail customers and delivery of such wastewater to the Rivanna Water and Sewer Authority (RWSA). The management of the Authority is vested in a board of six members appointed by the County’s BOS.

## **B. ORGANIZATIONAL DESCRIPTION**

The ACSA is comprised of approximately 80 employees working within five different operating departments: Administration, Engineering, Finance, Information Technology, and Maintenance. (See Organizational Chart, Appendix A)

## **C. ACSA SANITARY SEWER COLLECTION SYSTEM**

The ACSA sanitary sewer collection system is comprised of approximately 316 miles of sewer mains and 10 wastewater pump stations.

- 1) The sewer mains consist of a variety of materials: asbestos-cement (AC), cast iron (CI), ductile iron (DI), polyvinyl chloride (PVC), reinforced concrete (RC), and vitrified clay (VC). Approximately 24 miles of sewer main have been relined using cured in place pipe (CIPP). About 50% of our sewer mains are less than 25 years old.
- 2) The manholes in our system are predominantly constructed of precast concrete, though there are a few that are made of brick. As the ACSA evaluates drainage basins for rehabilitation any brick manholes that are encountered are either rehabilitated or replaced with precast concrete structures.
- 3) All wastewater pump stations except for one (Madison Office Park) have an emergency standby generator powered by either propane or

diesel fuel. Every wastewater pump station except for one (Madison Office Park) has an emergency bypass connection to use with a portable pumping system in case of standby generator failure or catastrophic pump failure. Each wastewater pump station is connected to a Supervisory Control and Data Acquisition (SCADA) System that continually monitors the performance and status of each station to allow for a rapid response to any problems.

## II. MEASURES AND ACTIVITIES

### A. MAINTENANCE DEPARTMENT

The ACSA Maintenance Department is comprised of approximately 36 employees working on a variety of crews to manage, operate, and maintain our utility system. Of the 36 positions within the Maintenance Department, 13 are dedicated to the operation, maintenance, and repair of our sanitary sewer system. These employees are divided into the following crews:

- Two 2-man CCTV camera vans responsible for the methodical inspection of gravity sewer mains currently in service and the routine inspections of new assets prior to acceptance and at the one-year warranty anniversary date.
- An 8-man group that will split into two or three man crews that are responsible for all flushing, rodding, manhole cleaning, and adjustments of manhole frame and covers, plus other minor repairs.

1) The Maintenance Department currently has three locations that are used to store equipment and materials dedicated to the operation and maintenance of our sanitary sewer system:

- a) Operations Center (168 Spotnap Road): There are two buildings dedicated to the repair and storage of vehicles and equipment the ACSA uses to maintain our utility system. The main warehouse has four heated bays dedicated to our sewer operations. Three of these bays are used to store our two CCTV camera vans and a third bay is used to store the vacuum truck. The fourth bay is used to store the all-terrain vehicle, sewer plugs, some confined space equipment, etc. The sewer saddles and the couplings for repairing sewer mains are also stored in this location. The other structure is an unheated building with eight bays where we store our small dump trucks, asphalt roller, forklift, miscellaneous equipment, and lime for any sanitary sewer overflows (SSOs). The Maintenance Yard is a fenced area that has four concrete bins of various sizes. The two largest bins are used to store two types of gravel for backfilling when we have sewer main repairs. The other two bins are used to store clean dirt and spoils until the spoils can be disposed of properly. We also store a minimum number of trench shoring panels at this location.

- b) Crozet Maintenance Yard (4675 & 4677 Three Notch'd Road): The ACSA has a fenced in maintenance yard with two buildings that are strictly used for the storage of material and equipment. We store the bulk of our trench shoring panels at this location as well as our manhole frame and covers, riser rings for making grade adjustments, and all of our pipe to make repairs to sanitary sewer mains.
  - c) Northfields Water Pump Station (1900 Rolling Hill Road): This is a water pump station with ample storage space that provides the ACSA with an area to store our two sewer bypass pumps, plus the hoses and fittings necessary to put them in operation where needed.
- 2) Several large pieces of equipment and vehicles are dedicated to the task of operating, maintaining, and repairing our sanitary sewer system. A list of this equipment can be found in Appendix B.
  - 3) Several standard operating procedures (SOPs) have been developed by the Maintenance Department such as: Cleaning Gravity Sewers, Procedure for Rodding Sewer Mains, Procedure to Clear Wastewater Stoppage and Contain Manhole Overflow, Sewer Main Repair, Manhole Inspection, and Wet Well and Manhole Pumping. (See Appendix B)

## **B. GEOGRAPHIC INFORMATION SYSTEM (GIS)**

In the early 1990's we initiated our GIS Program to bring all our utility system into an electronic mapping system to analyze our utility assets and assist us in long-range planning. ACSA staff was involved in the actual building of the system to help us understand exactly how it was constructed and have confidence in its accuracy. We invested in Global Positioning System (GPS) hardware and software to locate existing and new utility assets. We partnered with the County in obtaining base mapping developed from aerial photography and began overlaying our utilities onto these maps. We developed the database structure for all our physical utility assets and determined what attributes were the most important for each type.

In the early 2000's we selected the ESRI ArcGIS software package as our GIS platform and transferred all our valuable data into this format. Over the years, with the IT Department's support, our GIS has become a fully developed tool with workflows established to gather data from inspections, maintenance field crews, and utility locators to correct and update our utility assets. This is a tool that is

available to all office personnel and can be carried into the field to provide immediate information about our utility system, with links to scanned record construction drawings and even pump station manuals. The GIS is integrated into our Computerized Maintenance Management System (CMMS) that tracks all work performed on wastewater assets.

- 1) All new sanitary sewer assets are located utilizing GPS technology and are incorporated into the GIS along with the appropriate attribute information.
- 2) The rehabilitation of all sanitary sewer mains is documented in the GIS, including the relining of sanitary sewer mains and point repairs.
- 3) Flushing and rodding activities are tracked through the CMMS.
- 4) A work order is established in the CMMS to request the correction and editing of any sanitary sewer asset in the GIS, based upon field observation and discrepancies.

### **C. ACQUISITION OF SYSTEM INFORMATION**

There are several programs within the ACSA through which we can obtain timely and relevant information about our sanitary sewer system. Different technologies are applied to this aspect of our operations, as well as the old-fashioned physical site visit.

- 1) Supervisory Control and Data Acquisition: The ACSA has established a Supervisory Control and Data Acquisition (SCADA) System to monitor all our critical assets, including sanitary sewer pump stations. Of our ten sanitary sewer pump stations all but one (Madison Office Park) are connected to the SCADA System via a cellular network. The one station not monitored is scheduled for replacement with one that has increased capacity, which will be connected to our SCADA System. The SCADA network is completely isolated from all other ACSA networks and can only be accessed through secure VPN connection using password protected VPN client software. As an additional security measure none of the sanitary sewer pump stations can be controlled remotely; adjustments to their operational parameters can only be made at the stations. The Central Control Station (CCS) in our administrative offices manages the data and provides Human Machine Interface (HMI) screens that show a pictorial representation of station components and their status, which are available to all employees with secure access. It also stores data in the Historian Server for future analysis.

Our SCADA System monitors several conditions at our sanitary sewer pump stations and when necessary, issues alarms. The alarms are generated at the Programmable Logic Controller (PLC) located in each pump station and are displayed on the local HMI. The alarms from the PLC are transferred to the CCS Server HMI that then sends a text message, email, and/or makes calls to cell phones with a recorded message, if the alarms are present longer than a user-specified interval. The type of alarm will determine if Maintenance personnel are required to take immediate action at the pump station. The following is a list of alarms and components that are monitored at each pump station:

- a) Cellular Communications (loss of communications greater than 30 minutes)
- b) Loss of Control Power (problem within the PLC panel)
- c) Station Power Failure (alarm only if generator fails to start; 5 to 10 minute delay)
- d) Station Intrusion
- e) Generator Status (operation is monitored if engaged; alarm if fails to start or stops)
- f) Transfer Switch (operation is monitored if engaged)
- g) Float Control Mode (issue with primary bubbler/transducer level control in the wet well)
- h) High Wet Well Level
- i) Low Wet Well Level
- j) Pump Fault
- k) Pump Temperature High
- l) Pump Hand, Off, Auto (HOA) (mode is monitored for which is engaged)
- m) Uninterrupted Power Supply (UPS) Failure
- n) UPS on Battery (monitors status when engaged)
- o) Transducer Failure
- p) Wet Well Level (monitored continually to show pumping trends)

The CCS keeps an historical log of all alarms, which includes a time stamp and a description for each alarm. This data can be used to create a notification history.

Data stored in the Historian Server can be used to review current and past performance of specific components in the sanitary sewer pump stations utilizing dynamic reports. Also, the trends of monitored equipment can be analyzed and graphical plots of sensor values can be created. It's important to note that besides giving ACSA staff real-time status of our wastewater pump stations SCADA also provides a

way to determine if a drainage basin served by a pump station is losing capacity due to an increase in infiltration and inflow (I&I) during rain events.

- 2) Computerized Maintenance Management System: Cityworks AMS is now implemented as the ACSA's Computerized Maintenance Management System (CMMS) to have a centralized hub for inspections, service requests, work orders, and inventory management. With Cityworks being a GIS-centric CMMS and all the ACSA's sanitary sewer assets existing in the GIS, Cityworks provides enhanced capabilities such as having a single asset repository and allowing the importing of maintenance and inspection data into the GIS. Cityworks has also been integrated with the ACSA's CCTV software and with a citizen-facing service request portal that allows customers to initiate non-emergency service requests.

Cityworks is used to record maintenance activities on sanitary sewer assets such as gravity mains, force mains, and manholes. It is also used for so-called vertical assets such as those inside of our pump stations like generators, pumps, motors, and more. Cityworks is used daily for CCTV televising of sewer gravity mains, pump station inspections, and many more activities. In the rare event of a sewer overflow, Cityworks can generate a report which is sent to the Virginia Department of Environmental Quality (DEQ). This is just one of at least 40 reports available through the software.

The CMMS enables the ACSA to better track maintenance work activities, realize efficiencies, establish reoccurring inspections, enable reporting, and enhance management capabilities, and hold staff accountable. By providing a daily tracking system for inventory used the CMMS ensures that critical replacement parts for operation and maintenance of the wastewater system are readily available. Alerts can be set up within the software to trigger the ordering of replacement of critical supplies. Staff can also make more informed decisions regarding workload and asset maintenance. Future enhancements will allow for more in-depth asset management. Capital Improvement Program (CIP) planning will be augmented with additional information on an individual asset level.

- 3) Closed Circuit Television (CCTV) Inspection Program: The ACSA has two CCTV camera vans that are deployed throughout the sanitary sewer system to conduct inspections of existing and new sewer mains. One van is dedicated to the systematic televising of gravity sewer mains

to evaluate the condition of pipes and ensure they are free of roots or grease deposits and flowing properly. Additionally, the CCTV inspection is also utilized to locate sources of infiltration and inflow (I&I) in the sanitary sewer system so they can be eliminated. The CCTV crew is responsible for scoring the sewer mains using the National Association of Sewer Service Companies (NASSCO) rating system and the scores are uploaded to the GIS. The second van is dedicated to the inspection of new sewer mains for additional quality control to ensure the mains have been constructed in accordance with our standards before we accept them into our sanitary sewer system. Additionally, this CCTV crew conducts another inspection near the end of the one-year warranty period for newly constructed sewer mains to ensure any deficiencies in construction are corrected at the developer's expense before the ACSA assumes responsibility for all future maintenance.

- 4) Fats, Oils, and Grease Abatement Program: The ACSA recognizes the critical importance of an active Fats, Oils, and Grease (FOG) Abatement Program in reducing the number and severity of sanitary sewer overflows (SSOs). Our experience of the past several years is consistent with literature reports that some 40-67% of SSOs are either directly related to grease accumulations, or grease is a contributing factor in the overflow.

The foundation of the ACSA's FOG Program is a detailed regulation adopted by the Board of Directors in 2009 (see Appendix C). In addition to mandating the installation, operation, and proper maintenance of a grease control device by a food service establishment (FSE), the regulation requires the permitting of FSEs, with associated permit fee. Unannounced inspection visits occur 3-4 times per year for the facilities using the smaller, inside grease traps, while the inspection of the outside, in-ground grease interceptors is 1-2 times annually. Inspections of the latter involve a visual assessment and use of a "sludge-judge" for determining the grease/gray water/solids profile. Manifests from the contract cleaning of the grease interceptors also provide us with profiles as regular updates for these facilities. (See Appendix C for various FOG related SOPs)

Inspection visits are supplemented by the monitoring of both ACSA sewer mains and facility laterals by two fully equipped closed-circuit television (CCTV) camera crews operated by the Maintenance Department. Evidence of significant grease accumulation is relayed to FOG Program personnel, as well as to Maintenance crews. The removal of accumulated grease in facility sewer laterals is the

responsibility of the FSE, as is the responsibility of accumulated grease in the ACSA sewer mains if it can be clearly shown that the grease originated from one facility. The FSE is required to contract with a company that can dislodge the grease and collect it downstream to prevent further contamination of the sanitary sewer system.

The education of FSE personnel is an important component of our program. We include a detailed Kitchen Best Management Program document with each new FOG permit for display in the food preparation area. On-site training and education are also a part of the inspection visits. We have partnered with the Environmental Health Division of the Virginia Department of Health, such that their inspectors assist with education in grease control, as well as observe the posted grease trap cleaning records.

#### **D. ROUTINE PREVENTATIVE OPERATION AND MAINTENANCE ACTIVITIES**

Over the last several years the ACSA Maintenance Department has instituted several procedures and purchased equipment to create a comprehensive preventative maintenance program. The ACSA has also created new positions and hired the personnel to fill them, providing the necessary man-hours to look for problems in our sanitary sewer system before they result in service interruptions and system failures, requiring costly repairs.

- 1) Sanitary Sewer Pump Stations Inspection Program: The Facilities Management Group within the Maintenance Department performs routine checks on all sanitary sewer pump stations twice a week, typically Monday and Friday. The inspections include logging pump runtime hours, wet well levels, generator runtime hours, checking generator fuel, oil, and antifreeze levels, checking pump oil levels, greasing, and exercising spring relief valves, etc. Generators are also exercised weekly under full load, Dezurik 3-way valves are exercised and greased monthly, and pumps are visually inspected, and test run each visit. Exhaust fans are also checked for proper operation and a visual inspection is conducted of the buildings and grounds, plus fences to confirm security measures. In addition to the weekly check of standby generators the oil is changed annually and every three years a load bank test is conducted by an outside, independent contractor. An annual electrical preventative maintenance check is conducted of all terminal connections to ensure they are tight, and amps drawn by various components are measured. All inspections and oil changes are tracked through the Cityworks CMMS software and staff uses a phone app or iPad tablet to log the readings and complete any assigned work orders.

- a) **Pump Maintenance Schedule:** All but two of our sanitary sewer pump stations operate with Gorman-Rupp equipment, which is relatively trouble-free. The impeller clearances are checked annually, and shims are removed or added to maintain the correct clearances. When adjustments can no longer be made using shims, the entire rotating assembly is replaced including the impeller. If there is an oil seal failure or the bearings fail, the complete rotating assembly is also replaced. Motors are evaluated regularly and replaced as needed, such as when their amp draw increases.
  - b) **Pump Station Reliability:** The Madison Office Park Pump Station is the only station in our system without a standby generator and this is due to space constraints because of its close proximity to an office building. Like all the other pump stations in our system it will have an emergency bypass pump connection for use with a portable pumping system when it is upgraded within the next year (SOP: Emergency Pump Bypass Hook-Up – Appendix B). It will also be incorporated into our SCADA System as part of the upgrade, along with all our other sanitary sewer pump stations, which are continually monitored for performance and operational status to allow for a rapid response to any problems.
- 2) **Closed Circuit Television (CCTV) Inspection Program:** The ACSA has two CCTV camera vans that are deployed throughout the sanitary sewer system to conduct inspections of existing and new sewer mains. One van is dedicated to the systematic televising of gravity sewer mains to evaluate the condition of pipes and ensure they are free of debris, roots or grease deposits and flowing properly. Areas identified as having these recurring issues are relayed to the Sewer Operations Supervisor for the scheduling of regular flushing operations. Additionally, the CCTV inspection is also utilized to locate sources of infiltration and inflow (I&I) in the sanitary sewer system so they can be eliminated and identify any pipeline defects in need of immediate repair. (This aspect of the CCTV Inspection Program is described in more detail below under Paragraph F.) The second van is dedicated to the inspection of new sewer mains for additional quality control to ensure the mains have been constructed in accordance with our standards before we accept them into our wastewater system. Additionally, this CCTV crew conducts another inspection near the end of the one-year warranty period for newly constructed sewer mains to ensure any deficiencies in construction are corrected at the developer's expense before the ACSA assumes responsibility for all future maintenance.

- 3) Flushing and Rodding Program: Most of the efforts in the flushing and rodding of gravity sanitary sewer mains are driven by the data generated from the CCTV Inspection Program as it methodically works its way through the sanitary sewer collection system. The ACSA Maintenance Department will set up a quarterly schedule for the flushing of sewer mains where the CCTV crews have discovered recurring instances of gravel or other debris, roots, and the accumulation of grease. This often occurs where relatively flat (low slope value) sewer mains with low flow velocities allow the settlement of debris in the pipe. Once identified these areas are placed on a similar schedule for CCTV inspection with the flushing operation completed in advance, such that the televising can confirm the cleaning of the sewer mains. If the problem area worsens, causing an increase in the frequency of flushing and/or rodding the sewer main is added to the CIP for rehabilitation or replacement. The rodding and flushing of sewer mains are tracked in the CMMS creating a history for each main that can be reported out. In addition to the areas discovered by the CCTV crews the Maintenance Department has established a daily routine flushing program whereby the entire gravity sanitary sewer system is proactively flushed whether or not there is debris present in the mains and manholes. Under this program, approximately 20% to 24% of the sewer collector network is flushed annually. Over the past dozen years, the ACSA has witnessed a steady decline in the number of sewer mains in need of regular flushing and/or rodding. This can be attributed to the ACSA's aggressive program to reduce I&I through the rehabilitation of sewer mains and manholes, which began by targeting the oldest portions of our collection system. In particular extra effort has been expended to reline many of the vitrified clay sewer mains in the system.
  
- 4) Sanitary Sewer Evaluation Surveys: The ACSA has maintained a systematic schedule of sanitary sewer evaluation surveys (SSES) using a term contract consultant that targets large drainage basins for I&I reduction. The consultant utilizes several program components to identify excessive groundwater (infiltration) and rainfall (inflow) induced flows within the sanitary sewer system including manhole inspections, flow monitoring, night flow isolation and measurement, smoke testing, flooded dyed water testing, and cleaning/CCTV inspections. The following is a summary of each component:
  - a) Manhole visual inspections are performed to reveal structural defects as well as sources of I&I. These inspections are performed with the assistance of a pole-mounted camera used to capture the condition of the sewer mains just upstream and

downstream. Manholes are graded based upon the NASSCO rating system. Pipe defects or obstructions observed in sewer mains via the pole camera would be recommended for CCTV inspection and cleaning, if necessary.

- b) Flow monitoring establishes the baseline infiltration rate, and the typical sanitary sewer flows in the sanitary sewer system during dry weather, for comparison with sewer flows during and after rainfall events. The inflow within each sub-basin is evaluated based upon total volume as well as the peak wet weather flow to average dry weather flow ratio. The total volume quantifies the contribution from a given storm whereas the peak to dry weather flow ratio measures the impact intensity of a given storm event on system flows. Sanitary sewer systems with a high peak wet weather to average dry weather flow ratio are more likely to surcharge or overflow than those with a high inflow volume but low flow ratio. Flow monitoring is used to identify areas that exhibit I&I and to quantify these flows to target further investigations within the drainage basin. Once areas are identified as having I&I issues, they may be prioritized for smoke testing and night flow isolation and measurement.
- c) Smoke testing is generally proposed for sections of the system exhibiting significant inflow quantities and can be used to find cross-connections with stormwater collection systems and roof drains, broken service laterals, or major pipe defects. Sewer mains are divided into shorter sections with flow from small diameter lines blocked off in manholes with sandbags. Smoke forced through isolated sewer segments will be emitted from inflow sources and can be easily documented for future corrective action. Where smoke is detected exiting stormwater structures near sanitary sewer mains, flooded dyed water testing may be recommended to verify an interconnection between the two separate systems.
- d) Night flow isolation and measurement can be used to focus on areas of higher infiltration within drainage basins based on flow monitoring results. Night flow isolation and measurement can also be used to evaluate smaller networks of sewer mains within a larger drainage basin that don't have enough flow to make flow monitoring practical. These investigations can lead to recommendations for CCTV work in areas where the infiltration flows are elevated, suggesting pipe defects that may need to be identified.

- e) Cleaning and CCTV inspections are conducted in sanitary sewer pipe segments where obstructions or defects are observed with the pole camera during manhole inspections and where high rates of I&I point toward pipeline defects. The CCTV work is conducted by either a sub-consultant or by an ACSA CCTV crew with the video footage provided to the consultant for review and analysis. The location, type, and severity of each defect is noted, as well as the location, size, and condition of all service laterals. Any identified defects will be targeted for the appropriate corrective action in the rehabilitation phase of the project.
  
- f) Flooded dyed water testing is not commonly used in the SSES process except in special instances when a spike in I&I during a rain event can't be readily explained with subsequent smoke testing or visual proof via CCTV. Dyed water is either dumped into an adjacent stormwater system or is flooded onto the ground surface above a particular sanitary sewer segment with a CCTV camera rig inserted into the suspect main to locate the point of entry.

The rehabilitation of any defects or issues discovered during the SSES are carried out soon after the final report is received and approved by ACSA Engineering staff. The ACSA has two annually renewable rehabilitation contracts to complete any work identified in the SSES Report by simply issuing a work order along with the necessary data from the investigation. One contract is used to carry out rehabilitation that requires excavation such as, point repairs on sewer mains, sewer main replacement, and manhole frame and cover adjustments. The other contract is used to carry out rehabilitation that is completed using trenchless technologies such as, relining of sewer mains, segmental liners, top hat liners for lateral connections, sealing manhole cracks, repair of pipe connections in manholes, and manhole coating.

## **E. CAPACITY ASSESSMENT**

Due to the interconnectedness of the ACSA sanitary sewer collection system with the sanitary sewer systems of our utility partners, the Rivanna Water and Sewer Authority (RWSA) and the City of Charlottesville (City), the assessment of our system capacity cannot be conducted in isolation. The assessment of our capacity requires coordination and cooperation with our utility partners. Also, since the City and the ACSA are the only two wholesale customers of RWSA all funding for RWSA programs and operations are provided by them. The majority of the ACSA sanitary sewer collection system connects to one of the RWSA's sanitary sewer

interceptors and this holds true for the City as well. In addition, the RWSA owns and operates all the Water Resource Recovery Facilities (WRRF), formerly referred to as wastewater treatment plants, where all the wastewater collected by the ACSA and the City is treated. It is therefore the responsibility of all the utility partners to evaluate and assess the capacity of each of their collection systems to ensure our capability to provide sanitary sewer service to existing and future customers.

- 1) RWSA Comprehensive Sanitary Sewer Interceptor Study: In 2006 the RWSA initiated steps to complete a “first ever” comprehensive survey of its sanitary sewer interceptor network. The goal was to determine the wastewater flow capacity in the Urban and Crozet Service Areas by estimating the current and future dry and wet weather flows within the sanitary sewer system. This would allow RWSA, ACSA, and the City to establish realistic goals with timelines for the reduction of I&I and to develop a capital improvement program to provide adequate sewer system capacity to accommodate future growth.
  - a) Flow Metering: In the Urban Area around Charlottesville and in the town of Crozet twenty-five area-velocity flow meters were deployed to measure dry and wet weather flows over the course of nine months. During this time there were two significant storm events of sufficient intensity to provide quality data for the sanitary sewer system response to wet weather.
  - b) Model Development & Calibration: The model of the RWSA interceptor system was built from GIS data imported into the InfoSWMM model software. It was then converted to EPA SWMM 5.0, which could be easily imported into other modeling software. The model was calibrated utilizing the dry and wet weather flows, including two major storm events.
  - c) Flow Projections: Average daily flows were estimated for the future years 2030, 2060, and full build-out conditions. These projections were based upon data provided by University of Virginia, University of Virginia Foundation, City of Charlottesville, Albemarle County Service Authority, and Albemarle County Department of Community Development.
  - d) Flow Management Plans: Graphical representations were created to assist the RWSA and their utility partners in focusing on interceptor reaches with capacity issues. The graphs visually represent timelines and sizing requirements for upgrading these

reaches to handle future flows and to establish goals to identify I&I reduction targets within the interceptor system to be addressed by the City and ACSA.

- e) Capacity Evaluation Summary: The final report published in July 2010 documented the agreed upon Comprehensive Sanitary Sewer Interceptor Plan accepted by the RWSA, the City of Charlottesville, and the ACSA. It established priority sewersheds served by the various interceptors for I&I reduction and each entity initiated SSESs in these areas. Goals were set to reduce I&I such that by 2020 no interceptor would have a peaking factor greater than 10 and other sewersheds would have a 25% reduction in I&I to control SSOs under the two-year design storm. The Crozet Service Area was the exception in that I&I reduction be targeted to prevent upgrade to the interceptors in that area and the four pumping stations downstream, pending the collection of additional metering data to assess progress. A potential capital improvement for the Crozet Service Area could be the construction of a Flow Equalization Tank (FET) to mitigate peak wet weather flows. The goal for year 2060 was set to have I&I reductions such that all flows would be contained in the interceptors without SSOs, and no interceptor required to be upgraded except as necessary to provide a minimum capacity of 3.5 times the average dry weather flow.
- f) Permanent Flow Metering Locations: Twelve permanent flow meters were established (10 in the Urban Area; 2 in Crozet) to track progress toward I&I reduction and monitor future growth in the development areas.
- g) Comprehensive Sanitary Sewer Interceptor Model Updates: As part of a cost share agreement between the City and ACSA for funding future RWSA capacity-related capital improvement projects in the sanitary sewer interceptor system, all the parties established a schedule for updating the model to track I&I reduction and monitor available capacity. Counting from 2010, every five years temporary sewer flow meters would be added to the twelve permanent flow meters to quantify the wastewater contributions to the interceptor system from the City and the ACSA, plus capture significant storm events. The model would be recalibrated, and the results analyzed to update goals for I&I reduction and capital project planning. Also beginning in 2010 every ten years the projected flows estimated for future

development would be updated and capital project timelines adjusted as necessary.

(1) Year 2015 Model Update – Dry and wet weather flow data was collected using thirteen permanent sewer flow meters (starting in 2011) and twenty-three temporary flow meters deployed in the service area (late 2014 to early 2015). The EPASWM model was converted back to the InfoSWM software and updated with new GIS data from the utility partners. It incorporated upgrades to RWSA interceptors and pump stations, including the future upgrade of Rivanna Pump Station under construction at that time. Through aggressive I&I reduction programs the utility partners were able to meet their goals for the year 2020 ahead of schedule. The priority list of interceptors and their sewersheds for I&I reduction was reduced from fifteen to four, with the one in Crozet not needing any reduction if the FET is constructed. Anticipated capacity upgrades to interceptors targeted the earliest one in the Crozet Service Area to be operational by year 2025 (the FET) and the next earliest by year 2035. All other capacity upgrades to interceptors are not expected to be needed until year 2060 or 2066 with the long-term planning horizon set at year 2075.

(2) Year 2020 Model Update - Dry and wet weather flow data was collected using fourteen permanent sewer flow meters (starting in 2016) and twenty-three temporary flow meters deployed in the service area (April 2019 to December 2019). The sanitary sewer interceptor model from year 2015 was updated with the primary improvements to the RWSA sanitary sewer system completed or in-progress since the published report dated September 2016. The fully operational Rivanna Pump Station was incorporated into the 2020 model, including physical features such as the tunnel, invert elevations, and operational controls. The physical features and operational controls of the Crozet Flow Equalization Tank (under construction at the time) were added based upon the construction documents. The Crozet FET is anticipated to be in service by the end of calendar year 2022 and will mitigate the peak wet weather flows in the collector system. The calibration of the 2020 model is

based upon the temporary flow metering period, which had a few large storms and provided adequate data to estimate the rainfall derived infiltration and inflow (RDII) in the City and ACSA sewersheds. However, year 2018 was one of the wettest on record and therefore provided the best data for validation of the model with the large storm events that occurred. It should be noted that the year 2020 flow metering data was not used to calibrate or validate the model because of the changes in flow patterns due to the pandemic. The timing and magnitude of the modeled wet weather peak flows matched the observed flows very closely. The observed peak wet weather flows in the 2020 updated model are less than what had been projected for that year in the 2015 updated model. The proactive efforts to reduce I&I throughout our sanitary sewer systems by all the utility partners have continued to bring down the peak wet weather flows such that the next interceptor to have its capacity upgraded isn't anticipated to be operational until after 2035.

- 2) RWSA Capacity Certification Program: All new proposed private development projects submitted to the ACSA for connection to our sanitary sewer system are evaluated by the assigned engineer to estimate the anticipated average daily wastewater flow. Those projects that will generate an estimated average daily wastewater flow of greater than or equal to 40,000 gpd must receive a capacity certification from the RWSA. Our engineers use a template document to request a capacity certification from RWSA and utility plans do not receive final approval until the certification is received. Any projects regardless of size in sewersheds served by interceptors that have been prioritized for I&I reduction (such as the Crozet Service Area) are required to have a RWSA Sewer Capacity Certification before their utility plans are approved.
- 3) ACSA Sewer Flow Meter Program: In 2008 the ACSA began a program to monitor the wastewater flows in our sanitary sewer system so we could methodically determine the extent of our I&I problems. Over a two-year period, we purchased several portable flow meters that we deploy throughout our sewer system, mostly in smaller drainage basins. We currently own thirteen (13) Hach Flo-Dar sensors with companion wireless loggers that transmit the flow data to the Cloud where our staff can download it. In addition, we own several level sensors that can help us identify which sewer runs within a branching system are

reacting to storm events, thereby helping us target where we need to install our flow meters for a quantitative analysis of I&I. To aid us in creating hydrographs of our drainage basins we also own nine (9) rain gauges that are distributed throughout our service area.

- a) **Small Drainage Basin Flow Monitoring:** With the creation of the Comprehensive Sewer Interceptor Model by RWSA that periodically analyzes at a macro level the I&I present in the regional wastewater system and the available capacity, the ACSA concentrates on monitoring sewer flows in smaller sub-drainage basins. The Engineering Department targets those portions of our sanitary sewer system that flow into the RWSA interceptors identified as priorities for the reduction of I&I. Data from these investigations can be used to direct our CCTV crews for a closer look at the condition of our sewer mains and manholes. Additionally, the ACSA sewer flow meters are deployed in drainage basins post-rehabilitation to determine the success of our I&I reduction efforts. In areas where our sanitary sewer system will be extended to serve new development our sewer flow monitoring program helps identify potential flow capacity limits of existing sewer mains early in the plan review phase. Data on dry and wet weather flows can also be utilized to create hydraulic sewer models in various sub-drainage basins.
  
- b) **Hydraulic Sewer Modeling:** Rather than try to incorporate small sub-drainage basins into the RWSA Comprehensive Sewer Model the ACSA is focused on the development of local hydraulic sewer models in select sewersheds. The largest of these would be the Crozet service area where I&I is still significant but is mitigated by the construction of the FET. Another drainage basin targeted for modeling is the Village of Rivanna that is served by a small water resource recovery facility (WWRF) and experiences peak wet weather flows. Other small sewersheds to be targeted will be located along the boundary of our existing collector system and designated growth areas for the County of Albemarle. The ACSA currently owns the InfoWorks ICM hydraulic model software that is quite complex and more conducive to larger diameter networks with combined storm and sanitary sewers. Since the ACSA system has no combined sewers and consists predominantly of eight-inch diameter mains, Engineering staff is considering a move to a simpler software platform.

- 4) Localized Collector System Capacity: In lieu of a widespread network of hydraulic sewer models our engineers currently utilize spreadsheets, incorporating the most limiting sewer segment (lowest slope value), customer usage data, and flow projections for the proposed development to evaluate the available capacity. ACSA sewer flow meters are used to verify the diurnal wastewater flows for the receiving mains and identify any capacity limiting I&I during wet weather events, if possible.

## **F. IDENTIFY AND PRIORITIZE STRUCTURAL DEFICIENCIES AND REHABILITATION ACTIONS**

Over a decade ago the ACSA committed to a more proactive program of sanitary sewer inspections to assess the condition of pipelines by identifying structural defects, sources of I&I, buildup of FOG, root intrusion, and corrosion. An existing van was upgraded with the latest software and CCTV equipment, plus a second van was added to the fleet. While one van was exclusively dedicated to a methodical inspection of our wastewater collection system and the other to quality control inspections of new sewers, both at times were used to inspect active sewers. With our two CCTV vans we are able to inspect on average approximately 18% to 20% of our sanitary sewer collection system annually. The CCTV vans utilize the GraniteNet software platform to create videos and map defects for each gravity sewer main inspected. Each crew is responsible for scoring the gravity sewer mains using the National Association of Sewer Service Companies (NASSCO) rating system and the scores are uploaded to the GIS via a direct link.

- 1) Find and Fix Program: The ACSA's "find and fix" program was established around the same time we expanded our CCTV capability to increase the amount of gravity sewer mains upon which we could conduct condition assessments. During the routine televising of our sewer collection system the CCTV crews produce video recordings of any problem areas, such as cracked pipe, offset joints, root intrusion, and evidence of groundwater infiltration. The videos of these structural defects are forwarded to our staff engineers to evaluate and rate the severity of the defects so they can be prioritized for repair. Each staff engineer is NASSCO certified for pipeline, manhole, and lateral assessment. To move quickly from assessment to rehabilitation of sewer mains, the ACSA has created two annually renewable Job Order style contracts. One is referred to as our Miscellaneous Sewer Repair/Replacement Project that covers all rehabilitation work requiring excavation and the other is called our Miscellaneous Sewer Rehabilitation Project that encompasses trenchless methods such as pipe lining, pipe bursting, and coating or sealing of manholes. With

these two on-call contractors it typically only takes a couple of weeks to compile a list of rehabilitation tasks and issue a work order for scheduling. Funding in the amount of \$400,000 is included in our CIP Budget annually to repair defects in our gravity sewer system to prolong the life of our assets and to reduce infiltration and inflow, thereby preserving flow capacity for our customers.

- 2) Manhole Inspections: Every manhole that is opened to provide access to a sewer main to be televised is inspected for defects and evidence of I&I using the NASSCO rating system. Any defects are noted and forwarded to the engineers to prioritize for rehabilitation using our on-call contractors as part of the “find and fix” program. Any manholes in our sanitary sewer system that are visited by ACSA staff, whether or not they are NASSCO certified, are opened and inspected for defects, evidence of I&I, and safe condition of the access steps. A simple form is used to verify materials and physical attributes as a quality control check against the data shown in the GIS, to obtain a description of the overall condition of the manhole (See SOP in Appendix B). If the inspector is not NASSCO certified any information concerning defects and/or I&I are forwarded to personnel who are certified for a follow-up inspection. When major rain events occur that shut down most of the field operations of the Maintenance Department, utility workers are deployed out into the sewer collection system to inspect manholes to look for I&I under wet weather conditions.

## **G. TRAINING**

Collection system employees are exposed to numerous challenging conditions, and adequate training, including safety training, is necessary for employees to meet these challenges. In 1982, the ACSA adopted a policy on safety in the workplace. Regular training sessions have been provided so that each employee can be informed and play an active role in ensuring their safety and the safety of those around them. To keep safety in the forefront, the ACSA developed a *Manual of Safety Policies* that includes the following applicable training programs:

- 1) Bloodborne Pathogens: All Maintenance Department employees will be trained regarding bloodborne pathogens at the time of initial employment and every year thereafter through the safety training program. In addition, all employees who have voluntarily been trained to perform CPR and emergency first aid will be educated in the dangers of bloodborne pathogens and will be trained in the exposure control plan outlined in the *Manual of Safety Policies*.

- 2) Confined Space: All new employees are trained in the hazards of working in confined spaces. Yearly equipment training is provided by the ACSA as well as classroom confined space entry training and gas monitor training.
  - a) Attendant – Receives training in the general hazards of working in confined spaces as well as having completed training specific to behavioral changes common in persons exposed to hazardous atmospheres, operation and use of retrieval systems, communication with entry personnel, and all other duties assigned to the position of attendant.
  - b) Entry Supervisor – Receives training indicated above in the Attendant section, as well as having considerable experience in confined space work, atmospheric testing and calibration of instruments, and familiarity with any necessary special equipment and tools.
- 3) CPR/AED and First Aid: Training shall be provided to each CPR/AED and First Aid user every two years.
- 4) Fire Extinguishers: The ACSA provides annual training on the safe operation of fire extinguishers through BizLibrary, our online learning partner. Fire extinguishers are also inspected monthly as part of the Vehicle Inspection requirements and annually by a third-party contractor.
- 5) Immunizations: The ACSA will cover the costs of the following immunizations: Hepatitis B, diphtheria and tetanus.
- 6) Lock-Out/Tag-Out: All new employees are provided a copy of the ACSA's Lock-Out/Tag-Out policy contained within the *Manual of Safety Policies*. Employees are trained to recognize applicable hazardous energy sources, the type and magnitude of energy present in the workplace, and the proper means necessary for energy isolation and control.
- 7) Personal Protective Equipment: It is the ACSA's policy to provide all the following personal protective equipment to the employee: Eye and Face Protection, Hearing Protection, Head Protection, Leg Protection, Hand Protection, Respiratory Protection, and Protective Clothing (Rain suit and rubber boots, Tyvek suits, High Visibility Vests and Pants). The ACSA also provides employees who are required to wear safety-toed

shoes/boots an allowance to purchase for the allotted amount per fiscal year toward the purchase of this protective footwear.

- 8) Traffic Safety: All Maintenance Department employees are trained and state-certified to properly flag traffic in roadway work zones.
- 9) Trenching and Shoring: All excavations five feet or greater in depth shall be appropriately benched, shored, or sloped according to procedures and requirements set forth in the *Manual of Safety Policies*. Supervisors have the primary responsibility for the implementation of the Trenching and Excavation Safety Policy for their job site. The supervisor of the work must be a “competent person” as defined by OSHA. The ACSA has the primary responsibility for providing training, trench protection systems, effective barricades and supporting the use of other protective measures deemed prudent and necessary by the competent person.

### III. DESIGN AND PERFORMANCE PROVISIONS

#### A. PROJECT MANAGEMENT GROUP

Over four decades ago the ACSA established a robust and proactive approach for the oversight of the design and construction of all sanitary sewer assets that connect to the wastewater collection system. The Project Management Group within the Engineering Department currently consists of three staff engineers and five construction inspectors (See ACSA Organizational Chart – Appendix A). This group is responsible for the oversight of the design and construction of all private development that connects to and extends our sanitary sewer system, as well as the design and construction of all wastewater CIP projects. The primary function of the Project Management Group is to interpret, apply, and enforce the *General Water and Sewer Construction Specifications* of the ACSA.

- 1) General Water and Sewer Construction Specifications: In the early 1980's the ACSA developed a set of standardized construction specifications to govern the design and construction of all sanitary sewers connecting to our public utility system. These local specifications meet or exceed the requirements of the Sewer Collection and Treatment (SCAT) Regulations published by the Virginia Department of Environmental Quality (DEQ). The ACSA specifications are generally reviewed annually or biennially to remain current with accepted best practices and/or improvements in methods or materials utilized in the construction of sanitary sewers. In accordance with the ACSA's *General Water and Sewer Construction Specifications* no stormwater systems shall be connected to the ACSA sanitary sewer system. The specifications also require that every sanitary sewer main and manhole be tested to ensure they are essentially watertight to prevent I&I. The ACSA specifications also establish design standards for sanitary sewer systems to provide guidance to consultants who are designing extensions of our sanitary sewer system. Copies of the ACSA's *General Water and Sewer Construction Specifications* are provided to any design consultant and contractor performing work on sanitary sewers that will connect to our public utility system and be accepted by the ACSA for operation and maintenance. The ACSA's *General Water and Sewer Construction Specifications* serve as the basis for the creation of contract documents for all sanitary sewer CIP projects.

- a) Sanitary Sewer Design Criteria: Since the ACSA's *General Water and Sewer Construction Specifications* meet the requirements of the Virginia SCAT Regulations, industry

accepted design criteria are met in all designs submitted to the ACSA for approval. The design criteria specific to the ACSA are noted as follows:

- (1) Minimum Slope Requirements – The Virginia SCAT Regulations specify a minimum slope of 0.40% for 8-inch diameter sewer mains but the ACSA requires a slightly more stringent requirement of 0.50% minimum slope.
  - (2) Depth of Cover – When the depth of cover is equal to or greater than fifteen (15) feet the sewer main must be constructed of ductile iron pipe (DIP). The minimum depth of cover is three (3) feet, however under extraordinary circumstances and only with special permission, the cover may be less if the sewer is DIP and protected against excessive live loads.
  - (3) Design Capacity – For estimating projected sewer flows of proposed residential development a value of 100 gpd per person is used with 2.5 persons per residential unit being the average in Albemarle County. To make allowance for some I&I over time, the ACSA uses a value of 270 gpd per residential unit when estimating anticipated wastewater production. No distinction is made between apartments, condos, and single family (attached and detached) units. All other sewer usage types follow the recommendations of the SCAT Regulations.
  - (4) Drop Manholes – The ACSA will allow internal drop connections in manholes. Manholes with a single 8-inch diameter pipe drop connection shall have a minimum inside diameter of sixty (60) inches. Manholes with two 8-inch diameter drop connections or a single 10-inch or 12-inch diameter drop connection shall have a minimum inside diameter of seventy-two (72) inches.
- 2) County of Albemarle Site Review Committee: The ACSA has an engineer assigned to sit on the Albemarle County Site Review Committee that approves all proposed development in the County, to represent our interests. This engineer also participates in any pre-application conferences organized by the County where potential developers can get an idea of the site plan approval requirements and

learn of any issues they may have to address before submission of formal plans. With this early look at upcoming development the Engineering Department has the opportunity to evaluate the capacity of our receiving sanitary sewers and alert the developer of any capacity problems before construction design drawings are submitted. This is particularly important for the ACSA to address in the instances of proposed rezoning proposals as these often involve increased density of development that may not have been accounted for in previous sanitary sewer design. Site plans for developments that will add to our sanitary sewer system will not receive final approval from the County until their utility construction drawings have been approved by the ACSA.

3) New Construction Inspection: The overwhelming majority of the ACSA sanitary sewer system has been constructed by private developers seeking to connect to our public utility and extend service to their property. Upon completion of these private projects the developer officially dedicates the sanitary sewer infrastructure and appurtenances to the ACSA and the ACSA accepts ownership in perpetuity. A one-year warranty period ensuring against faulty materials and workmanship begins on the date of acceptance of the utilities by the ACSA. Some portions of the ACSA sanitary sewer system have been installed through our Capital Improvement Program (CIP) whereby the ACSA contracts for the design and construction of new sanitary sewer systems to provide service to areas within our jurisdiction where private septic systems are failing, or as part of our repair/replacement program of existing ACSA owned utilities.

a) Enforcement: Each private development project within our jurisdictional area that connects to our sanitary sewer system is assigned an engineer as a project manager and a field inspector.

(1) The engineer is responsible for reviewing the utility construction drawings showing the sanitary sewer system that will become part of our sewer network, ensuring that the design meets all our standards in the *General Water and Sewer Construction Specifications*. During construction the project manager will interpret and enforce the specifications, resolve construction conflicts with the contractor, approve any deviations from the approved construction drawings, and review all legal documents for the dedication of the new sanitary sewer facilities to ACSA ownership.

- (2) Prior to construction the inspector is responsible for verifying that all materials used in the construction of the sewer system are included on our Approved Products List. During construction the inspector will enforce the specifications to ensure the proper bedding, backfill, and compaction of sewer mains and manholes is accomplished. The Inspector will witness all tests to prove the sewer mains and manholes are watertight. Prior to the end of the one-year warranty period, the inspector will conduct a final inspection of the project in coordination with the ACSA Maintenance Department to verify no defects in materials or workmanship are present.
- 4) CIP Rehabilitation Program: Several large drainage basins within our sanitary sewer collection system have been evaluated and rehabilitated over the past dozen or so years, including the satellite systems in Crozet and Scottsville. The SSES projects that were conducted in these many sewersheds have educated our staff engineers in the various methods to ascertain the sources of I&I typically found in sanitary sewers. The development of the technical specifications for our two renewable replacement and rehabilitation contracts by our term contract consultant have provided our engineers with the knowledge required to manage these projects. Over the same period all of our inspectors have acquired a great deal of field experience in the oversight of rehabilitation work in accordance with the contracts. This experience along with the NASSCO certifications required of our engineers has provided the ACSA with the ability to ensure that all rehabilitation work is completed correctly to minimize future problems. Since the miscellaneous sewer rehabilitation contracts run for a maximum length of three years before being rebid, the specifications developed by our consultant in the future will keep pace with the latest techniques and technologies in the field.

## **B. UTILITY LOCATION GROUP**

The Utility Location Group within the Engineering Department is currently made up of three utility location technicians directly supervised by a staff engineer. The primary responsibility of this group is to maintain compliance with the Virginia Utility Protection Service (VUPS) Program, otherwise known as Miss Utility, that requires utility notification prior to any excavation, as mandated by state law. The obvious importance of this program to the ACSA CMOM Program is the protection of existing wastewater utilities from being damaged, causing service failures and potentially SSOs. In addition to managing the utility location responsibilities the

personnel in the Utility Location Group have the responsibility for the review of all Building Permits (including sub-types such as Sign Permits and Demolition Permits) that will be submitted to the County of Albemarle. Their knowledge of the utility system and experience in using the GIS and record drawings makes them ideally suited to prevent encroachment of and conflicts with our wastewater assets well before construction begins.

- 1) County of Albemarle Permit Review Program: The ACSA has created a pre-application process that requires everyone desiring to build, alter or demolish a structure within our utility jurisdictional area to obtain our approval before submitting their Building Permit to the County. The County will not accept permits that don't include a pre-approval from the ACSA. The primary reason for our review of Building Permits is to protect our sewer assets from damage and to preserve access for operations and maintenance.
  - a) Building Permits and Sign Permits: These permits mainly deal with free-standing structures that have the potential to be in direct conflict with our sanitary sewer utilities or encroach upon our utility easements. Our reviewers initially compare the proposed location of structures to our sewer assets using the GIS to determine their proximity. Additional detailed information about our utility locations can be obtained from record drawings, or in the case of newer developments, by consulting with an ACSA project engineer. For structures that appear to be within ten (10) feet or closer to our easement, the developer is required to stake out the corners of the structure in the field, including any building overhangs. Once staked our utility locators visit the site to verify our exact utility location relative to the proposed structure and make their determination whether to approve the permit or not. Copies of commercial building permits are given to the Environmental Group within the Engineering Department, who manage the FOG Abatement Program, to ensure the identification of customers who are required to install FOG reduction devices.
  - b) Demolition Permits: These permits allow the razing of a structure, which has the potential to expose our sanitary sewer system to inflow of stormwater runoff and/or the entry of debris that could create a blockage resulting in an SSO. Our reviewers determine if the structure to be demolished is connected to our sanitary sewer system. If it is they will contact the demolition contractor to arrange for a visual confirmation that the building

has been disconnected from the sewer and the resulting service lateral pipe is plugged watertight. Approval of the Demolition Permit is granted after visual confirmation of the disconnection with the sewer service lateral and the securing of the pipe to prevent the entrance of runoff or debris.

- c) Zoning Clearances: A zoning clearance is an approval from the County of Albemarle that a proposed use is allowed by the zoning of the specific parcel in question and is only used for existing structures. These permits apply only to non-residential construction and can cover the following actions: a change of ownership, change of use, change of name, or a new business. The vast majority of zoning clearances involve a new business moving into an existing building. Although ACSA personnel who review and approve the various County permits do not approve zoning clearances, they do receive copies of all zoning clearances within our jurisdiction. The relevance of zoning clearances to the ACSA CMOM Program is that it allows staff to identify a change in use that would require the addition of a grease trap or grease interceptor. Copies of all zoning clearances are provided to the Environmental Group within the Engineering Department who manage the FOG Abatement Program.

## IV. COMMUNICATIONS

### A. CAPITAL IMPROVEMENT PROGRAM

As part of the annual budget process the Engineering Department presents the proposed CIP budget for the upcoming fiscal year to our Board of Directors at their March meeting. Although not required by law the ACSA sets a public hearing for the April meeting of the Board and advertises twice ahead of the meeting to encourage public attendance and comments on upcoming or existing projects.

1) Sanitary Sewer Collection Systems: The ACSA serves many residential areas with public water but not sanitary sewer. These areas typically have undersized lots that cannot support a second or a replacement septic field. These subdivisions are listed in our 10-year CIP Budget to be served by extensions of our sanitary sewer collection system. The initiation of these projects is driven by the customers' need to rectify failing septic systems. When contacted by customer(s) in a subdivision who are having septic system problems, Engineering staff will survey the other customers in the subdivision to gauge the interest or need for public sewer service. Depending upon the response and location of lots desiring service our Board of Directors will make the decision whether or not to proceed with the project.

a) Customer Communications: When a sanitary sewer collection system extension project is initiated, ACSA Engineering staff will communicate with the customers at several points during the process:

(1) Field Surveying – Letters are mailed to the residents of the subdivision notifying them that field surveying work is imminent.

(2) Design Stage (50% to 90%) - At some point after the 50% design stage and prior to the completion of the 90% design stage a public meeting is held with the residents to introduce the project and seek input from them about their particular lot. At this time a Fact Sheet is created and mailed to everyone in the project area that reiterates the information delivered at the public meeting for the benefit of those who could not attend. Attempts are made to create a list of email addresses for future communications and if there is an active Homeowners Association (HOA) ACSA staff reaches out to the

leadership to enlist them as an ally in getting information out to the neighborhood.

(3) Easement Acquisition – For most sanitary sewer projects, utility easements are required from property owners for the installation and future maintenance of the sewer collection system. Engineering staff take the lead in actively negotiating with private property owners for the necessary easements, including monetary compensation based on the value of the land.

(4) Construction – Just prior to the start of construction the neighborhood is informed of the anticipated start date for construction along with the name of the contractor, the project manager’s contact information, and the inspector’s contact information. During construction the residents are provided with periodic updates on the project status and other relevant information.

2) Sanitary Sewer Rehabilitation & Upgrades: The rehabilitation and upgrades to existing sanitary sewer mains, as well as upgrades to sanitary sewer pump stations are handled a little differently since they tend to affect a smaller number of customers. With the “Find and Fix” rehabilitation contracts the work on sewer mains can be as simple as adjusting a manhole frame and cover or as complicated as replacing a run of sewer between manholes. Likewise in the trenchless rehabilitation category the work can be as simple as sealing cracks in manholes or as complicated as relining a few hundred feet of sewer main. In most cases the customer(s) can be notified that repair work is going to take place on or near their property. When sewer mains are replaced or relined there will be service disruptions for several customers, requiring more advanced notification and coordination, but still much less impact to a neighborhood than the installation of a subdivision sewer collection system. As for pump station upgrades, even though there is a significant period of design, it is mostly the customers in the immediate vicinity of the pump station who are affected by the work.

3) Fats, Oils, and Grease Abatement: During the routine CCTV inspections of our sanitary sewer system the televising crew will make note of any grease accumulation in residential areas where no FSEs are located, and this data is passed along to FOG Program personnel. These areas will be targeted for distribution of educational kits as part

of our outreach program to educate customers about avoiding the discharge of FOG into our sanitary sewer system. The educational kit is a “door hanger” bag that includes a cover letter, bi-lingual (English/Spanish) brochure prepared by ACSA staff, and a plastic lid that fits multiple-sized cans. The plastic lid is used to encourage residents to pour grease and fat into empty food cans for storage in the refrigerator or freezer for disposal in the solid waste stream, rather than disposal in the drains. The ACSA’s strategic goal is to distribute 1800 FOG education kits each year. The education of residential customers, particularly those in multi-family complexes, continues to grow in importance now that we have established better control of the FSEs. There are other attempts at FOG education that target the regional population at large that consist of print ads in the local free weekly paper just before the holidays of Thanksgiving and Christmas, considered to be a period of intense food preparation.

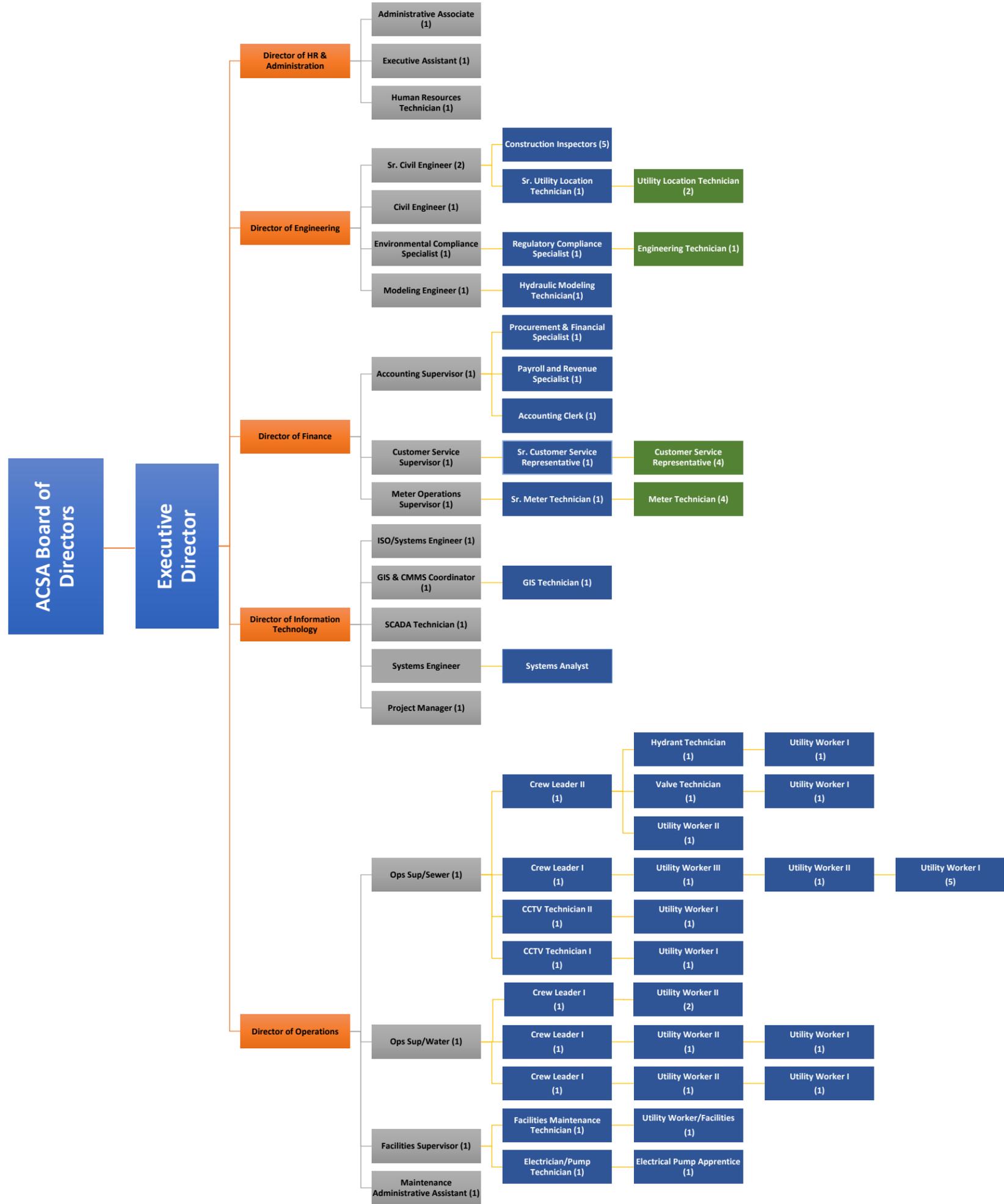
## **B. SANITARY SEWER OVERFLOW RESPONSE PLAN**

In an effort to properly respond to and address any reported sanitary sewer overflow, the ACSA developed a Sanitary Sewer Overflow Response Plan (SORP). The full SORP is included in Appendix D, including the Sewer Overflow Report Form. The primary objectives of the SORP are to protect public health and the environment, comply with regulatory agency guidelines and permits, to address procedures managing sewer overflows, and minimize the risk of enforcement actions against the ACSA. The Sewer Overflow Report Form must be filed with the Virginia Department of Environmental Quality within 24 hours of an overflow confirmation.

**APPENDICIES**

# APPENDIX A

# ACSA Organizational Chart



# APPENDIX B

**ACSA Sewer Equipment List**

<b>Sewer Equipment List</b>		<b>Location</b>
<b>2020 F-350 Service Truck</b>	<b># 21</b>	<b>Pantops</b>
<b>2020 Sewer Flush Truck</b>	<b># 31</b>	<b>Pantops</b>
<b>2011 Vactor Truck</b>	<b># 32</b>	<b>Pantops</b>
<b>2020 Sewer Camera Van</b>	<b># 39</b>	<b>Pantops</b>
<b>2014 Sewer Camera Van</b>	<b># 20</b>	<b>Pantops</b>
<b>2012 Ford F550 Service Truck</b>	<b># 18</b>	<b>Pantops</b>
<b>2017 Kawasaki UTE Sewer Camera Unit</b>		<b>Pantops</b>
<b>2009 Sewer Rodder</b>		<b>Crozet</b>
<b>Extra Sewer Camera &amp; Crawler</b>		<b>Pantops</b>
<b>2015 Cues MP 2020 Push Camera</b>		<b>Pantops</b>
<b>2022 Polaris Ranger with Trailer</b>		<b>Pantops</b>
<b>Skid steer with a brush attachment for easement maintenance</b>		<b>Pantops</b>
<b>Woodchipper</b>		<b>Crozet</b>
<b>Godwin Sewer Bypass Pumps (2)</b>		<b>Northfields</b>
<b>Light Towers (2)</b>		

The ACSA has 10 employees trained in Confined Space Rescue and we have a stand-alone enclosed trailer that carries the following equipment:

<b>Gas monitors</b>	<b>4500 psi air tanks</b>	<b>Air cart with regulator</b>
<b>Air supply lines</b>	<b>Safety Harnesses</b>	<b>Full face masks</b>
<b>Sala DBI Man lift</b>	<b>Miller Tripods</b>	<b>Ventilation Fan</b>
<b>Generator</b>	<b>Fall Arrest</b>	<b>Retrieval devices</b>
<b>Air Packs with 15-minute bottles</b>		

**The following equipment is available as needed to facilitate maintenance and repairs on our sewer collection system as necessary.**

**Large Dump Trucks (4)**

**Small Dump Trucks (4)**

**Backhoes (3)**

**Small Excavators (2)**

**Traffic signs & barricades**

**Trailers (7)**

**Message Boards (2)**

**Trench Boxes**

**Updated August 04, 2022**

# Operations Manual

## Standard Operating Procedure for Cleaning Sewers

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### 1.0 Objective

- 1.1 To efficiently and safely clean sewer lines to minimize sewer overflows and/or back-ups.

### 2.0 Scope

- 2.1 This SOP applies to all ACSA employees that are assigned to perform sewer cleaning tasks.

### 3.0 Responsibility

- 3.1 The responsibility of this SOP involves every ACSA employee performing sewer line cleaning.

### 4.0 Safety Requirements

- 4.1 All ACSA employees performing this assignment shall adhere to the following safety guidelines:
  - 4.1.1 – Employees will wear the following PPE items (hard hat, steel-toed safety shoes or boots, Class 3 vest, gloves, and safety glasses).
  - 4.1.2 – Place proper traffic signs, cones, and barricades, as required in the VDOT Work Zone Safety Manual.
  - 4.1.3 – Check for overhead objects (power lines, branches, etc.) that may come in contact with the vactron-boom.
  - 4.1.4 – Confirm sewer line information and data on GIS, prior to performing cleaning process.

### 5.0 Equipment Set-Up

- 5.1 Make sure water tank is full.
- 5.2 Position vehicle hose reel over the manhole that the crew will be working.
- 5.3 Install cleaning nozzle on the hose.
- 5.4 Double check work site for safety.
- 5.5 Whenever possible, plan to clean sewers from the downstream manhole.

### 6.0 Procedures

- 6.1 Insert the debris trap.
- 6.2 Start the auxiliary engine.
- 6.3 Lower the hose, with a guide or roller to protect the hose, into the manhole and direct it into the sewer to be cleaned.
- 6.4 Start the high-pressure pump and set the engine speed to provide adequate pressure for the sewer cleaning operation.
- 6.5 Open the water valve and allow the hose to proceed up the sewer. The hose speed should not exceed 3 feet per minute.
- 6.6 Allow the hose to proceed 25% of the length of the sewer and pull the hose back.
- 6.7 Observe the nature and the quantity of debris pulled back to the manhole.
- 6.8 If there is little or no debris, allow the hose to proceed to the upstream manhole.
- 6.9 If there is moderate to heavy debris, clean the remaining portion of the sewer in steps not to exceed 25% of the length of the sewer.
- 6.10 Open the upstream manhole and verify that the nozzle is at or past the manhole.
- 6.11 The sewer has been adequately cleaned when:
  - 6.11.1 – Successive passes with a cleaning nozzle do not produce any additional debris.
- 6.12 Determine the nature and quantity of the debris removed during the cleaning operation. Use the codes in Table 4-B-1 to report the nature and quantity of debris. Figure 4-B-1 is an excerpt from the CWEA "Hydroflush Best Practices Manual" publication and sets guidelines for coding debris found during field work.

# Operations Manual

## Standard Operating Procedure for Cleaning Sewers

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**Table 1 – Criterion for Coding Debris Found During Cleaning**

Type of Debris	<i>Clear (no debris)</i>	<i>Light</i>	<i>Moderate</i>	<i>Heavy</i>
<i>Sand, grit, rock</i>	<i>CLR</i>	<i>DL</i>	<i>DM</i>	<i>DH</i>
<i>Grease</i>	<i>CLR</i>	<i>GL</i>	<i>GM</i>	<i>GH</i>
<i>Roots</i>	<i>CLR</i>	<i>RL</i>	<i>RM</i>	<i>RH</i>
<i>Other (specify)</i>	<i>CLR</i>	<i>OL</i>	<i>OM</i>	<i>OH</i>

### 6.0 Procedures

- 6.13 Remove the debris from the manhole, using the vacuum unit.
- 6.14 Rewind the hose on the reel.
- 6.15 Remove the debris trap.
- 6.16 Clean the mating surface and close the manhole. Ensure that the manhole is properly seated.
- 6.17 Enter the results on the Work Order.
- 6.18 Move the cleaning unit, break down, and stow the traffic controls.
- 6.19 Proceed to the next cleaning job site.

### 7.0 End of the Day

- 7.1 Inspect hose for damage or wear when winding sewer hose back onto the reel after the last line flushing.
- 7.2 Pick-up signs, stands, cones, etc.

### 8.0 Consequences

- 8.1 Failure to comply with this procedure may:
  - 8.1.1 – Cause personal injury or death.
  - 8.1.2 – Damage to equipment.
  - 8.1.3 – Sewer blockages or overflows resulting in property or environmental damage.

## Standard Operating Procedure for Rodding Sewer Lines

---

### 1.0 Objective

- 1.1 To rod sewer lines in a safe, effective, and timely manner.

### 2.0 Scope

- 2.1 This SOP applies to all ACSA personnel who Rod sewer lines.

### 3.0 Standard Operating Procedure

- 3.1. Analyze the job site. If needed, set up traffic control following the Work Zone Safety Guidelines. All employees will make sure they have the appropriate personal protective equipment.
  - 3.2 Check over rodding machine, gas, oil, tires, and over all condition
  - 3.3 Start rodder let warm up no more than 5 minutes. Install the three inch hose at connection point where rods come out of machine. Use handle marked left or right to rotate rods and handle marked forward, reverse to extend rods through hose. This hose will have a rod and rope attached.
  - 3.4. Move rods through the hose till a whole rod is visible
  - 3.5 Choose head to be used, normally one size smaller than the pipe. Attach rod on head by aligning hook with hole in barrel and thread onto barrel tighten nut.
  - 3.6 Position the rodder such that the bend of the hose is not too excessive and parallel with line. Too much of a bend can cause rods to break.
  - 3.7 Once set up, tie rope off that's attached to the hose to prevent hose going up in line.
  - 3.8 Act of Rodding: Moving handle marked left or right hold in right position, move handle marked forward reverse move handle to forward and hold. Note: rod will be rotating in a clockwise rotation and going forward into hole. Speed of rotation and movement forward need to be slow especially in clay pipe.
  - 3.9 Pay close attention to speed of engine, Hydraulic gauge, and speed of rods going in. If the engine bogs down this suggest an obstruction. An obstruction can do a couple of things, cause rods to bend possibly up into operators area, break the rods, break up obstruction, or shutdown the engine.
  - 3.10 Broken rods can occur in numerous areas, inside the machine, in the hose, in the manhole, or in the line. Broken rods shall be fixed immediately.
  - 3.11 Any time rods are noticed to be loose or bent they need to be replaced or tightened
  - 3.12 When the head reaches the next manhole or finishing place let go of handles no movement Tie rope that is on the hose such that the rod is standing straight up. Now move handle marked left or right holding it in right, and forward reverse to reverse. Thus bringing it back to you. Once your back remove hose and rods from manhole, remove head from rods, and then bring rods back to machine stopping at last barrel just before it goes into machine. Disconnect hose from machine and secure hose on side of Machine.
  - 3.13 Some tips on rodding of lines, Using a smaller head first then using size of pipe, Using a smaller head then using a compressed head has proven to work on roots that create the curtain effect . Rotation and speed of rods moving in line should be slow and steady
-

## Standard Operating Procedure to Unblock Or Clear Wastewater Stoppage and Contain Manhole Overflow

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### 1.0 Purpose

1.1 This maintenance activity is performed to unblock or clear a wastewater stoppage or back up and to contain any resulting manhole overflow. Stoppages and backups may be caused by grease buildup, sags or low velocity in the line, a collapsed line, root intrusion, or blockage due to introduction of extraneous materials in the line.

### 2.0 Scope

2.1 This SOP applies to all ACSA personnel who may be taking and dispatching the call to the employees who respond and mitigate or control the situation.

### 3.0 Standard Operating Procedure

3.1 Upon receipt of a complaint regarding a stoppage, backup, or manhole overflow; the Supervisor or his crew will go to the site to verify the extent of the problem. Upon positive verification of this problem on the ACSA side, Dispatch will be notified. The supervisor or crew may then request a flusher truck or other equipment at this location as necessary.

3.2 Analyze the job site. If needed, set up traffic control following the Work Zone Safety Guidelines. (Refer to the SOP for Work Zone Safety)

3.3 All employees will make sure they have the appropriate personal protective equipment.

3.4 If the manhole is overflowing proceed with containment measures insuring that sanitary measures are observed while performing this operation.

3.5 Once the truck arrives, insure truck is loaded with water. Engage the truck in the downstream Manhole with the nozzle pointing upstream. Insure proper nozzle is used, depending on the size of the line and the suspected material encountered.

3.6 Operate the high pressure hose back and forth several times to dislodge the blockage. Insure that high pressure hose is operated slowly back and forth to dislodge and wash material away from the walls.

3.7 Flusher truck operator should note type of material being washed down the line after flushing has begun. If large quantities of grease are present, the operator needs to slow operations down and slowly clean line several times. Operator should note reel counter so that distance of the blockage can be located.

3.8 The vactor truck should have the vacuum tube in place to suction all debris from the manhole and to prevent it from continuing downstream.

3.9 Continue operations until all grease, roots or other debris has been cleaned from the line.

3.10 After the line is cleaned, the line should be televised to determine the efficiency of the line cleaning and the cause of the problem.

3.11 If large quantities of grit or dirt are noted during flushing activities, this may indicate a collapse or joint separation in the main.

3.12 If grit alone is present, keep flushing and removing until water is clean.

3.13 The presence of dirt may indicate serious problems with the line. If the supervisor or crew leader feels it is possible to get a camera through the line, he should schedule this line for televising as soon as possible.

3.14 In the event the line cannot be readily cleaned, it may be advisable to set up a pump until the line can be cleaned.

3.15 Once the line has been cleaned, before leaving the site ensure proper clean-up and disinfection of all contaminated uniforms and tools to ensure health and safety of personnel.

3.16 If the stoppage or backup results in a manhole overflow, notify Dispatch so that proper notifications are made. Manholes upstream of this location should be checked for possibilities of further backups.

3.17 Rake and dispose of any large pieces of fecal matter, toilet paper, or other debris which

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# Operations Manual

## Standard Operating Procedure for Water & Sewer

### WS – S01 Sewer Main Repair

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#### 1.0 Objective

- 1.1 To repair the sewer main in a timely and efficient manner while minimizing disruption in service to the customer.
- 1.2 To ensure the sewer main repair meets current standards.

#### 2.0 Scope

- 2.1 This procedure applies to the repair of the sewer main at the point of failure, as determined by CCTV inspection or measurements determined by Maintenance staff.
- 2.2 This procedure applies to sewer main repair of pipes less than 24-inches in diameter.

#### 3.0 Reference

- 3.1 Albemarle County Service Authority's Manual of Safety Policies.
- 3.2 OSHA 29 CFR 1926, Subpart P 1926.650, 1926.651, and 1926.652.
- 3.3 Albemarle County Service Authority's General Water & Sewer Construction Specifications.

#### 4.0 Responsibilities

- 4.1 Person in charge.

#### 5.0 Procedure

- 5.1 The person in charge will make sure "Miss Utility" has been notified and the appropriate utilities have been located.
  - 5.2 All appropriate traffic signs will be placed in the appropriate location (refer to Work Zone Safety Guidelines for Temporary Traffic Control).
  - 5.3 The person in charge will determine and deploy all required equipment and materials needed to the job site.
  - 5.4 All employees will make sure they have the appropriate personal protective equipment.
  - 5.5 The person in charge will determine the location and size of excavation to repair the sewer main.
  - 5.6 The person in charge will determine if the sewer main needs to be plugged or the sewer flow will need to be diverted, prior to cutting or breaching the pipe. We will make every effort not to spill sewage.
  - 5.7 Where possible, excavate parallel with the pipe being repaired. Consider locations of other buried utilities.
  - 5.8 Have crews locate and expose any shallow buried underground utilities that have been located.
  - 5.9 The person in charge shall check up and down stream manholes for the depth of main and/or check GIS maps for depth and main information.
  - 5.10 The person in charge, based on information gathered from Section 5.9 and/or Safety Manual Guidelines, shall use any trench boxes or shoring equipment needed to protect workers.
  - 5.11 The person in charge, or his designee, will determine once the damaged pipe has been exposed, how much pipe will be replaced.
  - 5.12 The person in charge, or his designee, will ensure that the pipe is bedded and properly coupled to prevent misalignment or sagging of the pipe.
  - 5.13 When reconnecting a sewer service, at a repair point, a service saddle or a tee shall be installed.
  - 5.14 The person in charge will make sure all backfill is performed to the required specifications and confirm that guidelines have been met.
  - 5.15 Final grade of all excavations must be smooth and level.
  - 5.16 The person in charge will inspect the site for cleanliness and safety before leaving.
  - 5.17 All traffic control signs must be removed and stored in the proper location.
  - 5.18 All tools and equipment, used on the job, must be disinfected and cleaned according to WS-A01 Tool Disinfection.
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**Operations Manual**  
**Standard Operating Procedure for Water & Sewer**  
**WS – S01 Sewer Main Repair**

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- 5.19 The person in charge must ensure all work orders, safety forms, invoices and redline edits are properly filled out and reported in a timely manner (within 24 hours or next work day, if on a weekend or holiday).

**6.0 Consequences**

- 6.1 Failure to follow this procedure may result in:
- 6.1.1 – Premature failure of repairs.
  - 6.1.2 – A repair that becomes an on-going maintenance issue.
  - 6.1.3 – Release of sewage into the environment.

## **Standard Operating Procedure for Manhole Inspection**

---

### **1.0 Purpose**

1.1 To ensure the condition of the manhole and steps.

### **2.0 Scope**

2.1 This procedure applies to all ACSA NASSCO certified employees.

### **3.0 Standard Operating Procedure**

3.1 All employees will make sure they have the appropriate personal protective equipment

3.2 For each manhole in the area, field crews perform visual manhole inspections, correcting the GIS when errors or omissions are encountered. Looking for lid type, material, depth, number of mains in, number of laterals, step condition and overall condition of the manhole.

3.3 During a manhole inspection determine the lid type, physical condition, location and possible sources of infiltration and inflow for the manhole and steps. Taking note of the material of the manhole.

3.4 After the inspection of the physical conditions, get the depth of the manhole from the center of the manhole to the center of the invert.

3.5 Check for any incoming mains, laterals and drops to make sure the information is correct on the GIS

3.6 Inspection form included on the back

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## Standard Operating Procedure for Manhole Inspection

### MANHOLE INSPECTION FORM

Manhole # \_\_\_\_\_ Date Inspected \_\_\_\_\_  
Lid Type \_\_\_\_\_ Material \_\_\_\_\_ Depth \_\_\_\_\_  
# of Mains In \_\_\_\_\_ # of Laterals In \_\_\_\_\_ Step Condition \_\_\_\_\_  
Overall condition of manhole \_\_\_\_\_

Manhole # \_\_\_\_\_ Date Inspected \_\_\_\_\_  
Lid Type \_\_\_\_\_ Material \_\_\_\_\_ Depth \_\_\_\_\_  
# of Mains In \_\_\_\_\_ # of Laterals In \_\_\_\_\_ Step Condition \_\_\_\_\_  
Overall condition of manhole \_\_\_\_\_

Manhole # \_\_\_\_\_ Date Inspected \_\_\_\_\_  
Lid Type \_\_\_\_\_ Material \_\_\_\_\_ Depth \_\_\_\_\_  
# of Mains In \_\_\_\_\_ # of Laterals In \_\_\_\_\_ Step Condition \_\_\_\_\_  
Overall condition of manhole \_\_\_\_\_

Manhole # \_\_\_\_\_ Date Inspected \_\_\_\_\_  
Lid Type \_\_\_\_\_ Material \_\_\_\_\_ Depth \_\_\_\_\_  
# of Mains In \_\_\_\_\_ # of Laterals In \_\_\_\_\_ Step Condition \_\_\_\_\_  
Overall condition of manhole \_\_\_\_\_

Manhole # \_\_\_\_\_ Date Inspected \_\_\_\_\_  
Lid Type \_\_\_\_\_ Material \_\_\_\_\_ Depth \_\_\_\_\_  
# of Mains In \_\_\_\_\_ # of Laterals In \_\_\_\_\_ Step Condition \_\_\_\_\_  
Overall condition of manhole \_\_\_\_\_

Manhole # \_\_\_\_\_ Date Inspected \_\_\_\_\_  
Lid Type \_\_\_\_\_ Material \_\_\_\_\_ Depth \_\_\_\_\_  
# of Mains In \_\_\_\_\_ # of Laterals In \_\_\_\_\_ Step Condition \_\_\_\_\_  
Overall condition of manhole \_\_\_\_\_

## EMS Document

# A170 Wet Well and Manhole Pumping Standard Operating Procedure

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### 1.0 Purpose

- 1.1 The purpose of this Standard Operating Procedure (SOP) is to outline the proper procedure for ACSA personnel to pump out wet wells and sewer manholes, and keep any sewage product from impacting the environment.

### 2.0 Scope

- 2.1 This SOP applies to all personnel who may operate the vacuum truck.

### 3.0 Standard Operating Procedure

- 3.1 All sewerage waste product that is removed from our sewer pump station wet wells and/or sewer manholes into our sewer vacuum truck will be done in such a manner as not to allow any product release onto the ground.
- 3.2 Any product removed from a sewer wet well or a sewer manhole into the sewer vacuum truck shall also be off loaded at an appropriate sewer treatment facility.
- 3.3 The driver or vacuum truck operator shall fill out a manifest log for each load showing point of origin and point of disposal.
- 3.4 If the product cannot be disposed of at a sewer treatment facility and it has to be placed in another manhole, no product is to be discharged onto the ground or allowed to enter a storm drain or any body of water.
- 3.5 Should any product be spilled onto the ground or into a body of water, refer to A150 Sewer Overflows Standard Operating Procedure (SOP) for clean-up guidelines.

### 4.0 Responsibility

- 4.1 All ACSA personnel who may respond to a sewer call involving the use of the sewer vacuum truck.

### 5.0 Consequences

- 5.1 Failure to adhere to this procedure will result in the following:
  - 5.1.1 release waste and bacteria into state waters;
  - 5.1.2 release waste and bacteria into public or private property;
  - 5.1.3 subject the ACSA to fines from EPA and/or DEQ;
  - 5.1.4 unwanted news coverage.

## Standard Operating Procedure for Emergency Standby Bypass

### Hook-Up at Sewer Pump Stations

---

#### 1.0 Objective

- 1.1 To efficiently hook-up bypass pump in an emergency situation such as a natural disaster, etc.

#### 2.0 Scope

- 2.1 This procedure applies to all activities involving ACSA sewer pump stations

#### 3.0 Responsibility

- 3.1 The responsibility of following this SOP involves the following ACSA employees: Operations Manager, Operations Supervisor, Facilities Supervisor, Electrical/Pump Technician, and Electrical/Pump Apprentice.

#### 4.0 Safety

- 4.1 The ACSA is responsible for providing each employee with the proper Personal Protective Equipment (PPE).
- 4.2 PPE required for this task will be safety-toe shoes, safety glasses, goggles or face shield, hard hat, leather and/or vinyl gloves. Hearing protection is optional.
- 4.3 It is the employee's responsibility to have PPE readily available and to use the proper PPE required for the task.

#### 5.0 Standard Operating Procedure

- 5.1 Pick up one of the pumps (unit 166 or 171) along with enough suction (4" orange) and discharge (Flanged 4" blue) hoses to reach your bypass connections, and take to site in need. (Pumps located at Northfields Pump Station, 1900 Rolling Hill Road)
  - 5.1.1 – Using Key Ch751, unlock door on unit and check fuel and oil levels. Top off as needed.
  - 5.1.2 – Turn pump ignition key to "manual" and press "start" to make sure pump will start up.
  - 5.1.3 – After pump has started and tested OK, shut down unit and turn key off.
  - 5.1.4 – Take pump to site and set up
  - 5.1.5 – Once pump is in place, lower jack stands to stabilize and level pump. Set wheel chocks.
  - 5.1.6 – Using 4" orange suction hose, install screen on end that will be dropped in wet well and lower until screen touches bottom. Hook other end to Quick coupling on rear end of pump.
  - 5.1.7 – Using 4" flanged blue hose, bolt to existing standby pump connection on force main. One end of hose already bolted to pump.
  - 5.1.8 – Where flanged suction hose is bolted to bypass connection there are two (2) valves in normal operation. Valve #1 is open and valve #2 is closed. To place pump in service, close valve #1 first, then open valve #2.
  - 5.1.9 – There is a garden hose inside pump cabinet that needs to be hooked up to connection on back of pump marked "air relief." Other end of hose needs to be placed in wet well. This is to bleed off air for these self-priming pumps so they will pump properly.
  - 5.1.10 – Turn on ignition switch. Press "start" button (button is heat-activated so make sure fingers are warm). Pump wet well down until you see suction piping of the permanent pumps of the station and shut off pump.

## Standard Operating Procedure for Emergency Standby Bypass

### Hook-Up at Sewer Pump Stations

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- 5.1.11 – At this point, locate the two floats and connecting cables. Lower red float until it is about one (1) foot above piping and set it at this point. Use wire ties or whatever available to secure so float cannot drop. This is cut-off float for pump when in auto operation.
- 5.1.12 – Locate incoming flow or lateral to wet well. Set yellow float about one (1) foot below this pipe and secure it so it stays at this level. This is the float to cut pumps on when in auto operation.
- 5.1.13 – Connect end of cable with pins and screw on connector to bottom of control box on pump (labeled).
- 5.1.14 – Turn ignition key to “on” position and place unit in auto mode. Add water to wet well to test-run pump through a couple cycles. After pump has completed a couple cycles, it should be ok to be left alone.
- 5.1.15 – Continue to monitor pump daily while station is down, checking oil and fuel. Also, check for any unusual noises, vibrations, or heat. Walk around checking pump and hoses for leaks.
- 5.1.16 – Once problem is corrected and pump is no longer needed, turn off key and shut pump down.
- 5.1.17 – Switch valves back to normal operation in which valve #1 will now be open and valve #2 will be closed. Open valve #1 first.
- 5.1.18 – Unhook all hoses and clean up. Raise jack stands on pumps. Take pump and hoses back to Northfields Pump Station for storage. Plug drop cords back up to battery charger to keep ready for next emergency.

#### 6.0 Consequences

- 6.1 Failure to follow these procedures may result in the following:
  - 6.1.1 – Failure to have pumps operating may result in sewage backups that could flood back into homes.
  - 6.1.2 – Failure to have pumps operating may result in the overflow of sewage from wet wells and manholes, leading to the contamination of streams.

# APPENDIX C

**SECTION 19 – FATS, OILS AND GREASE [Added 12/17/09; Amended 01/20/22; Revised 7/1/15]****19-01. INTRODUCTION.**

Fats, oils and grease (FOG) are a significant concern for the ACSA in the operation of the wastewater collection system. When not disposed of properly, they congeal and accumulate along the walls of the sanitary sewers. This constricts the pipes, impedes the flow of wastewater, and raises the potential for blockage. Grease also affects the proper operation of pump stations, leading to sewage accumulation in wet wells. Either of these situations can eventually result in a sanitary sewer overflow in which wastewater is discharged from a manhole, or wastewater enters residences and businesses. This is both an environmental issue and a public health concern, in which sewage can contaminate the ground, local bodies of water, and any property with which the wastewater comes into contact.

The financial burden related to excessive FOG is potentially two-fold. Maintenance crews of the ACSA devote considerable time to cleaning sewerage components, and treatment processes may be hindered at the wastewater treatment plants.

FOG discharges relate directly to the preparation, cooking, and disposal of food items. These can originate from residences and from commercial, institutional, and industrial facilities. However, it is restaurants and related commercial food service establishments that are the most significant source of FOG due to the amount of oil and grease used in cooking, and with other food preparation.

**19-02. PURPOSE.**

This Section is adopted for the following purposes:

1. To set forth requirements for non-residential users of the ACSA wastewater collection system to capture and dispose of FOG, enabling the ACSA to comply with applicable federal and state laws, and with the Sewerage User Regulations of the Rivanna Water and Sewer Authority (RWSA), incorporated herein as Appendix A. Specifically, Part II, Section 4, Paragraph b prohibits the discharge of any wastewater containing more than 100 parts per million (ppm) of FOG.
2. To reduce the operational and maintenance costs of the ACSA by limiting the introduction of FOG into the wastewater collection system.
3. To reduce the impact on the RWSA wastewater treatment operations by limiting the amount of FOG delivered by the ACSA wastewater collection system.
4. To protect public health and prevent environmental disturbances by eliminating or reducing sanitary sewer overflows due to grease accumulations.

**19-03. APPLICABILITY.**

The provisions of this Section are applicable to all commercial food service establishments, commercial office buildings with food service, industries with food service, and institutions with food service that discharge to the ACSA wastewater collection system. Collectively, these shall hereinafter be referred to as Food Service Establishments (FSEs).

**19-04. GENERAL REQUIREMENTS.**

1. All FSEs shall install, operate, and maintain at their expense, a grease control device.
2. All FSEs shall obtain a FOG Waste Discharge Permit.
3. A concentration of 100 ppm of FOG, measured as Hexane Extractable Material, in the discharge of an FSE is established as an Action Level.
4. The maintenance costs related to excessive grease in the ACSA wastewater collection system, and traceable to the food service operations of an FSE, shall be the responsibility of the FSE.
5. The maintenance and clean-up costs of a sanitary sewer overflow that is related to excessive grease in the ACSA wastewater collection system, and traceable to the food service operations of an FSE, shall be the responsibility of the FSE.
6. Any fines imposed upon the ACSA by the Commonwealth of Virginia or the United States of America regarding a sanitary sewer overflow that is related to excessive grease in the ACSA wastewater collection system, and traceable to the food service operations of an FSE, shall be the responsibility of the FSE.

#### **19-05. EXEMPTION FROM GREASE CONTROL DEVICE REQUIREMENTS.**

The ACSA may grant an exemption from the requirements to install and maintain a grease control device to an FSE that is determined to have no, or minimal, adverse grease impact upon the ACSA wastewater collection system due to the nature of the FSE operations. To be considered for an exemption, the FSE may be asked to provide a written request to the ACSA, stating in detail the grounds for the exemption. Following review of the request, the ACSA may elect to inspect the FSE during its normal business hours. The final decision on granting an exemption shall rest with the Executive Director or designated agent, and a written response shall be provided to the FSE. At any time, the ACSA may revoke the exemption and require installation of a grease control device.

There shall be limited circumstances in which an exemption is granted, and shall be related to the following:

1. A commercial establishment that serves only food typically considered snack food, both packaged and unpackaged, with or without warming.
2. A school, industry, or commercial office building within which a lunchroom may exist, yet the only food that is made available to the students, employees, or guests is from snack and drink machines.
3. A bed and breakfast establishment which prepares and serves only the breakfast meal to its guests and employees, with fewer than four (4) guest rooms, and fewer than eight (8) guests.
4. A residential care facility for the aged, infirmed, or disabled within which fewer than four (4) adults are provided care.
5. A day care facility for the aged, infirmed, or disabled within which fewer than six (6) adults are provided care.
6. A day care facility for babies and children within which fewer than six (6) children are provided care.
7. A day care facility for babies and children within which the food preparation does not include frying, or food preparation and cleaning do not exceed that of an average private residence.
8. A church within which a kitchen facility may exist, yet on-site food preparation and cleaning do not exceed that of an average private residence.
9. An FSE that is determined, by previous monitoring or a review of planned operations, to not generate FOG in excess of an average private residence.

#### **19-06. NEW ESTABLISHMENTS.**

The ACSA shall require all new FSEs to install the appropriate grease control device(s) prior to initiating operations. In general, this shall be a grease interceptor for all restaurants, supermarkets, hospitals, schools, motels, and industries. Further, the ACSA shall require an FSE with a grease control device to obtain a FOG Waste Discharge Permit.

#### **19-07. EXISTING ESTABLISHMENT; NEW ESTABLISHMENT IN EXISTING BUILDING.**

All existing FSEs shall have grease control devices that meet the same general requirements for installation and design as for new establishments. This shall also pertain to a new establishment that begins operations in an existing building, and an existing FSE that expands its food service operations.

If the ACSA determines the grease handling facilities or methods of an existing FSE are inadequate to prevent excessive FOG from entering the ACSA wastewater collection system, the FSE shall be notified in writing of the deficiencies, listing the required improvements and a compliance deadline. Required improvements may include additional training of the kitchen staff, modifications of the grease control device maintenance schedule, the installation of a larger, or additional, grease trap, or the installation of a grease interceptor. The ACSA may require the FSE to provide a schedule of corrective action to attain full compliance.

The ACSA shall allow an FSE without a grease control device a compliance deadline not to exceed two (2) months for the installation of a grease trap(s), or not to exceed six (6) months for the installation of a grease interceptor, following written notification from the ACSA. If an FSE that is required to install a grease interceptor does not have an existing grease trap, then the latter shall be installed within two (2) months of notification by the ACSA, unless the grease interceptor is installed within that same period.

The Executive Director or designated agent may decide in certain instances that the installation of a grease interceptor on an existing FSE property is physically impossible due to space limitations, is not feasible due to inadequate slope for proper gravity flow, or for other reasons. In these instances, the Executive Director may allow installation of a grease trap, or traps, meeting the design specifications listed herein. The FSE manager shall be responsible for aggressive kitchen Best Management Practices and grease trap maintenance programs to produce wastewater that meets the FOG discharge requirements. Such FSEs may be subject to routine sampling to confirm compliance with the requirements herein.

#### **19-08. GRANDFATHERING OF EXISTING ESTABLISHMENTS.**

The ACSA shall allow existing FSEs, in which a grease trap or grease interceptor has been installed prior to the effective date of this Section, to continue operation of the existing device, if the device is effective:

1. In keeping grease from accumulating in the ACSA wastewater collection system and in the sewer lines of the FSE.
2. In producing wastewater in which FOG remains below the Action Level.

The ACSA may require an existing FSE which operates a grease trap to add a sample valve to the discharge pipe from the device, and prior to a union with any building sewage drain. The ACSA may require an existing FSE which operates a grease interceptor to add a sample box to the discharge pipe from the device, and prior to a union with any building sewage drain. This requirement of a sample valve or sample box shall typically be limited to FSEs in which there is a history of poor grease control device maintenance.

The ACSA may require an existing FSE which expands its food service operations to install a larger grease trap, additional grease traps, or a grease interceptor, to replace or operate in conjunction with an existing grease trap.

#### **19-09. DESIGN, SIZING, AND INSTALLATION REQUIREMENTS.**

All grease traps and interceptors shall be designed, sized, and installed according to the standards of the Virginia Uniform Statewide Building Code and the International Plumbing Code.

Various formulas exist to calculate the proper size of a grease interceptor. The ACSA shall not require the use of any one formula, but rather the use of sound engineering judgment in this instance.

General specifications are as follows.

- A. A grease trap shall:
  1. Be constructed of corrosion-resistant metal or plastic.
  2. Be accessible for cleaning, maintenance, and inspection.
  3. Contain properly installed and functioning baffles necessary to achieve the appropriate retention time to allow for proper separation of FOG and solids from the gray water.
  4. Handle the flow from no more than three (3) kitchen sinks, and be located as close to the sink(s) as possible.
  5. Receive the discharge from any dishwasher that operates at 130 degrees Fahrenheit or less (chemical sanitizing dishwasher). Depending upon the number of sinks, this may require the installation of a second grease trap.
  6. Not receive discharge that exceeds 130 degrees Fahrenheit.
  7. Not receive discharge from a food grinding unit unless a properly-sized solids interceptor has been installed.
  8. Receive only gray water.
  9. Be installed with a flow control or restricting device to restrict the flow to the rated capacity of the trap.
  10. Be installed with a sample valve on the discharge line from the device and prior to a union with any building sewage drain.

**B. A grease interceptor shall:**

1. Be constructed of precast concrete meeting the standards of ASTM C1613-17, or of corrosion-resistant polyethylene or polypropylene fiberglass meeting the standards of ASME A112.14.3 or PDI-G101.
2. Be sized from a minimum of 1,000 gallons to a maximum of 3,000 gallons if constructed of precast concrete or have a flow rate/grease capacity of 75-200 GPM if constructed of polyethylene or polypropylene.
3. Contain multiple chambers and properly-positioned tee piping to achieve a minimum thirty (30) minute retention time before gray water is discharged to the ACSA wastewater collection system.
4. Be installed on the FSE property and in a location outside the FSE, with access for inspection, cleaning, pumping, and maintenance.
5. Not be installed in areas subject to heavy traffic, where possible, and shall be accessible for inspections at all times, having no permanent or temporary structure or container placed directly over the unit.
6. Have a minimum 20-inch diameter manhole access cover, extended to finish grade, over each chamber.
7. Have solid, water-tight access covers that prevent infiltration of stormwater or other surface water. Any gaskets shall be positioned beneath the cover.
8. Be designed with a clean-out that can serve as a sample box at the outlet.
9. Receive the discharge from all FSE drains and fixtures through which grease may be released, including all sinks, food grinding units, dishwashers, and floor drains.
10. Receive only gray water.
11. Be installed at a minimum distance of ten (10) feet from dishwashers and sinks to allow for optimal cooling of the wastewater.
12. Not receive discharge that exceeds 150 degrees Fahrenheit.
13. Include a properly-sized solids interceptor, or have its volume increased by 25%, when receiving discharge from a food grinding unit.
14. Be installed with an approved flow control or restricting device.

**19-10. FOG WASTE DISCHARGE PERMIT.**

The ACSA shall require all FSEs that currently possess, or are required to install, a grease control device to obtain a FOG Waste Discharge Permit. No FSE shall discharge to the ACSA wastewater collection system without obtaining a permit unless an exemption has been received.

The permit application shall, at a minimum, include the following information:

1. The name, address, and telephone number of the applicant, and the name, address, and telephone number of the ACSA account owner, if different from the applicant.
2. A description of the food service operations, cuisine, the hours of operation, and number of meals served per day.
3. A detailed list and number of all kitchen food preparation appliances, and kitchen fixtures, including size.
4. All grease control devices, or other pretreatment equipment, currently installed.

The ACSA may request other information of the FSE, related to the food service operations and potential food service discharges, to properly evaluate the permit application.

The completed FOG Waste Discharge Permit application shall be submitted to the ACSA for review. The ACSA may elect to inspect the FSE during its normal business hours. If the application is accepted, a permit shall be issued within thirty (30) days after receipt of the permit application. The applicant shall be allowed a thirty (30) day comment period. A permit shall contain general, and possibly specific, conditions for the FSE.

Permits shall be issued for a period of three (3) years. An expired permit shall continue to be in effect and enforceable if failure to reissue the permit is not due to any delinquency on the part of the FSE. No permit shall be transferable without the permission of the ACSA.

Denial of an original or renewal permit shall be based upon an incomplete application, an unacceptable size and/or design of the grease control device(s), failure to pay charges that have been levied, a history of FOG discharge violations, or other related factors.

#### **19-11. FOG WASTE DISCHARGE PERMIT CONDITIONS.**

The issuance of a FOG Waste Discharge Permit shall contain the following conditions or limits:

1. A requirement for the proper installation, operation, and maintenance of the approved grease control device(s).
2. A requirement for documentation of a cleaning and maintenance schedule for the grease control device(s).
3. A recommendation for implementation and documentation of a kitchen Best Management Practices program.
4. The establishment of a concentration of 100 ppm of FOG, measured as Hexane Extractable Material, as an Action Level.
5. A possible requirement for laboratory testing of FOG, Biochemical Oxygen Demand (BOD), and Total Suspended Solids (TSS). Testing may be conducted at least once during the permit period to document that Section 19.-11.4 is being met.
6. A requirement to report to the ACSA any anticipated expansion of food service operations prior to initiating such a project.
7. The issuance of a permit shall not relieve the FSE from complying with applicable laws, regulations, and ordinances promulgated by other governmental authorities.
8. The FSE agrees to hold harmless the ACSA and its employees from any liabilities arising from the operations of the FSE.

The terms and conditions of the permit are subject to modification by the ACSA at any time as just cause exists. The ACSA shall inform an FSE of any proposed change in the issued permit at least thirty (30) days prior to the effective date of the change, and shall give the FSE a reasonable timetable for compliance.

#### **19-12. GENERAL MAINTENANCE OF GREASE TRAPS AND INTERCEPTORS.**

Proper maintenance of grease traps and interceptors is crucial to establish optimal efficiency of the devices, and thus eliminate or minimize the discharge of grease from the FSE. A grease control device shall be cleaned as often as necessary to ensure that:

1. There is no evidence of grease in the ACSA wastewater collection system that can be traced directly to the operations of the FSE.
2. There is no evidence of grease in the sewer lines of the FSE.
3. The discharge of FOG to the ACSA wastewater collection system remains below the Action Level.
4. Floating material and sediment do not accumulate to impair the operation of the device.
5. No oil or grease is observed to discharge from the device.

The ACSA shall provide a detailed packet of information that describes proper cleaning and maintenance of the devices. However, due to varying designs and sizes, the FSE shall follow specific manufacturer guidelines for cleaning and maintenance in all instances.

General guidelines for cleaning and maintenance include:

1. Grease traps and interceptors shall be kept free at all times of such solid materials as gravel, sand, bones, shells, cigarettes, utensils, towels, and rags that will reduce the effective volume of the device and increase the frequency of cleaning.
2. The total depth of the surface FOG, combined with the settled solids, should not exceed approximately 25% of the total depth of the liquid/solid column.
3. Based upon the above, a grease trap will typically require cleaning every 1-4 weeks, and a grease interceptor will generally require cleaning every 2-3 months. However, the actual loading on a device shall determine the specific cleaning schedule in all instances, and this schedule may require periodic adjustment based upon food volume and specific menu items.

### **19-13. KITCHEN BEST MANAGEMENT PRACTICES.**

The application of kitchen Best Management Practices (BMP) by an FSE serves as a critical initial step in reducing the amount of FOG that enters a grease control device, and therefore in prolonging the periods between cleaning and maintenance. The ACSA strongly encourages each FSE to establish a kitchen BMP program, and provide continuous training and monitoring of employees. The ACSA shall provide a packet of information that describes aspects of a kitchen BMP program.

### **19-14. WASTE GREASE DISPOSAL.**

All FSEs are encouraged to use designated buckets for the disposal of waste grease removed from grease traps during cleaning. Such material shall not be combined with cooking oil that is to be recycled. Buckets should have a well-sealing lid and shall be disposed of at a facility permitted to receive such waste.

### **19-15. GREASE INTERCEPTOR CLEANING AND MAINTENANCE.**

Specific requirements for the servicing of grease interceptors shall include the following:

1. Cleaning and related maintenance shall be contracted to a company that is permitted by the Commonwealth of Virginia to transport waste.
2. Such service shall be performed at least every three (3) months, unless written permission for a schedule of less frequent service has been provided by the ACSA.
3. Cleaning and maintenance shall include the evacuation of all contents of the interceptor, including floating materials, gray water, and settled solids.
4. All waste removed from an interceptor shall be disposed of at a facility permitted to receive such wastes.
5. Gray water or potable water shall be returned to the interceptor following waste evacuation and cleaning.
6. Other than the gray water immediately returned to the interceptor to complete maintenance, none of the waste material removed from an interceptor shall be discharged to the ACSA wastewater collection system.

### **19-16. PROHIBITIONS.**

The following practices and devices are prohibited:

1. Any modification of a grease interceptor, such as alteration or removal of a flow constricting device, that causes flow to rise above the design capacity of the unit or reduce the retention time.
2. Interceptor cleaning that involves only skimming the surface layer, partial cleaning, or the use of any method that does not remove the entire contents of the vessel.
3. The introduction of such agents as concentrated detergents, other surfactants, emulsifiers, degreasers, solvents, or any other type of product that will liquefy grease wastes.
4. The addition of any chemical enzyme product unless written permission has been granted by the ACSA.
5. The addition of bacteria unless written permission has been granted by the ACSA.
6. The use of automatic, or mechanically operated, grease removal systems unless written permission has been granted by the ACSA.

### **19-17. RECORDKEEPING.**

FSEs with a grease control device shall maintain records of all cleaning and maintenance. These records shall include, at a minimum:

1. The date and time of service.
2. The name and signature of the FSE representative who performed or witnessed the service.
3. The contract company that performed the service (if applicable).
4. The name and signature of the contract company employee (if applicable).
5. The gallons of waste removed.
6. A copy of the service record or manifest from the contract company (if applicable).

Records shall be placed in a logbook, folder, or binder, shall be maintained on site for at least the previous three (3) years, and shall be made available immediately to the ACSA on demand during an inspection, or at intervals specified in a permit. Any falsification of maintenance records is a violation of this policy.

**19-18. INSPECTION VISITS.**

Authorized representatives of the ACSA shall request the right to enter the premises to determine whether an FSE complies with all requirements of this Section. Entry shall be during normal operating hours and for the purpose of inspection and evaluation of the FSE's grease control program.

Inspection may involve any of the following items:

1. The integrity of the grease control device
2. The amount of grease present in the device
3. Wastewater appearance and clarity
4. Cleaning and maintenance records
5. All food processing areas and fixtures
6. Sampling of discharge water from the device

The FSE shall keep grease control device(s) accessible at all times. The ACSA shall have the option of requesting that a grease trap be opened by a representative of the FSE.

The ACSA shall make the result of the inspection available to the FSE representative verbally or in written form. A written report shall be delivered within ten (10) business days of the inspection if the FSE is found to be out of compliance with any of the requirements outlined in this Section, and shall include the necessary corrective action and a timetable for accomplishing such improvements.

**19-19. USE OF CAMERAS.**

As a part of the inspection of an FSE, the ACSA reserves the right to photograph the kitchen facilities and any grease control device, including its contents, for the purpose of documentation.

The ACSA also reserves the right to photograph and film the interior of the building sewage drain and/or building sewer, such as by means of closed-circuit television. Photo and video documentation of grease accumulation along the walls of the pipe shall be evidence that the FSE must install a grease control device, that an existing grease control device is not being maintained properly, or that an additional grease control device may be required. The FSE may also be required to clean its building sewage drain and building sewer in coordination with ACSA maintenance crews. The expense of such cleaning shall be borne by the FSE.

**19-20. SAMPLING AND TESTING.**

The ACSA may periodically collect samples for laboratory testing as one means to determine if an FSE complies with the requirements of this Section, and with other requirements of the *Rules and Regulations*.

Sampling and testing may consist of FOG, BOD, and TSS. Any additional sample collection and testing for these parameters shall be at the discretion of the ACSA, and shall relate to a history of the FSE's discharge, or to existing conditions.

Sampling shall involve grab samples which are collected, stored, transported, and analyzed in accordance with the procedures specified in 40 CFR Part 136. All testing shall be conducted by a private commercial laboratory which is in good standing with the Virginia Department of Environmental Quality, and which has attained certification within the Virginia or National Environmental Laboratory Accreditation Program (VELAP/NELAP).

Sample collection from a grease trap shall be from the sample valve at the outlet of the device, if present, or from the nearest manhole that receives only the discharge of the FSE. Sample collection from a grease interceptor shall be from the sample box at the outlet of the device, if present, or from the nearest manhole that receives only the discharge of the FSE.

A copy of the analysis report of any laboratory testing on samples collected from an FSE shall be mailed to the FSE within ten (10) business days of receipt by the ACSA. The report shall include, at a minimum, an explanatory cover letter, the chain of custody form, the laboratory at which testing occurred, the results of the testing, the test methods used, and the dates of analyses.

5. The failure of an FSE to respond satisfactorily to an NOV, when the issue is the falsification of grease control device maintenance records, shall result in a charge. See Appendix B.
6. The failure of an FSE to respond satisfactorily to an NOV, when the issue is the failure to submit a FOG Waste Discharge Permit application, or pay a permit fee, shall result in a charge until the application is submitted or the fee is paid. See Appendix B.
7. An FSE whose operations cause or allow grease to be discharged to the extent that it accumulates in the ACSA wastewater collection system, shall be liable for the costs to clean and/or repair the facilities, including all labor, materials, and equipment.
8. An FSE whose operations cause or allow grease to be discharged to the extent that it accumulates in the ACSA wastewater collection system, and results in a sanitary sewer overflow, shall be liable for the costs to clean and/or repair the facilities and affected area, including all labor, materials, and equipment.
9. An FSE whose operations cause or allow grease to be discharged to the extent that it accumulates in the ACSA wastewater collection system, and results in a sanitary sewer overflow, shall be liable for any fines dispensed by the Commonwealth of Virginia or the United States of America.
10. A commercial waste hauler or individual who discharges to the ACSA wastewater collection system the wastes collected from a grease interceptor shall be assessed a charge. See Appendix B.

### **19-23. APPEAL PROCESS.**

An FSE, commercial waste hauler, or individual shall have the right to appeal any of the costs or charges listed in Section 19-22.1 through 19.22-10 according to the following procedure:

1. A notice to appeal shall be requested in writing and delivered to the office of the Executive Director no later than five (5) business days following the receipt of notice of the cost or charges to be levied.
2. The failure to file such notice to appeal within such time limit shall be deemed a waiver of the right to appeal.
3. Upon receipt of the appeal request, the Executive Director shall render a decision within thirty (30) calendar days.
4. The decision shall be sent by certified mail to the appellant.

## **Standard Operating Procedure**

### **Fats, Oils and Grease Abatement Program – Permitting Process**

#### **1.0 Purpose**

- 1.1 This Standard Operating Procedure (SOP) describes the process by which restaurants and other food service establishments (FSEs) are permitted by the Fats, Oils and Grease (FOG) Abatement Program to discharge wastes into the ACSA wastewater collection system.

#### **2.0 Scope**

- 2.1 This SOP applies to all ACSA customers who own or manage a restaurant or other FSE who are required to obtain a FOG Waste Discharge permit for their facility, as described in Section 19 of the ACSA *Rules and Regulations*.
- 2.2 Certain restaurants in the ACSA jurisdictional area are not provided sewer service. These, and other, FSEs are exempt from these regulations; see Section 19-05 of the *Rules and Regulations*.
- 2.3 This SOP applies to all personnel who enter FOG program data into the Linko software database.

#### **3.0 Equipment and Supplies**

- 3.1 A computer into which the Linko database has been installed.
- 3.2 Standard office supplies.

#### **4.0 Procedure**

- 4.1 Identify a new restaurant or FSE by visual evidence, information from Customer Service, information received directly from the owner or manager of the facility, from County records, or by other means.
- 4.2 Deliver a packet of information to the new FSE that includes:
  - 4.2.1 Cover letter with background information on the FOG Abatement Program, the dangers of FOG in the wastewater collection system, and immediate expectations of the customer.

- 4.2.2 Information on the distinction between a grease trap and a grease interceptor, how each is to be cleaned, and a list of local contractors who perform those services.
  - 4.2.3 A FOG Waste Discharge Permit Application to be completed and submitted.
  - 4.2.4 Instructions for the FOG permit application.
  - 4.2.5 Kitchen Best Management Practices (BMPs).
  - 4.2.6 A grease trap/grease interceptor Maintenance Verification Form.
- 4.3 Deliver to the restaurants in the Stonefield complex a slightly modified application form since the Stonefield complex owner, and not the individual restaurant, is responsible for all cleaning and maintenance of the grease interceptors.
  - 4.4 An owner or manager familiar with the material described in Step 4.2 may be delivered only the permit application, and not the additional background and educational material, as occurs when a restaurant moves to a new location.
  - 4.5 Generate compliance letters for the failure of an FSE to return a completed application form, if necessary. The letters follow the guidelines of Sections 19-21 and 19-22 of the *Rules and Regulations*, and the SOP "FOG Abatement Program – Notice and Compliance Letters."
  - 4.6 Stamp the application form with the date received, and review the form for thoroughness. Contact the FSE if answers have been omitted, or if questions arise from the information provided. The application form is to be filed in the Environmental Compliance Specialist's office.
  - 4.7 Enter primary contact and a variety of other information, including "Application Date" to the Linko database according to the SOP "Fats, Oils and Grease Abatement Program - Permittee and Inspection Data Entry." The primary contact name and mailing address will be the name and address to whom a permit and invoice are mailed. (This information is requested on the application form).
  - 4.8 Complete an invoice request form on the intranet from which Customer Service will generate an invoice. The amount due on the invoice (\$250 for three years, or \$83.33/\$83.34 for one year) is based upon the preference of the customer.
  - 4.9 The invoice request form is reviewed and signed by the Director of Engineering and the Customer Service Supervisor.
  - 4.10 The prepared invoice is given to the Environmental Compliance Specialist for inclusion in a permit packet (see Step 4.11) that is mailed or delivered to the FSE.
  - 4.11 The permit packet includes:

- 4.11.1 Cover letter.
- 4.11.2 Invoice.
- 4.11.3 Addressed, return envelope.
- 4.11.4 FOG Waste Discharge Permit with cover page identifying the FSE and the effective dates of the permit, and a signature page.
- 4.11.5 Kitchen BMPs.
- 4.11.6 A grease trap/grease interceptor Maintenance Verification Form.
- 4.12 The outside of the manila envelope should be stamped "Invoice Enclosed."
- 4.13 To enter the effective date of the permit in the Linko database, complete Steps 4.1, 4.16 and 4.17 of the SOP "FOG Abatement Program – Permittee and Inspection Information Entry."
- 4.14 After selecting the proper facility, click on the "Site & Date Info" box in the toolbar near the middle of the screen.
- 4.15 In the "Permit Event Dates" section, enter the date of the permit (mm/dd/yyyy) in the "Effective Date" box.
- 4.16 **Payment.** The FSE has 45 days in which to make payment on the waste discharge permit invoice.
- 4.17 Customer Service will notify the Environmental Compliance Specialist when the permit payment has been received from the FSE by delivering a "paid" copy of the invoice request, or a similar notice.
- 4.18 Generate non-compliance cover letters using Word for the failure of an FSE to pay a permit fee, if necessary. The letters follow the guidelines of Sections 19-21 and 19-22 of the *Rules and Regulations*.
- 4.19 A Notice of Non-Compliance letter will be mailed with an updated invoice on which a first set of late charges has been added (beyond 45 days).
- 4.20 A Notice of Violation (NOV) letter will be mailed with an updated invoice on which a second set of late charges has been added (a total of at least 75 days).
- 4.21 The NOV letter will be sent by certified mail, and gives the FSE ten (10) additional business days in which to make payment (a total of at least 85 days).
- 4.22 If the permittee has still failed to make payment on the most recent invoice that includes at least two (2) sets of late charges, prepare an invoice request form on the intranet for a charge of \$500 as called for in Section 19-22 of the *Rules and Regulations*.
- 4.23 The invoice request form is reviewed and signed by the Director of Engineering and the Customer Service Supervisor.
- 4.24 This charge is repeated monthly until the original permit fee, all associated late charges, and all penalty charges, are paid in full.

- 4.25 **For FSEs making annual payments**, an invoice request for \$83.33 for the second year of the permit, and for \$83.34 for the third year of the permit, should be prepared no later than the 15<sup>th</sup> of the month preceding renewal.
- 4.26 The prepared invoice is given to the Environmental Compliance Specialist for inclusion in an envelope with a cover letter and an addressed, return envelope.
- 4.27 **For FSEs that require a renewal permit**, it is critical that confirmation of the primary contact person and address pertaining to permits be made. A request that the FSE complete a new permit application is optional.
- 4.28 An invoice request (\$250 or \$83.33) should be prepared no later than the 15<sup>th</sup> of the month preceding renewal.
- 4.29 Repeat Steps 4.10 - 4.12 pertaining to mailing.
- 4.30 For the sizable number of original FSEs in the program (year 2010) which renew every three (3) years in September and October, invoice requests should be prepared no later than thirty (30) days preceding permit renewal to allow Customer Service sufficient time to prepare the invoices.
- 4.31 Repeat Steps 4.13 - 4.16 to enter updated permit effective date information into the Linko database.

**5.0 Responsibilities**

- 5.1 The Environmental Compliance Specialist will review this SOP annually to ensure its applicability.
- 5.2 The Engineering Director will review the SOP annually following review, and any edits made, by the Environmental Compliance Specialist.
- 5.3 Any ACSA employee involved with a particular step(s) in the permitting process, and/or entering FOG customer information into the Linko database, will follow the protocol of this document.

<b>Written By:</b>	Tim Brown		Environmental Compliance Specialist	September 22, 2014
<b>Approved by:</b>	Peter Gorham		Engineering Director	

**Annual Review:**

<b>Environmental Compliance Specialist</b>	<b>Date</b>	<b>Engineering Director</b>	<b>Date</b>

## **Standard Operating Procedure**

### **Fats, Oils and Grease Abatement Program - Inspection of a Grease Interceptor**

#### **1.0 Purpose**

- 1.1 This Standard Operating Procedure describes the process of inspecting a grease interceptor located outside a food service establishment (FSE) permitted in the ACSA Fats, Oils and Grease (FOG) Abatement Program.

#### **2.0 Scope**

- 2.1 This SOP applies to all personnel who inspect grease interceptors.
- 2.2 This SOP applies to all permitted FSEs which have grease interceptors.
- 2.3 The term grease interceptor refers to a large-capacity grease control device located outside a facility. It is located below ground level, and typically holds more than 250 gallons of liquid.

#### **3.0 Equipment and Supplies**

- 3.1 Gloves
- 3.2 Manhole puller
- 3.3 Tape measure
- 3.4 Measuring pole with "feeler" bracket
- 3.5 DipStick-Pro (Sludge Judge)
- 3.6 Interceptor design report forms (if necessary; attached)
- 3.7 Inspection report forms (attached)

#### **4.0 Procedure**

**For a detailed inspection of the design and size of an interceptor, begin with Step 4.1. For a routine inspection, go immediately to Step 4.20.**

- 4.1 Greet facility employee and inform him/her of the purpose of the visit.
- 4.2 Determine number of manholes related to the interceptor. Check appropriate box on design report form.
- 4.3 Remove manhole lid(s) with manhole puller.

- 4.4 Measure approximate length and width of interceptor by observing the interior walls through the manhole openings. Record measurements on design report form.
- 4.5 Insert measuring pole into interceptor until it touches the bottom and remove. Measure wet section of pole with measuring tape for interceptor depth. Record measurement on design report form.
- 4.6 Calculate interceptor size using the following formula:
  - 4.6.1  $(L' \times W' \times H' \times 7.48 = \text{gallons})$
  - 4.6.2 Record result of calculation on design report form.
- 4.7 Determine the outlet side of the interceptor by observing the flow of its liquid contents. Most of the time you can clearly see liquid flowing into one side of the interceptor and exiting on the opposite side of the interceptor through the inlet and outlet Ts. Once the outlet side is determined, insert the measuring pole into interceptor until it touches the bottom. Measure the length of the measuring pole that is above the top of the manhole frame. Line up “feeler bracket” with the likely location of bottom of outlet T. Pull up on measuring pole until “feeler bracket” catches bottom of outlet T. Measure the length of the measuring pole that is above the top of the manhole frame. Subtract the first measurement from the second measurement and add 2.5 inches (the distance from the bottom of the pole to the “feeler” bracket) to calculate the distance between the bottom of the outlet T and the bottom of the interceptor. This should be no greater than 18” or less than 12”. Record measurement on design report form.
- 4.8 Determine if baffle is present and the size of its opening, if possible. Check appropriate box and record measurement on design report form.
- 4.9 Determine the size and material (metal or plastic) of the inflow and outflow pipes. Use tape measure to measure distance from top of the manhole frame to top of inflow and outflow pipes. Examine condition of pipes including any presence of corrosion. Record observations and measurements on design report form.
- 4.10 Insert sludge judge and slowly lower into interceptor until it reaches the bottom of the interceptor. Allow time for tube to fill with liquids. Tug rope slightly and remove sludge judge from interceptor. Use tape measure to measure grease, gray water and solids depths (top to bottom). Record profile on design report form.
- 4.11 Place sludge judge over open manhole and push pin extending from bottom of unit to release contents.
- 4.12 Assess overall condition of interceptor and record on design report form.

General guidelines:

  - All gray water or very thin layer of grease – excellent condition
  - Thin layer of grease with gray water directly underneath – good condition

- Grease and solids levels combined exceed 1/4 of total depth – poor condition
  - Missing or outlet T that is not within 18” from the bottom of interceptor – needs repair
  - Inlet or outlet pipe that is rusty and falling apart – needs repair
- 4.13 Replace manhole lid(s) with appropriate tools.
- 4.14 Assess tightness of manhole lid(s) for infiltration prevention and note on design report form.
- 4.15 Repeat Steps 4.2-4.14 for any additional grease interceptors.
- 4.16 Complete design report form(s) and have employee sign.
- 4.17 Give copy of design report form(s) to employee.
- 4.18 Advise employee of results and needed corrective action (such as the need to pump more frequently), if necessary.
- 4.19 Follow up with Notice of Non-Compliance letter if the FSE fails to take corrective action in a timely manner.
- 4.20 **For a routine inspection:** Greet facility employee and inform him/her of the purpose of the visit.
- 4.21 Locate the interceptor manhole lid(s), inspect the lid(s), and assess the tightness of each lid for infiltration prevention.
- 4.22 Remove the manhole lid(s) with manhole puller.
- 4.23 Perform a general inspection of the interceptor, using the attached drawing, and to include the following:
- 4.23.1 Condition of the inlet pipe and T, if accessible and visible.
  - 4.23.2 Condition of the outlet pipe and T.
  - 4.23.3 Other deterioration.
- 4.24 Record on inspection report form.
- 4.25 Insert sludge judge and slowly lower into interceptor until it reaches the bottom of the interceptor. Allow time for tube to fill with liquids. Tug rope slightly and remove sludge judge from interceptor. Use tape measure to measure grease, gray water and solids depths (top to bottom). Record on inspection report form.
- 4.26 Place sludge judge over open manhole and push pin extending from bottom of unit to release contents.
- 4.27 Replace manhole lid(s) with appropriate tools.
- 4.28 Repeat Steps 4.21-4.27 for any additional grease interceptors.
- 4.29 Complete inspection report form(s) and have employee sign.
- 4.30 Give copy of inspection report form(s) to employee.
- 4.31 Advise employee of results and needed corrective action (such as the need to pump more frequently), if necessary.
- 4.32 Follow up with Notice of Non-Compliance letter if the FSE fails to take corrective action in a timely manner.

## 5.0 Responsibilities

- 5.1 The Regulatory Compliance Specialist will review this SOP annually to ensure its applicability.
- 5.2 The Environmental Compliance Specialist will review the SOP annually following review, and any edits made, by the Regulatory Compliance Specialist.
- 5.3 Any ACSA employee inspecting grease interceptors will follow the protocol of this document.

<b>Written By:</b>	Eric Nutter		Engineering Technician	July 21, 2014
<b>Approved by:</b>	Tim Brown		Environmental Compliance Specialist	July 25, 2014

### Annual Review:

<b>Regulatory Compliance Specialist</b>	<b>Date</b>	<b>Environmental Compliance Specialist</b>	<b>Date</b>

## **Standard Operating Procedure**

### **Fats, Oils and Grease Abatement Program - Inspection of a Grease Trap**

#### **1.0 Purpose**

- 1.1 This Standard Operating Procedure describes the process of inspecting a grease trap located inside a food service establishment (FSE) permitted in the ACSA Fats, Oils and Grease Abatement Program.

#### **2.0 Scope**

- 2.1 This SOP applies to all personnel who inspect grease traps.
- 2.2 This SOP applies to all permitted FSEs which have a grease trap(s).
- 2.3 The term grease trap refers to a small-capacity grease control device located inside a facility. It can be positioned directly beneath a pre-rinse station or other sink, or below floor level, and it typically holds fewer than 50 gallons of liquid.

#### **3.0 Equipment and Supplies**

- 3.1 Gloves
- 3.2 Screwdrivers (standard and Phillips)
- 3.3 Socket wrench and sockets
- 3.4 Slip joint pliers (Channel locks)
- 3.5 Paint stir stick
- 3.6 Inspection report forms (attached)
- 3.7 Maintenance (cleaning) schedules

#### **4.0 Procedure**

- 4.1 Greet facility employee and inform him/her of the purpose of the visit.
- 4.2 Check for maintenance (cleaning) schedule and note date of last cleaning on inspection form.
- 4.3 Locate grease trap and remove lid with appropriate tools.
- 4.4 Insert paint stir stick into trap and stir.
- 4.5 Determine approximate amount of grease (top layer) in trap. This layer should not exceed 1/3 of the total depth.

- 4.6 Determine inspection results. General guidelines:
- All gray water or very thin layer of grease – excellent condition (pass)
  - Thin layer of grease with gray water directly underneath – good condition (pass)
  - Grease exceeds 1/3 of total depth – poor condition (fail)
  - Nearly full of oil; minimal or no gray water – extremely poor condition (fail)
  - Solids on the bottom of the trap that exceed 1/3 of the total depth – poor condition (fail)
- 4.7 Replace lid and secure with appropriate tools.
- 4.8 Repeat Steps 4.3 - 4.7 for any additional grease traps.
- 4.9 Fill out inspection report(s) and have employee sign.
- 4.10 Give copy of inspection report(s) to employee.
- 4.11 Advise employee of inspection results and corrective action (such as the need to clean more frequently, or to maintain better cleaning records), if necessary. Make note if a follow-up Notice of Non-Compliance letter is warranted, such as due to repeat offences.
- 4.12 Leave copies of cleaning schedules if requested, or the current cleaning schedule is close to being full.

## 5.0 Responsibilities

- 5.1 The Regulatory Compliance Specialist will review this SOP annually to ensure its applicability.
- 5.2 The Environmental Compliance Specialist will review the SOP annually following review, and any edits made, by the Regulatory Compliance Specialist.
- 5.3 Any ACSA employee inspecting grease traps will follow the protocol of this document.

<b>Written By:</b>	Eric Nutter		Engineering Technician	June 9, 2014
<b>Approved by:</b>	Tim Brown		Environmental Compliance Specialist	June 16, 2014

**Annual Review:**

<b>Regulatory Compliance Specialist</b>	<b>Date</b>	<b>Environmental Compliance Specialist</b>	<b>Date</b>

## **Standard Operating Procedure**

### **FOG Abatement Program - Permittee and Inspection Information Entry**

#### **1.0 Purpose**

- 1.1 This Standard Operating Procedure (SOP) describes the process by which new customer information and FOG inspection information are entered into the Linko software database. This includes customer contact information and detailed data pertaining to the facility, such as business hours, seating capacity, number of meals served, types of kitchen equipment, and the type and size of grease control device associated with the facility.

#### **2.0 Scope**

- 2.1 This SOP applies to all ACSA customers who maintain FOG-permitted food service establishments (FSEs).
- 2.2 This SOP applies to all personnel who enter FOG program data into the Linko software database.

#### **3.0 Equipment and Supplies**

- 3.1 A computer into which the Linko software has been installed.
- 3.2 A completed FOG application or FOG Inspection Report form.

#### **4.0 Procedure**

- 4.1 Open the Linko software database.
- 4.2 **If the intent is only to enter additional inspection information for an existing facility, go immediately to Step 4.16.** Otherwise, continue to Step 4.3.
- 4.3 Obtain completed FOG application form from customer.
- 4.4 Click on the "Linko FOG" tab at the top of the screen.
- 4.5 Click on "List" (Facilities) in the toolbar.
- 4.6 In the "Facility Group" drop-down list, select "Active Facilities."
- 4.7 Click on "Facility No." to sort list.
- 4.8 Scroll to bottom of list to find next available facility number ("Facility No.").

- 4.9 Scroll to top of list and click on “Add New” (at left margin) to add a new facility.
- 4.10 In the top half of the “Facility Detail” window:
  - 4.10.1 Enter new facility number in the “Facility No.” cell. (ex. FSE-0261)
  - 4.10.2 Enter the name of the facility.
  - 4.10.3 Enter the physical address of the facility in the appropriate cells.
  - 4.10.4 Using the various drop-down menus, select the appropriate information for the “Classification”, “Secondary Class” and “Map Category” cells.
  - 4.10.5 Using the drop-down menu, select the appropriate pumping frequency if the facility has a grease interceptor.
- 4.11 In the bottom half of the Facility Detail window, under the “Account Info” tab:
  - 4.11.1 Use the drop-down menu to select “Yes” for “Permitted.”
  - 4.11.2 Enter the appropriate information for the “Hours”, “Seating Capacity” and “# of Meals Served” cells.
  - 4.11.3 Click on the “Site and Date Info” tab.
  - 4.11.4 Enter the date of when the application was received in the “Application Date” cell.
  - 4.11.5 Select the appropriate inspection frequency using the drop-down menu (typically 3 months for traps and 6 months for interceptors).  
Note: More frequent visitation may be warranted, such as in the case of poor cleaning records, or insufficient cleaning.
  - 4.11.6 Select “Save” from the top right corner of the Facility Detail window.
- 4.12 Select “Close” from the top right corner of the Facility Detail window.
- 4.13 Find and select the newly added facility (usually at the bottom of the list) in the Facility List View and select the “Details” button to the left of it.
- 4.14 Select the “Extractors & Equipment” tab.
  - 4.14.1 Select “Add New” to add a new trap or interceptor associated with the facility.
  - 4.14.2 Enter a location description in the “Extractor Description” cell.
  - 4.14.3 Select an extractor type using the drop-down menu.
  - 4.14.4 Select a cleaning frequency using the drop-down menu.
  - 4.14.5 Enter the trap size.
  - 4.14.6 Select “Save” in the top right corner of the LinkoFOG Extractor Details window when finished.
  - 4.14.7 Select “Close.”
  - 4.14.8 Select “Add New” in the bottom portion to add kitchen equipment associated with the facility.
  - 4.14.9 Use the drop-down menu to select the type of kitchen equipment and enter the desired quantity.
  - 4.14.10 Select “Save” in the upper right corner of the LinkoFOG Equipment Details window.

- 4.14.11 Select “New” to continue adding additional kitchen equipment or select “Close” when finished.
- 4.15 Select the “Contacts” tab to enter the facility contact information.
  - 4.15.1 Select the “Details” button.
  - 4.15.2 Select the “Edit” button in the top right corner of the “LinkoFOG Industry Contacts” window.
  - 4.15.3 Select the desired salutation from the drop-down menu.
  - 4.15.4 Enter the appropriate contact name, mailing address and phone information in the provided cells.
  - 4.15.5 Select “Save” and “Close” when finished.
- 4.16 Entering Inspection information:** Select “Facilities” from the database main screen.
- 4.17 Using the “Facility Name” drop-down menu at the top of the screen, select the FSE of interest.
- 4.18 Click on the “Inspect Events” tab near the middle of the screen.
- 4.19 If this is the first inspection, select “Add New”, select the appropriate event type (TRAP\_INSP for trap and MANIFEST for interceptor), and select “Apply.” Otherwise, select the “Details” button beside the existing inspection entry to bring you to the “Inspection Event Detail” screen.
- 4.20 Using the various drop-down menus, select the appropriate information for the “Performed By”, “Inspection Result”, “Maintenance Log”, “Created By” and “Assigned To” cells.
- 4.21 If this is for a first inspection, enter the scheduled date in the “Due Date” cell. Otherwise, enter the appropriate date in the “Complete Date” cell. If this is for receipt of a first cleaning manifest, enter the “Due Date.” Otherwise, enter the appropriate date in the “Complete Date” cell.
- 4.22 Enter the “Inspection Reason” (Routine for grease traps and Manifest Request for interceptors).
- 4.23 Enter inspection results under “Inspection Comments.”
- 4.24 Select “Save” in the top right corner of the “Inspection Event Detail” screen.
- 4.25 When prompted to schedule this event again, select “Yes.”
- 4.26 Select “Save” and “Close.”
- 4.27 If this is an interceptor inspection entry, return to the “Inspection Event Detail” screen by selecting the “Details” button, and entering the most recent manifest profile in the “LinkoFOG Extractor Inspection Results” at the bottom of the screen.
- 4.28 Repeat Steps 4.17 – 4.27 for other FSEs, or exit the Linko software.

## **5.0 Responsibilities**

- 5.1 The Regulatory Compliance Specialist will review this SOP annually, based upon the approved date listed below, to ensure its applicability.

- 5.2 The Environmental Compliance Specialist will review the SOP annually following review, and any edits made, by the Regulatory Compliance Specialist.
- 5.3 Any ACSA employee entering FOG permittee and inspection information will follow the protocol of this document.

<b>Written By:</b>	Eric Nutter		Engineering Technician	August 25, 2014
<b>Approved by:</b>	Tim Brown		Environmental Compliance Specialist	September 22, 2014

**Annual Review:**

<b>Regulatory Compliance Specialist (Initials)</b>	<b>Date</b>	<b>Environmental Compliance Specialist (Initials)</b>	<b>Date</b>

## **Standard Operating Procedure**

### **FOG Abatement Program - Notice and Compliance Letters**

#### **1.0 Purpose**

- 1.1 This Standard Operating Procedure describes the process by which FOG notice, noncompliance, and violation letters are generated using the Linko database software.

#### **2.0 Scope**

- 2.1 This SOP applies to all FOG-permitted food service establishments.
- 2.2 This SOP applies to all personnel who generate FOG notice, noncompliance, and violation letters using the Linko database software.

#### **3.0 Equipment and Supplies**

- 3.1 A computer into which the Linko database software has been installed.

#### **4.0 Procedure**

- 4.1 Open the Linko database software.
- 4.2 **If the intent is to access an existing letter, go immediately to Step 4.17.**  
To create a new letter, continue to Step 4.3.
- 4.3 Click on "File" tab at the top left of the screen.
- 4.4 Click on the "Flexible Reporter" button at the bottom of the screen.
- 4.5 Click on the "Mail Merge Letter Mgt." tab.
- 4.6 Select "PERMITS" from the "Mail Merge Category" drop-down menu.
- 4.7 Select an existing letter to use as a template for a new letter.
- 4.8 Click on the "New" button at the top right of the screen.
- 4.9 Enter a name for the new letter in the dialog box and click "OK."
- 4.10 Click on and highlight the new letter in the list on the left side of the screen.
- 4.11 Click the "Edit" button. The letter will open in Microsoft Word.
- 4.12 In Microsoft Word, proofread and make necessary edits.
- 4.13 When finished editing, click the "File" tab and click "Save" to save the document.

- 4.14 Close Microsoft Word.
- 4.15 In Linko, click the “Close” button at the top right of the screen to exit the Flexible Reporter.
- 4.16 To close Linko, click the “Exit Program” button, or proceed to Step 4.17 to send the letter.
- 4.17 Click on the “Facilities” button.
- 4.18 Navigate to the appropriate facility using the “Facility Name” pull-down menu at the top of the screen.
- 4.19 Click on the “Reports” button on bottom right hand side of screen.
- 4.20 Click on the “Mail Merge Letters” tab.
- 4.21 Click on and highlight the appropriate letter from the list of letters that have been written.
- 4.22 Click on the “Preview Letter” button. The letter will open in Microsoft Word.
- 4.23 In Microsoft Word, proofread letter and make necessary edits.
- 4.24 Click on the “File” tab and select “Save As” to save the document or “Print” to print the document.
- 4.25 Close Microsoft Word when finished.
- 4.26 In Linko, choose “Yes” or “No” from the dialog box to record the letter as an event.
- 4.27 To exit the Reports screen, click the “Close” button at the top right corner of the screen.
- 4.28 To exit the Facilities screen, click the “Close” button at the top right corner of the screen.
- 4.29 To close Linko, click the “Exit Program” button.

## 5.0 Responsibilities

- 5.1 The Regulatory Compliance Specialist will review this SOP annually, based upon the approved date listed below, to ensure its applicability.
- 5.2 The Environmental Compliance Specialist will review the SOP annually following review, and any edits made, by the Regulatory Compliance Specialist.
- 5.3 Any ACSA employee generating FOG notice, noncompliance, and violation letters will follow the protocol of this document.

<b>Written By:</b>	Eric Nutter		Engineering Technician	November 5, 2014
<b>Approved by:</b>	Tim Brown		Environmental Compliance Specialist	November 5, 2014

**Annual Review:**

<b>Regulatory Compliance Specialist (Initials)</b>	<b>Date</b>	<b>Environmental Compliance Specialist (Initials)</b>	<b>Date</b>

# APPENDIX D

## Albemarle County Service Authority

## Sewer Overflow Response Plan

**I. Authority**

- a. The ACSA operates its sewage collection system, pump stations and force mains under a license from the Virginia State Water Control Board (License VA-00255182).

The pump stations and sewer lines are operated and maintained by employees of the ACSA.

**II. General**

- a. The Sewer Overflow Response Plan (SORP) is in place to ensure that every report of a confirmed sewer overflow is immediately dispatched to the appropriate crews so that the effects of the overflow can be minimized with respect to impacts to public health and adverse effects on beneficial uses and water quality of surface waters and customer service. The SORP further includes provisions to ensure safety pursuant to the directions provided by the ACSA Safety Manual and Confined Space Operational Procedures, and that notification and reporting is made to the appropriate authorities. For purposes of this SORP “confirmed sewage spills” are also referred to as an “SSO.” The effective date of this plan is June 1, 2012.
- b. Objectives: The primary objectives of the SORP are to protect public health and the environment, comply with regulatory agency guidelines and permits, to address procedures for managing sewer overflows, and minimize the risk of enforcement actions against the Albemarle County Service Authority.
- c. Additional objectives of the SORP are as follows:
  - Provide appropriate customer service;
  - Protect the sewage collection system and pump stations;
  - Protect ACSA personnel;
  - Protect private and public property beyond the collection system.

This plan shall not supersede existing emergency plans or standard operating procedures (SOPs) unless directed by the Executive Director or his appointed designee.

- d. Organizational Plan: The key elements of the SORP are addressed individually as follows:
  - Section III- Overflow Response Procedure
  - Section IV- Public Advisory Procedure
  - Section V- Regulatory Agency Notification Procedure
  - Section VI- Media Notification Procedure

- Section VII- Distribution and Maintenance of SORP.
- e. SSO Tracking: Each manhole in the system has a numeric identification which should be used to reference and report all information. All sewer overflows will be tracked and recorded in the database to identify problem areas and areas where we have reoccurring incidents. Depending on the completeness and accuracy of the information reported, the Operations Manager or the designated employee shall monitor the spill problem areas with frequent flushing or rodding to eliminate any further SSOs until a crew can be scheduled to repair defects causing overflows.

### **III. Overflow Response Procedure**

The Overflow Response Procedure presents a strategy or action plan to mobilize labor, equipment, tools and materials to correct or repair any condition or situation that may cause or contribute to an SSO. The plan considers a wide range of potential system failures that could cause an overflow to surface waters, lands and structures.

- a. Receipt of Information Regarding an SSO: An overflow may be detected by ACSA employees or by others. The ACSA Administration Department and the Customer Service Department is primarily responsible for receiving phone calls from the public of possible sewer overflows from the collection system, and for issuing work orders.

Generally, telephone calls from the public reporting possible sewer overflows are received during normal business hours, Monday thru Friday from 8:00 a.m. until 5:00 p.m. at the ACSA office. The after-hours and holiday calls are handled by our answering service, Voicelink at (888) 252-3468.

The ACSA employee handling the sewer overflow call shall attempt to obtain all relevant information available:

- Time and date of call;
- Specific location;
- Description of problem;
- Time possible overflow was noticed by the caller;
- Caller's name and phone number;
- Observations of the caller (odor, is sewage entering a waterway);
- Any other relevant information that will enable responding staff to locate, assess and stop the overflow.

The ACSA employee shall record the overflow information and dispatch ACSA staff immediately.

- b. The pump stations are monitored by internal alarms and ACSA staff is notified by an auto dialer if there is a pump failure, or loss of power. Upon receiving an alarm, an ACSA employee is to immediately respond and investigate.
- c. Sewer overflows detected by any personnel in the course of their normal duties are immediately reported to the Operations Manager or Operations Supervisor so that the appropriate sewer crew can be dispatched to investigate and clear the situation.
- d. A reported sewer blockage will not be considered a sewer overflow unless there is an actual spill of sewer products into the environment.
  - A Sewer Overflow Report Form (Appendix I Example) shall be filed within 24 hours of an overflow confirmation. The Operations Manager or the Operations Supervisor is responsible for reviewing, updating, and signing the final overflow report.
  - Dispatching of sewer crews to site of sewer overflow: Failure of any component within the wastewater collection system that threatens to cause or causes a SSO triggers an immediate response to isolate and correct the problem. Crews and equipment are available to respond to any SSO location. Any reported SSO requires the ACSA Maintenance crews or a staff member be immediately dispatched to the reported SSO. Depending on information received, additional crews or personnel may be placed on stand-by and the Operations Supervisor and/or the Operations Manager may be notified of the potential problem.
    - i. The person handling the initial call for an SSO will immediately dispatch someone to investigate, or dispatch a sewer crew.
    - ii. The person handling the initial call will notify the Operations Manager or Operations Supervisor by the quickest communication tools available, if the call warrants such notification.
  - Crew Instructions: Contact responding crews by the quickest or most reliable method available.
  - Employee or crews dispatched to an SSO will proceed immediately to the site of the reported SSO. Should an employee or crew get delayed due to any reason, they shall report the delay to their supervisor.
  - Crews are to report findings, damages and results to the Operations Supervisor or the Operations Manager as soon as the situation allows a report to be given.
- e. Additional Resources: The senior employee onsite has the authority to request additional resources.
- f. Preliminary Assessments: The crew's primary focus will be stopping the SSO. The crew shall not enter private property to inspect or assess

damages. Should the conditions warrant, photographs of the outdoor area of the sewer overflow and affected areas should be taken and filed with the SSO report. In case of damage to private property, ACSA staff should advise the owner or residents to have the area cleaned up as quickly as possible and to use bleach to kill any bacteria. ACSA staff shall not admit liability should a property owner ask about clean-up or responsibility. Advise the customer to contact the office should they feel a claim is justified.

g. Supervisor Follow-up:

- Determine the cause of the overflow;
- Make sure the Emergency Response Plan was followed;
- Make sure appropriate paperwork is filled.

h. Overflow Correction, Containment, and Clean-up: SSOs of various sizes occur from time to time regardless of the preventative efforts of the ACSA. They may result from blockages, pipe failures, and mechanical malfunctions, along with natural or man-made causes. The ACSA is constantly on alert and ready to respond to any sanitary sewer overflow in our response area.

i. Specific Actions to be performed by the ACSA Crews during an SSO:

- Protect public health, environment, and property from sewage overflows and to restore surrounding area back to normal as soon as possible;
- To establish perimeters and control zones with appropriate signs, cones, barricades, vehicles or natural land contours;
- To minimize the ACSA's exposure to any regulatory agency penalties and fines;
- To notify the DEQ of overflow and potential impacts;
- To contain the sewer overflow to the maximum extent possible and to make every effort to prevent sewage from entering into state waters or a storm drain.

Under most circumstances, the ACSA staff handles all response actions with its own Maintenance staff. They have the skills and experience to respond rapidly and in the most appropriate manner. An important issue with respect to an emergency response is to make sure any temporary actions to control or divert the sewer overflow does not create problems elsewhere in the system.

***Do not shut down a pump station or allow sewage to back-up and create another SSO. Establish a pump-around or a pump and haul.***

Circumstances or conditions may arise when the ACSA could benefit from the support of another utility or private contractor. Contact the Operations Supervisor or Operations Manager for assistance and approval.

#### **IV. Responsibilities of Crews Upon Arrival**

It is the responsibility of the ACSA crew(s) or personnel who arrive on site of an SSO to protect the health and safety of the public by mitigating the impact of the overflow to the extent possible. Should the overflow not be the responsibility of the ACSA but there is imminent danger to public health or private property, or the potential of the overflow to enter state waters, then the ACSA personnel will take prudent emergency action to contain or mitigate the situation until the responsible party assumes responsibility and provides action.

#### **V. Initial Measures for Containment**

Initiate appropriate measures to contain the overflowing sewage and recover where possible any sewage which has been discharged, minimizing the impact to public health or the environment.

- Determine immediate destination of the overflow (ex. storm drain, street curb, body of water, creek bed, etc.);
- Identify and request any necessary materials and equipment to contain or isolate the overflow, if not readily available;
- Take immediate steps to contain the overflow (ex. block or sandbag the storm drains, recover by using the vacuum truck, divert to downstream manhole if possible);

#### **VI. Measures for Prolonged Overflow Conditions**

In the event of a prolonged sewer line blockage, a sewer line collapse, or failure, set up a portable by-pass pumping operation.

Upon arrival at an SSO, the responding crew will:

- Determine the cause of the overflow (ex. sewer line blockage, pump station mechanical or electrical failure, sewer line break, etc.);
- Identify and request additional resources to correct the overflow or to assist in determining the cause;
- Take appropriate measures to protect the health and safety of affected public property;
- Take immediate and necessary steps to stop the overflow (ex. unstop blockage in the line, manually operate the pump station controls, repair pipes, etc.);
- Request additional personnel, materials, supplies or equipment that will expedite and minimize the impact of the overflow;
- If private property is impacted and the situation warrants, provide information to the Health Department at (434) 972-6226, or if afterhours, call (866) 531-3068;
- Establish periodic monitoring of the bypass pumping operation to monitor fuel and efficiency;
- Address any regulatory issues along with emergency repairs.

## **VII. Clean-up**

Clean-up overflow sites immediately and thoroughly after an overflow. No readily identified sewage solids, papers, rags, plastics, rubber products are to remain.

- Where practical, thoroughly flush the area of any sewage or gray water. Any solids or debris are to be flushed, swept, raked, picked-up and properly disposed of;
- Secure the overflow area to prevent contact by members of the public until the site has been thoroughly cleaned;
- Where sewage has ponded, pump area dry and dispose at approved location;
- If ponded area cannot be pumped, it may be treated with bleach. If sewage is discharged into a body of water, do not use bleach or other disinfectants. Instead, contact the DEQ at (540)574-7800 for specific instructions.

## **VIII. Overflow Report**

The Operations Supervisor, Operations Manager, or the ACSA designee will complete the Sewer Overflow Report Form and forward it to the A-Team to be faxed to the DEQ's Valley Regional Office.

The report shall include the following:

- Indication that the SSO had reached state waters;
- Indication that the SSO had not reached stated waters;
- Determination of a start time for overflow;
- Determination of a stop time for the overflow. Including when the blockage was cleared or flow was controlled or contained;
- Arrival of the ACSA personnel if the overflow stopped between the time it was reported and the time of arrival of ACSA personnel;
- Determination of flow rate will be an educated guess and some assumptions. Estimate the gallons per minute (GPM) by one of the following criteria:
  - i. Observation of flow;
  - ii. Measurement of actual overflow from sewer main;
  - iii. Investigate area for evidence of ponding or indications of overflow volume;
  - iv. Estimate flow and multiply by duration of flow when it was identified until SSO was controlled.
- Obtain photographs of the event, when possible;
- Assess any damage to the exterior areas of the property. **DO NOT ENTER PRIVATE PROPERTY.**

## **IX. Customer Satisfaction**

The supervisor or response crew will notify, in person or by phone, the person who reported the overflow. The cause of the overflow and its resolution will be disclosed if causes can be determined.

## **X. Public Advisory Procedures**

This section describes the actions the ACSA takes when necessary to limit public access to areas potentially impacted by unpermitted discharges of pollutants to state waters from the wastewater collection system.

- **Temporary Signage:** The ACSA will discuss with the Local Health Department of the DEQ Valley Regional Office, whether it is necessary to provide warnings of any potential public health risks due to an SSO;
- **Other Media Notifications:** In the event of a major SSO, the ACSA, after conferring with the DEQ and/or Local Health Department, will if necessary prepare a pre-scripted notice to be published or aired to the general public.

## **XI. Regulatory Agency Notification Plan**

The Regulatory Agency Notification Plan establishes procedures which the ACSA follows to provide formal notice to the DEQ and EPA as necessary in the event of an SSO.

Agency notifications will be performed in parallel with internal notifications. The procedures for providing notification to the media and public are covered in Section XII Media Notification Procedure. Internal notification and mobilization of personnel are detailed in Section III Overflow Response Procedure.

Using data supplied during the investigation and crew response data, the supervisor or designee prepares the initial and final overflow reports. A written version of the report needs to be faxed to DEQ within 24-hours of the SSO and a follow-up letter needs to be sent to DEQ within 24-hours or the next business day.

## **XII. Media Notification Procedure**

When an overflow has been confirmed and the volume or location of the spill is a threat to public health, take the following steps to notify to the media:

- The sewer crews or supervisor will report the incident and the potential threat to the Operations Manager or his designee;
- The Operations Manager or his designee will contact the Executive Director or Acting Executive Director. The Executive Director shall be the Public Information Officer (PIO) unless he/she appoints someone else;
- All media inquiries are to be referred to the PIO. This should eliminate misinformation from being given to the public;
- The Executive Director shall determine who is authorized to speak to the media as an ACSA Representative.

## **XIII. Distribution and Maintenance of the Sewer Overflow Reponse Plan**

This plan shall be reviewed annually and any policies or procedures will be reviewed and changed to achieve the intended objectives.

**VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY  
VALLEY REGIONAL OFFICE  
OVERFLOW/SPILL/UNAUTHORIZED DISCHARGE REPORT FORM**

**THIS FORM IS ONLY TO BE USED FOR NON EMERGENCY 24-HOUR NOTIFICATION  
EMAIL FORM TO [VRO.SSO-UD@deq.virginia.gov](mailto:VRO.SSO-UD@deq.virginia.gov)**

**For emergencies call the Virginia Department of Emergency Services 24-hour telephone service at  
1-800-468-8892.**

Date Reported:
Time Reported:
Reported By:
Affiliation:
Telephone No.:

**FACILITY INFORMATION**

Facility Name:	
Permit No (if applicable):	
Physical Address:	
Contact:	Telephone No.:

**OVERFLOW/SPILL/UNAUTHORIZED DISCHARGE INFORMATION**

Location (physical address) of discharge:	
Latitude:	Longitude:
Description of discharged material:	
Cause of discharge:	
Date and time discovered:	
Volume of discharge (gallons):	
Duration of discharge:	
Did the discharge reach state waters?    Yes <input type="checkbox"/> No <input type="checkbox"/>	
If yes, name of the state water that the discharge reached:	
What, if any, impact to state waters was observed?	
Did the discharge occur due to a rain event?    Yes <input type="checkbox"/> No <input type="checkbox"/>	
Was a fish kill observed?    Yes <input type="checkbox"/> No <input type="checkbox"/>	
Has VDH been notified?    Yes <input type="checkbox"/> No <input type="checkbox"/> If so, when?    Date:	Time:
Corrective Action Taken:	
Comments:	

If report taken by DEQ staff, report taken by:	
--	--