

# **CITY OF HOT SPRINGS**

Utilities Department 780 Adams Street Hot Springs, Arkansas 71901

October 26, 2022

Mr. Alan J. York, Associate Director Ms. Leslie Allen-Daniel, Enforcement Coordinator ArkansasEnergy&EnvironmentOfficeofWater Quality 5301 Northshore Drive North Little Rock, Arkansas 72118

RE: Permit No. AR0033880, AFIN 26-00145 Hot Springs Utilities — Request for Bacteria Sampling and a Communications Plan for Sanitary Sewer Overflows at Manhole 1750 into Gulpha Creek and Spencer Bay

Dear Mr. York:

DEQ recently accepted Hot Springs's Bacteria Sampling and a Communications Plan for Sanitary Sewer Overflows in Hot Springs Creek. Hot Springs is asking DEQ to approve a revision of our previously submitted plan for Manhole 1750/Gulpha Creek/Spencer Bay (attached). The revised plan mirrors the plan for SSOs in Hot Springs Creek. The proposed revision drops the Water Quality Analysis by an outside laboratory. After a year of testing, the overall results do not indicate that SSO's at Manhole 1750 have a significant impact on the levels of items tested by the WQA (pH SU, Temperature C, DO ppm, Conductivity uS/cm, Turbidity NTU, Alkalinity mg/L; BOD mg/L, TSS mg/L, Ammonia mg/L, Total Phosphorus mg/L.). Fecal coliforms are also removed from the plan. The meaningful data is actually related to E coli levels.

In addition, the proposed Standard Operating Procedure for SSO's discharging into Gulpha Creek and Spencer Bay aligns with the contact periods as depicted in Rule2.507, mirroring the accepted plan for Hot Springs Creek SSO's.

I am asking that you review and accept the revised plan. I look forward to your response. Should you have any further questions, please contact me at <u>mledbetter@cityhs.net</u> or by phone at 501-651-7730.

Sincerely,

alletta

Monty Ledbetter Utilities Director

Attachments:

Exhibit A – Revised Manhole 1750 Sanitary Sewer Overflow Standard Operating Procedure Exhibit B – Sampling Sites

cc:

Arkansas Energy & Environment: Richard Healey, <u>HEALEYR@adeq.state.ar.us</u>; Leslie Allen-Daniel, ALLEN-<u>DANIEL@adeq.state.ar.us</u> | City of Hot Springs: Bill Burrough, City Manager. <u>bburrough@cityhs.net</u>; ToddPiller, <u>tpiller@cityhs.net</u>; Gary <u>Carnahan.gcarhahan@cityhs.net</u>; Harold Mauldin, <u>hmauldin@cityhs.net</u> | Crist Engineers: Craig Johnson P.E., <u>cjohnson@cristengineers.com</u>

# EXHIBIT A

## STANDARD OPERATING PROCEDURE

SOP Title:Manhole 1750 Sanitary Sewer Overflow Standard Operating ProcedureSOP CODE:6459.662.61-2022.10CATEGORY:SSO RESPONSE

OBJECTIVE	To provide clear and complete instructions for responding to sanitary sewer overflows at Manhole 1750 in particular.					
BACKGROUND	Manhole 1750 has a history of overflows during periods of wet weather due to the hydraulic design combined with unidentified I&I in the Gulpha Sewer Basin. Any SSO during an average to dry weather condition would likely be due to a blockage or equipment failure at the Gulpha Pump Station.					
SAFETY PROCEDURES	Personnel responding to any SSO must wear appropriate personal protective equipment (PPE) to prevent contact with raw sewage. PPE may include rubber gloves, rubber boots, impermeable coveralls and protective headwear with splash shield.					
POTENTIAL HAZARDS	Manhole 1750 is located (117 Catherine Heights Rd.) near Gulpha Creek, which flows into Spencer Bay and on to Lake Catherine. SSO contamination impacts the water quality of an arused for recreational activities.					
RESPONSE	Upon notification from remote sensing equipment, notification by the remote float auto-dia SCADA, other staff, or public notification, the City of Hot Springs shall respond to investigate the potential occurrence of an SSO at Manhole 1750. Personnel responding to an SSO may encounter an emergency that requires immediate action. The first responders to the site during normal business hours will be Wastewater Lift Station crews. After hours, On-Call personnel will respond and call for back up personnel as needed.					
	Responding personnel will:					
	<ol> <li>Determine if a SSO is occurring.</li> <li>Determine whether the spill has reached Spencer Bay.</li> <li>Upon validation that the spill has reached Spencer Bay, notify testing laboratory to acquire testing samples*.</li> <li>Post ADH signs at locations shown in Exhibit A for Sample Site 1, should the spill rea Spencer Bay.</li> <li>Provide a CodeRED in accordance with Public Notification requirement in this SOP f effected area as outlined in the notification boundary shown in Exhibit A.</li> <li>Determine the cause of the problem (blockage, equipment failure at Gulpha Pump Station, wet weather I&amp;I)</li> <li>Determine what additional resources may be needed (equipment and materials).</li> <li>Document any necessary information needed for reporting requirements.</li> <li>Take photos of the impacted area.</li> <li>Estimate the release volume based on size of the sewer, weather conditions and th extent of the release.</li> <li>Report spill in accordance with Office of Water Quality, DEQ reporting requirement</li> </ol>					
	*Should the CHS lab not be available for immediate sampling, City of Hot Springs personnel acquire a sample and hold in accordance with testing protocol and provide a chain of custod to the testing laboratory for further handling.					

CONTAINMENT	Containment of an overflow is the responder's first priority. The methods used will vary on a case-by-case basis. The Manager, Crew Leader and maintenance responders will:
	<ol> <li>Identify and obtain the necessary equipment and materials needed to contain the overflow.</li> </ol>
	<ol> <li>Take immediate steps to contain the overflow (block path toward receiving water, recover with vacuum truck).</li> </ol>
	<ol> <li>Determine whether additional containment measures are needed.</li> </ol>
CORRECTION OF	The time required to correct the cause of the overflow depends on the determined cause.
OVERFLOW	Responding crews must begin by investigating upstream manholes and the downstream lift station for evidence of blockage or equipment failure. When necessary, contractor services may be requested as an additional resource to abate the overflow.
SAMPLING AND TESTING	Upon response to the spill and validation that the spill is entering Spencer Bay, the following sampling and testing will be initiated for <i>E. Coli</i> .
	May 1 to September 30:
	<ol> <li>Sampling shall occur at the locations shown on Exhibit A.</li> <li>First <i>E.Coli</i> test shall be for Sample Site 1.</li> </ol>
	<ol> <li>Results shall be made available to the City of Hot Springs within three (3) calendar days of the event from the testing laboratory.</li> </ol>
	<ol> <li>Should the E.Coli test result exceed 126 cfu/100ml at Sample Site 1 as shown on Exhibit A, ADH signs will be posted for Sample Site 2, Sample Site 3, Sample Site 4 and Sample Site 5.</li> </ol>
	<ol> <li>A second series of tests will be scheduled and conducted for Sample Site 2, Sample Site 3, Sample Site 4 and Sample Site 5, until two consecutive results for <i>E.Coli</i> are equal to or less than 126 cfu/100ml are achieved, at which time the testing will cease.</li> </ol>
	<ol> <li>ADH Signs shall be removed upon satisfaction of E.Coli testing at or less than 126 cfu/100ml for Sample Sites 2, Sample Site 3, Sample Site 4 and Sample Site 5.</li> <li>City of Hot Springs shall email all test results to DEQ's Office of Water Quality, Enforcement Branch at <u>water-enforcement-report@adeq.state.ar.us</u> upon receipt from the testing laboratory.</li> </ol>
	October 1 to April 30:
	1. Sampling shall occur at the locations shown on Exhibit A.
A Charles	<ol> <li>First <i>E.Coli</i> test shall be for Sample Site 1.</li> <li>Results shall be made available to the City of Hot Springs within three (3) calendar days of the event from the testing laboratory.</li> </ol>
	<ol> <li>Should the <i>E.Coli</i> test result exceed 630 cfu/100ml at Sample Site 1 as shown on Exhibit A, ADH signs will be posted for Sample Site 2, Sample Site 3, Sample Site 4 and Sample Site 5.</li> </ol>
	<ol> <li>A second series of tests will be scheduled and conducted for Sample Site 2, Sample Site 3, Sample Site 4 and Sample Site 5 until two consecutive results for <i>E.Coli</i> are equal to or less than 630 cfu/100ml are achieved, at which time the testing will cease.</li> </ol>
	<ol> <li>ADH Signs shall be removed upon satisfaction of E.Coli testing at or less than 630 cfu/100ml for Sample Sites 2, Sample Site 3, Sample Site 4 and Sample Site 5.</li> <li>City of Hot Springs shall email all test results to DEQ's Office of Water Quality, Enforcement Branch at <u>water-enforcement-report@adeq.state.ar.us</u> upon receipt from the testing laboratory.</li> </ol>
	E Coli testing will be performed at the Hot Springs Regional Wastewater Treatment Plant which is an approved laboratory. Should it be necessary to outsource such analysis, the testing shall be conducted at approved Department of Environmental Quality laboratory.

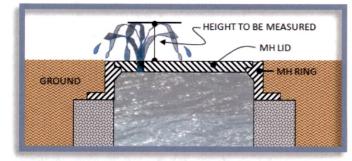
RECOVERY/CLEANUP	<ul> <li>Cleanup will be completed for all SSOs following containment and correction of the overflow. The recovery efforts will be directed at returning the affected to a pre-release condition as quickly and efficiently as possible. Cleanup activities will vary depending on the situation. Actions selected will be performed thoroughly. The general process is as follows: <ol> <li>Response crew will use appropriate PPE during cleanup and recovery</li> <li>Affected area will be cleaned as much as possible using rakes, shovels, hand picker tools and vacuum equipment.</li> <li>Affected overflow area will be evaluated for appropriate disinfection. This may include applying lime to absorb liquid and raise the pH to reduce pathogens, applying a nonhazardous bio-enzymatic bacteria consuming product to reduce impact of pathogens on receiving waters.</li> <li>Maintain, as far as possible, an appropriate buffer zone between limited areas and the waters of the state and the United States.</li> <li>The immediate area around the overflow site will be inspected to ensure that no visual residue remains, including solids, papers, and rags, etc.</li> </ol> </li> </ul>
	collected and disposed of properly. 7. All wash-down water must be returned to the sewer system.
ADDITIONAL RESOURCES	If the maintenance crew is unable to contain and clean up the affected area with typical maintenance equipment, then the next step will be to bring in contractor or other construction support. The following steps will be taken by on-call management:
	<ul> <li>Assess and mark the boundaries of the suspected area for all utility service locations (marking materials such as white paint will be used to mark the boundaries, and "Locate" will be written to indicate the area).</li> <li>1. Call (811) CALL BEFORE YOU DIG.</li> <li>2. Determine the additional resources and type of construction crew required to perform the task(s).</li> <li>3. Call for the additional resources using existing approved contact lists as deemed necessary.</li> <li>4. Enlist appropriate contract services.</li> <li>5. Manage actions taken by the additional construction crew to clean up the affected area.</li> </ul>
FIELD REPORTING	<ul> <li>Ensure actions are documented following the SSO reporting procedures.</li> <li>Responding personnel will collect accurate and complete field data required to be submitted to</li> </ul>
	<ul> <li>DEQ. The following information will be documented:</li> <li>1. Date and time of notification (SCADA, Public Notification, Staff Report)</li> <li>2. Date and time of dispatch</li> <li>3. Date and time of arrival</li> <li>4. Date and time of departure</li> <li>5. Date and time of release ended (estimated as close as possible)</li> <li>6. Location</li> <li>7. Upstream manhole overflow status</li> <li>8. Probable Cause</li> <li>9. Estimated release</li> <li>10. Visual impact observed</li> <li>11. Actions to repair/mitigate</li> </ul>
REGULATORY	Shawn Davis, Wastewater Collection Manager, or his designate will report the SSO to the Arkansas Energy and Environment Department, Office of Water Quality within 24 hours.
REPORTING	The Online Sanitary Sewer Overflow (SSO) Reporting Form can be found at <u>https://www.adeq.state.ar.us/water/enforcement/sso/submit.aspx</u>

REGULATORY REPORTING	This initial 24-hour report should include the following information:
continued	<ol> <li>Permit Number</li> <li>Location of overflow (manhole number or street address)</li> <li>The receiving water (if applicable)</li> <li>Cause of overflow (if known)</li> <li>Estimated volume of overflow</li> <li>Total duration of the overflow</li> </ol>
	If the "total duration of the overflow" is not known when the 24-hour SSO online report is submitted, then a follow-up report (5-day report) giving a detailed account of the overflow and the steps taken to resolve it must be submitted within 5 days of the overflow's discovery. This report can be submitted by email at <u>ssoadeq@adeq.state.ar.us</u> or by <u>mail</u> (include Attn: Water Quality Enforcement).
	A sample of the spill shall be taken prior to confluence of the receiving stream for <i>E.coli</i> . Results of the testing shall be reported to the DEQ's Office of Water Quality, Enforcement Branch within three calendar days of the event sampled. Test results will be emailed to <u>water-</u> <u>enforcement-report@adeq.state.ar.us</u>
	Sample locations are shown in Exhibit A.
PUBLIC NOTIFICATION	When SSO spill reaches Gulpha Creek and Spencer Bay, City of Hot Springs Utilities will take measures to inform those affected by the possible impact on water quality. The methods of public notification include:
	May 1 to September 30:
	<ol> <li>Signs will be posted at locations as detailed in this SOP as first response to the spill advising against human contact with the affected water in accordance with this SOP. Signs will be removed when testing concludes bacteriological standards are achieved in accordance the sampling and testing section in this SOP.</li> </ol>
	Sign content shall be as follows:
	HEALTH ADVISORY WATER QUALITY IN THIS AREA MAY BE UNSAFE SWIM AT YOUR OWN RISK Arkansas Department of Health 4815 West Markham Street • Little Rock Arkansas 72205-3867 Environmental Health (501)661-2171
	Epidemiology (501)661-2893
	2. A <b>CodeRED</b> alert will be sent to the population living near the water bodies in accordance with boundary shown on Exhibit A.
	<u>ADVISORY</u> As of [date and time] a <b>NO SWIMMING</b> Advisory has been issued for the Spencer Bay area due to a wastewater overflow. Hot Springs Utilities will monitor the water quality in the area until it is safe for human contact. <b>If you have any questions, you</b> <b>may contact Hot Springs Utilities at (501) 321-6200</b>
	3. Upon satisfaction of <i>E.Coli</i> testing as outlined in Sampling and Testing section of the SOP the Recission of Advisory shall be provided.
	<u>RECISSION OF ADVISORY</u> The <b>NO SWIMMING</b> Advisory issued on [date and time] for the Spencer Bay area has been canceled. The Bacteriological survey indicates that the water is safe for human contact. <b>If you have any questions, you may contact Hot Springs Utilities at (501)</b> <b>321-6200</b>

ASSOCIATED EQUIPMENT	The foll	owing equipment may be deployed f	or respondir	ng to any SSO:	
	1.	Flusher/Vac Truck	6.	Shovels	
	2.	Backhoe	7.	Rakes	
· · · · · ·	3.				
	4.	Crew Trucks	9.	Trash Bags	
	5.	Confined Space Entry Equipment			
PPE	The foll	owing personal protective equipmen	it may be rec	uired when responding to any SSO:	
	1.	Hard Hats	5.	Rubber gloves	
	2.	Safety Glasses/Goggles	6.	Rubber Boots	
	3.	Face Shield	7.	Protective Body Suit	
	4.	Ear/Noise Protection	8.	Respirators	

The following pages are tools for responding personnel to use in estimating SSO amounts. The information is largely derived from the <u>Sewer Spill Estimation Guide</u> developed by the Orange County Area Waste Discharge Requirements Steering Committee, Orange County, CA.

### LOSS FROM PICK AND VENT-HOLE SSOs

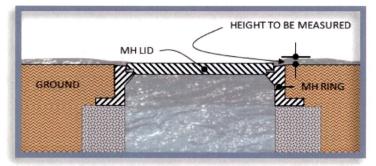


To estimate an SSO from a pick or vent-holes, measure the height of the wastewater plume exiting the hole(s). Find the height and hole diameter on the manhole pick or vent-hole chart to determine the flow rate. Multiply the flow rate time the number of holes that are discharging wastewater. Once the volume (gpm) has been determined, multiply the gpm by the duration of the SSO in minutes.

Pick and Vent Hole Estimation Chart (24" Cover)											
Vent/Pick Hole Diameter (Inches)	Water Height (Inches)		ater Height (Inches) Height Gallons Gallons /Pick (Feet) Minute Hour Diameter (Inches)	ght (Inches)	Water Height (Feet)	Gallons per Minute	Gallons per Hour				
0.50	1/16	0.063	0.005 0	0.23	14	0.75	1/16	0.063	0.005	0.51	31
0.50	1/8	0.125	0.010	0.33	20	0.75	1/8	0.125	0.010	0.72	43
0.50	1/4	0.250	0.021	0.47	28	0.75	1/4	0.250	0.021	1.02	61
0.50	1/2	0.500	0.042	0.66	40	0.75	1/2	0.500	0.042	1.44	86
0.50	3/4	0.750	0.063	0.81	49	0.75	3/4	0.750	0.053	1.77	106
0.50	1	1.000	0.083	0.94	56	0.75	1	1.000	0.083	2.04	122
0.50	1 1/4	1.250	0.104	1.05	63	0.75	1 1/4	1.250	0.104	2.28	137
0.50	13/8	1.375	0.115	1.10	66	0.75	13/8	1.375	0.115	2.39	143
0.50	1 1/2	1.500	0.125	1.15	69	0.75	1 1/2	1.500	0.125	2.50	150
0.50	15/8	1.625	0.135	1.20	72	0.75	15/8	1.625	0.135	2.60	156
0.50	13/4	1.750	0.146	1.24	74	0.75	13/4	1.750	0.146	2.7	162
0.50	2	2.000	0.167	1.33	80	0.75	2	2.000	0.167	2.89	173
0.50	2 1/4	2.25	0.188	1.41	85	0.75	2 1/4	2.250	0.188	3.06	184
0.50	2 1/2	2.50	0.208	1.48	89	0.75	2 1/2	2.500	0.208	3.23	194
0.50	23/4	2.75	0.229	1.56	94	0.75	23/4	2.750	0.229	3.38	203
0.50	3	3.00	0.250	1.62	97	0.75	3	3.000	0.250	3.53	212
0.50	3 1/4	3.25	0.271	1.69	101	0.75	3 1/4	3.250	0.271	3.66	220
0.50	3 1/2	3.50	0.292	1.75	105	0.75	3 1/2	3.500	0.292	3.82	229
0.50	3 3/4	3.75	0.313	1.82	109	0.75	3 3/4	3.750	0.313	3.95	237
0.50	4	4.00	0.333	1.88	113	0.75	4	4.000	0.333	4.08	245

<u>Example</u>: The measured height of the plume exiting the vent hole is 1 inch from a  $\frac{1}{2}$ " hole and there are four vent holes. The total volume per minute would be 0.94 gpm (from chart above) or 3.76 gpm total (0.94 gpm x 4 holes). If the SSO lasted one hour, the total wastewater lost would be 226 gallons (3.76 gpm x 60 minutes = 225.6 gallons).

# LOSS AROUND EDGE OF NON-VENTED COVER



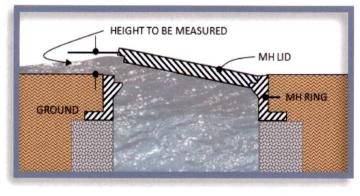
To estimate an SSO from a where wastewater is escaping from around the perimeter of the manhole cover, measure the observed height of the wastewater plume exiting the cover. Find the manhole diameter. Use the chart below to estimate volume of SSO. Wastewater escaping from vent/pick holes must be accounted for separately using Pick and Vent Hole Estimation Chart.

#### Estimated SSO Flow Out of Manhole with Cover in Place

			24 Inc	ch Cover			
Height of Spout above MH	SSO Flow		Minimum Sewer Size in Which	Height of Spout above	SSO	Flow	Minimum Sewer Size in Which
Rim (inches)	GPM	MGD	Flow is Possible	MH Rim (inches)	GPM	MGD	Flow is Possible
1/4	1	0.001		5	148	0.240	
1/2	3	0.004		5 1/4	166	0.266	Marian Social
3/4	6	0.008		5 1/2	185	0.294	。自由自己的 4
1	9	0.013		5 3/4	204	0.322	6"
1 1/4	12	0.018	Net Mild	6	244	0.352	19738-08
1 1/2	16	0.024	C. 55 8 28	6 1/4	265	0.382	11301636
1 3/4	21	0.030		6 1/2	286	0.412	Line we had t
2	25	0.037		6 3/4	308	0.444	Constant Ser
2 1/4	31	0.045	Contraction of the	7	331	0.476	1912 1928
2 1/2	28	0.054		7 1/4	354	0.509	
2 3/4	45	0.065		7 1/2	377	0.543	1910年1月1日
3	54	0.077		7 3/4	401	0.578	8"
3 1/4	64	0.092		8	426	0.613	
3 1/2	64	0.107	A STREET	8 1/4	451	0.649	
3 3/4	75	0.125		8 1/2	476	0.686	1 March 1
4	87	0.145	State State	8 3/4	502	0.723	TREET
4 1/4	100	0.166	19.10	9	529	0.761	APRIL AND
4 1/2	115	0.189					
4 3/4	131	0.214					

<u>Example</u>: The measured height of the plume exiting a 24" manhole is 1 inch. The total volume would be 12 gpm from around the manhole cover. Calculate the total exiting from vent/pick hole(s) and add to the total lost around the ring. if the SSO lasted 1 hour (60 minutes), multiply 12 gpm x 60 minutes = 780 gallons per hour + amount lost through pick/vent holes.

### LOSS FROM TILTED COVER



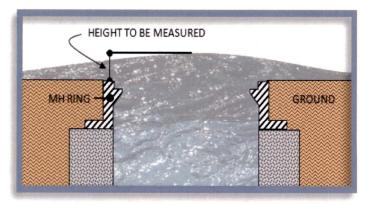
To estimate the volume of a spill that occurs when the SSO pressure only lifts one side of the cover, calculate the area (in square feet) from where the wastewater is escaping and the velocity (in square feet per second). The velocity is estimated from visual observation with 2 ft/sec or less being a small velocity, 4 to 5 ft/sec being a medium velocity and 7 ft/sec or higher being a large velocity. Velocities above 7 ft/sec may be strong enough to blow the cover off. Next, multiply the duration (in seconds) that the SSO occurred. Finally, multiply by 7.48 (gallons per cubic foot) to determine the volume of the SSO in gallons. Volume = Area (sq. ft.) x Velocity (ft/sec) x Time (seconds) x 7.48 (gal/cu. ft)

Area Calculation Chart							
ight of Flow (Inches) 24 Inch Manhole (Square Feet)							
0.5	0.131						
1	0.262						
1.5	0.393						
2	0.524						
2.5	0.655						
A3	0.786						
3.5	0.917						
4	1.048						

*Example*: The measured height of the plume exiting the side or a 24-inch manhole is 2 inches. Using the above chart, a 2-inch plume from one side provides 0.524 square feet of area. The velocity is estimated at 4-feet/second (visual observation) with a duration of 1 hour. The total estimated SSO is 56,441 gallons (0.524 sq. ft x 4 ft/sec x 60 minutes x 7.48).

To estimate velocity, drop a small floating object into the flow and time how long it takes to travel a measured distance.

# LOSS FROM A MANHOLE WITHOUT A LID IN PLACE



Typically, when an SSO reaches 7 cubic feet per second (approximately 3,000 gpm or about 4.32 MGD), the flow is sufficient to blow the manhole cover off. To estimate the volume, take several measurements from the surface close to the manhole ring to the top of the plume and average the findings. Find the average height of the plume on the Area Calculation Chart to determine the rate of flow exiting the manhole. Multiply the flow rate expressed in gallons per minute by the duration of the SSO in minutes to determine the total volume of the SSO.

*Example:* If the average height of the plume exiting a 24" manhole is 2 inches on the chart, the flow in gallons would be 3,444 gpm. If the flow lasted for 60 minutes, the amount of SSO would be estimated at 206,640 gallons (3,444 gpm x 60 min.).

	Series and	No. of Street,	24 Inch	Cover			
Height of Spout above MH Rim (inches)	SSO Flow		Minimum Sewer Size in	Sewer Spout	SSO	Minimum Sewer Size in	
	GPM	MGD	Which Flow is Possible	above MH Rim (inches)	GPM	MGD	Which Flow is Possible
1/8	58	0.04		1 5/8	2,396	3.45	18
1/4	62	0.09	A REAL PROPERTY.	1 3/4	2,799	4.03	
3/8	111	0.16	Charles States	1 7/8	3,132	4.51	
1/2	160	0.23	S. S. Martin	2	3,444	4.96	21
5/8	215	0.31	6	2 1/8	3,750	5.40	
3/4	354	0.51	8	2 1/4	3,986	5.74	
7/8	569	0.82	10	2 3/8	4,215	6.07	
1	799	1.15	12	2 1/2	4,437	6.39	
1 1/8	1,035	1.49	C'MARKER R	2 5/8	4,569	6.58	24
1 1/4	1,340	1.93	15	23/4	4,687	6.75	
1 3/8	1,660	2.39	attraction of the	27/8	4,799	6.91	
1 1/2	1,986	2.86	2 North March	3	4,910	7.07	

## PICTORIAL REFERENCE

Currently there are two pictorial charts widely used to assist with estimating SSO Volumes displayed below. To use either of these Pictorial references, select the picture that most accurately represents the SSO being estimated. Use the gpm associated with the picture multiplied by the duration of the SSO to estimate the spill volume.

*Example*: If the selected picture shows 300 gpm and the duration is 55 minutes, the total estimated spill volume would be 16,500 gallons (300 gpm x 55 minutes).

#### Reference Sheet for Estimating Sewer Spills

From the UC San Diego Overflow Emergency Response Field Guide







25 gpm



50 gpm



100 gpm



150 gpm



200 gpm



225 gpm

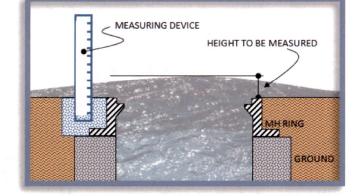


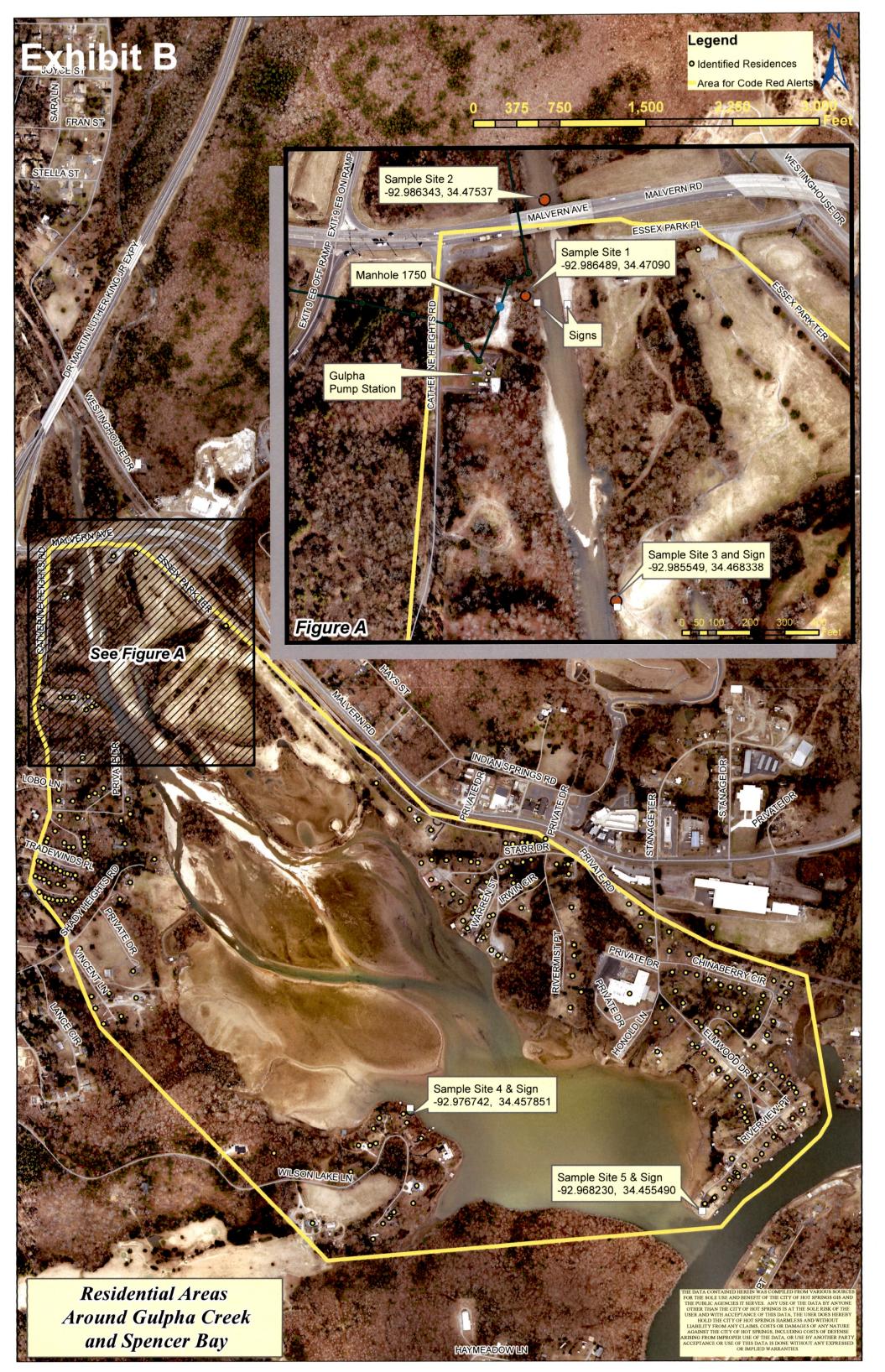
250 gpm



275 gpm

Hot Springs Utilities installed a measuring device at Manhole 1750 close to the rim of the manhole to assist personnel in measuring the height of the overflow plume.













CITY OF HOT SPRINGS Utilities Department 780 Adams Street Hot Springs, Arkansas 71901

#### TO:

Mr. Alan J. York, Associate Director M. Leslie Allen-Daniel, Enforcement Coordinator Arkansas Energy & Environment Office of Water Quality 5301 Northshore Drive North Little Rock, Arkansas 72118