

LETTER OF AGREEMENT

This is a Letter of Agreement (“Agreement”) between the City of Killeen (referred to herein as “City”) and Pipeline Analysis, LLC (referred to herein as “Contractor”), collectively the “Parties”. This Agreement is made this _____ day of _____ 2023.

In consideration of the premises and of the mutual covenants and agreements contained in this Agreement, the Parties hereby agree as follows:

Scope of Agreement. The purpose of this Agreement is to enlist the services of Contractor to: Complete a city-wide wastewater dry and wet weather flow assessment as outlined in the attached Scope of Services (the “Project”)

Term of Agreement. This Agreement shall commence on the ____ day of _____, 2023, and terminate 180 calendar days after commencement of work on the Project.

Consideration. Contractor agrees to provide the services stated above:

_____ at the rate of \$_____ per hour; or

X for the lump sum payment not to exceed \$352,598.

Independent Contractor. Contractor shall act as an Independent Contractor. Under no circumstances shall Contractor be deemed an employee or partner of Owner.

Applicable Laws: Contractor shall follow all applicable local, State, and Federal laws, regulations, and requirements for the abatement and disposal of lead, asbestos, and other routinely encountered hazardous substances. If any unusual substances or extraordinary amounts of the aforementioned substances are encountered, the Contractor will contact the City to contact the State and the relevant agency with authority for regulation of the substance.

Standard of Care. The standard of care for all professional engineering and related services performed or furnished by Contractor under this Agreement will be the care and skill ordinarily used by members of the Contractor’s profession practicing under similar circumstances at the same time and in the same locality.

Insurance. Contractor shall procure and maintain insurance in the following amounts:

Worker’s Compensation	Statutory
Automobile Liability	\$500,000 Combined single Limit for each accident (Bodily injury and property damage).
General Liability	\$1,000,000 each occurrence (Bodily injury and property damage).
Professional Liability	\$1,000,000 general aggregate.

On all policies, except Worker's Compensation, City shall be listed as an additional insured with a full waiver of subrogation. A certificate of coverage shall be provided to the City prior to commencing work on the Project.

Subcontracts and Assignments. Contractor's rights and obligations hereunder are deemed to be personal and may not be transferred or assigned. Any assignments shall be void and of no effect.

Indemnification. To the fullest extent permitted by law, City or Contractor, as applicable, shall indemnify and hold harmless the other party, and the other party's officers, directors, partners and employees from and against any and all costs, losses and damages (including, without limitation, all fees and charges of attorneys and other professionals, and all court or dispute resolutions costs) caused by the negligent acts or omissions of the City or Contractor, as applicable, or their respective officers, directors, partners, employees and consultants with respect to the performance under this Agreement or the Project.

Termination. This Agreement may be terminated by either party for cause upon thirty (30) calendar days' written notice, provided such cause cannot be reasonably cured within such thirty (30) day period. City may terminate this Agreement for convenience effective upon receipt of written notice declaring the same and Contractor shall be compensated for all work completed at that time in accordance with this Agreement.

Texas Law. This Agreement shall be subject to and governed by the laws of the State of Texas. The Parties agree that for venue purposes, any and all lawsuits, disputes, or causes of action shall be in Bell County, Texas.

Severability. If any provision of this Agreement shall, for any reason, be held to violate any applicable law, then the invalidity of such a specific provision in this Agreement shall not be held to invalidate the remaining provisions of this Agreement.

Survival. Any provision of this Agreement providing for indemnity, insurance or a duty that necessarily will not be completed until after the expiration or termination of this Agreement shall continue in full force and effect until such a time as all duties have been fully performed.

Non-waiver. Failure to enforce any provision of this Agreement by either party shall not constitute a waiver of that provision for purposes of the subsequent enforcement of that provision or the remainder of this Agreement.

Entire Agreement. This Agreement shall represent the entire agreement by and between the Parties and it may not be changed except by written amendment duly executed by all Parties.

Contract Verification. Texas law provides that a governmental entity may not enter into certain contracts for goods and services with a company unless the company provides written verification regarding aspects of the company's business dealings.

Acknowledgement – “Boycott Israel”

Texas Government Code, Chapter 2271 – the company must verify that it does not boycott Israel and will not boycott Israel during the term of the contract. Boycott Israel is defined in Government Code Chapter 808.

Acknowledgement – “Boycott Energy Companies”

Texas Government Code, Chapter 2274 – the company must verify that it does not boycott energy companies and will not boycott energy companies during the term of the contract. Boycott energy company is defined in Government Code Chapter 809.

Acknowledgement – “Prohibition on contracts with companies that discriminate against firearm and ammunition industries”

Texas Government Code, Chapter 2274 – the company must verify that it does not have a practice, policy, guidance or directive that discriminates against a firearm entity or firearm trade association and will not discriminate during the term of the contract against a firearm entity or firearm trade association. Verification is not required from a sole source provider. Discriminate, firearm entity and firearm trade association are defined in Government Code Chapter 2274.

Affected by the above statutes are contracts 1) with a company with ten (10) or more full-time employees, and 2) valued at \$100,000 or more to be paid wholly or partly from public funds. A contract with a sole proprietorship is not included.

By signing below, I verify that the company listed below does not boycott Israel, does not boycott energy companies and does not discriminate against firearms entities or firearm trade associations and will not do so during the term of the contract entered into with the City of Killeen. I further certify that I am authorized by the company listed below to make this verification.

SIGNED, ACCEPTED AND AGREED TO this ____ day of _____, 2023, by the undersigned Parties who acknowledge that they have read and understand this Agreement and that the Agreement is issued in accordance with local, State, and Federal laws, and the undersigned Parties hereby execute this legal document voluntarily and of their own free will.

City

Contractor

Kent Cagle, City Manager
City of Killeen

Mattie A. Engels
Printed: Mattie A Engels
Title: VP Engineering

Professional Services Contract Temporary Wastewater Flow Monitoring Scope of Services



February 1, 2023



PIPELINE ANALYSIS LLC
1115 MAIN STREET
GARLAND, TEXAS 75040
800-637-0164

TBPE FIRM NO. F-6538

EXHIBIT A – SCOPE OF SERVICES

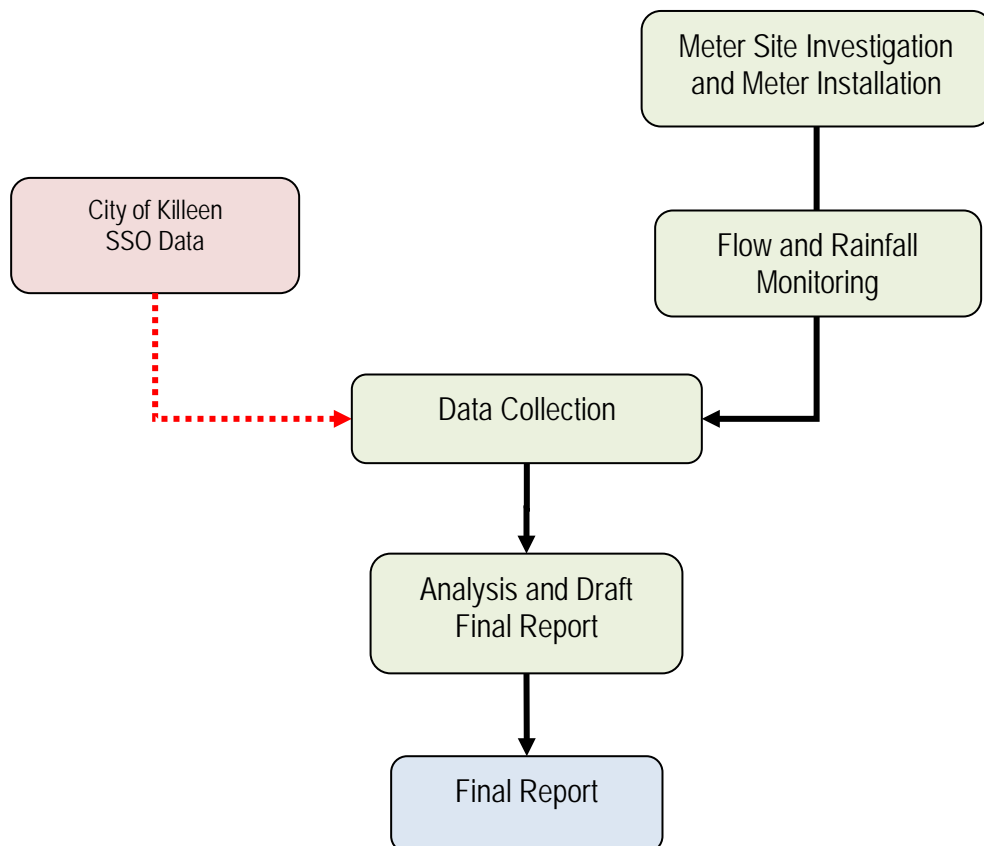
PROJECT DESCRIPTION

The City-wide wastewater flow assessment project will consist of:

- 1) Temporary wastewater flow monitoring at 26 sites
- 2) Temporary rainfall monitoring at 8 sites
- 3) Utilize various permanent flow meter data, as needed, to supplement the temporary flow metering
- 4) Analysis of systemwide infiltration/inflow
- 5) Comparison with previous flow metering, where applicable
- 6) Determine pipeline capacity utilized at each metering site

This scope of services is to complete a dry and wet weather flow assessment for the City of Killeen. Figure 1 presents the operational flow chart for the flow monitoring.

FIGURE 1 - PROJECT FLOW CHART



BASIC SERVICES

TASK 100 MOBILIZATION/PROJECT ADMINISTRATION

MOBILIZATION

Mobilize project team and coordinate startup. Establish personnel assignments and responsibilities. Inventory equipment needs and order expendable supplies. Perform meter pre-calibration, prepare mounting rings for various pipe sizes, set-up meter database and project information.

Preliminary placement of flow meters and rainfall gauges will be field verified to finalize meter placement. The site inspections will verify wastewater flows, line sizes, debris levels, flow hydraulics and access. Site inspection reports will be prepared based on the field observations. Meter sites will be finalized, or new alternative sites established.

PROJECT ADMINISTRATION

This task includes internal project administration and oversight including scheduling, budget, quality assurance and control and reporting during all phases of the project. The project schedule will be reviewed in detail and milestones for the completion of each task will be assigned. The project schedule will be reviewed and updated monthly to ensure that all tasks are completed in a timely and organized fashion.

Management work items include:

1. Field crew supervision and project planning
2. Obtain initial maps for field use and verification
3. Prepare monthly billings
4. Schedule equipment and order supplies
5. Meetings and progress reports

To Be Provided by City:

1. Previous studies for the service areas to be investigated (if requested)
2. Current GIS sewer maps and protocol for naming new assets located during the investigation
3. Access for placement of equipment and personnel (if requested)
4. As-built drawings, sewer key maps, street plans, electronic aerial photographs if available and if requested at no cost to Pipeline Analysis
5. Complaint records, high maintenance locations and historical SSO location data
6. Master Plan projects completed and planned
7. Wastewater flow data from specified existing metering vaults and lift stations.
8. Provide coordination to obtain flow data from existing metering stations operated by Fort Hood and WCID.

TASK 200 TEMPORARY FLOW AND RAINFALL MONITORING

In order to perform I/I analysis and establish the existing capacity being used during dry and wet weather, it will be necessary to obtain flow monitoring information during both dry and wet weather. Under ideal conditions, multiple events are recorded to establish the volume of extraneous water that enters the collection system. From this collected data the inflow response for each storm event is determined. Information obtained during the monitoring period will be used to determine the following for each metering site:

- Average daily flow-dry weather
- Peak flow-dry weather
- Average daily flow-wet weather
- Peak flow-wet weather
- Total I/I volume
- Compare current data with flow data collected by Pipeline Analysis in 2007 to gauge increase/decrease in flows

The meter site selection has been accomplished based on the previous metering and a review of collection system maps. Twenty-six (26) flow monitoring sites have been identified. Each monitoring site was selected so that the footage of the collection system upstream of the meter can be isolated for the purposes of determining extraneous I/I and other engineering analysis. Flow meters that record flow depth and velocity will be used to obtain the necessary hydraulic information for subsequent analysis. Existing permanent flow meters will be used to supplement the project. Figures 2 and 3 presents the preliminary flow metering schematic diagram for the project. Table 1 presents a summary of the preliminary flow and rain gauge locations.

Figure 2
Preliminary Flow Meter Schematic Diagram
Nolan Creek Service Area

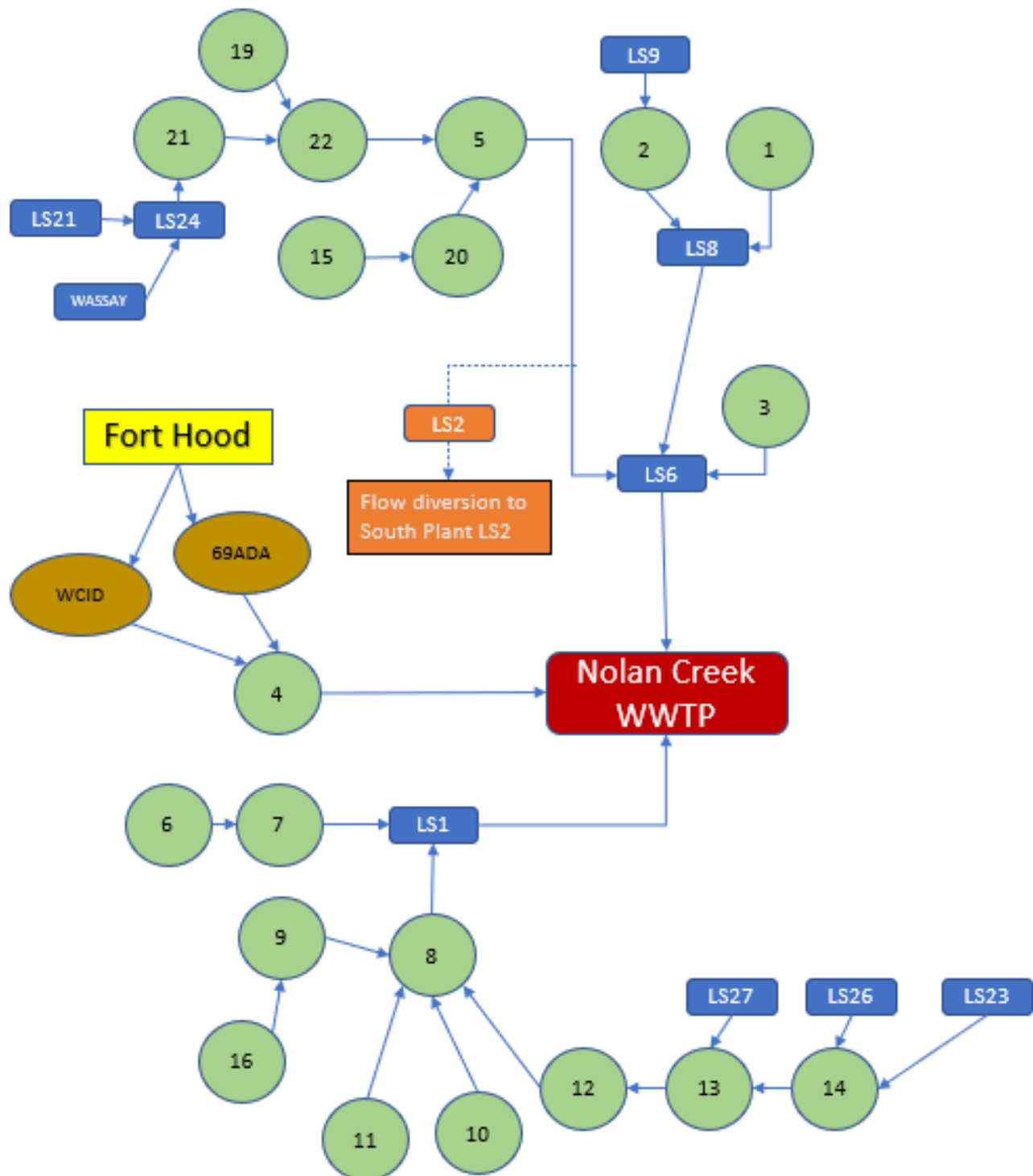
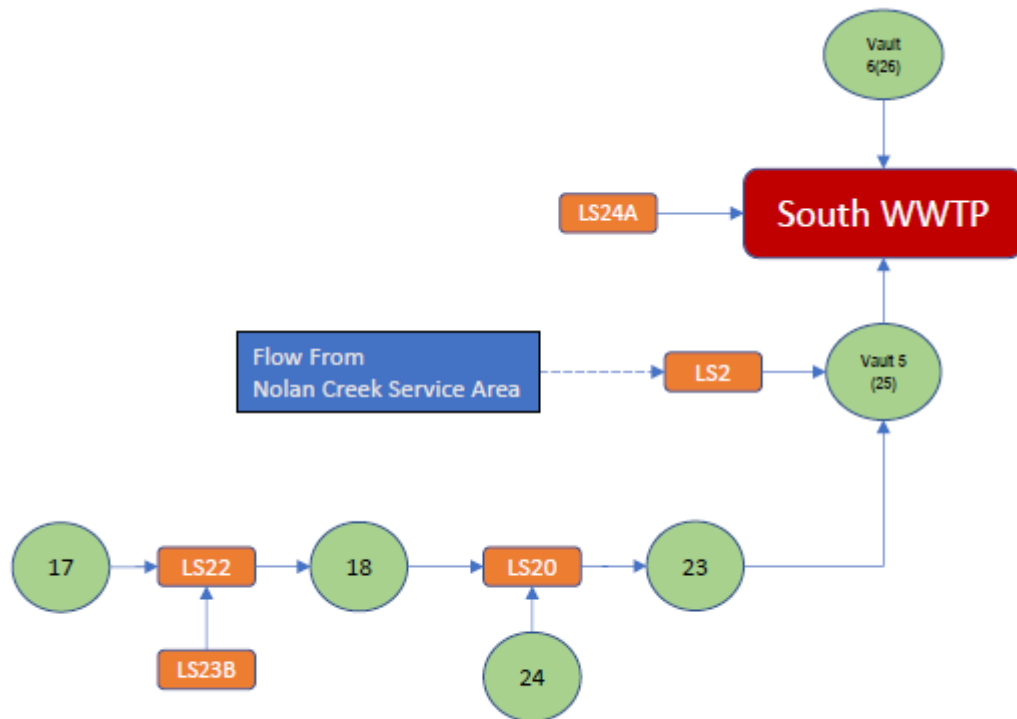


Figure 3
Preliminary Flow Meter Schematic Diagram
South Service Area



Note: Check meters installed upstream of Vault 5 and Vault 6

Table 1 **Preliminary Flow and Rain Gauge** **Site Summary**

Preliminary Site Locations

Meter ID	Size	MH ID
1	15	E14MH02097
2	18	E13MH02292
3	21	F12MH22196
4	42	E10MH01995
5	36	F12MH02295
6	18	E11MH22236
7	18	F10MH02245
8	44	F10MH02222
9	10	F08MH02196
10	30	G06MH06039
11	12	G06MH06035
12	30	H05MH06047
13	27	J04MH04070
14	24	L03MH04338
15	12	F08MH02196
16	15	F07MH01939
17	18	Q06MH00001
18	18	D12MH22336
19	18	K11MH03917
20	24	I10MH01481
21	20	L11MH04407
22	36	I11MH01626
23	36	O14MH06463
24	15	Q07MH11776
25-PM5	30	O16MH06475
26-PM6	36	M15MH06477
RG1		LS26
RG2		LS22
RG3		LS24
RG4		Vault 5
RG5		LS9
RG6		LS2
RG7		Fire Station-5 (905 W Jasper Dr)
RG8		Elam at S. Fort Hood St.

Flow monitoring will be undertaken for sixty (60) consecutive days starting in Spring 2023 to optimize the probability of obtaining multiple storm events for analysis. A milestone will occur sixty (60) days into the flow monitoring where a determination will be made with respect to the adequacy of recorded rainfall events. If adequate rainfall (as determined by the City project manager) has occurred within the sixty (60) days of initial monitoring, then the flow metering portion of the project will be terminated, and flow and rainfall metering billings will cease. If inadequate rainfall is determined then, at City's option, the metering may be extended. Each flow meter will call the Pipeline Analysis server daily to confirm operation and maintenance parameters are within normal limits.

Continuously recording rainfall meters are used to accurately measure rainfall intensity and duration throughout the monitoring period over each service area. This data will be used to establish the rainfall distribution over the entire study area using GIS mapping tools. The rainfall distribution will establish the amount of rain that fell over each meter basin. Analysis of the flow meter data for each rain event will establish the percentage of rainfall that entered the wastewater collection system.

Eight (8) rainfall gauges will be installed during the monitoring period. Rain Gauges are calibrated during installation and prior to removal using a graduated cylinder with known volume of water. Bird restrictors are installed on each rain gauge to minimize droppings that impact accuracy. The rain gauges will call into the Pipeline Analysis server daily to confirm operation and maintenance parameters are within normal limits.

METER INSTALLATION, CALIBRATION AND DATA COLLECTION

All equipment will use wireless data transmission. The Telog™ wireless information management system provides an automated means of collecting, archiving, presenting and sharing data from wastewater collection system remote sensors including flow meters and rain gauges.

Understanding the hydraulics of each proposed metering location will ensure that the site selection is appropriate and that the recorded data is accurate. Where flow hydraulics are poor due to abrupt changes in flow direction, large deposits of silt, restrictions, etc. a proposed meter location may be changed upstream or downstream to ensure proper hydraulic conditions in order to obtain accurate flow data.

The temporary flow meters proposed will utilize area/velocity technology combined with wireless telemetry. Both the Manning and continuity equations may be compared during analysis. Each flow meter will be calibrated in a hydraulic flume located at Pipeline Analysis's office. In addition, a field calibration check will be performed following installation and periodically throughout the monitoring period. Calibration of each meter is a simple procedure consisting of independently verifying depth of flow and performing a velocity profile to verify average velocity. The flow sensors will be secured to a steel mounting band that fits securely in the pipeline. The data logger for each site will be installed in the top of each manhole and the meter will be activated at user defined sampling intervals, typically 15 minutes. Telemetry to each site will be established by wireless data link and confirmed by data transmission. Routine maintenance and service will be undertaken to confirm normal operation. Telog™ Enterprise software is used to review each meter status and sensor health. Crews will be dispatched to replace any malfunctioning equipment. Written logs of each site visit will be maintained and will be used to record date and time of visit, meter velocity and depth reading, corresponding independent velocity and depth reading, maintenance items such as battery voltage, etc.

Each continuously recording rainfall gauge will be installed and calibrated to ensure proper operation and recording. Rainfall gauges are of the tipping bucket type with wireless telemetry and accurately record rainfall to 0.01 inches. Rainfall gauges will be set to 5-minute sampling intervals. Maintenance logs will be prepared for each site visit and will show as a minimum the date, time, operational check, verification of recordings, and other applicable maintenance items such as battery voltage, etc.

Pipeline Analysis will coordinate with the City to obtain electronic flow data from existing permanent flow meters within the collection system. The City permanent meter data will be used to supplement the temporary flow meters.

TASK 300 DATA ANALYSIS AND FINAL REPORT

During and following completion of the flow and rainfall monitoring, Pipeline Analysis will analyze the gathered data and develop tabular and graphical summaries. Comparisons with any previous historical flow meter data will be reviewed. The impact of silt and debris will also be evaluated. Information obtained during the monitoring period will be used to determine the following for each site:

1. Dry Weather Average Daily Flow – A typical dry weather week, not impacted by rainfall, will be established. Velocity data will be compared to debris levels to analyze the scouring velocity necessary to prevent deposition in the lines. Discrete flows from each monitored sub-basin will be calculated.

2. Dry Weather Peak Flow – Peak flows during dry weather will be determined from the recorded data.
3. Wet Weather Average Daily Flow – Wet weather flows for each rainfall event will be analyzed to determine the percentage of rainfall that enters the collections system (also known as the leakiness factor). Comparing the storm event flow with the dry weather flows will establish the Rainfall Derived Infiltration/Inflow (RDII). This value will vary for each storm duration and intensity. The discrete RDII for each sub-basin will be determined and will allow the ranking (prioritization) of each sub-basin by severity of RDII.
4. Wet Weather Peak Flow – Peak flow rates during wet weather are critical to capacity analysis. Peaking ratios (Peak flow rate to average dry weather flow) will be compared for dry and wet weather.
5. Total I/I volume – The area under each storm event curve will be evaluated to establish the volume of rainfall induced infiltration/inflow. These values can then be normalized to establish the volume of RDII per inch of rainfall. Projections can then be made to determine the impact of RDII during a normal year.
6. A comparison of the collected data with the 2007 flow data, where applicable, will be undertaken to determine the effectiveness of previous system rehabilitation.
7. Billing meters located at vaults 5 and 6 will be compared to flow meters installed immediately upstream of each vault.
8. The findings and data will be compiled for inclusion in Final Report.
9. City will provide flow data from existing meters as requested. The following existing meters have been identified for likely incorporation into the metering project. Other metering data may be requested.

Meter ID	Size	Description
69 ADA	8	Fort Hood Meter
WCID	42	Fort Hood Meter
PM1	27	E09MH01984
PM2	24	E09MH01981
PM5	30	O16MH06475
PM6	36	M15MH06477
LS 1	City Meter	Lift Station 1
LS 2	City Meter	Lift Station 2
LS 6	City Meter	Lift Station 6
LS 23	City Meter	Lift Station 23
LS 23B	City Meter	Lift Station 23B
Nolan Cr WWTP	City Meter	Wastewater Treatment Plant
South WWTP	WCID Meter	South Treatment Plant

EXHIBIT B – SCHEDULE

Exhibit B presents the project schedule noting that the field testing is weather dependent.

Task	Description	Month				
		1	2	3	4	5
100	a. Mobilization					
	b. Project Administration					
200	Temporary Flow and Rainfall Monitoring					
	a. Flow Meter Site Inspection/Meter Installation					
	b. Rain Gauge Installation					
	c. Temporary Flow Monitoring - 60 days					
	d. Temporary Rain Gauge Monitoring - 60 days					
300	Data Analysis and Final Report					

EXHIBIT C – FEE

Killeen Infiltration/Inflow Analysis

Task	Description	Estimated Quantity	Unit Price	Total
100	a. Mobilization	L.S.	L.S.	\$ 5,680.00
	b. Project Administration	L.S.	L.S.	\$ 23,278.00
200	Temporary Flow and Rainfall Monitoring			
	a. Flow Meter Site Inspection/Meter Installation	26	\$1,360.00	\$35,360.00
	b. Rain Gauge Installation	8	\$250.00	\$2,000.00
	c. Temporary Flow Monitoring - 60 days	1560	\$155.00	\$241,800.00
	d. Temporary Rain Gauge Monitoring - 60 days	480	\$21.00	\$10,080.00
300	Data Analysis and Final Report	L.S.	L.S.	\$34,400.00
Total Not To Exceed				\$ 352,598.00