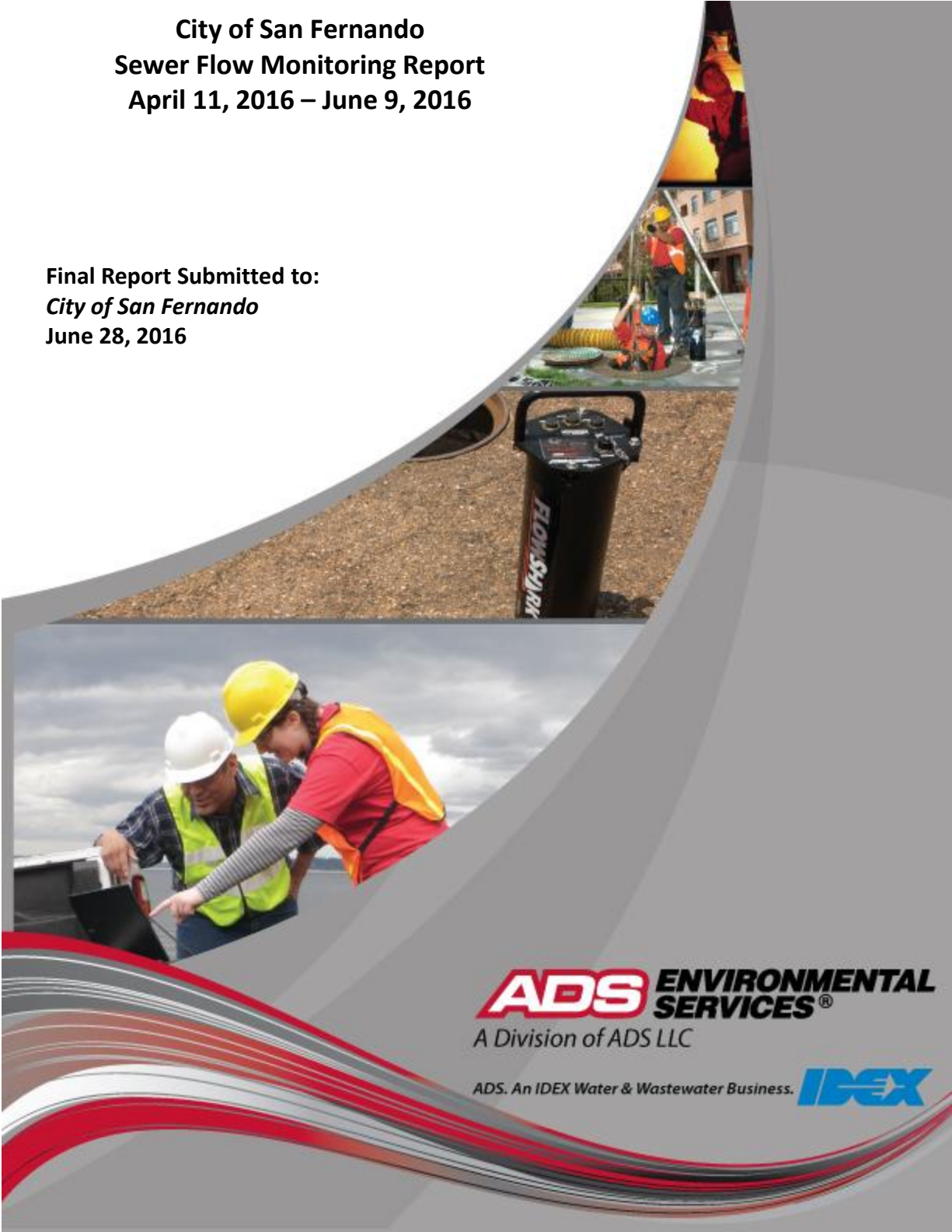


**City of San Fernando
Sewer Flow Monitoring Report
April 11, 2016 – June 9, 2016**

**Final Report Submitted to:
City of San Fernando
June 28, 2016**



**ADS ENVIRONMENTAL
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City of San Fernando Sewer Flow Monitoring Study

April 11, 2016 - June 9, 2016

Prepared for:

Chris Marcarello
Deputy City Manager/Public Works Director
117 Macneil St.
San Fernando, CA 91340

Prepared by:

ADS Environmental Services, Inc.
4820 Mercury Street, Suite C
San Diego, CA 92111

Letter of Transmittal



June 28, 2016

Mr. Chris Marcarello
Deputy Manager/Public Works Director
117 Macneil Street
San Fernando, CA 91340

SUBJECT: City of San Fernando Sewer Flow Monitoring Study 2016

Dear Mr. Marcarello,

ADS is pleased to submit the report for the City of San Fernando Sewer Flow Monitoring Study 2016. The metering was conducted for sixty (60) days at twelve (12) locations. The study period is April 11, 2016 - June 09, 2016 .

The report contains hourly averaged depth, velocity, and quantity hydrographs as well as daily long tables for the metering period in pdf format. An Excel file containing depth, quantity, and velocity entities for the monitoring location in 5-minute format is also provided.

In addition, we would be happy to further explain any details about the report that may seem unclear. Should you have any questions or comments, you may contact the Project Manager, Paul Mitchell at (714) 379-9778 ext 223.

Thank you for choosing ADS products and services to meet your flow monitoring needs.

Sincerely,
ADS ENVIRONMENTAL SERVICES

Sean O'Donnell
Data Analyst

Scope and Methodology

Introduction

The City of San Fernando, CA entered into an agreement with ADS Environmental Services to conduct flow monitoring at twelve (12) metering points within the City of San Fernando Sanitary Sewer Collection System. The study was contracted for a (60) sixty day monitoring period. Rain data from one (1) rain gauge source was provided for use in conducting the Rain Induced Inflow/Infiltration Analysis. The primary objective was to evaluate capacity, verify permanent downstream monitor SF01, and possible infiltration and inflow analysis.

Project Scope

The scope of this study involved using flow monitors to quantify wastewater flows at the designated locations. Specifically, the study included the following key components.

- Investigate the proposed flow-monitoring sites for adequate hydraulic conditions.
- Flow monitor installations.
- Flow monitor confirmations and data collections.
- Flow data analysis.

Equipment installation was completed on April 8. The study period began on April 11, 2016 and was completed on June 09, 2016 .

Flow Monitoring Equipment



The **ADS FlowShark Triton** monitor was selected for this project. This flow monitor is an area velocity flow monitor that uses both the Continuity and Manning's equations to measure flow.

The ADS FlowShark Triton monitor consists of data acquisition sensors and a battery-powered microcomputer. The microcomputer includes a processor unit, data storage, and an on-board clock to control and synchronize the sensor recordings. The monitor was programmed to acquire and store depth of flow and velocity readings at 5-minute intervals.

The FS Triton monitor features cross-checking using multiple technologies in each sensor for continuous running of comparisons and tolerances. The FS Triton monitor

can support two (2) sets of sensors. The sensor option used for this project was: **The Peak Combo Sensor** installed at the bottom of the pipe includes three types of data acquisition technologies.

The ***up looking ultrasonic depth*** uses sound waves from two independent transceivers to measure the distance from the sensor upward toward the flow surface; applying the speed of sound in the water and the temperature measured by sensor to calculate depth.

The ***pressure depth*** is calculated by using a piezo-resistive crystal to determine the difference between hydrostatic and atmospheric pressure. The pressure sensor is temperature compensated and vented to the atmosphere through a desiccant filled breather tube.

To obtain ***peak velocity***, the sensor sends an ultrasonic signal at an angle upward through the widest cross-section of the oncoming flow. The signal is reflected by suspended particles, air bubbles, or organic matter with a frequency shift proportional to the velocity of the reflecting objects. The reflected signal is received by the sensor and processed using digital spectrum analysis to determine the peak flow velocity.

Installation

Installation of flow monitoring equipment typically proceeds in four steps. First, the site is investigated for safety and to determine physical and hydraulic suitability for the flow monitoring equipment. Second, the equipment is physically installed at the selected location. Third, the monitor is tested to assure proper operation of the velocity and depth of flow sensors and verify that the monitor clock is operational and synchronized to the master computer clock. Fourth, the depth and velocity sensors are confirmed and line confirmations are performed.

In pipes up to 42 inches in diameter, the sensors were mounted on expandable stainless steel rings, inserted at least a foot upstream into influent pipes and tightened against the inside walls of the pipes. Influent pipe installations reduce the influences of turbulence and backwater often caused by changes in channel geometry in manholes.



Data Collection, Confirmation, and Quality Assurance

Data collects were done remotely via wireless connect on a weekly basis via ADS Field Representatives. During the monitoring period, field crews visit each monitoring location to verify proper monitor operation and document field conditions. The following quality assurance steps are taken to assure the integrity of the collected data:

Measure power supplies: monitors were powered by dry cell battery packs. Voltages were recorded and battery packs replaced, as necessary. Separate batteries provided back-up power to memory allowing primary batteries to be replaced without loss of data.

Clock synchronization: Field crews synchronized monitor clocks to master clocks.

Confirm depth and velocity readings: Field crews descended into meter manholes to manually measure depths and velocities and compare them meter readings to confirm that they agreed. They also measured silt levels, if any, in the inverts of the pipes. Silt areas were subtracted from flow areas to compute true areas of flow.

Confirm average velocities through cross-sectional velocity profiles: Since ADS velocity sensors measure peak velocity, field crews collected cross-sectional velocity profiles in order to develop a relationship between peak and average velocity in lines that meet the hydraulic criteria.

Upload and Review Data: Data collected from the monitors were uploaded and reviewed by a Data Analyst for completeness, outliers and deviations in the flow patterns, which indicate system anomalies or equipment failure.

Flow Quantification Methods

There are two main equations used to measure open channel flow: the **Continuity Equation** and the **Manning Equation**. The Continuity Equation, which is considered the most accurate, can be used if both depth of flow and velocity are available. In cases where velocity measurements are not available or not practical to obtain, the Manning Equation can be used to estimate velocity from the depth data based on certain physical characteristics of the pipe (i.e. the slope and roughness of the pipe being measured). However, the Manning equation assumes uniform, steady flow hydraulic conditions with non-varying roughness, which are typically invalid assumptions in most sanitary sewers. The Continuity Equation was used exclusively for this study.

Continuity Equation

The Continuity Equation states that the flow quantity (Q) is equal to the wetted area (A) multiplied by the average velocity (V) of the flow.

$$Q = A * V$$

This equation is applicable in a variety of conditions including backwater, surcharge, and reverse flow.

Data Analysis and Presentation

Data Analysis

A flow monitor is typically programmed to collect data at either 15-minute or 5-minute intervals throughout the monitoring period. The monitor stores raw data consisting of (1) the ultrasonic depth, (2) the peak velocity and (3) the pressure depth. The data is imported into ADS's proprietary software and is examined by a data analyst to verify its integrity. The data analyst also reviews the daily field reports and site visit records to identify conditions that would affect the collected data.

Velocity profiles and the line confirmation data developed by the field personnel are reviewed by the data analyst to identify inconsistencies and verify data integrity. Velocity profiles are reviewed and an average to peak velocity ratio is calculated for the site. This ratio is used in converting the peak velocity measured by the sensor to

the average velocity used in the Continuity equation. The data analyst selects which depth sensor entity will be used to calculate the final depth information. Silt levels present at each site visit are reviewed and representative silt levels established.

Occasionally the velocity sensor's performance may be compromised resulting in invalid readings sporadically during the monitoring period. This is generally caused by excessive debris (silt) blocking the sensor's crystals, shallow flows ($\sim < 2''$) that may drop below the top of the sensor or very clear flows lacking the particles needed to measure rate. In order to use the Continuity equation to quantify the flow during these periods, a Data Analyst and/or Engineer will use the site's historical pipe curve (depth vs. velocity) data along with valid field confirmations to reconstitute and replace the false velocity recordings with expected velocity readings for a given historical depth along the curve.

Selections for the above parameters can be constant or can change during the monitoring period. While the data analysis process is described in a linear manner, it often requires an iterative approach to accurately complete.

Data Presentation

This type of flow monitoring project generates a large volume of data. To facilitate review of the data, results have been provided in graphical and tabular formats. The flow data is presented graphically in the form of scattergraphs and hydrographs. Hydrographs are based on hourly averaging. Tables are provided in daily average format. These tables show the flow rate for each day, along with the daily minimum and maximums, the times they were observed, the total daily flow, and total flow for the month (or monitoring period). The following explanation of terms may aid in interpretation of the tables and hydrographs.

DEPTH - Final calculated depth measurement (in inches)

QUANTITY - Final calculated flow rate (in MGD)

VELOCITY - Final calculated flow velocity (in feet per second)

REPORT TOTAL - Total volume of flow recorded for the indicated time period (in MG)

Site Commentary

Site Information

SF_Bas01	
Pipe Dimensions	10.13" x 10.13"
Silt Level	0.00"

Overview

Site SF_Bas01 functioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flows remained free flowing throughout the period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This line is located downstream of locations SF_Bound3, SF_Bound6, and SF_Bound112alt. A review of balancing indicated no problems. A net flow of .159 MGD was reported for the period.

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 35% full at its recorded peak of 3.57 inches and approximately 26% full during its recorded average depth of 2.65 inches.

Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.65	5.43	0.428
Minimum	1.64	2.62	0.103
Maximum	3.83	6.72	0.815
Time of Minimum	4/28/2016 3:30 AM	4/19/2016 2:25 AM	4/19/2016 2:25 AM
Time of Maximum	6/9/2016 6:35 AM	5/4/2016 7:05 AM	4/13/2016 7:00 AM

Data Quality

Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF_Bas01		Install Date: 03/30/16		Monitor Type		Peak Doppler	
Address/Location: 614 Harding				Monitor Model		Triton	
				Data Acquisition		Manual/Wireless Collect	
				Manhole ID			
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		10.13"
					Pipe Width:		10.13"
Investigation Information:							
Date/Time of Investigation:		03/30/16 13:21		Manhole Depth:		8'	
Site Hydraulics:		Good straight through flow		Manhole Material / Condition		Precast/Good	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition:		VCP/Good	
Upstream Manhole:		Not investigated		Land Use:	Residential ☐	Commercial ☒	Industrial ☐
Downstream Manhole:		Not investigated			Trunk ☐		
Depth of Flow:	2.50	" +/-	0.25	Oxygen:	20.9	H2S:	0
Range (Air DOF):	+/-			LEL:	0	CO:	0
Peak Velocity:	6.08	fps		Safety Notes: 2 crews required and one flagger is needed.			
Silt:	0.00	Inches					
Other Information:							
		Cross Section				Plan	
Installation Information				Backup		Yes	
Installation Type: Standard				Trunk		No	
Sensors Devices: Ultrasonic/Pressure/Velocit				Lift / Pump Station		?	
Surcharge Height: 0				WWTP		Distance	
Rain Gauge Zone:				Other			
Additional Site Information / Comments:							
Standard Traffic Control with No Safety Concerns							

SCATTERGRAPH REPORT

SF_Bas01

Flow Monitor

SF_Bas01

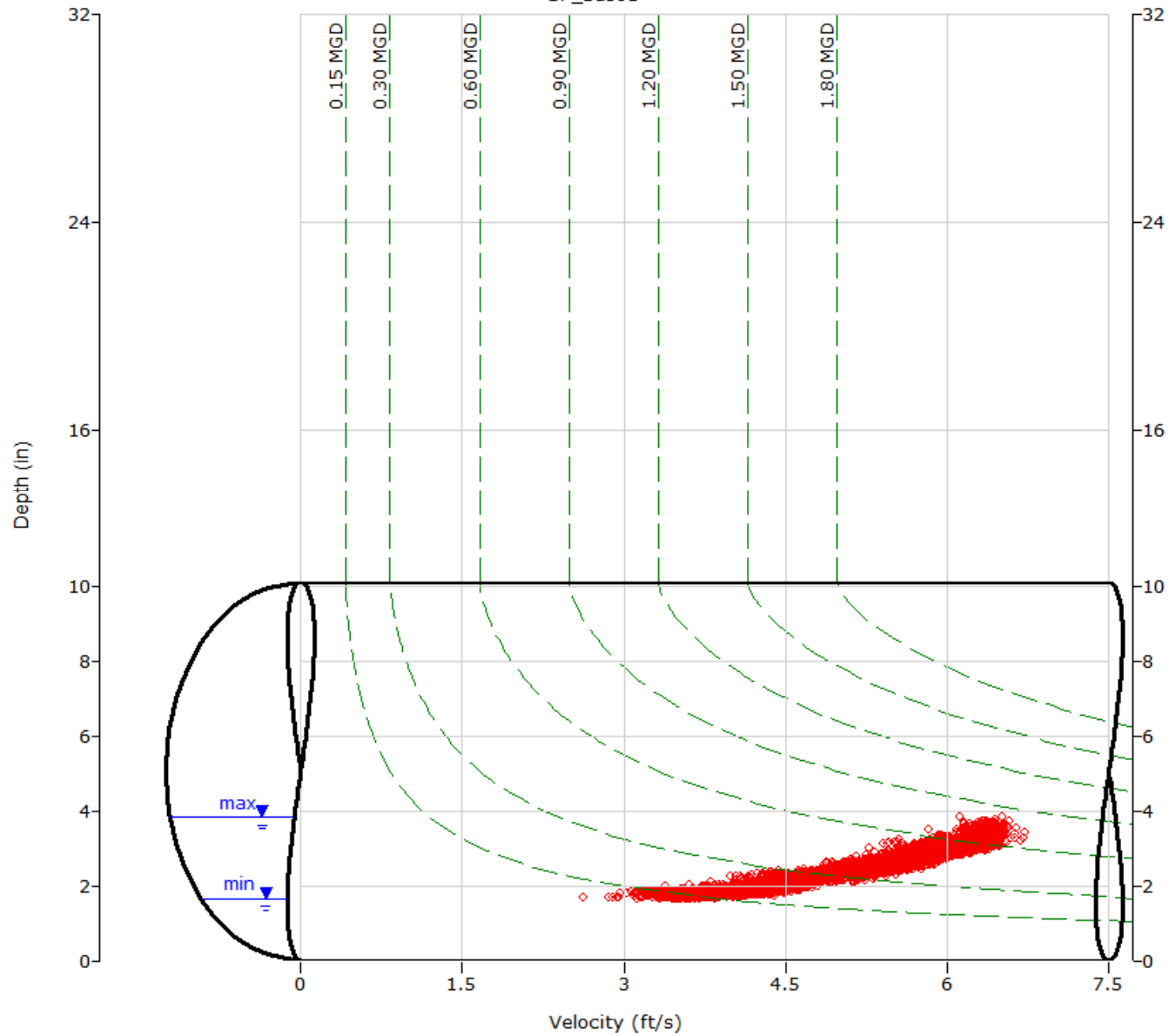
Pipe Height
10.13 in

Report Period

4/11/2016
To
6/9/2016

Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth



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HYDROGRAPH REPORT

SF_Bas01

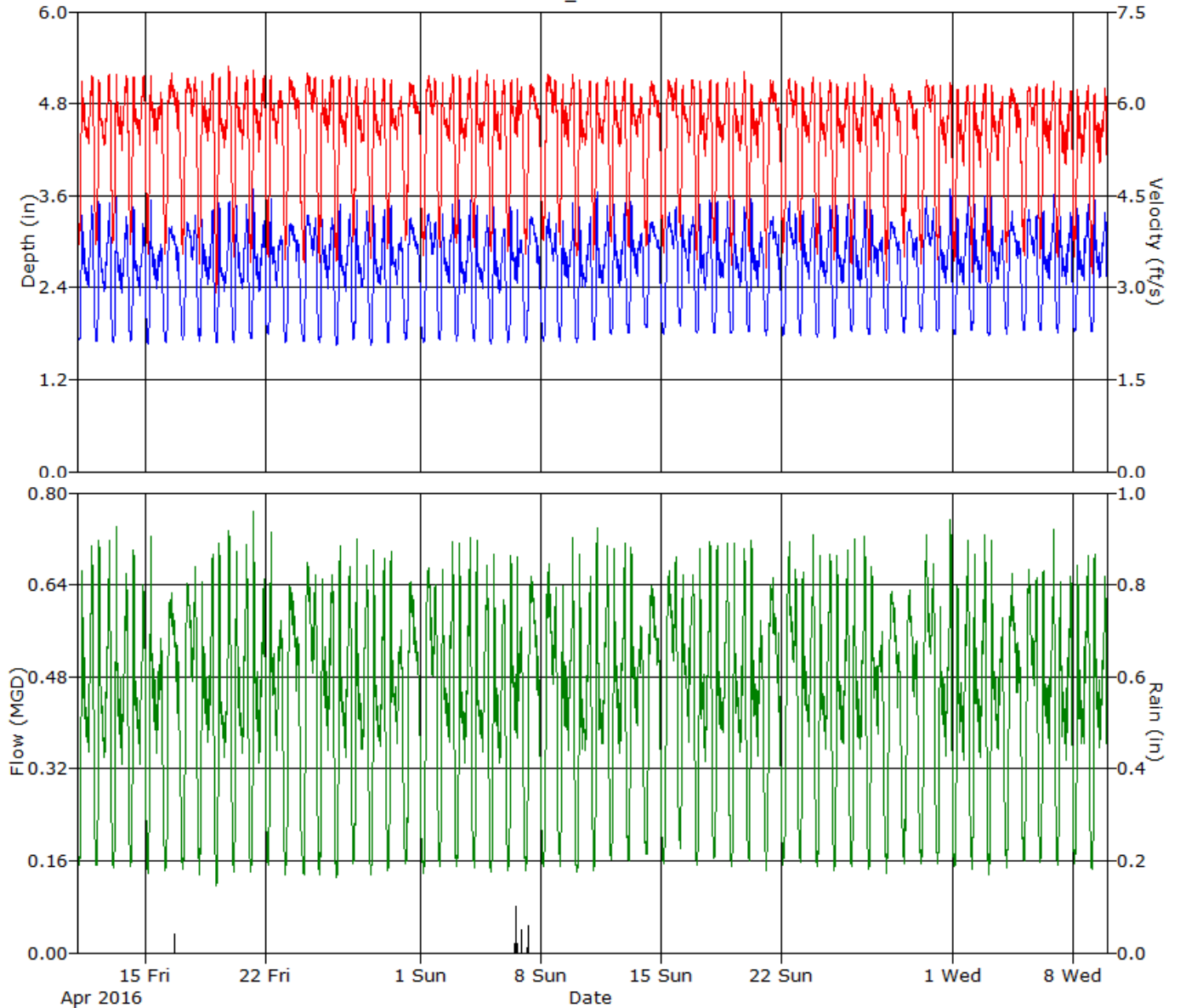
Flow Monitor
SF_Bas01

Pipe Height
10.13 in

Report Period
4/11/2016
To
6/9/2016

Legend
— Depth
— Velocity
— Quantity
— Rain

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Daily Tabular Report For The Period 4/11/2016 - 6/9/2016

SF_Bas01, Pipe Height: 10.13 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	03:15	1.71	20:45	3.53	2.61	03:15	3.57	20:50	6.45	5.46	03:15	0.144	20:45	0.720	0.422	0.422	
4/12/2016	03:35	1.70	21:10	3.61	2.59	02:55	3.64	21:10	6.52	5.45	02:55	0.148	21:10	0.754	0.416	0.416	
4/13/2016	03:30	1.67	07:00	3.83	2.57	02:15	3.67	07:00	6.52	5.50	03:20	0.146	07:00	0.815	0.414	0.414	
4/14/2016	03:20	1.69	06:50	3.52	2.55	03:00	3.57	06:50	6.49	5.50	03:00	0.145	06:50	0.725	0.410	0.410	
4/15/2016	02:40	1.66	07:00	3.60	2.55	03:25	3.49	07:30	6.47	5.46	03:25	0.136	07:00	0.741	0.404	0.404	
4/16/2016	04:40	1.69	11:50	3.22	2.64	02:35	3.53	12:05	6.68	5.55	04:40	0.141	12:05	0.655	0.438	0.438	0.04
4/17/2016	04:35	1.72	21:00	3.62	2.68	04:35	3.29	12:25	6.55	5.57	04:35	0.134	21:00	0.743	0.450	0.450	
4/18/2016	03:10	1.69	21:25	3.50	2.61	02:45	3.17	21:25	6.52	5.50	02:45	0.130	21:25	0.723	0.423	0.423	
4/19/2016	03:30	1.67	20:15	3.61	2.58	02:25	2.62	20:20	6.64	5.41	02:25	0.103	20:15	0.758	0.413	0.413	
4/20/2016	03:30	1.69	21:10	3.54	2.61	03:20	3.44	21:05	6.49	5.47	03:30	0.137	21:05	0.730	0.422	0.422	
4/21/2016	03:45	1.73	06:50	3.76	2.60	01:55	3.22	06:55	6.58	5.47	03:40	0.138	06:55	0.796	0.420	0.420	
4/22/2016	03:05	1.78	07:05	3.61	2.61	01:55	3.31	07:20	6.46	5.45	03:40	0.146	07:05	0.747	0.419	0.419	
4/23/2016	03:15	1.68	13:55	3.26	2.67	03:30	3.33	11:00	6.46	5.54	03:30	0.132	11:00	0.640	0.446	0.446	
4/24/2016	05:05	1.70	10:10	3.47	2.71	03:25	3.22	10:00	6.71	5.56	03:25	0.131	10:10	0.701	0.458	0.458	
4/25/2016	03:20	1.68	20:30	3.35	2.62	03:10	3.18	20:50	6.47	5.49	03:10	0.126	20:20	0.671	0.425	0.425	
4/26/2016	03:20	1.64	07:20	3.57	2.57	03:35	3.12	07:20	6.47	5.42	03:35	0.120	07:20	0.736	0.411	0.411	
4/27/2016	02:45	1.71	06:50	3.60	2.61	02:10	3.72	20:25	6.44	5.48	02:45	0.154	06:50	0.737	0.421	0.421	
4/28/2016	03:30	1.64	21:20	3.53	2.58	03:10	3.32	20:55	6.46	5.41	03:10	0.129	21:20	0.718	0.412	0.412	
4/29/2016	03:00	1.68	07:10	3.53	2.58	02:00	3.59	07:30	6.43	5.42	02:55	0.143	07:10	0.717	0.410	0.410	
4/30/2016	04:10	1.72	11:35	3.50	2.68	04:10	3.73	09:10	6.41	5.51	04:10	0.152	11:35	0.674	0.443	0.443	
5/1/2016	05:00	1.68	11:15	3.39	2.70	04:45	3.49	12:05	6.55	5.51	04:50	0.138	12:05	0.687	0.452	0.452	
5/2/2016	03:10	1.71	20:30	3.63	2.65	03:15	3.54	21:05	6.49	5.47	03:15	0.143	20:55	0.752	0.430	0.430	
5/3/2016	03:10	1.69	21:30	3.68	2.60	03:10	3.58	07:15	6.50	5.44	03:10	0.142	21:30	0.761	0.417	0.417	
5/4/2016	03:25	1.71	07:10	3.56	2.59	03:15	3.63	07:05	6.72	5.44	03:15	0.148	07:10	0.738	0.415	0.415	
5/5/2016	03:30	1.66	06:55	3.49	2.53	02:15	3.49	20:25	6.42	5.39	03:30	0.137	06:55	0.709	0.398	0.398	
5/6/2016	02:50	1.68	06:55	3.52	2.60	02:40	3.38	16:05	6.43	5.46	02:50	0.133	16:05	0.714	0.418	0.418	0.34
5/7/2016	03:30	1.69	10:15	3.35	2.68	03:30	3.48	11:05	6.44	5.50	03:30	0.138	10:15	0.661	0.444	0.444	0.13
5/8/2016	04:25	1.69	11:20	3.42	2.65	04:05	3.69	10:50	6.50	5.59	04:10	0.148	11:20	0.690	0.443	0.443	
5/9/2016	03:25	1.70	21:30	3.69	2.59	01:15	3.67	21:40	6.49	5.47	03:25	0.148	21:30	0.769	0.416	0.416	
5/10/2016	03:25	1.69	21:45	3.53	2.56	03:35	3.35	06:25	6.49	5.39	03:35	0.133	21:45	0.716	0.406	0.406	
5/11/2016	04:05	1.72	07:00	3.67	2.62	02:10	3.32	21:30	6.50	5.44	02:10	0.137	07:20	0.748	0.422	0.422	
5/12/2016	02:25	1.78	21:55	3.65	2.66	02:20	3.61	21:45	6.41	5.49	02:20	0.154	21:55	0.753	0.432	0.432	
5/13/2016	03:25	1.80	07:10	3.66	2.67	03:25	3.55	06:55	6.35	5.42	03:25	0.154	07:10	0.745	0.428	0.428	
5/14/2016	04:40	1.87	11:25	3.30	2.75	03:00	3.56	10:45	6.43	5.51	03:00	0.167	11:25	0.649	0.456	0.456	
5/15/2016	04:45	1.79	21:15	3.49	2.76	04:30	3.50	21:15	6.46	5.51	04:30	0.152	21:15	0.712	0.464	0.464	
5/16/2016	04:05	1.90	22:00	3.41	2.74	03:15	3.75	20:00	6.43	5.52	03:15	0.177	20:35	0.679	0.451	0.451	
5/17/2016	03:50	1.79	07:10	3.74	2.66	03:20	3.32	20:05	6.46	5.41	03:20	0.146	07:10	0.782	0.427	0.427	
5/18/2016	03:10	1.80	20:55	3.63	2.66	02:05	3.43	21:50	6.43	5.44	02:05	0.151	20:55	0.744	0.428	0.428	
5/19/2016	03:20	1.80	07:00	3.61	2.64	02:45	3.10	20:45	6.58	5.39	02:45	0.136	21:30	0.754	0.423	0.423	
5/20/2016	03:50	1.82	07:00	3.58	2.62	03:05	3.45	07:30	6.33	5.35	03:05	0.154	07:00	0.722	0.411	0.411	
5/21/2016	03:40	1.77	12:35	3.49	2.72	03:20	3.12	12:40	6.44	5.47	03:20	0.136	12:35	0.705	0.448	0.448	
5/22/2016	03:15	1.77	11:45	3.61	2.76	03:15	3.43	11:45	6.43	5.51	03:15	0.145	11:45	0.743	0.463	0.463	
5/23/2016	03:20	1.77	21:05	3.59	2.67	04:05	3.53	21:45	6.44	5.43	04:05	0.153	21:05	0.737	0.431	0.431	
5/24/2016	03:20	1.75	21:05	3.59	2.65	02:55	3.25	21:20	6.43	5.39	02:55	0.137	21:05	0.724	0.424	0.424	
5/25/2016	02:35	1.72	21:25	3.63	2.64	02:35	3.10	21:25	6.36	5.36	02:35	0.126	21:25	0.740	0.419	0.419	
5/26/2016	04:00	1.82	07:00	3.63	2.65	02:55	3.11	21:30	6.52	5.36	02:55	0.138	21:30	0.745	0.421	0.421	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)							Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total	
5/27/2016	03:15	1.79	07:15	3.46	2.66	03:20	2.97	07:10	6.32	5.35	03:20	0.129	07:15	0.687	0.423	0.423		
5/28/2016	03:45	1.81	12:00	3.28	2.71	03:00	3.07	11:50	6.36	5.39	03:10	0.135	12:00	0.638	0.440	0.440		
5/29/2016	04:05	1.81	11:55	3.35	2.68	04:15	3.49	12:00	6.30	5.31	04:05	0.154	11:55	0.649	0.425	0.425		
5/30/2016	03:45	1.84	12:25	3.66	2.78	04:20	3.39	11:15	6.39	5.44	03:45	0.152	12:25	0.747	0.464	0.464		
5/31/2016	03:20	1.81	21:30	3.72	2.67	03:20	3.11	06:30	6.39	5.34	03:20	0.137	21:30	0.764	0.424	0.424		
6/1/2016	03:30	1.79	21:30	3.63	2.67	01:45	3.13	20:40	6.32	5.29	01:45	0.139	21:35	0.728	0.422	0.422		
6/2/2016	02:35	1.83	21:30	3.64	2.71	03:10	3.12	18:50	6.36	5.33	03:10	0.140	07:05	0.738	0.431	0.431		
6/3/2016	03:35	1.78	07:05	3.57	2.63	02:55	3.03	07:40	6.31	5.31	02:55	0.132	07:05	0.717	0.413	0.413		
6/4/2016	04:05	1.78	11:35	3.50	2.74	04:00	3.02	13:10	6.29	5.42	04:00	0.131	11:35	0.689	0.446	0.446		
6/5/2016	03:40	1.84	10:30	3.51	2.77	04:05	3.29	22:00	6.34	5.41	04:05	0.148	10:30	0.695	0.455	0.455		
6/6/2016	03:30	1.84	21:30	3.70	2.67	03:15	3.28	21:30	6.43	5.34	03:15	0.147	21:30	0.769	0.422	0.422		
6/7/2016	03:15	1.81	21:40	3.40	2.66	02:55	3.27	07:10	6.28	5.26	02:55	0.145	21:40	0.662	0.414	0.414		
6/8/2016	02:25	1.82	07:10	3.57	2.70	02:55	3.11	21:20	6.34	5.31	02:55	0.138	07:10	0.708	0.427	0.427		
6/9/2016	02:15	1.80	06:35	3.83	2.69	04:10	3.17	21:50	6.30	5.25	04:10	0.142	06:35	0.765	0.422	0.421		

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			25.693	0.51
Avg	2.65	5.43	0.428	

Site Commentary

Site Information

SF_Bas02	
Pipe Dimensions	12.00" x 12.00"
Silt Level	0.00"

Overview

Site SF_Bas02 functioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flows remained free flowing throughout the period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This line is located downstream of location SF_Bound432. A review of balancing indicated no problems. A net flow of .330 MGD was reported for the period.

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 26% full at its recorded peak of 3.11 inches and approximately 21% full during its recorded average depth of 2.48 inches.

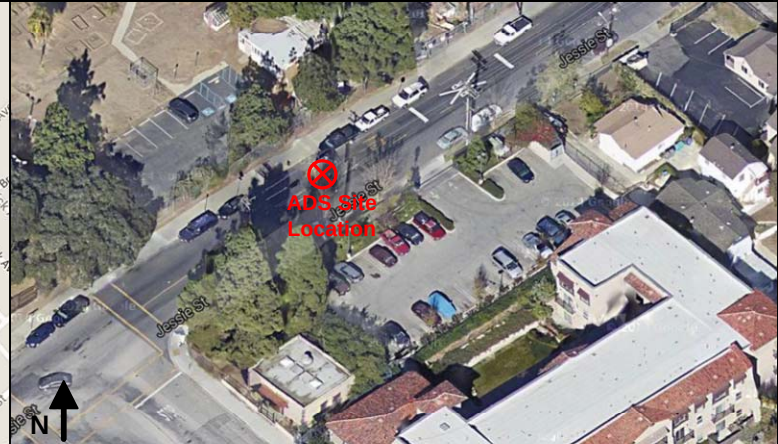
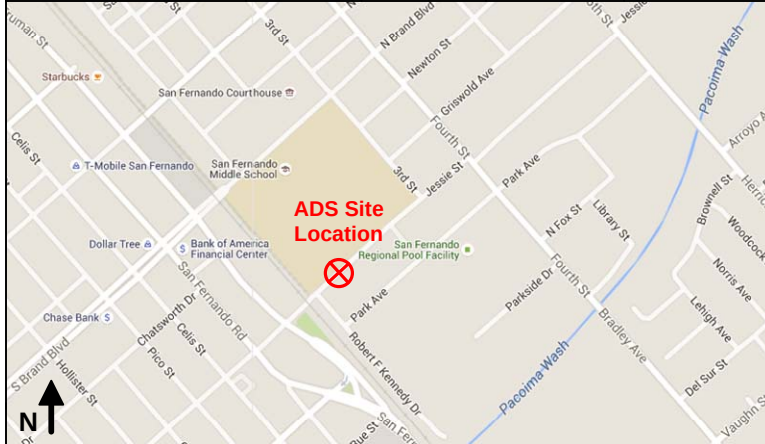
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.48	4.65	0.366
Minimum	1.47	2.68	0.108
Maximum	3.30	6.19	0.692
Time of Minimum	4/27/2016 4:05 AM	5/11/2016 2:25 AM	5/11/2016 2:25 AM
Time of Maximum	5/6/2016 4:00 PM	5/26/2016 2:35 PM	5/26/2016 2:35 PM

Data Quality

Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

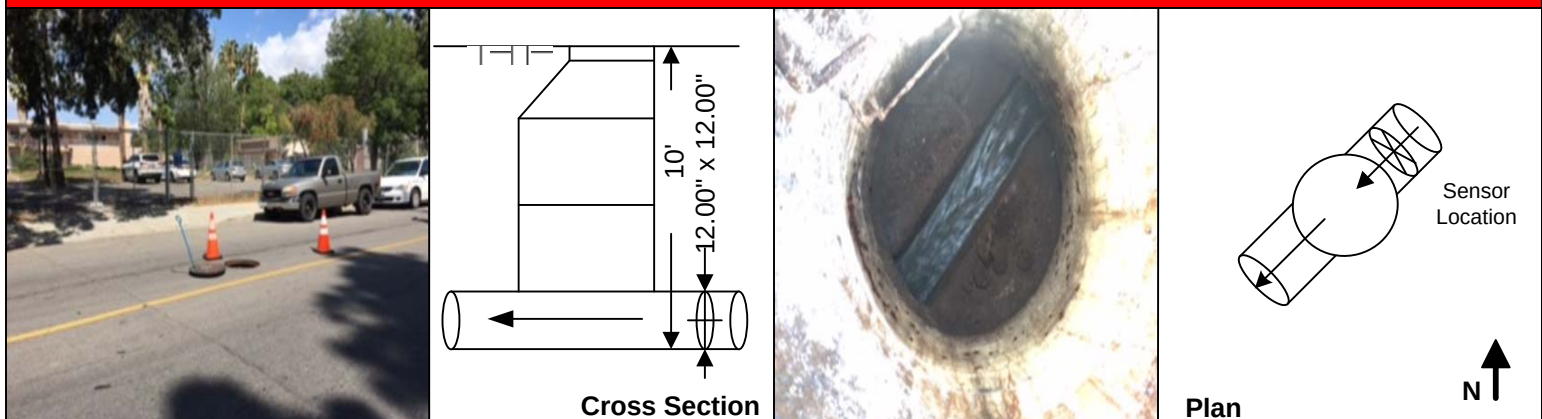
Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF_Bas02		Install Date: 03/30/16		Monitor Type		Peak Doppler	
Address/Location: Jessie & 1 st St				Monitor Model		Triton	
				Data Acquisition		Manual/Wireless Collect	
				Manhole ID			
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		12.00"
					Pipe Width:		12.00"



Investigation Information: Manhole Information:

Date/Time of Investigation:		03/30/16 12:05		Manhole Depth:		10'	
Site Hydraulics:		Good straight through flow		Manhole Material / Condition		Precast/Good	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition:		PVC/Good	
Upstream Manhole:		Not investigated		Land Use:	Residential ☐	Commercial ☒	Industrial ☐
Downstream Manhole:		Not investigated		Oxygen: 20.9	H2S: 0	LEL: 0	CO: 0
Depth of Flow:	2.38	+/-	0.25	Safety Notes: 2 man crew required; Night sight due to traffic control			
Range (Air DOF):	+/-						
Peak Velocity:	5.70	fps					
Silt:	0.00	Inches					

Other Information:



Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard	Trunk		x		
Sensors Devices:	Ultrasonic/Pressure/Velocit	Lift / Pump Station		x		
Surcharge Height:	0	WWTP		x		
Rain Gauge Zone:		Other		x		

Additional Site Information / Comments:

Standard Traffic Control with No Safety Concerns

SCATTERGRAPH REPORT

SF_Bas02

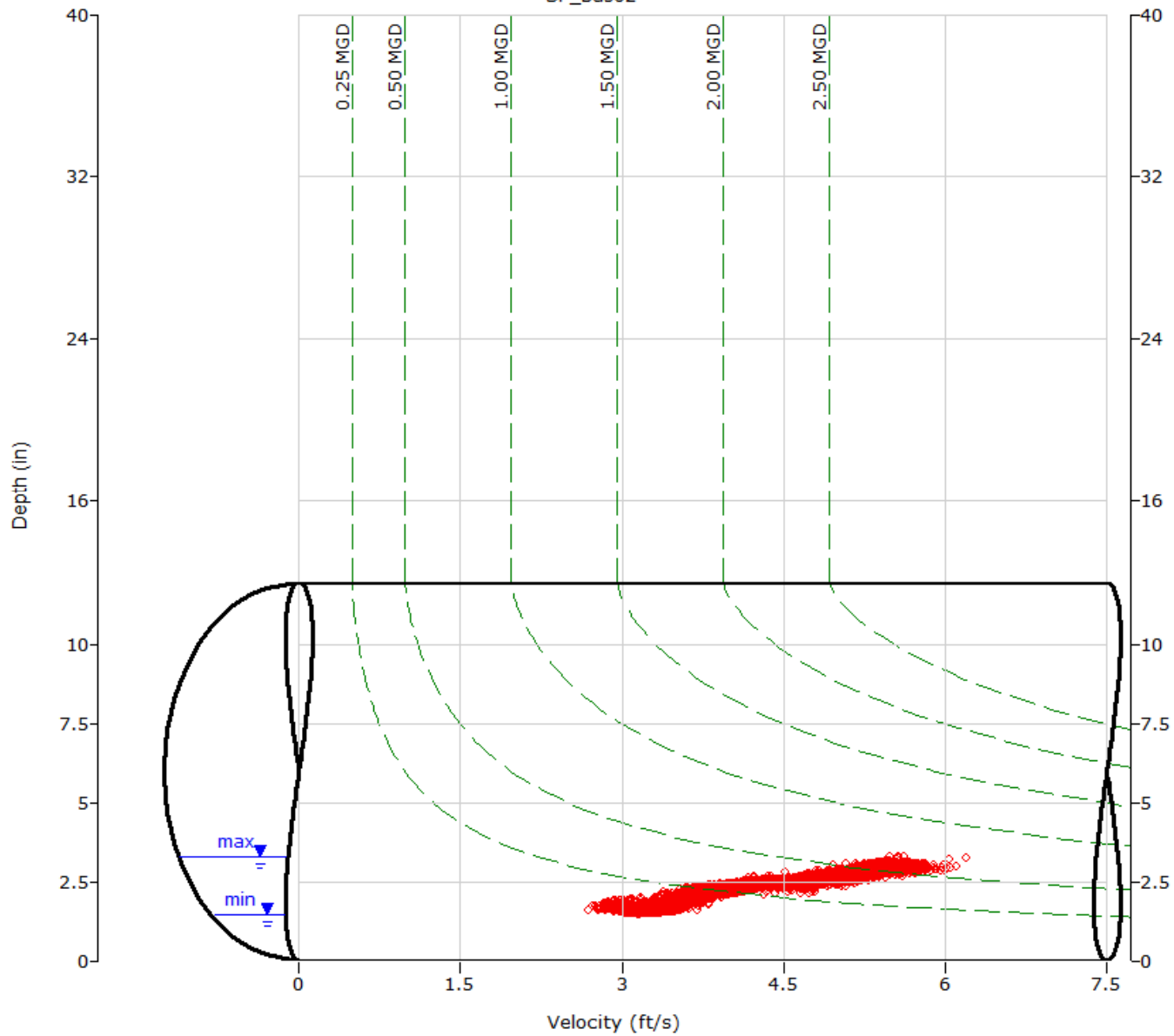
Flow Monitor
SF_Bas02

Pipe Height
12.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
○ Depth - Velocity
--- Iso-Q™
--- Silt
▼ Min-Max Depth

AGS ENVIRONMENTAL
SERVICES



HYDROGRAPH REPORT

SF_Bas02

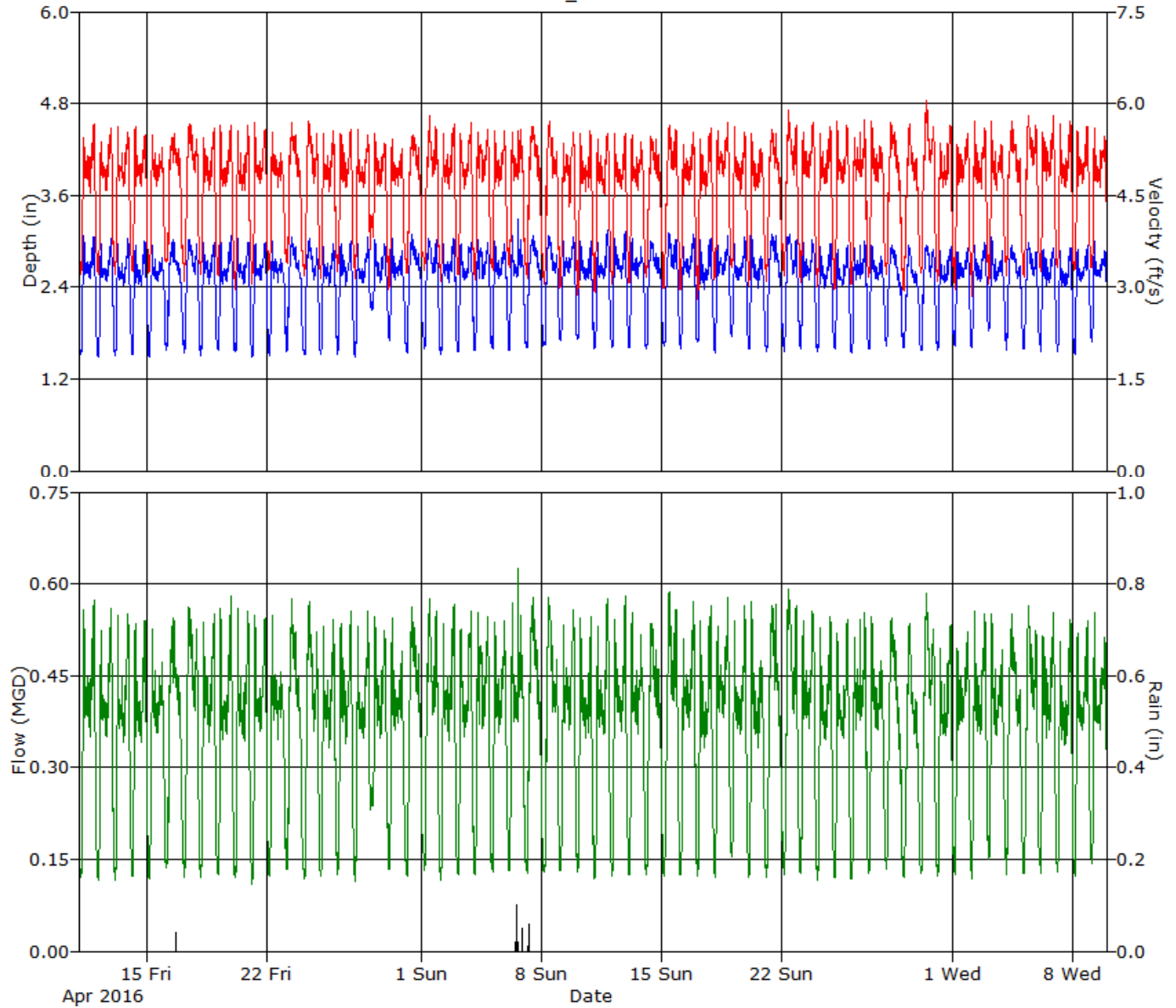
Flow Monitor
SF_Bas02

Pipe Height
12.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
— Depth
— Velocity
— Quantity
— Rain

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Daily Tabular Report For The Period 4/11/2016 - 6/9/2016

SF_Bas02, Pipe Height: 12 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	03:40	1.53	07:25	3.11	2.48	03:30	3.19	21:25	5.71	4.63	03:30	0.121	21:30	0.578	0.367	0.367	
4/12/2016	04:15	1.49	21:05	3.08	2.43	03:25	3.20	20:45	5.68	4.61	03:25	0.116	21:05	0.569	0.356	0.356	
4/13/2016	03:35	1.49	21:10	3.04	2.44	03:35	3.19	07:35	5.64	4.66	03:35	0.116	21:10	0.557	0.360	0.360	
4/14/2016	03:20	1.52	21:30	3.02	2.43	03:20	3.22	07:15	5.68	4.64	03:20	0.120	21:30	0.549	0.357	0.357	
4/15/2016	02:45	1.49	07:30	2.97	2.42	02:40	3.21	07:20	5.54	4.60	02:45	0.116	07:20	0.538	0.350	0.350	
4/16/2016	03:30	1.55	12:00	3.03	2.49	04:10	3.39	09:50	5.58	4.69	03:30	0.132	13:50	0.546	0.372	0.372	0.04
4/17/2016	04:00	1.52	11:00	3.04	2.49	04:20	3.07	14:10	5.76	4.71	04:25	0.120	10:25	0.570	0.378	0.378	
4/18/2016	03:45	1.49	07:20	3.02	2.46	02:35	3.17	21:40	5.63	4.64	02:35	0.119	07:20	0.556	0.363	0.363	
4/19/2016	04:25	1.56	21:40	3.10	2.46	03:15	3.16	21:30	5.74	4.63	03:50	0.125	21:40	0.586	0.363	0.363	
4/20/2016	03:25	1.55	07:40	3.06	2.45	02:55	2.89	21:20	5.65	4.57	03:15	0.120	07:25	0.564	0.357	0.357	
4/21/2016	02:45	1.49	21:45	3.00	2.45	02:50	3.04	07:10	5.72	4.64	02:45	0.110	07:10	0.558	0.361	0.361	
4/22/2016	03:25	1.51	07:40	3.00	2.43	02:15	3.20	07:10	5.68	4.61	03:30	0.120	07:35	0.552	0.353	0.353	
4/23/2016	04:00	1.55	10:05	3.07	2.50	04:00	3.38	11:05	5.81	4.69	04:00	0.130	11:05	0.590	0.377	0.377	
4/24/2016	04:10	1.50	11:35	3.04	2.46	04:00	3.18	11:55	5.77	4.66	04:10	0.117	11:55	0.578	0.369	0.369	
4/25/2016	04:05	1.52	20:20	2.99	2.45	03:35	3.11	20:10	5.59	4.62	03:35	0.120	20:20	0.550	0.359	0.359	
4/26/2016	03:25	1.51	21:55	3.01	2.46	02:30	3.16	21:50	5.58	4.64	02:30	0.121	21:55	0.557	0.362	0.362	
4/27/2016	04:05	1.47	20:55	3.06	2.44	03:50	3.14	07:05	5.63	4.61	04:05	0.112	21:10	0.559	0.357	0.357	
4/28/2016	02:15	2.09	21:45	3.03	2.56	01:00	3.39	07:10	5.53	4.73	00:30	0.210	07:30	0.554	0.381	0.381	
4/29/2016	03:15	1.68	10:05	3.09	2.48	02:35	2.86	10:05	5.52	4.53	02:35	0.130	10:05	0.571	0.355	0.355	
4/30/2016	04:15	1.54	12:00	3.13	2.51	04:10	3.20	13:35	5.52	4.64	04:10	0.121	12:00	0.579	0.375	0.375	
5/1/2016	04:50	1.58	10:30	3.05	2.50	04:35	3.26	12:20	5.80	4.67	05:45	0.131	12:15	0.581	0.375	0.375	
5/2/2016	03:30	1.50	21:15	3.05	2.49	03:40	3.05	21:50	5.68	4.67	03:30	0.115	21:55	0.571	0.371	0.371	
5/3/2016	03:40	1.55	07:10	3.01	2.47	03:55	3.13	07:15	5.71	4.66	03:55	0.121	21:40	0.561	0.366	0.366	
5/4/2016	02:45	1.57	07:35	3.02	2.50	02:35	3.09	20:55	5.64	4.69	03:40	0.122	07:35	0.558	0.374	0.374	
5/5/2016	04:05	1.58	07:35	3.04	2.48	04:00	3.14	07:15	5.63	4.63	04:00	0.127	07:35	0.553	0.365	0.365	
5/6/2016	03:10	1.57	16:00	3.30	2.53	03:55	3.26	08:00	5.68	4.69	03:55	0.128	16:10	0.629	0.381	0.381	0.34
5/7/2016	04:25	1.60	12:10	3.10	2.53	04:15	3.09	10:40	5.72	4.70	04:15	0.126	12:15	0.588	0.384	0.384	0.13
5/8/2016	03:15	1.61	11:00	3.10	2.51	03:20	3.02	12:15	5.75	4.63	03:20	0.127	10:50	0.583	0.376	0.376	
5/9/2016	04:00	1.69	21:35	3.08	2.52	03:20	2.79	21:35	5.61	4.59	03:20	0.123	21:35	0.576	0.372	0.372	
5/10/2016	04:10	1.70	21:45	3.03	2.49	03:45	2.85	20:20	5.73	4.57	03:35	0.128	21:45	0.559	0.361	0.361	
5/11/2016	02:15	1.59	21:40	3.15	2.49	02:25	2.68	20:45	5.64	4.55	02:25	0.108	20:45	0.593	0.362	0.362	
5/12/2016	03:30	1.60	21:40	3.15	2.53	03:35	3.03	21:45	5.57	4.57	03:30	0.122	21:45	0.592	0.372	0.372	
5/13/2016	04:10	1.59	07:25	3.10	2.48	03:25	3.02	07:15	5.52	4.55	04:10	0.122	07:25	0.573	0.358	0.358	
5/14/2016	04:10	1.58	11:55	3.06	2.51	04:10	3.12	09:45	5.57	4.60	04:10	0.123	11:55	0.563	0.370	0.370	
5/15/2016	05:25	1.52	11:20	3.13	2.52	04:50	2.84	10:20	5.79	4.64	05:25	0.113	11:50	0.592	0.378	0.378	
5/16/2016	04:10	1.58	21:00	3.09	2.51	03:25	2.78	21:00	5.54	4.58	03:25	0.112	21:00	0.574	0.367	0.367	
5/17/2016	02:20	1.66	07:00	3.05	2.47	04:00	2.73	21:55	5.64	4.56	03:40	0.120	21:50	0.571	0.358	0.358	
5/18/2016	03:55	1.54	21:40	3.08	2.52	02:50	3.10	21:50	5.74	4.72	03:40	0.120	21:45	0.588	0.382	0.382	
5/19/2016	02:50	1.74	20:50	3.07	2.52	02:35	3.30	07:00	5.69	4.65	02:35	0.152	20:55	0.568	0.370	0.370	
5/20/2016	03:50	1.59	07:05	3.10	2.46	02:50	3.01	07:05	5.55	4.54	02:50	0.121	07:05	0.578	0.352	0.352	
5/21/2016	03:40	1.55	17:15	3.15	2.52	03:35	2.98	11:35	5.68	4.64	03:35	0.115	17:10	0.588	0.379	0.379	
5/22/2016	04:50	1.55	11:50	3.10	2.52	04:10	3.09	11:00	5.99	4.73	04:10	0.121	11:00	0.601	0.385	0.385	
5/23/2016	04:05	1.59	19:35	3.03	2.49	03:35	2.98	20:40	5.77	4.70	03:35	0.122	19:35	0.563	0.372	0.372	
5/24/2016	03:30	1.55	22:05	2.97	2.43	03:25	2.99	20:55	5.72	4.63	03:20	0.115	20:55	0.559	0.356	0.356	
5/25/2016	04:10	1.58	20:50	3.00	2.42	03:40	2.91	07:00	5.78	4.64	04:05	0.117	20:50	0.559	0.354	0.354	
5/26/2016	03:35	1.53	14:35	3.26	2.47	02:05	2.92	14:35	6.19	4.68	02:05	0.113	14:35	0.692	0.369	0.369	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)							Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total	
5/27/2016	04:00	1.58	06:25	3.19	2.45	03:00	3.14	06:25	6.03	4.65	03:35	0.125	06:25	0.654	0.359	0.359		
5/28/2016	03:40	1.61	10:40	2.95	2.46	04:20	3.18	10:15	5.78	4.69	04:20	0.130	10:35	0.548	0.367	0.367		
5/29/2016	03:35	1.59	11:10	2.96	2.38	04:05	2.90	12:25	5.86	4.55	04:05	0.119	11:55	0.541	0.340	0.340		
5/30/2016	04:40	1.57	12:30	2.97	2.47	04:40	3.22	12:30	6.10	4.80	04:40	0.126	12:30	0.596	0.380	0.380		
5/31/2016	03:35	1.57	21:45	2.92	2.45	04:05	3.06	21:30	5.67	4.67	04:05	0.120	21:45	0.539	0.361	0.361		
6/1/2016	04:10	1.62	21:25	2.96	2.46	03:55	2.94	21:00	5.55	4.64	03:55	0.123	21:25	0.527	0.361	0.361		
6/2/2016	02:45	1.61	21:50	2.99	2.48	03:45	2.79	07:30	5.76	4.65	03:45	0.115	07:35	0.558	0.367	0.367		
6/3/2016	03:35	1.80	07:35	3.07	2.52	03:35	2.83	07:10	5.77	4.63	03:35	0.135	07:35	0.555	0.369	0.369		
6/4/2016	03:40	1.56	11:40	2.96	2.49	03:50	3.10	11:05	5.83	4.74	03:50	0.121	11:05	0.563	0.375	0.375		
6/5/2016	04:00	1.56	10:55	3.08	2.48	04:20	3.12	10:35	5.83	4.79	03:55	0.124	10:55	0.597	0.379	0.379		
6/6/2016	04:05	1.54	21:35	2.93	2.45	03:45	3.21	21:35	5.82	4.75	04:05	0.124	21:35	0.559	0.368	0.368		
6/7/2016	04:10	1.53	21:30	2.92	2.41	04:10	3.26	21:05	5.78	4.68	04:10	0.122	21:05	0.545	0.352	0.352		
6/8/2016	03:55	1.52	21:45	2.94	2.45	03:25	3.26	07:00	5.81	4.69	03:40	0.123	20:40	0.547	0.363	0.363		
6/9/2016	03:40	1.67	07:15	3.03	2.49	02:00	3.30	07:35	5.64	4.66	03:35	0.142	07:15	0.565	0.366	0.366		

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			21.987	0.51
Avg	2.48	4.65	0.366	

Site Commentary

Site Information

SF_Bas03	
Pipe Dimensions	10.88" x 10.88"
Silt Level	0.00"

Overview

Site SF_Bas03 functioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flows operated in multiple data regimes throughout the period. Backwater conditions were experienced during the period April 21, 2016 through April 28, 2016. The ultrasonic and velocity sensors became fouled from April 28, 2016 through April 29, 2016. Data recorded during this period were not included in the finalization process.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 48% full during its recorded peak of 5.17 inches and approximately 28% full during its recorded average depth of 3.07 inches.

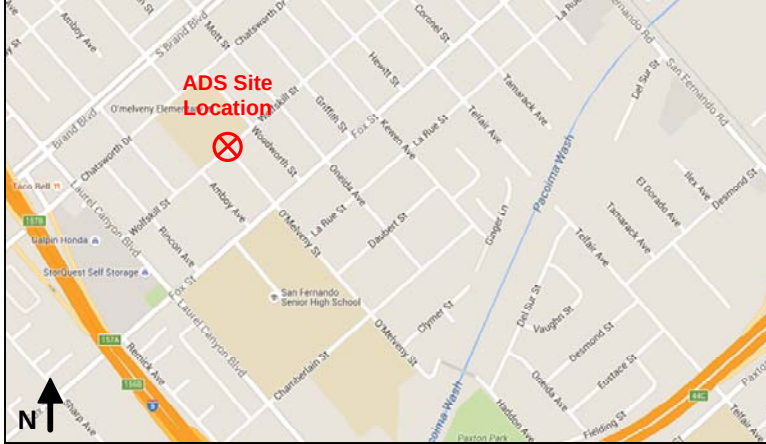
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.07	3.54	0.343
Minimum	1.54	0.56	0.042
Maximum	5.82	5.42	0.819
Time of Minimum	4/26/2016 1:25 PM	4/22/2016 3:55 AM	5/5/2016 2:50 AM
Time of Maximum	4/21/2016 8:50 PM	5/18/2016 3:50 PM	5/27/2016 7:30 AM

Data Quality

Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	98
Velocity (ft/s)	98
Quantity (MGD)	98

Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF_Bas03		Install Date: 03/30/16		Monitor Type		Peak Doppler	
Address/Location: Wolfskill St & O'Melveny St.		Monitor Model		Triton			
		Data Acquisition		Manual/Wireless Collect			
		Manhole ID					
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		10.88"
					Pipe Width:		10.88"



Investigation Information:				Manhole Information:			
Date/Time of Investigation:		03/30/16 11:00		Manhole Depth:		9'	
Site Hydraulics:		Fast straight through flow		Manhole Material / Condition		Brick/Fair	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition:		PVC/Fair	
Upstream Manhole:		Not investigated		Land Use:	Residential ☒	Commercial ☐	Industrial ☐ Trunk ☐
Downstream Manhole:		Not investigated		Oxygen: 20.9	H2S: 0	LEL: 0	CO: 0
Depth of Flow:	2.75	+/-	0.25	Safety Notes: 2 man crew required; No special requirements			
Range (Air DOF):		+/-					
Peak Velocity:	5.51	fps					
Silt:	0.00	Inches					

Other Information:							
		Cross Section				Plan	

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk			x		
Sensors Devices:	Ultrasonic/Pressure/Velocity	Lift / Pump Station			x		
Surcharge Height:	0	WWTP			x		
Rain Gauge Zone:		Other			x		

Additional Site Information / Comments:	
Standard Traffic Control with No Safety Concerns	

SCATTERGRAPH REPORT

SF_Bas03

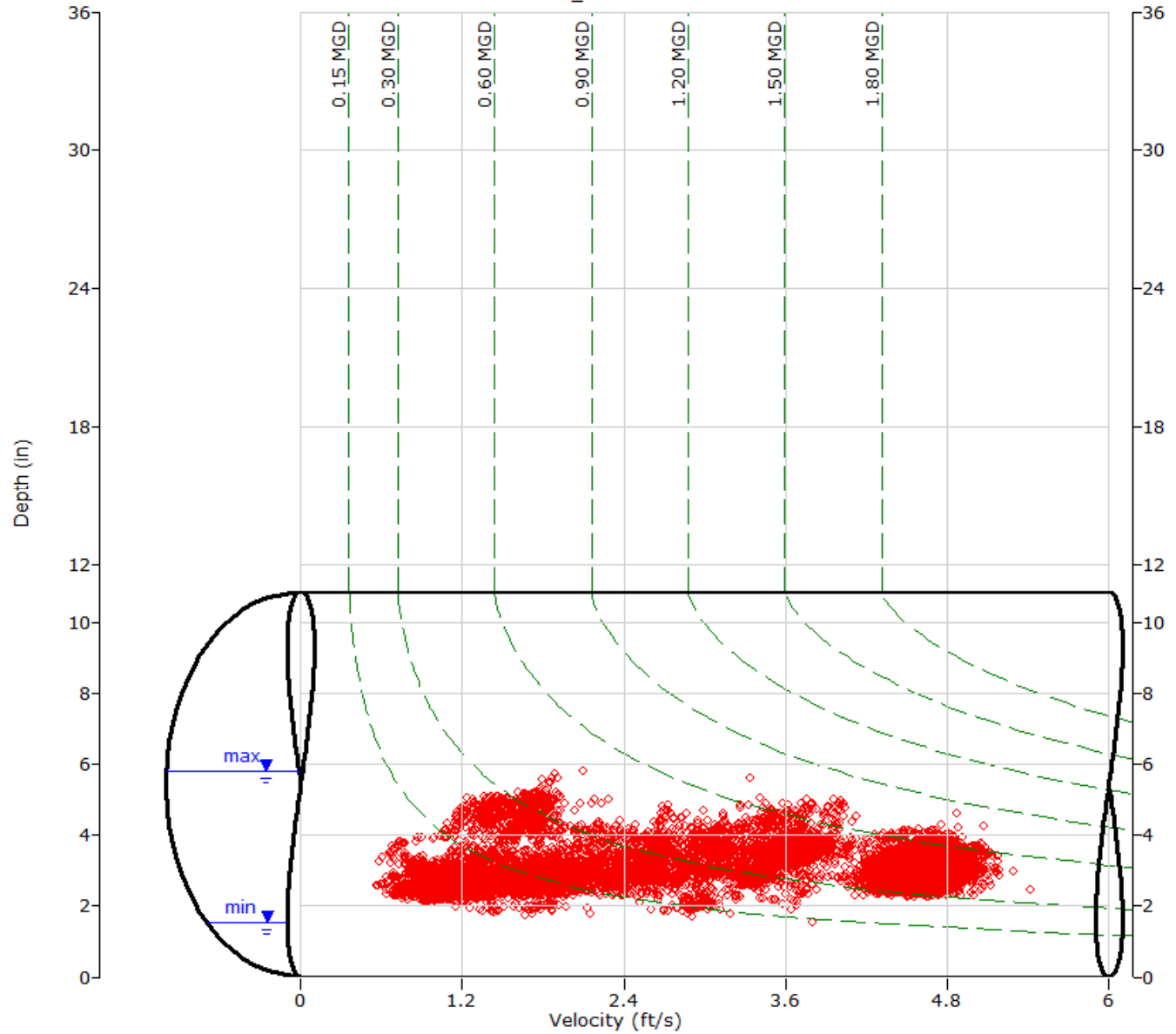
Flow Monitor
SF_Bas03

Pipe Height
10.88 in

Report Period
4/11/2016
To
6/9/2016

Legend
○ Depth - Velocity
--- Iso-Q™
--- Silt
▼ Min-Max Depth

AGS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT

SF_Bas03

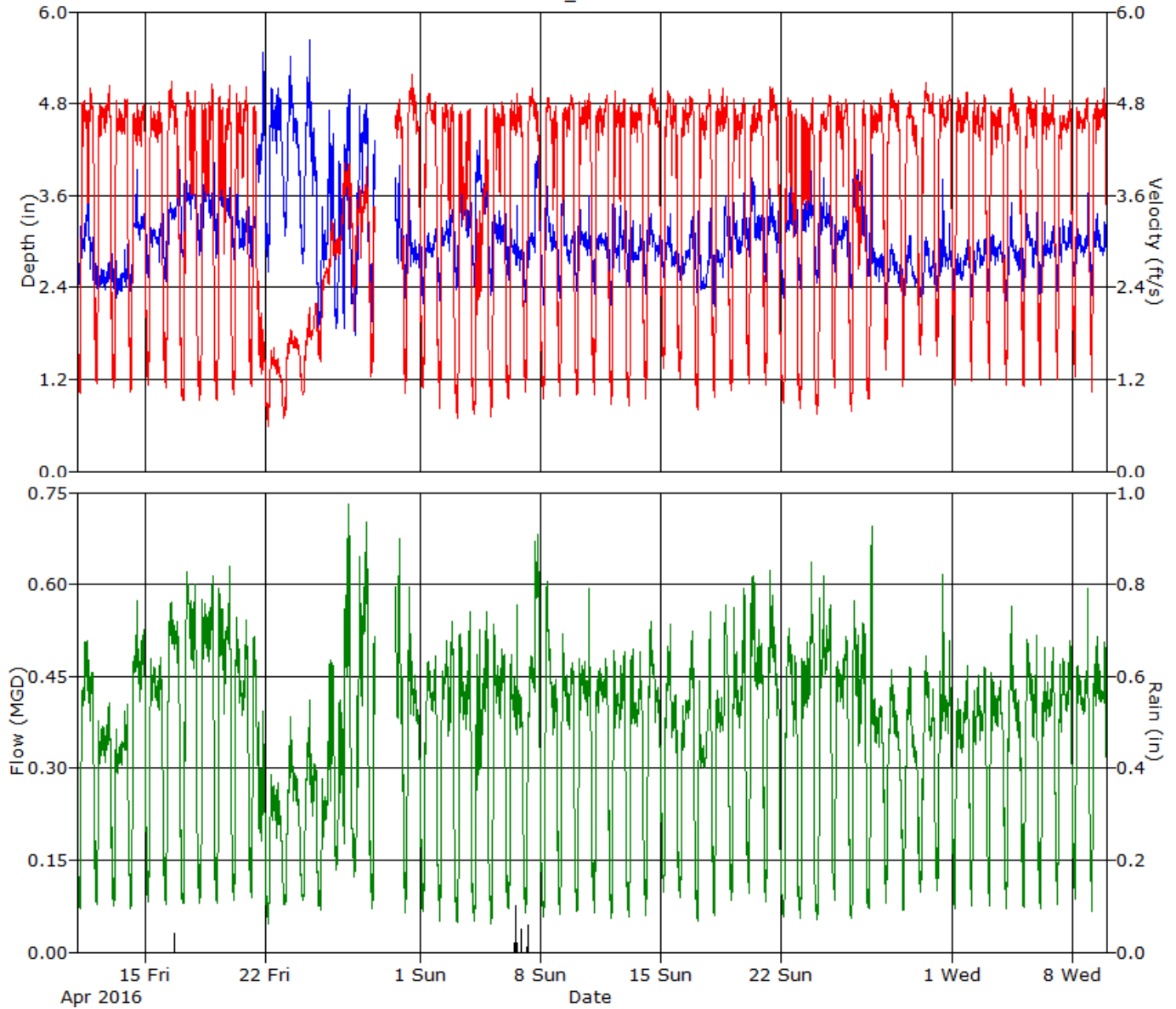
Flow Monitor
SF_Bas03

Pipe Height
10.88 in

Report Period
4/11/2016
To
6/9/2016

Legend
— Depth
— Velocity
— Quantity
— Rain

AGS ENVIRONMENTAL
SERVICES



Daily Tabular Report For The Period 4/11/2016 - 6/9/2016

SF_Bas03, Pipe Height: 10.88 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	23:20	2.35	15:15	3.80	2.96	02:30	0.95	18:35	5.13	3.74	02:10	0.067	16:10	0.562	0.351	0.351	
4/12/2016	16:10	2.34	06:35	3.15	2.57	00:45	1.10	19:50	5.11	3.88	04:00	0.074	06:35	0.428	0.291	0.291	
4/13/2016	08:40	2.23	22:50	3.10	2.57	03:15	1.01	21:50	4.90	3.83	03:15	0.068	22:10	0.435	0.286	0.286	
4/14/2016	02:50	2.33	11:15	4.43	3.06	02:00	1.01	21:15	4.90	3.80	02:00	0.067	11:25	0.615	0.381	0.381	
4/15/2016	02:00	2.46	23:25	3.58	3.05	03:50	1.04	18:25	4.97	3.76	03:50	0.075	20:30	0.502	0.365	0.365	
4/16/2016	03:40	2.44	22:55	3.97	3.28	03:50	1.03	12:10	5.18	3.63	03:50	0.072	09:25	0.586	0.398	0.398	0.04
4/17/2016	03:45	2.71	06:35	3.98	3.49	03:45	0.85	21:10	5.06	3.39	03:45	0.069	18:45	0.645	0.406	0.406	
4/18/2016	04:10	2.79	10:15	4.20	3.50	04:10	0.90	19:45	5.13	3.48	04:10	0.076	22:00	0.647	0.415	0.415	
4/19/2016	03:05	2.77	06:10	4.05	3.52	03:40	0.86	21:10	5.05	3.49	03:40	0.073	11:55	0.658	0.415	0.415	
4/20/2016	04:00	2.75	06:30	3.76	3.15	01:35	0.96	20:50	5.09	3.72	04:00	0.082	07:30	0.563	0.373	0.373	
4/21/2016	04:05	2.66	20:50	5.82	3.77	10:30	1.01	08:55	4.86	2.31	04:00	0.083	10:40	0.722	0.287	0.287	
4/22/2016	03:55	2.58	08:10	5.07	4.16	03:55	0.56	12:05	1.67	1.21	03:55	0.043	07:30	0.311	0.187	0.187	
4/23/2016	03:10	3.02	10:50	5.72	4.23	02:00	0.59	10:05	1.90	1.47	02:00	0.061	10:50	0.419	0.229	0.229	
4/24/2016	23:55	2.65	13:15	5.72	3.94	04:35	0.99	13:05	2.28	1.65	04:35	0.081	13:05	0.429	0.234	0.234	
4/25/2016	01:40	1.75	16:15	4.84	3.14	02:35	1.33	22:15	3.35	2.47	02:35	0.064	19:40	0.525	0.262	0.262	
4/26/2016	13:25	1.54	21:30	5.05	3.26	03:05	2.70	13:30	4.18	3.37	03:10	0.127	19:30	0.740	0.369	0.369	
4/27/2016	06:05	1.68	11:45	4.88	3.55	04:10	1.73	20:05	3.97	3.27	04:10	0.111	20:10	0.706	0.405	0.405	
4/28/2016	06:00	1.76	09:40	4.38	2.99	03:10	0.91	07:40	3.47	2.44	05:00	0.060	09:40	0.531	0.249	0.101	
4/29/2016	21:40	2.44	18:30	4.23	3.27	23:55	2.37	18:30	5.07	4.44	23:55	0.245	18:30	0.762	0.470	0.199	
4/30/2016	03:50	2.14	08:35	3.90	2.89	03:50	0.99	12:50	5.18	3.83	03:50	0.058	08:40	0.649	0.348	0.348	
5/1/2016	04:35	2.18	23:20	3.27	2.86	03:20	0.99	13:20	5.07	3.79	03:20	0.060	21:35	0.486	0.342	0.342	
5/2/2016	04:05	2.18	17:50	3.72	3.00	04:05	0.79	23:00	4.98	3.59	04:05	0.047	20:25	0.580	0.349	0.349	
5/3/2016	03:10	2.30	10:30	3.83	3.19	04:10	0.64	19:25	4.81	3.17	04:10	0.045	21:10	0.558	0.339	0.339	
5/4/2016	04:05	2.39	10:30	4.49	3.48	04:05	0.71	21:00	4.84	2.65	04:05	0.048	10:35	0.590	0.322	0.322	
5/5/2016	03:05	2.29	06:30	3.57	3.04	02:50	0.64	19:40	5.07	3.49	02:50	0.042	07:40	0.538	0.347	0.347	
5/6/2016	19:20	2.30	16:00	3.66	2.89	02:00	0.86	16:05	4.94	3.69	02:00	0.063	16:00	0.608	0.331	0.331	0.34
5/7/2016	03:55	2.16	20:35	4.14	3.12	02:45	0.91	09:05	5.19	3.76	04:00	0.059	20:40	0.685	0.393	0.393	0.13
5/8/2016	04:25	2.14	09:15	3.83	2.99	04:25	0.91	12:30	4.94	3.61	04:25	0.053	09:15	0.619	0.352	0.352	
5/9/2016	02:50	2.25	08:40	3.75	2.94	03:30	0.93	21:40	5.00	3.71	03:30	0.059	09:20	0.540	0.347	0.347	
5/10/2016	02:15	2.31	19:40	3.97	2.95	02:15	0.91	19:55	4.95	3.76	02:15	0.059	19:40	0.668	0.354	0.354	
5/11/2016	04:05	2.28	09:00	3.34	2.88	03:50	0.93	21:15	5.00	3.83	03:20	0.062	20:15	0.485	0.349	0.349	
5/12/2016	02:55	2.16	06:35	3.74	2.96	04:10	0.85	09:10	5.18	3.63	04:10	0.052	09:10	0.546	0.343	0.343	
5/13/2016	03:50	2.38	06:05	3.54	2.90	02:00	0.82	18:25	4.95	3.64	03:55	0.056	19:25	0.529	0.329	0.329	
5/14/2016	04:10	2.27	09:25	3.47	2.92	03:55	0.87	13:50	5.05	3.80	03:55	0.058	10:10	0.550	0.352	0.352	
5/15/2016	04:25	2.51	13:55	3.48	2.90	04:05	1.18	13:10	5.10	3.85	04:05	0.086	13:55	0.562	0.346	0.346	
5/16/2016	04:20	2.48	21:10	3.44	2.86	02:15	1.04	16:55	5.08	3.82	02:15	0.077	21:15	0.548	0.341	0.341	
5/17/2016	04:10	2.22	21:30	3.91	2.67	04:10	0.75	20:40	5.06	3.72	04:10	0.046	21:30	0.663	0.296	0.296	
5/18/2016	03:25	2.10	19:25	3.64	2.86	03:50	0.89	15:50	5.42	3.86	03:50	0.053	19:25	0.577	0.349	0.349	
5/19/2016	03:00	2.62	21:40	3.73	3.07	02:55	0.95	07:20	4.90	3.79	02:55	0.074	21:40	0.616	0.370	0.370	
5/20/2016	03:55	2.74	07:40	3.84	3.26	03:55	1.03	20:20	4.93	3.80	03:55	0.085	07:40	0.625	0.405	0.405	
5/21/2016	04:05	2.44	10:05	3.71	3.16	02:35	1.05	16:05	5.08	3.70	02:35	0.075	10:05	0.635	0.381	0.381	
5/22/2016	04:10	2.24	13:25	3.73	3.13	05:20	0.83	12:25	4.91	3.21	05:20	0.053	20:25	0.553	0.338	0.338	
5/23/2016	03:40	2.36	18:55	4.15	3.24	04:10	0.78	21:45	4.92	3.25	03:45	0.053	18:55	0.671	0.356	0.356	
5/24/2016	03:20	2.46	07:20	3.97	3.19	02:00	0.69	21:30	4.96	3.55	02:00	0.052	07:20	0.654	0.381	0.381	
5/25/2016	03:55	2.60	15:10	3.51	3.04	02:35	0.99	13:20	4.94	3.83	02:35	0.076	21:10	0.524	0.371	0.371	
5/26/2016	03:00	2.31	12:45	4.00	3.37	03:10	0.74	08:45	4.91	3.20	03:00	0.048	06:40	0.628	0.370	0.370	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	
5/27/2016	18:25	2.41	07:30	4.61	2.84	01:30	0.87	19:15	4.98	3.72	03:45	0.065	07:30	0.819	0.324	0.324	
5/28/2016	03:50	2.15	11:35	3.00	2.63	03:05	1.16	11:35	5.01	4.03	03:05	0.074	11:35	0.470	0.319	0.319	
5/29/2016	04:45	2.08	13:45	3.16	2.61	03:35	1.08	14:25	4.93	3.81	03:40	0.064	13:45	0.480	0.299	0.299	
5/30/2016	02:35	2.14	11:20	3.09	2.64	02:35	1.14	11:20	5.09	4.01	02:35	0.066	11:20	0.497	0.320	0.320	
5/31/2016	02:00	2.34	11:20	4.26	2.77	02:15	1.33	19:55	5.01	4.04	02:15	0.088	11:20	0.721	0.346	0.346	
6/1/2016	02:15	2.19	21:30	3.09	2.66	03:40	0.99	21:50	5.11	3.98	03:40	0.060	21:30	0.491	0.320	0.320	
6/2/2016	03:10	2.27	21:55	3.08	2.77	02:55	1.11	21:55	4.91	3.95	02:55	0.073	21:55	0.477	0.336	0.336	
6/3/2016	04:10	2.23	09:45	3.10	2.82	04:05	1.18	09:20	4.88	3.92	04:05	0.073	09:20	0.471	0.343	0.343	
6/4/2016	04:10	2.21	10:40	3.65	2.80	03:45	1.07	11:25	5.01	3.93	04:05	0.068	11:15	0.597	0.343	0.343	
6/5/2016	04:30	2.26	09:10	3.51	2.89	05:05	1.06	12:25	4.99	3.89	04:20	0.070	09:10	0.545	0.355	0.355	
6/6/2016	03:25	2.13	09:45	3.32	2.84	03:25	0.95	10:50	5.29	3.95	03:25	0.055	21:15	0.531	0.350	0.350	
6/7/2016	03:20	2.31	11:15	3.56	2.92	03:20	1.11	21:20	4.94	3.92	03:20	0.072	21:45	0.539	0.362	0.362	
6/8/2016	04:05	2.40	21:35	4.20	2.92	02:15	1.10	19:40	4.94	3.96	02:15	0.078	21:35	0.725	0.363	0.363	
6/9/2016	03:10	2.27	10:20	3.67	2.92	03:00	1.03	21:50	5.13	4.01	03:10	0.066	10:20	0.593	0.370	0.370	

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			20.204	0.51
Avg	3.07	3.54	0.343	

Site Commentary

Site Information

Sf_Bas04	
Pipe Dimensions	18.00" x 18.00"
Silt Level	0.00"

Overview

Site Sf_Bas04 unctioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. Periodic invalid velocity data was recorded at this location due to partial fouling of the sensor. The apparent occasional velocity outliers during the period between April 14 and May 4 were reconstituted using the best fit curve generated based on the depth to velocity relationship exhibited by this line.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This line is located downstream of locations SF_Bas02, SF_Bas4A, SF_Bas4B, and SF_Bound595alt. A review of balancing showed minimal net flows. An average net of .066 MGD was reported for the period.

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 33% full during its recorded peak of 6.02 inches and approximately 24% full during its recorded average depth of 4.40 inches.

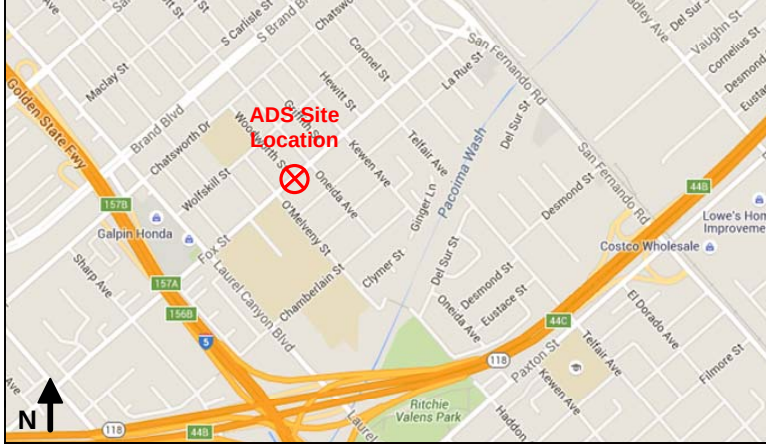
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	4.40	6.53	1.464
Minimum	2.28	4.64	0.398
Maximum	6.29	7.37	2.466
Time of Minimum	6/2/2016 3:55 AM	4/20/2016 3:15 AM	6/2/2016 3:55 AM
Time of Maximum	4/16/2016 10:30 AM	5/23/2016 9:40 PM	6/4/2016 12:50 PM

Data Quality

Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF_Bas04		Install Date: 03/30/16		Monitor Type		Peak Doppler	
Address/Location: Fox St & Woodworth St		Monitor Model		Triton			
		Data Acquisition		Manual/Wireless Collect			
		Manhole ID					
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		18.00"
					Pipe Width:		18.00"



Investigation Information:				Manhole Information:			
Date/Time of Investigation:		03/30/16 10:45		Manhole Depth:		10'	
Site Hydraulics:		Fast straight through flow		Manhole Material / Condition		Brick/Fair	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition:		VCP/Fair	
Upstream Manhole:		Not investigated		Land Use:	Residential ☒	Commercial ☐	Industrial ☐ Trunk ☐
Downstream Manhole:		Not investigated		Oxygen: 20.9	H2S: 0	LEL: 0	CO: 0
Depth of Flow:	4.75	+/-	0.25	Safety Notes: 2 man crew required; No special requirements			
Range (Air DOF):		+/-					
Peak Velocity:	7.37		fps				
Silt:	0.00		Inches				

Other Information:							
		Cross Section				Plan	

Installation Information		Backup		Yes	No	?	Distance
Installation Type:	Standard	Trunk			x		
Sensors Devices:	Ultrasonic/Pressure/Velocit	Lift / Pump Station			x		
Surcharge Height:	0	WWTP			x		
Rain Gauge Zone:		Other			x		

Additional Site Information / Comments:	
Standard Traffic Control with No Safety Concerns	

SCATTERGRAPH REPORT

Sf_Bas04

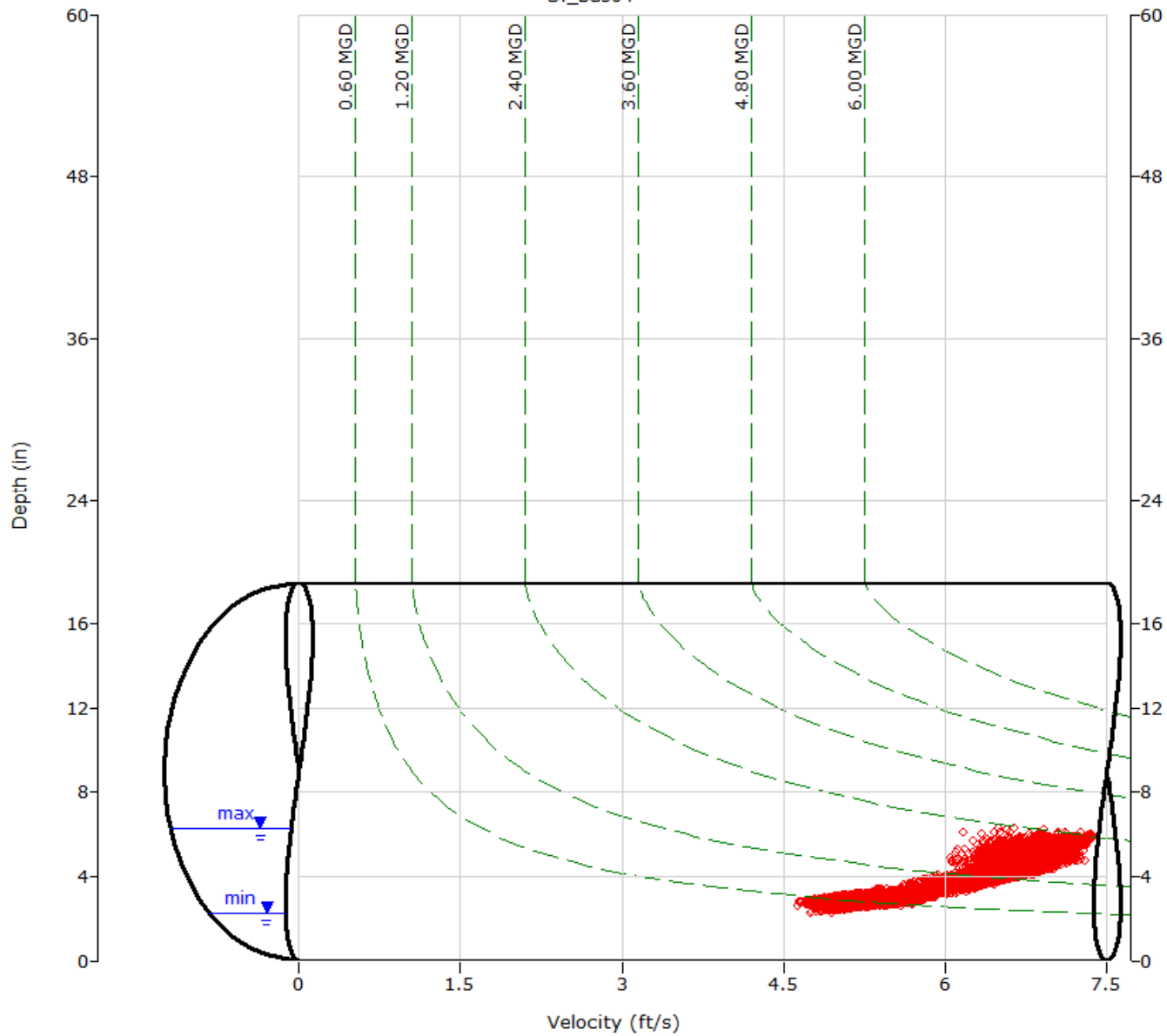
Flow Monitor
Sf_Bas04

Pipe Height
18.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
○ Depth - Velocity
--- Iso-Q™
--- Silt
▼ Min-Max Depth

AGS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT

Sf_Bas04

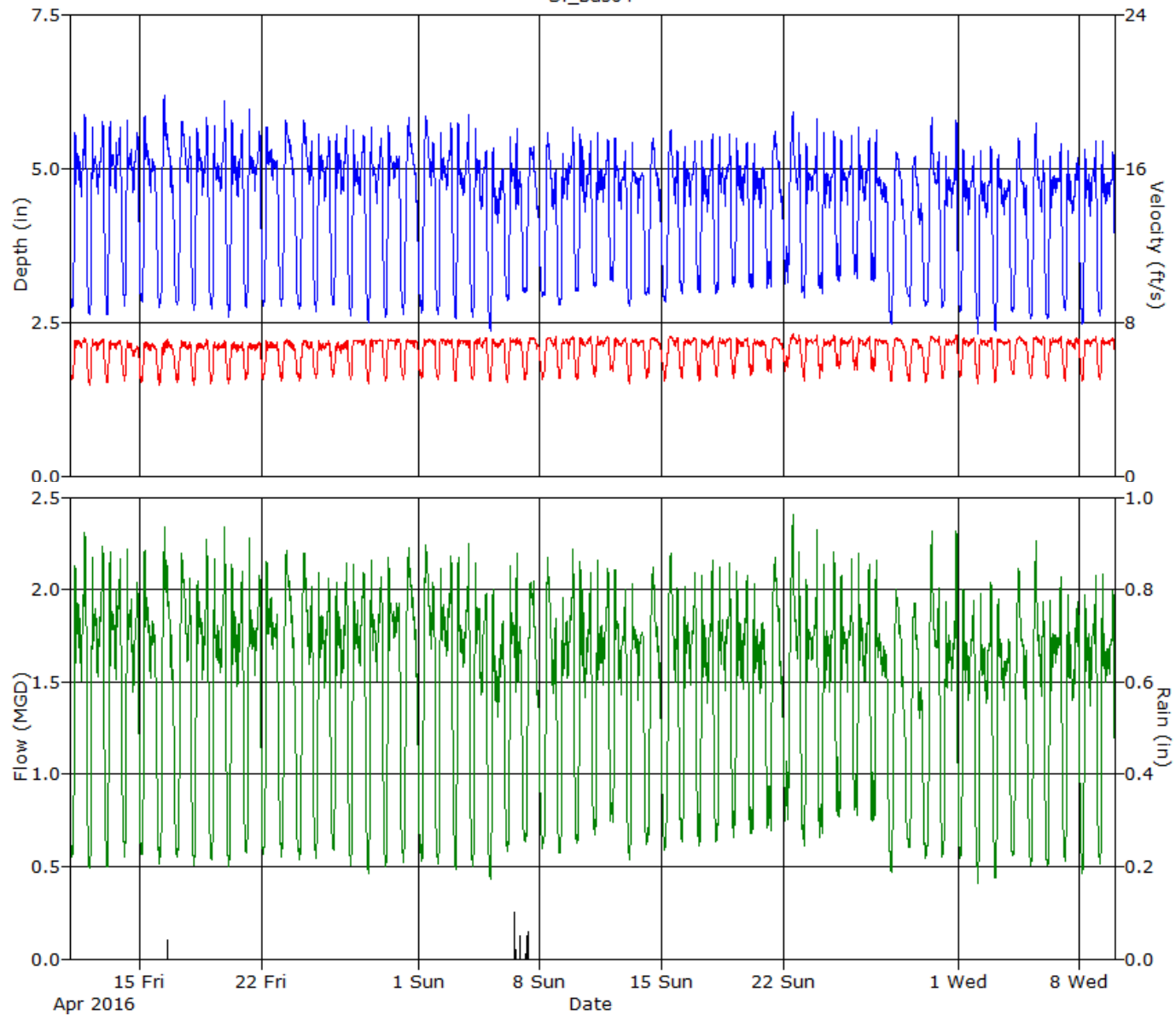
Flow Monitor
Sf_Bas04

Pipe Height
18.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
— Depth
— Velocity
— Quantity
— Rain

AGS ENVIRONMENTAL
SERVICES



Daily Tabular Report For The Period 4/11/2016 - 6/9/2016

Sf_Bas04, Pipe Height: 18 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	03:15	2.74	21:15	5.98	4.54	02:30	5.01	20:50	7.25	6.51	03:50	0.551	21:15	2.368	1.534	1.534	
4/12/2016	03:10	2.61	21:20	5.77	4.52	03:25	4.72	21:35	7.15	6.43	03:10	0.487	21:15	2.238	1.515	1.515	
4/13/2016	03:50	2.62	07:50	5.76	4.57	03:40	4.81	21:50	7.06	6.44	03:40	0.497	07:50	2.218	1.530	1.530	
4/14/2016	03:30	2.74	07:25	5.89	4.60	03:30	4.95	07:45	7.02	6.31	03:30	0.545	07:25	2.265	1.499	1.499	
4/15/2016	04:25	2.83	07:20	5.85	4.54	04:20	4.74	18:35	7.06	6.36	04:20	0.546	07:35	2.219	1.490	1.490	
4/16/2016	04:15	2.72	10:30	6.29	4.53	04:00	4.66	14:15	7.14	6.29	04:15	0.511	10:35	2.433	1.483	1.483	0.04
4/17/2016	04:20	2.76	11:15	5.80	4.51	04:20	4.65	10:35	7.11	6.31	04:20	0.515	10:45	2.238	1.482	1.482	
4/18/2016	03:50	2.67	21:25	5.85	4.55	02:55	4.71	22:00	7.15	6.39	03:50	0.498	21:25	2.302	1.509	1.509	
4/19/2016	04:10	2.69	21:05	6.10	4.54	02:40	4.66	20:55	7.12	6.38	04:15	0.514	21:15	2.419	1.503	1.503	
4/20/2016	03:05	2.55	07:25	5.80	4.53	03:15	4.64	10:40	7.06	6.34	03:15	0.475	07:45	2.196	1.484	1.484	
4/21/2016	03:05	2.72	07:20	6.09	4.57	02:05	4.82	19:40	7.07	6.40	02:05	0.562	07:20	2.339	1.512	1.512	
4/22/2016	03:05	2.73	07:20	5.73	4.54	03:25	4.85	07:30	7.07	6.42	03:25	0.535	07:30	2.186	1.501	1.501	
4/23/2016	04:10	2.76	10:15	5.80	4.51	04:10	4.75	09:50	7.16	6.41	04:10	0.527	10:35	2.237	1.498	1.498	
4/24/2016	05:20	2.68	10:40	6.03	4.47	05:15	4.80	11:20	7.12	6.36	05:20	0.517	10:40	2.304	1.474	1.474	
4/25/2016	03:05	2.66	07:30	5.61	4.47	01:10	4.88	20:00	7.10	6.41	03:25	0.533	07:30	2.132	1.471	1.471	
4/26/2016	02:40	2.76	21:20	5.72	4.52	03:00	5.13	12:45	7.06	6.42	02:40	0.579	21:25	2.161	1.493	1.493	
4/27/2016	03:20	2.58	07:50	5.65	4.46	03:20	4.97	19:20	7.06	6.61	03:20	0.500	07:50	2.150	1.521	1.521	
4/28/2016	03:45	2.48	07:30	5.68	4.42	03:45	4.81	19:20	7.06	6.58	03:45	0.457	07:30	2.163	1.498	1.498	
4/29/2016	03:50	2.56	07:45	5.74	4.47	03:50	4.93	11:20	7.06	6.62	03:50	0.489	07:45	2.191	1.528	1.528	
4/30/2016	03:15	2.57	11:40	5.83	4.48	03:15	4.96	08:50	7.06	6.55	03:15	0.497	11:40	2.231	1.523	1.523	
5/1/2016	05:05	2.62	10:50	5.87	4.48	05:05	5.03	15:45	7.06	6.54	05:05	0.517	10:50	2.249	1.519	1.519	
5/2/2016	03:35	2.56	21:25	5.79	4.51	03:35	4.93	10:05	7.06	6.61	03:35	0.489	21:25	2.213	1.543	1.543	
5/3/2016	03:50	2.53	21:45	6.03	4.46	03:50	4.89	19:05	7.06	6.59	03:50	0.479	21:45	2.317	1.510	1.510	
5/4/2016	03:05	2.55	07:30	5.64	4.38	03:05	4.92	22:15	7.17	6.58	03:05	0.487	07:30	2.147	1.473	1.473	
5/5/2016	03:45	2.28	07:45	5.34	4.11	02:50	4.90	20:40	7.13	6.50	03:45	0.416	07:45	2.011	1.332	1.332	
5/6/2016	04:15	2.83	16:25	5.67	4.34	03:20	4.79	16:35	7.20	6.56	03:20	0.572	16:25	2.208	1.441	1.441	0.34
5/7/2016	01:45	2.96	15:15	5.85	4.30	03:50	4.96	12:40	7.23	6.51	04:00	0.626	15:15	2.318	1.417	1.417	0.13
5/8/2016	03:40	2.91	10:55	5.72	4.26	03:55	4.85	21:55	7.25	6.50	03:55	0.588	10:55	2.251	1.400	1.400	
5/9/2016	03:05	2.77	21:20	5.71	4.41	02:40	4.96	21:45	7.26	6.58	03:35	0.570	21:20	2.248	1.483	1.483	
5/10/2016	03:10	2.98	07:40	5.56	4.40	03:40	4.97	21:40	7.22	6.56	03:45	0.623	07:40	2.159	1.468	1.468	
5/11/2016	04:40	3.03	20:55	5.62	4.46	03:10	5.04	07:50	7.23	6.62	03:10	0.658	20:55	2.204	1.503	1.503	
5/12/2016	01:40	3.16	07:35	5.52	4.43	04:55	5.31	22:00	7.22	6.64	04:55	0.728	07:35	2.128	1.487	1.487	
5/13/2016	03:55	2.71	07:35	5.44	4.32	03:35	4.71	07:55	7.13	6.54	03:55	0.517	07:45	2.055	1.431	1.431	
5/14/2016	03:55	2.91	12:05	5.57	4.32	03:50	4.98	12:00	7.22	6.55	03:55	0.606	12:05	2.166	1.435	1.435	
5/15/2016	05:40	2.82	12:30	5.65	4.32	04:05	4.85	12:25	7.24	6.53	04:15	0.576	12:25	2.215	1.437	1.437	
5/16/2016	04:50	2.94	21:20	5.46	4.40	02:50	4.97	21:55	7.21	6.60	02:50	0.622	21:25	2.099	1.474	1.474	
5/17/2016	04:00	2.96	21:40	5.57	4.38	03:50	4.92	21:55	7.25	6.57	03:50	0.609	21:40	2.176	1.458	1.458	
5/18/2016	02:15	2.94	21:25	5.60	4.45	04:15	4.93	21:50	7.21	6.63	04:15	0.616	21:25	2.174	1.503	1.503	
5/19/2016	02:35	3.03	07:20	5.52	4.45	03:10	5.01	22:05	7.21	6.59	03:10	0.640	07:35	2.108	1.489	1.489	
5/20/2016	04:40	3.05	07:30	5.40	4.35	04:35	5.05	08:10	7.10	6.56	04:35	0.650	07:30	2.042	1.433	1.433	
5/21/2016	05:55	3.00	12:00	5.63	4.44	05:45	5.17	13:30	7.22	6.62	05:55	0.689	11:55	2.191	1.496	1.496	
5/22/2016	06:05	3.10	12:45	6.00	4.55	02:30	5.37	12:30	7.36	6.70	02:25	0.739	12:45	2.448	1.564	1.564	
5/23/2016	05:20	2.88	21:40	5.90	4.41	04:15	4.93	21:40	7.37	6.63	04:30	0.606	21:40	2.399	1.485	1.485	
5/24/2016	02:55	2.92	21:35	5.77	4.41	01:55	4.98	21:40	7.31	6.61	01:55	0.639	21:35	2.299	1.475	1.475	
5/25/2016	05:20	3.12	07:10	5.98	4.49	04:50	5.38	21:55	7.29	6.69	05:15	0.749	07:10	2.363	1.519	1.519	
5/26/2016	05:00	3.19	07:30	5.74	4.51	04:35	5.21	21:45	7.26	6.68	04:35	0.717	07:30	2.238	1.529	1.529	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	
5/27/2016	01:30	3.13	07:20	5.66	4.35	01:40	5.33	07:35	7.14	6.67	05:05	0.745	07:35	2.176	1.449	1.449	
5/28/2016	04:30	2.45	13:20	5.27	4.10	04:30	4.91	10:35	7.20	6.49	04:30	0.457	10:45	2.005	1.330	1.330	
5/29/2016	06:35	2.59	11:00	5.22	4.04	05:30	4.86	13:30	7.15	6.40	06:35	0.564	11:00	1.951	1.272	1.272	
5/30/2016	03:45	2.74	11:55	5.83	4.29	03:10	4.86	12:00	7.29	6.51	03:45	0.540	11:55	2.330	1.433	1.433	
5/31/2016	02:50	2.73	21:50	5.82	4.30	03:45	4.97	21:55	7.34	6.59	02:45	0.551	21:50	2.346	1.431	1.431	
6/1/2016	03:40	2.66	07:40	5.31	4.25	03:35	5.11	18:25	7.30	6.61	03:40	0.540	07:40	2.003	1.409	1.409	
6/2/2016	03:55	2.28	21:55	5.39	4.18	03:55	4.75	22:10	7.19	6.55	03:55	0.398	21:55	2.065	1.373	1.373	
6/3/2016	03:45	2.34	07:40	5.22	4.15	03:45	4.84	07:35	7.14	6.56	03:45	0.421	07:35	1.961	1.359	1.359	
6/4/2016	03:45	2.67	12:50	6.08	4.20	04:25	5.25	12:50	7.26	6.61	03:55	0.558	12:50	2.466	1.391	1.391	
6/5/2016	05:10	2.55	11:00	5.80	4.20	04:25	5.10	11:00	7.27	6.57	05:10	0.508	11:00	2.312	1.395	1.395	
6/6/2016	03:55	2.55	22:00	5.45	4.27	03:40	5.04	11:15	7.26	6.61	03:00	0.504	22:00	2.110	1.424	1.424	
6/7/2016	04:10	2.67	07:35	5.30	4.22	04:00	4.87	18:50	7.28	6.55	04:10	0.522	18:50	1.992	1.382	1.382	
6/8/2016	03:25	2.41	21:45	5.51	4.24	03:00	4.88	22:15	7.23	6.57	03:25	0.445	21:45	2.115	1.407	1.407	
6/9/2016	03:35	2.58	07:25	5.46	4.27	03:55	4.98	08:00	7.20	6.60	03:40	0.516	07:30	2.089	1.419	1.418	

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			87.824	0.51
Avg	4.40	6.53	1.464	

Site Commentary

Site Information

SF_Bas4A	
Pipe Dimensions	15.00" x 15.00"
Silt Level	0.00"

Overview

Site SF_Bas4A functioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flows remained free flowing throughout the period. An increase in depth was observed during morning and evening hours throughout the monitoring period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This line is located downstream of locations SF_Bas01, and SF_Bound817. A review of balancing indicated no problems. A net flow of .343 MGD was reported for the period.

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 40% full at its recorded peak of 5.39 inches and approximately 24% full during its recorded average depth of 3.61 inches.

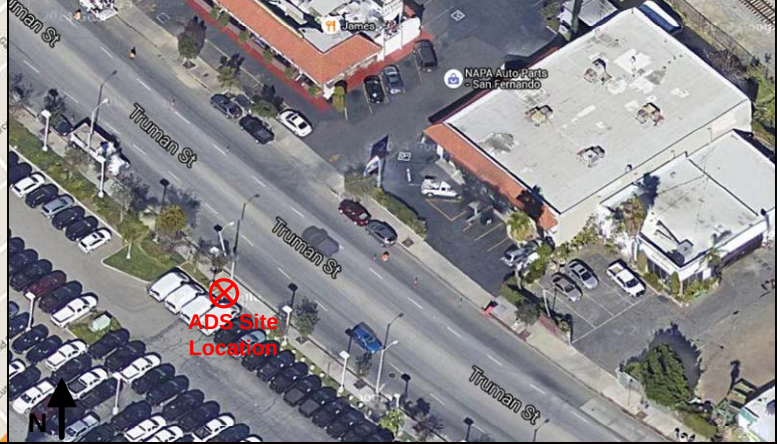
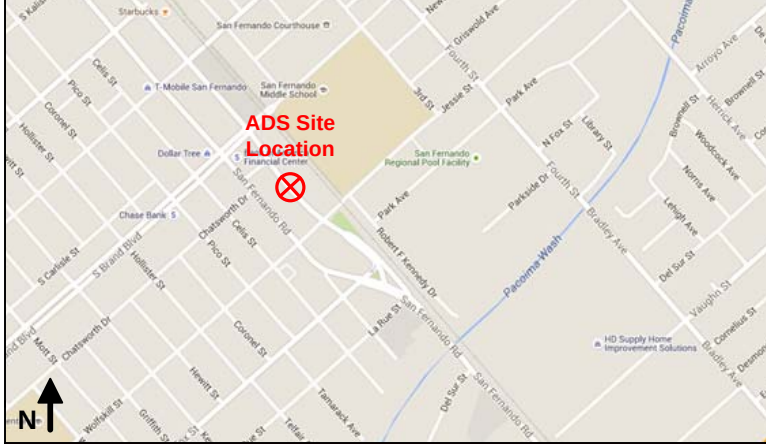
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	3.61	5.18	0.794
Minimum	1.98	3.68	0.230
Maximum	5.56	5.94	1.516
Time of Minimum	4/28/2016 3:45 AM	4/29/2016 3:55 AM	4/28/2016 3:45 AM
Time of Maximum	6/6/2016 9:55 PM	4/25/2016 7:30 AM	4/20/2016 7:35 AM

Data Quality

Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF_Bas04A		Install Date: 03/30/16		Monitor Type		Peak Doppler	
Address/Location: Truman & Wolfskill				Monitor Model		Triton	
				Data Acquisition		Manual/Wireless Collect	
				Manhole ID			
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		15.00"
					Pipe Width:		15.00"



Investigation Information:				Manhole Information:			
Date/Time of Investigation:		03/30/16 12:20		Manhole Depth:		18'	
Site Hydraulics:		Fast straight through flow		Manhole Material / Condition		Not Investigated	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition:		Not Investigated	
Upstream Manhole:		Not investigated		Land Use:	Residential ☐	Commercial ☐	Industrial ☐
Downstream Manhole:		Not investigated		Oxygen: 20.9	H2S: 0	LEL: 0	CO: 0
Depth of Flow:	3.75	+/-	0.25	Safety Notes: 2 man crew required; No special requirements			
Range (Air DOF):		+/-					
Peak Velocity:	6.10	fps					
Silt:	0.00	Inches					

Other Information:							
		Cross Section				Plan	

Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard	Trunk		x		
Sensors Devices:	Ultrasonic/Pressure/Velocit	Lift / Pump Station		x		
Surcharge Height:	0	WWTP		x		
Rain Gauge Zone:		Other		x		

Additional Site Information / Comments:	
Standard Traffic Control with No Safety Concerns	

SCATTERGRAPH REPORT

SF_Bas4A

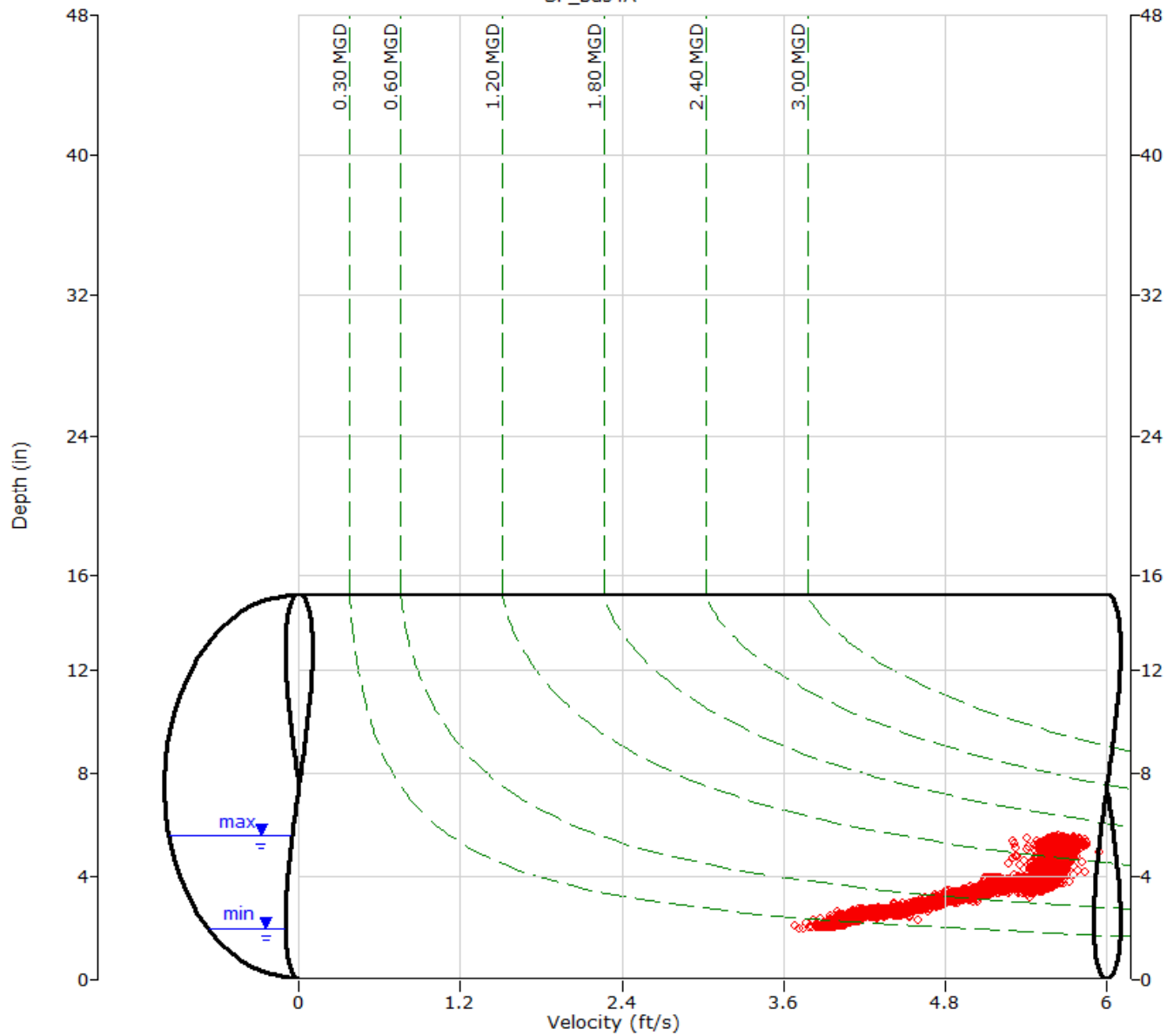
Flow Monitor
SF_Bas4A

Pipe Height
15.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
○ Depth - Velocity
--- Iso-Q™
--- Silt
▼ Min-Max Depth

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HYDROGRAPH REPORT

SF_Bas4A

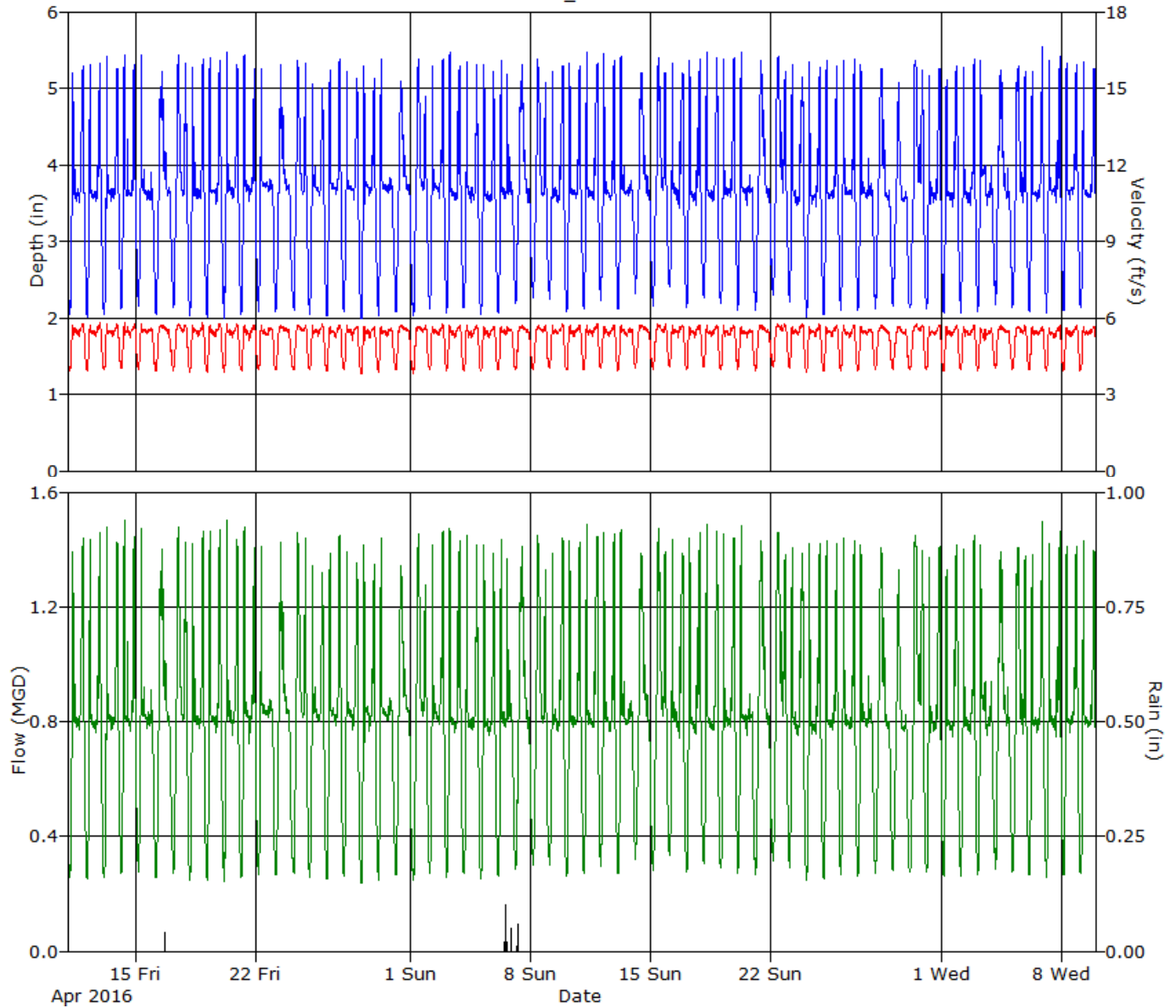
Flow Monitor
SF_Bas4A

Pipe Height
15.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
— Depth
— Velocity
— Quantity
— Rain

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Daily Tabular Report For The Period 4/11/2016 - 6/9/2016

SF_Bas4A, Pipe Height: 15 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	03:40	2.03	21:55	5.32	3.55	02:15	3.92	21:15	5.78	5.20	03:40	0.254	21:55	1.448	0.779	0.779	
4/12/2016	03:35	2.01	22:00	5.39	3.57	03:30	3.93	21:10	5.83	5.19	03:35	0.250	22:00	1.474	0.782	0.782	
4/13/2016	03:30	2.04	07:35	5.43	3.59	03:20	3.92	21:40	5.77	5.21	03:20	0.255	07:35	1.482	0.790	0.790	
4/14/2016	03:25	2.09	07:30	5.45	3.63	02:55	4.00	07:35	5.84	5.20	03:25	0.268	07:35	1.514	0.799	0.799	
4/15/2016	03:35	2.14	07:40	5.45	3.49	03:35	3.97	07:15	5.76	5.20	03:35	0.276	07:40	1.479	0.750	0.750	
4/16/2016	03:50	2.03	12:15	5.33	3.67	03:40	3.88	12:40	5.76	5.18	03:50	0.251	12:15	1.452	0.818	0.818	0.04
4/17/2016	04:20	2.11	11:05	5.44	3.72	04:05	3.92	20:05	5.82	5.20	04:05	0.268	11:05	1.491	0.835	0.835	
4/18/2016	03:40	2.00	21:45	5.41	3.60	03:35	3.87	21:10	5.83	5.20	03:40	0.244	21:45	1.470	0.794	0.794	
4/19/2016	03:30	2.01	07:30	5.41	3.60	03:45	3.87	20:40	5.85	5.19	03:45	0.245	21:50	1.475	0.795	0.795	
4/20/2016	03:25	1.99	07:35	5.50	3.59	03:20	3.84	21:25	5.85	5.18	03:25	0.239	07:35	1.516	0.787	0.787	
4/21/2016	02:40	2.05	07:35	5.46	3.58	04:10	3.93	20:50	5.75	5.17	02:40	0.259	07:35	1.490	0.782	0.782	
4/22/2016	03:30	2.07	07:25	5.29	3.50	04:30	3.82	07:35	5.72	5.18	03:30	0.263	07:25	1.415	0.751	0.751	
4/23/2016	03:45	2.08	10:00	5.38	3.58	03:40	3.93	09:40	5.77	5.17	03:40	0.262	10:00	1.443	0.784	0.784	
4/24/2016	05:10	2.09	10:30	5.40	3.66	04:25	3.97	10:40	5.77	5.18	05:10	0.268	10:30	1.465	0.815	0.815	
4/25/2016	03:25	2.03	07:35	5.22	3.57	03:30	3.95	07:30	5.94	5.19	03:25	0.254	07:35	1.372	0.779	0.779	
4/26/2016	03:45	2.02	21:00	5.39	3.60	03:40	3.87	20:45	5.73	5.17	03:45	0.247	21:05	1.459	0.789	0.789	
4/27/2016	03:10	2.08	21:35	5.29	3.59	02:50	3.92	07:30	5.69	5.18	03:55	0.261	07:30	1.421	0.786	0.786	
4/28/2016	03:45	1.98	07:20	5.32	3.56	03:45	3.72	07:20	5.70	5.14	03:45	0.230	07:20	1.436	0.774	0.774	
4/29/2016	03:25	2.01	07:15	5.41	3.47	03:55	3.68	07:20	5.67	5.16	03:55	0.241	07:15	1.448	0.743	0.743	
4/30/2016	04:20	2.08	09:10	5.28	3.63	04:00	3.94	10:10	5.76	5.18	04:00	0.262	09:10	1.391	0.799	0.799	
5/1/2016	04:55	2.02	12:35	5.42	3.67	04:50	3.79	10:40	5.77	5.15	04:55	0.244	12:35	1.466	0.814	0.814	
5/2/2016	03:25	2.11	21:55	5.42	3.63	03:20	3.98	21:35	5.75	5.19	03:20	0.271	21:55	1.477	0.801	0.801	
5/3/2016	03:10	2.04	07:25	5.54	3.62	03:15	3.93	07:15	5.73	5.18	03:15	0.254	07:25	1.513	0.795	0.795	
5/4/2016	02:55	2.10	07:30	5.40	3.57	02:55	3.85	20:30	5.73	5.16	02:55	0.260	07:25	1.459	0.778	0.778	
5/5/2016	03:35	2.02	07:15	5.36	3.51	03:35	3.92	07:10	5.67	5.15	03:35	0.250	07:10	1.441	0.756	0.756	
5/6/2016	03:15	2.02	07:20	5.36	3.48	03:15	3.92	07:35	5.66	5.17	03:15	0.250	07:25	1.440	0.749	0.749	0.34
5/7/2016	04:10	2.17	12:35	5.38	3.69	03:45	3.96	13:15	5.72	5.19	04:10	0.281	12:30	1.438	0.820	0.820	0.13
5/8/2016	03:55	2.24	11:05	5.40	3.72	03:50	3.94	11:25	5.72	5.17	03:55	0.293	11:10	1.449	0.829	0.829	
5/9/2016	03:45	2.24	21:50	5.30	3.62	03:45	4.01	21:30	5.80	5.20	03:45	0.297	21:50	1.446	0.797	0.797	
5/10/2016	03:05	2.06	07:25	5.39	3.63	04:10	3.89	21:35	5.74	5.19	03:05	0.258	07:25	1.455	0.800	0.800	
5/11/2016	03:25	2.12	07:40	5.48	3.66	03:25	3.90	22:20	5.77	5.20	03:25	0.266	07:40	1.493	0.813	0.813	
5/12/2016	03:05	2.22	07:25	5.53	3.64	03:25	4.01	21:40	5.76	5.20	03:05	0.295	07:25	1.486	0.801	0.801	
5/13/2016	03:00	2.10	07:35	5.44	3.49	03:00	3.88	07:25	5.69	5.18	03:00	0.261	07:35	1.478	0.748	0.748	
5/14/2016	04:00	2.30	12:55	5.29	3.72	04:00	4.04	11:25	5.75	5.22	04:00	0.310	12:55	1.414	0.832	0.832	
5/15/2016	04:35	2.15	12:20	5.44	3.78	04:10	3.98	13:50	5.84	5.19	04:30	0.280	12:15	1.483	0.853	0.853	
5/16/2016	03:15	2.37	07:30	5.33	3.69	03:45	4.07	07:20	5.78	5.24	03:15	0.330	07:20	1.445	0.818	0.818	
5/17/2016	02:50	2.12	22:05	5.38	3.63	02:50	3.99	22:00	5.77	5.21	02:50	0.273	22:00	1.476	0.801	0.801	
5/18/2016	03:25	2.20	07:35	5.48	3.66	02:25	4.04	21:10	5.74	5.22	03:25	0.292	07:35	1.494	0.810	0.810	
5/19/2016	03:20	2.18	07:25	5.44	3.64	02:30	3.97	20:40	5.74	5.20	02:30	0.283	07:25	1.481	0.803	0.803	
5/20/2016	03:00	2.10	07:25	5.50	3.47	02:55	3.96	07:20	5.69	5.16	02:55	0.268	07:35	1.493	0.739	0.739	
5/21/2016	04:20	2.08	11:50	5.40	3.70	04:10	3.92	15:45	5.78	5.18	04:20	0.261	11:50	1.439	0.823	0.823	
5/22/2016	03:45	2.21	11:15	5.44	3.92	04:40	3.95	20:45	5.76	5.25	03:45	0.290	11:05	1.475	0.905	0.905	
5/23/2016	03:55	2.18	07:30	5.30	3.64	03:55	4.03	21:10	5.80	5.23	03:55	0.287	07:35	1.406	0.807	0.807	
5/24/2016	03:25	2.00	07:40	5.34	3.56	02:40	3.85	21:25	5.74	5.17	03:25	0.242	21:55	1.431	0.777	0.777	
5/25/2016	03:25	2.04	07:45	5.37	3.57	03:20	3.90	21:40	5.73	5.17	03:25	0.253	21:50	1.433	0.780	0.780	
5/26/2016	03:30	2.07	22:05	5.43	3.60	03:30	3.86	06:45	5.75	5.16	03:30	0.256	07:35	1.465	0.784	0.784	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)							Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total	
5/27/2016	03:50	2.08	07:15	5.35	3.46	03:05	3.90	07:05	5.70	5.16	03:50	0.260	07:15	1.431	0.738	0.738		
5/28/2016	04:35	2.10	12:00	5.28	3.66	04:30	3.93	14:05	5.73	5.18	04:30	0.266	12:15	1.415	0.810	0.810		
5/29/2016	04:50	2.11	12:35	5.11	3.46	04:30	3.94	13:25	5.76	5.12	04:50	0.271	12:25	1.347	0.737	0.737		
5/30/2016	04:50	2.09	11:20	5.37	3.84	04:50	3.97	13:45	5.75	5.18	04:50	0.266	12:20	1.451	0.877	0.877		
5/31/2016	03:35	2.09	22:15	5.36	3.61	03:35	3.94	21:30	5.75	5.19	03:35	0.265	22:15	1.447	0.793	0.793		
6/1/2016	03:40	2.06	22:15	5.34	3.62	04:10	3.85	21:55	5.73	5.17	03:40	0.259	22:15	1.439	0.794	0.794		
6/2/2016	03:45	2.04	22:10	5.42	3.59	03:40	3.93	09:25	5.71	5.17	03:40	0.255	22:10	1.464	0.783	0.783		
6/3/2016	03:35	2.07	07:25	5.45	3.53	03:20	3.89	07:45	5.61	5.15	03:20	0.258	07:35	1.449	0.757	0.757		
6/4/2016	04:10	2.13	12:00	5.28	3.66	04:10	3.99	12:00	5.74	5.19	04:10	0.276	12:00	1.430	0.807	0.807		
6/5/2016	04:05	2.12	12:20	5.31	3.78	04:05	3.97	20:10	5.71	5.18	04:05	0.272	11:10	1.412	0.849	0.849		
6/6/2016	03:15	2.08	21:55	5.56	3.59	03:00	3.95	07:30	5.71	5.17	03:15	0.264	21:55	1.508	0.783	0.783		
6/7/2016	03:50	2.04	22:05	5.43	3.60	03:45	3.92	22:35	5.72	5.16	03:50	0.254	22:05	1.471	0.785	0.785		
6/8/2016	03:15	2.07	07:35	5.43	3.64	02:10	3.87	21:25	5.75	5.17	03:15	0.259	07:35	1.445	0.799	0.799		
6/9/2016	04:00	2.12	07:25	5.36	3.60	02:30	3.77	22:10	5.67	5.18	02:30	0.267	07:25	1.443	0.785	0.785		

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			47.663	0.51
Avg	3.61	5.18	0.794	

Site Commentary

Site Information

SF_Bas4B	
Pipe Dimensions	12.00" x 12.00"
Silt Level	0.00"

Overview

Site SF_Bas4B functioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flows remained free flowing throughout the period. A reduction in flow was observed during weekends.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This line is located upstream of location SF_Bas04. A review of balancing indicated minimal net flows (See SF_Bas04 Site Commentary For More Details).

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 24% full at its recorded peak of 2.91 inches and approximately 15% full during its recorded average depth of 1.78 inches.

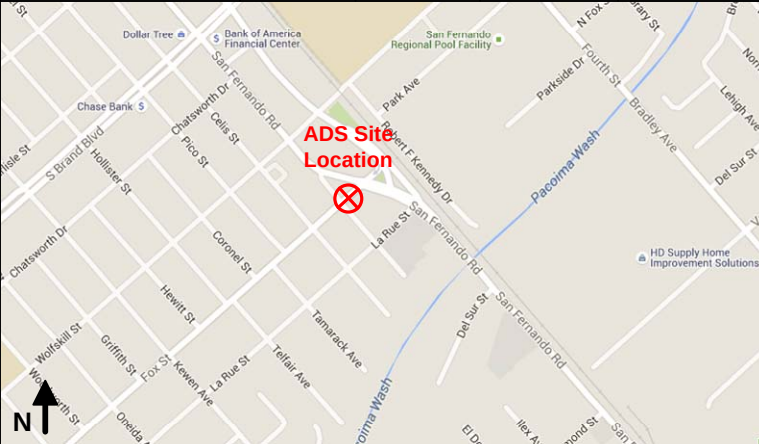
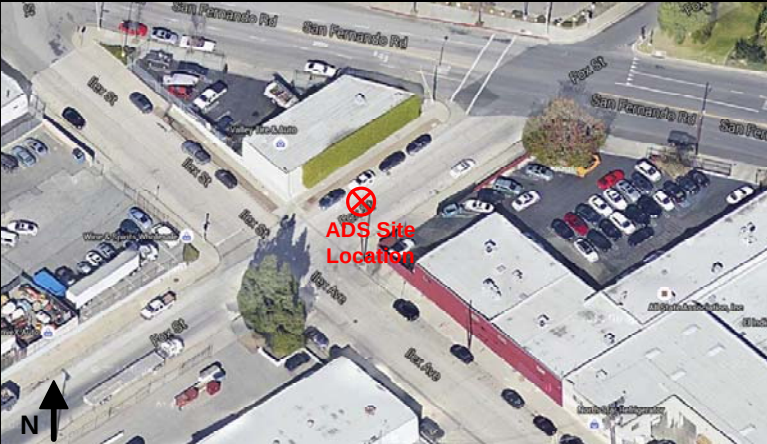
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.78	4.65	0.224
Minimum	1.37	3.00	0.108
Maximum	3.73	6.81	0.905
Time of Minimum	4/29/2016 5:45 AM	5/30/2016 12:20 AM	5/30/2016 12:20 AM
Time of Maximum	5/10/2016 11:20 AM	6/8/2016 1:35 PM	6/8/2016 1:35 PM

Data Quality

Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

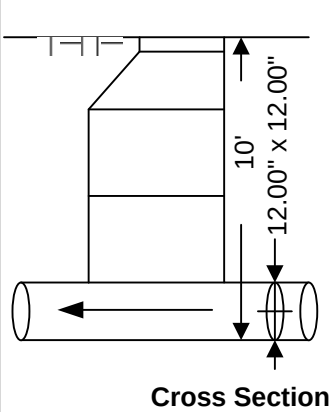
Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF_Bas04B		Install Date: 03/30/16		Monitor Type		Peak Doppler	
Address/Location: Fox St. & Illex St				Monitor Model		Triton	
				Data Acquisition		Manual/Wireless Collect	
				Manhole ID			
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		12.00"
					Pipe Width:		12.00"

Investigation Information:				Manhole Information:			
Date/Time of Investigation:		03/30/16 11:20		Manhole Depth:		10'	
Site Hydraulics:		Good straight through flow		Manhole Material / Condition		Precast/Good	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition:		PVC/Good	
Upstream Manhole:		Not investigated		Land Use:	Residential ☒	Commercial ☐	Industrial ☐ Trunk ☐
Downstream Manhole:		Not investigated		Oxygen: 20.9	H2S: 0	LEL: 0	CO: 0
Depth of Flow:	1.88	+/-	0.25	Safety Notes: 2 man crew required; No special requirements			
Range (Air DOF):		+/-					
Peak Velocity:	5.72		fps				
Silt:	0.00		Inches				

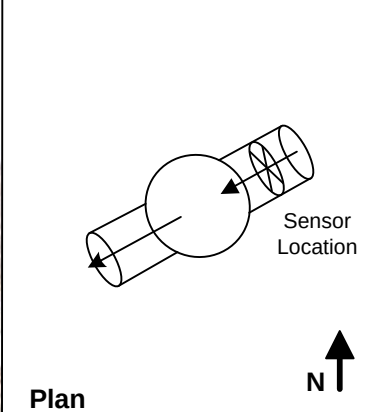
Other Information:





Cross Section





Plan

Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard	Trunk		x		
Sensors Devices:	Ultrasonic/Pressure/Velocity	Lift / Pump Station		x		
Surcharge Height:	0	WWTP		x		
Rain Gauge Zone:		Other		x		

Additional Site Information / Comments:

Standard Traffic Control with No Safety Concerns

SCATTERGRAPH REPORT

SF_Bas4B

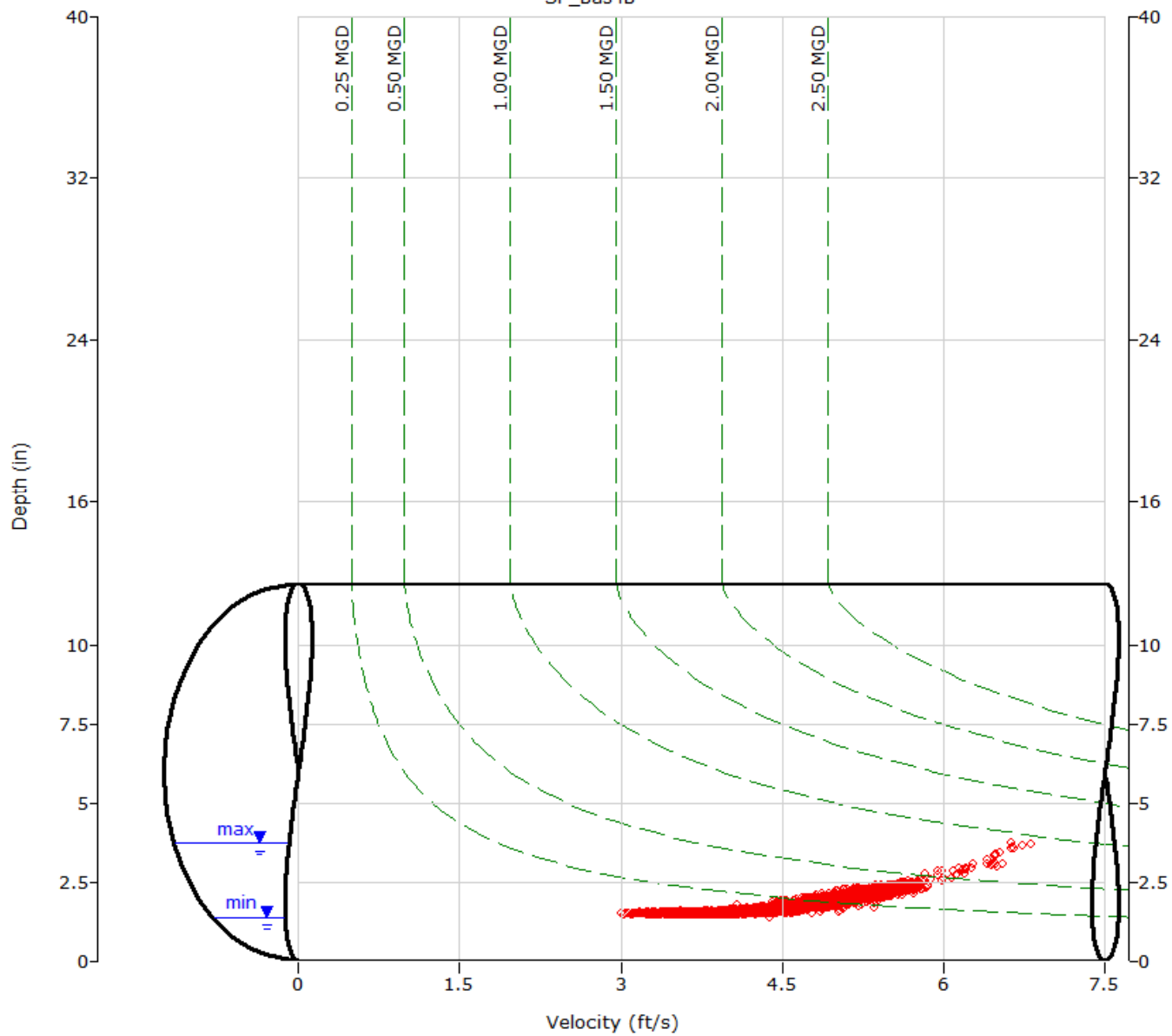
Flow Monitor
SF_Bas4B

Pipe Height
12.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
○ Depth - Velocity
--- Iso-Q™
--- Silt
▼ Min-Max Depth

AGS ENVIRONMENTAL SERVICES



HYDROGRAPH REPORT

SF_Bas4B

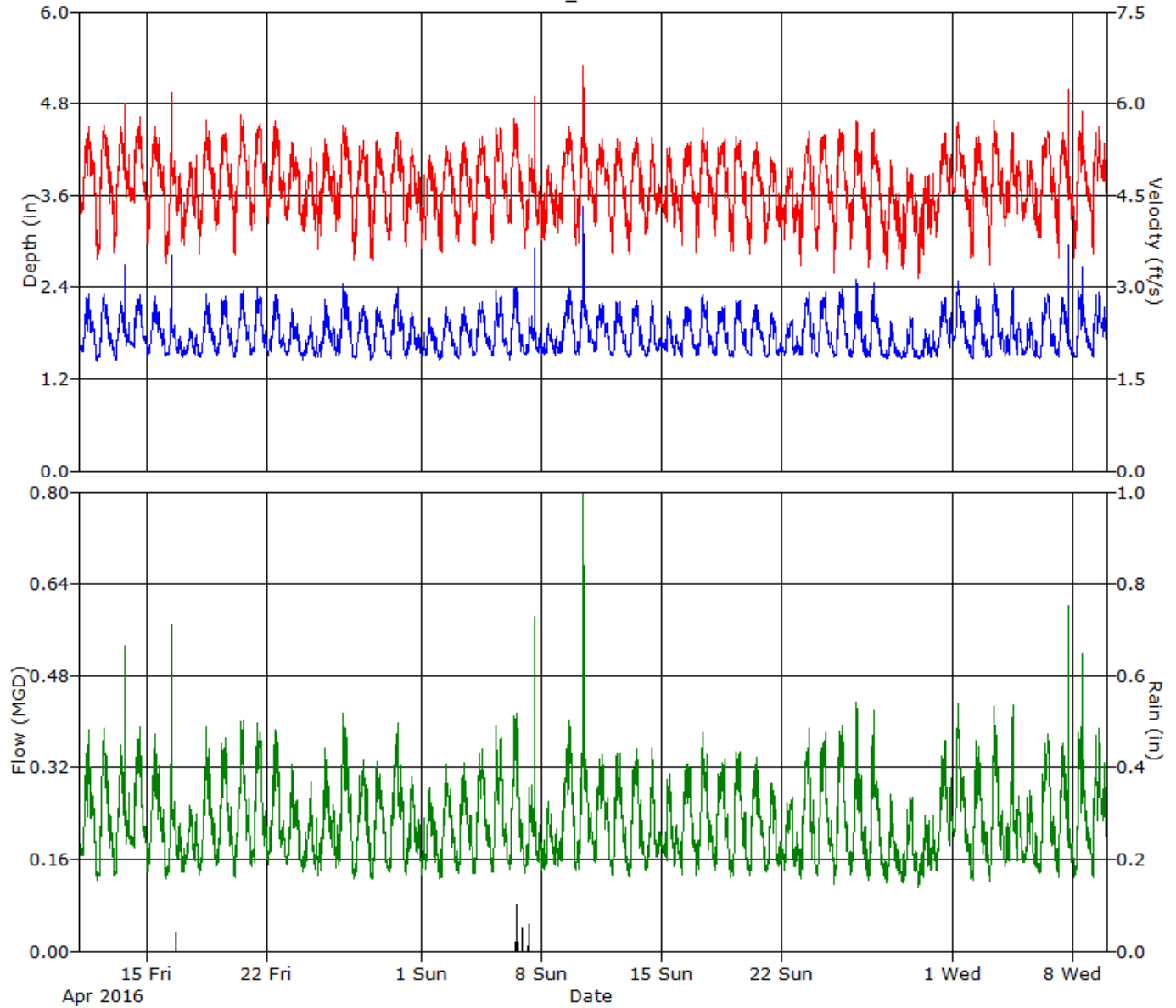
Flow Monitor
SF_Bas4B

Pipe Height
12.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
— Depth
— Velocity
— Quantity
— Rain

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SERVICES



Daily Tabular Report For The Period 4/11/2016 - 6/9/2016

SF_Bas4B, Pipe Height: 12 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	23:55	1.51	14:05	2.34	1.83	23:50	3.80	14:05	5.67	4.84	23:50	0.140	14:05	0.396	0.241	0.241	
4/12/2016	01:30	1.43	12:20	2.33	1.81	03:40	3.29	12:20	5.69	4.67	01:35	0.118	12:20	0.395	0.232	0.232	
4/13/2016	04:35	1.45	16:30	3.59	1.81	02:25	3.16	16:30	6.65	4.78	03:00	0.117	16:30	0.848	0.236	0.236	
4/14/2016	23:55	1.54	11:55	2.57	1.87	23:30	3.98	11:55	5.89	4.91	23:45	0.155	11:55	0.468	0.253	0.253	
4/15/2016	00:35	1.51	10:55	2.30	1.84	00:35	3.58	10:55	5.67	4.84	00:35	0.132	10:55	0.385	0.244	0.244	
4/16/2016	02:30	1.50	10:25	3.09	1.69	02:40	3.24	10:25	6.46	4.44	02:40	0.122	10:25	0.668	0.198	0.198	0.04
4/17/2016	01:55	1.49	12:35	1.92	1.63	03:55	3.21	20:45	5.23	4.40	03:55	0.120	12:35	0.269	0.183	0.183	
4/18/2016	01:25	1.47	10:50	2.33	1.80	00:40	3.43	10:05	5.75	4.77	00:40	0.127	10:05	0.396	0.234	0.234	
4/19/2016	01:45	1.51	09:05	2.53	1.85	00:15	3.82	09:05	5.83	4.85	00:15	0.142	09:05	0.453	0.245	0.245	
4/20/2016	01:40	1.48	11:10	2.40	1.85	02:20	3.41	11:15	5.86	4.86	02:55	0.126	11:10	0.423	0.248	0.248	
4/21/2016	02:35	1.51	10:10	2.44	1.86	05:55	3.79	13:35	5.80	4.89	02:10	0.143	10:10	0.420	0.253	0.253	
4/22/2016	01:10	1.50	13:55	2.36	1.83	01:10	3.92	11:55	5.79	4.91	01:10	0.144	13:55	0.400	0.246	0.246	
4/23/2016	05:05	1.50	10:20	2.15	1.72	05:40	4.00	10:25	5.39	4.69	02:30	0.149	10:20	0.333	0.212	0.212	
4/24/2016	02:10	1.44	13:40	2.03	1.62	23:55	3.51	13:35	5.34	4.42	23:55	0.127	13:35	0.303	0.183	0.183	
4/25/2016	00:20	1.49	09:40	2.37	1.77	00:10	3.60	09:40	5.49	4.70	00:10	0.131	09:40	0.390	0.221	0.221	
4/26/2016	00:35	1.50	10:20	2.47	1.90	00:35	3.77	10:45	5.68	4.87	00:35	0.138	10:20	0.423	0.257	0.257	
4/27/2016	05:00	1.47	15:10	2.16	1.78	02:20	3.23	15:05	5.40	4.61	02:20	0.119	15:10	0.335	0.221	0.221	
4/28/2016	01:45	1.45	15:00	2.40	1.76	03:30	3.15	15:00	5.74	4.55	03:30	0.117	15:00	0.415	0.215	0.215	
4/29/2016	05:45	1.37	12:50	2.39	1.87	03:50	3.64	14:05	5.57	4.78	04:55	0.135	14:45	0.398	0.246	0.246	
4/30/2016	02:40	1.47	10:15	2.09	1.70	02:15	3.38	10:15	5.33	4.51	02:15	0.123	10:15	0.315	0.201	0.201	
5/1/2016	23:50	1.48	10:35	2.03	1.68	01:10	3.42	11:15	5.18	4.47	01:10	0.126	11:15	0.294	0.196	0.196	
5/2/2016	01:40	1.46	11:00	2.22	1.73	03:30	3.32	16:05	5.37	4.59	03:30	0.119	11:00	0.347	0.211	0.211	
5/3/2016	04:00	1.46	08:55	2.33	1.75	03:45	3.33	08:55	5.62	4.60	03:45	0.122	08:55	0.389	0.215	0.215	
5/4/2016	01:10	1.50	12:40	2.34	1.81	02:35	3.44	12:40	5.51	4.71	02:35	0.130	12:40	0.383	0.233	0.233	
5/5/2016	04:00	1.50	10:00	2.42	1.84	05:00	3.51	14:40	5.62	4.80	05:00	0.130	10:00	0.407	0.243	0.243	
5/6/2016	04:00	1.45	13:55	2.49	1.84	03:30	3.82	10:00	5.78	4.79	04:10	0.142	13:55	0.439	0.243	0.243	0.34
5/7/2016	02:25	1.51	15:10	2.95	1.69	01:55	3.48	15:05	6.27	4.42	02:00	0.131	15:05	0.605	0.196	0.196	0.13
5/8/2016	19:30	1.50	09:15	1.94	1.64	00:30	3.45	09:15	5.00	4.34	00:30	0.128	09:15	0.265	0.182	0.182	
5/9/2016	00:00	1.53	16:05	2.42	1.91	00:30	3.76	11:40	5.65	4.89	00:30	0.143	15:25	0.409	0.260	0.260	
5/10/2016	04:55	1.52	11:20	3.73	1.91	00:45	3.45	11:30	6.73	4.81	00:45	0.131	11:20	0.892	0.259	0.259	
5/11/2016	04:50	1.56	15:50	2.23	1.85	04:50	3.89	14:00	5.54	4.78	04:50	0.150	14:00	0.359	0.241	0.241	
5/12/2016	05:05	1.50	09:25	2.37	1.78	05:00	3.37	10:35	5.49	4.58	05:00	0.125	09:25	0.388	0.220	0.220	
5/13/2016	04:25	1.48	13:40	2.26	1.79	04:25	3.45	13:40	5.63	4.63	04:25	0.125	13:40	0.374	0.225	0.225	
5/14/2016	03:40	1.49	12:05	2.29	1.69	05:00	3.77	12:05	5.47	4.49	05:00	0.137	12:05	0.369	0.199	0.199	
5/15/2016	19:10	1.50	09:05	2.14	1.72	19:30	3.76	09:05	5.46	4.56	19:30	0.140	09:05	0.335	0.205	0.205	
5/16/2016	05:15	1.48	09:50	2.18	1.80	05:05	3.63	16:45	5.41	4.70	05:05	0.132	14:15	0.338	0.228	0.228	
5/17/2016	01:30	1.50	10:55	2.35	1.82	01:40	3.27	11:00	5.67	4.77	01:40	0.120	10:55	0.398	0.237	0.237	
5/18/2016	23:40	1.50	13:35	2.24	1.80	01:45	3.72	13:35	5.46	4.79	03:30	0.137	13:35	0.358	0.233	0.233	
5/19/2016	02:05	1.48	09:45	2.23	1.80	01:45	3.22	08:30	5.61	4.65	01:45	0.116	14:05	0.351	0.227	0.227	
5/20/2016	03:40	1.51	14:50	2.21	1.79	04:45	3.24	14:50	5.51	4.62	04:45	0.121	14:50	0.355	0.224	0.224	
5/21/2016	05:35	1.48	10:35	2.09	1.67	03:05	3.68	10:25	5.14	4.41	03:05	0.134	10:35	0.300	0.193	0.193	
5/22/2016	05:15	1.51	15:50	2.02	1.70	04:10	3.66	15:50	5.09	4.40	04:40	0.139	15:50	0.286	0.194	0.194	
5/23/2016	20:00	1.51	14:50	2.72	1.85	03:10	3.18	14:50	5.95	4.65	03:10	0.121	14:50	0.513	0.238	0.238	
5/24/2016	02:55	1.49	14:15	2.46	1.84	00:30	3.40	14:15	5.59	4.69	03:05	0.124	14:15	0.419	0.238	0.238	
5/25/2016	03:00	1.49	14:25	2.42	1.84	02:35	3.07	07:55	5.72	4.67	02:35	0.112	14:30	0.405	0.237	0.237	
5/26/2016	23:40	1.47	10:10	2.54	1.78	01:40	3.25	10:10	5.76	4.64	01:40	0.118	10:10	0.451	0.224	0.224	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
5/27/2016	05:00	1.48	10:05	2.74	1.78	02:10	3.13	10:05	5.82	4.59	02:10	0.116	10:05	0.510	0.223	0.223	
5/28/2016	04:05	1.47	10:15	1.96	1.59	03:30	3.09	10:15	5.12	4.16	03:30	0.111	10:15	0.276	0.168	0.168	
5/29/2016	01:10	1.46	13:30	2.03	1.63	23:50	3.04	09:20	5.02	4.21	23:50	0.109	13:30	0.278	0.176	0.176	
5/30/2016	02:45	1.47	10:30	1.87	1.61	00:20	3.00	14:55	4.87	4.21	00:20	0.108	10:10	0.242	0.172	0.172	
5/31/2016	02:40	1.48	12:00	2.34	1.85	01:10	3.59	12:00	5.60	4.78	01:50	0.133	12:00	0.390	0.242	0.242	
6/1/2016	23:55	1.51	08:10	2.51	1.92	23:30	3.80	07:40	5.70	4.88	23:30	0.141	08:10	0.438	0.261	0.261	
6/2/2016	05:00	1.46	10:55	2.35	1.78	02:30	3.12	09:10	5.55	4.66	02:30	0.113	10:55	0.384	0.225	0.225	
6/3/2016	05:00	1.48	10:20	2.48	1.83	03:45	3.07	10:20	5.75	4.71	03:45	0.112	10:20	0.435	0.237	0.237	
6/4/2016	02:40	1.50	12:45	3.37	1.74	01:05	3.94	12:45	6.48	4.68	02:40	0.146	12:45	0.757	0.216	0.216	
6/5/2016	19:45	1.49	13:20	2.00	1.65	23:10	3.86	09:20	5.14	4.49	23:10	0.141	09:20	0.283	0.190	0.190	
6/6/2016	02:50	1.47	13:40	2.37	1.86	02:25	3.66	15:45	5.60	4.82	02:25	0.131	13:40	0.398	0.248	0.248	
6/7/2016	05:20	1.49	18:45	3.20	1.81	04:30	3.21	18:30	6.48	4.74	04:40	0.117	18:45	0.697	0.236	0.236	
6/8/2016	04:25	1.48	13:35	3.70	1.83	02:50	3.37	13:35	6.81	4.73	03:25	0.122	13:35	0.905	0.240	0.240	
6/9/2016	04:55	1.48	13:45	2.36	1.87	04:55	3.44	13:55	5.63	4.82	04:55	0.124	13:45	0.397	0.249	0.248	

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			13.452	0.51
Avg	1.78	4.65	0.224	

Site Commentary

Site Information

SF_Bound112alt	
Pipe Dimensions	8.00" x 8.00"
Silt Level	0.00"

Overview

Site SF_Bound112alt functioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. This is an alternate location. The original location was relocated due to client request. Review of the scattergraph shows that flows remained free flowing throughout the period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This line is located upstream of location SF_Bas01. A review of balancing indicated no problems (See SF_Bas01 Site Commentary For More Details).

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 44% full at its recorded peak of 3.52 inches and approximately 32% full during its recorded average depth of 2.57 inches.

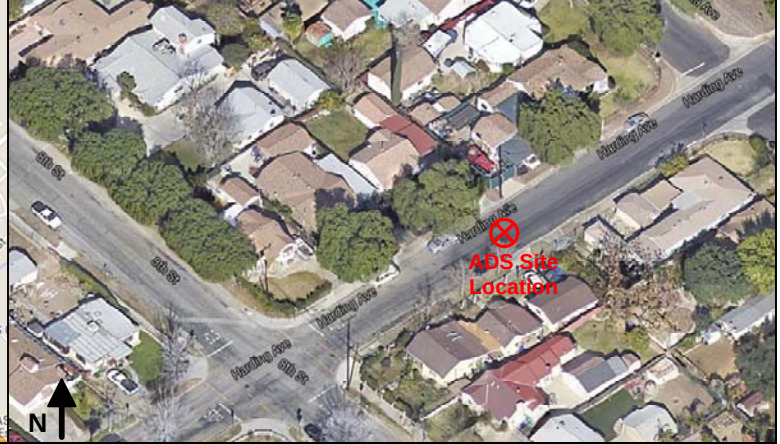
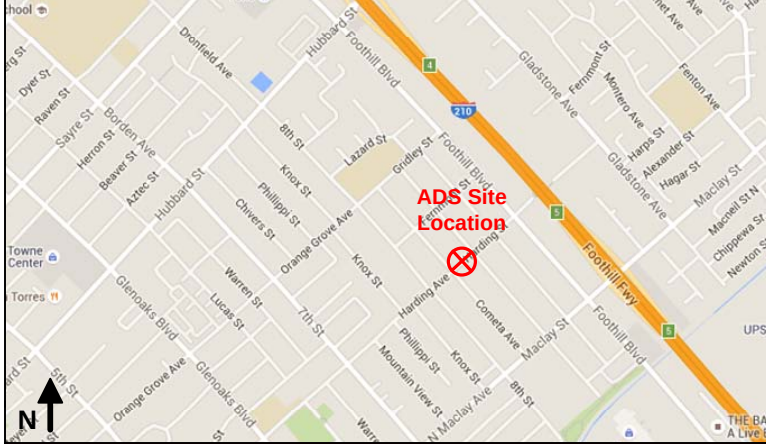
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	2.57	1.79	0.121
Minimum	1.42	0.51	0.019
Maximum	4.02	3.43	0.369
Time of Minimum	4/15/2016 1:10 AM	5/19/2016 2:30 AM	5/11/2016 3:15 AM
Time of Maximum	5/30/2016 11:00 AM	4/11/2016 8:15 AM	5/30/2016 11:00 AM

Data Quality

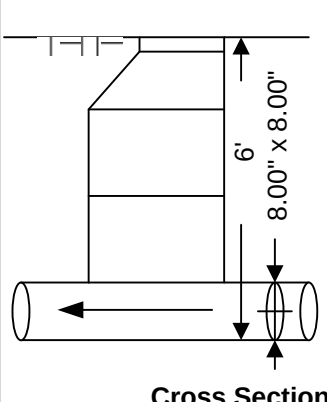
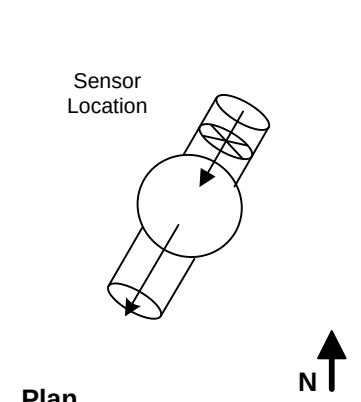
Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF_Bound112alt		Install Date: 04/07/16		Monitor Type		Peak Doppler	
Address/Location: 8 th and Harding; North on Harding				Monitor Model		Triton	
				Data Acquisition		Manual/Wireless Collect	
				Manhole ID			
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		8.00 "
					Pipe Width:		8.00 "



Investigation Information:				Manhole Information:			
Date/Time of Investigation:		04/07/16		Manhole Depth:		6'	
Site Hydraulics:		Good straight through flow		Manhole Material / Condition		Precast/Good	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition:		VCP/Good	
Upstream Manhole:		Not investigated		Land Use:	Residential ☒	Commercial ☐	Industrial ☐
Downstream Manhole:		Not investigated		Oxygen: 20.9	H2S: 0	LEL: 0	CO: 0
Depth of Flow:	2.38	+/-	0.25	Safety Notes: 2 man crew required; No special requirements			
Range (Air DOF):		+/-					
Peak Velocity:	2.40		fps				
Silt:	0.00		Inches				

Other Information:			
			

Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard	Trunk		x		
Sensors Devices:	Ultrasonic/Pressure/Velocit	Lift / Pump Station		x		
Surcharge Height:	0	WWTP		x		
Rain Gauge Zone:		Other		x		

Additional Site Information / Comments:

Standard Traffic Control with No Safety Concerns

SCATTERGRAPH REPORT

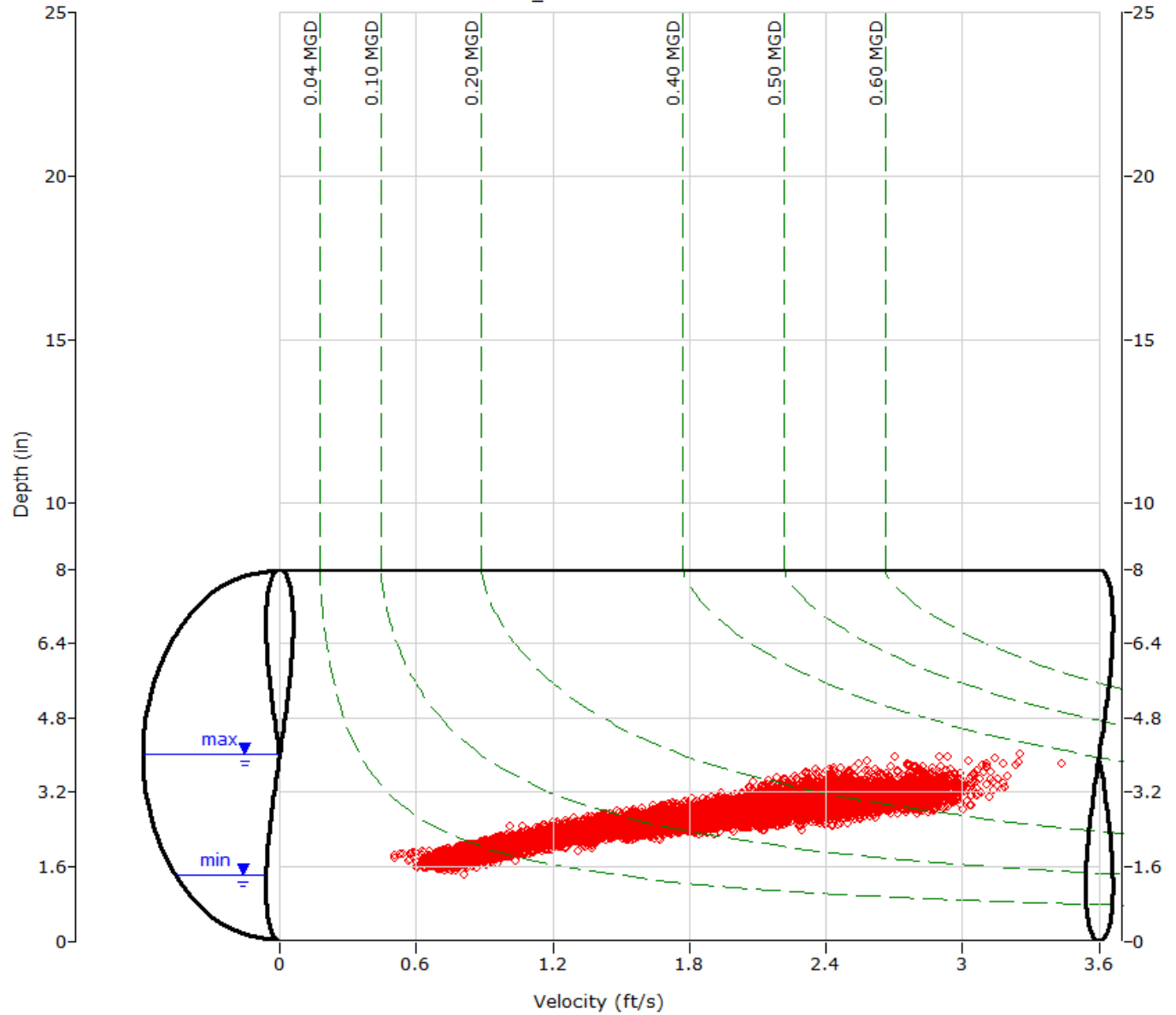
SF_Bound112alt

Flow Monitor
SF_Bound112alt

Pipe Height
8.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
○ Depth - Velocity
--- Iso-Q™
--- Silt
▼ Min-Max Depth

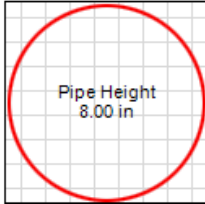


AGS ENVIRONMENTAL SERVICES

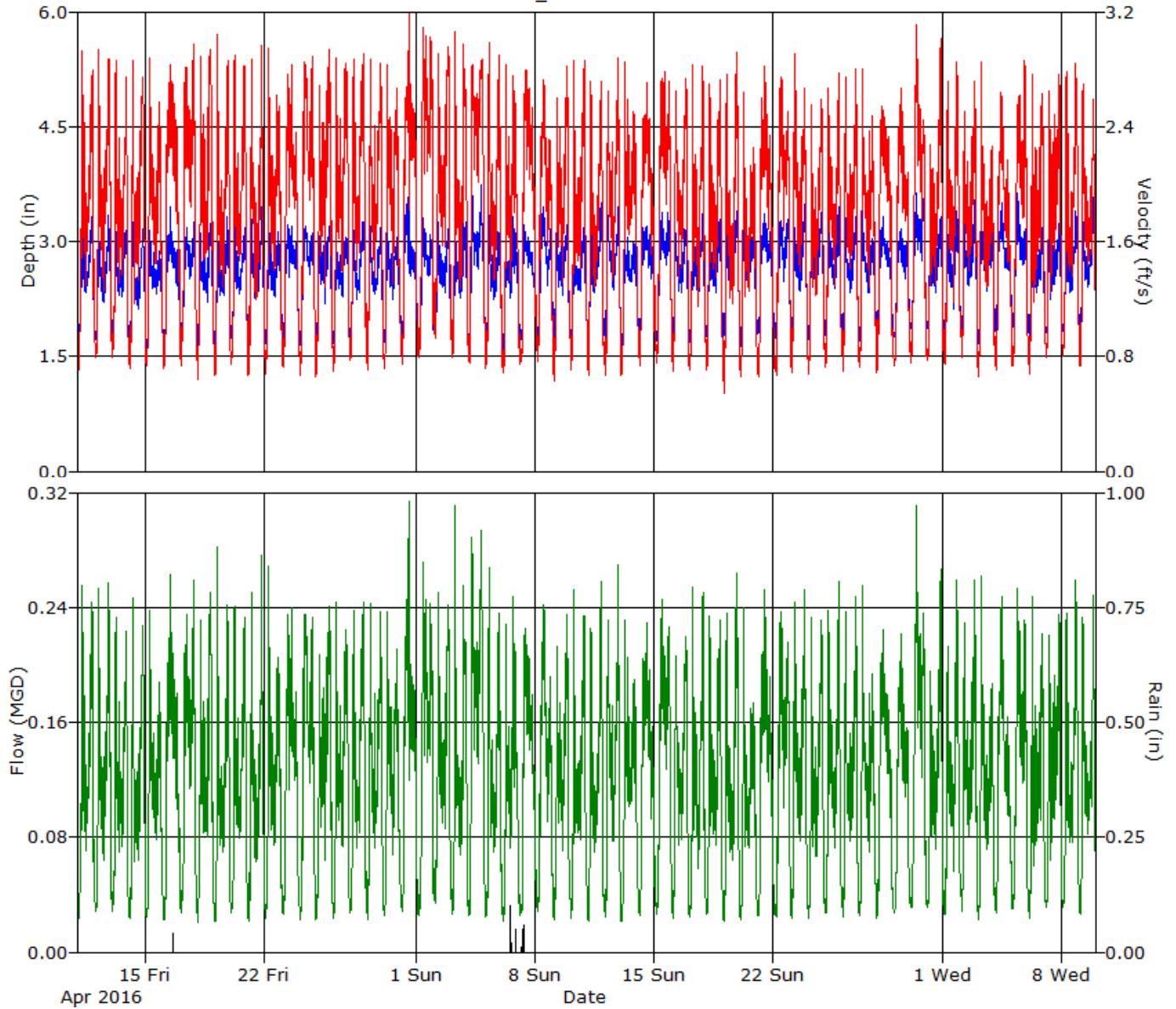
HYDROGRAPH REPORT

SF_Bound112alt

Flow Monitor
SF_Bound112alt



Report Period
4/11/2016
To
6/9/2016



Daily Tabular Report For The Period 4/11/2016 - 6/9/2016

SF_Bound112alt, Pipe Height: 8 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	02:55	1.58	08:15	3.81	2.53	02:55	0.69	08:15	3.43	1.76	02:55	0.022	08:15	0.364	0.118	0.118	
4/12/2016	02:15	1.70	19:35	3.47	2.51	02:55	0.75	07:05	2.98	1.81	02:55	0.027	07:05	0.274	0.118	0.118	
4/13/2016	02:40	1.74	18:55	3.34	2.53	02:45	0.63	06:45	2.94	1.73	02:45	0.026	06:45	0.244	0.114	0.114	
4/14/2016	03:20	1.59	06:45	3.36	2.43	02:55	0.71	20:25	2.94	1.75	03:20	0.023	06:45	0.261	0.111	0.111	
4/15/2016	01:10	1.42	07:10	3.38	2.41	01:40	0.69	07:10	2.99	1.76	01:40	0.022	07:10	0.271	0.109	0.109	
4/16/2016	03:55	1.49	11:35	3.67	2.52	02:15	0.70	11:30	2.97	1.92	02:15	0.021	11:35	0.283	0.128	0.128	0.04
4/17/2016	03:00	1.76	20:45	3.79	2.58	02:55	0.73	20:45	3.23	1.99	02:55	0.027	20:45	0.340	0.134	0.134	
4/18/2016	02:45	1.59	19:45	3.58	2.49	02:45	0.60	19:45	2.97	1.83	02:45	0.019	19:45	0.290	0.119	0.119	
4/19/2016	03:30	1.56	06:50	3.82	2.48	03:30	0.65	06:50	3.11	1.75	03:30	0.020	06:50	0.330	0.114	0.114	
4/20/2016	02:05	1.73	06:35	3.34	2.52	01:15	0.71	11:40	2.93	1.78	02:00	0.026	06:50	0.259	0.117	0.117	
4/21/2016	02:45	1.60	20:35	3.62	2.52	01:55	0.67	20:35	3.09	1.71	02:55	0.021	20:35	0.307	0.113	0.113	
4/22/2016	02:25	1.66	07:00	3.47	2.50	02:15	0.66	07:00	2.98	1.74	02:25	0.023	07:00	0.280	0.113	0.113	
4/23/2016	03:20	1.69	15:45	3.49	2.60	03:40	0.72	15:45	3.16	1.84	03:20	0.025	15:45	0.298	0.126	0.126	
4/24/2016	04:30	1.63	09:45	3.28	2.59	04:40	0.63	10:20	3.05	1.90	04:40	0.022	10:20	0.262	0.132	0.132	
4/25/2016	02:40	1.63	19:50	3.24	2.53	02:00	0.63	19:55	3.10	1.83	02:00	0.021	19:50	0.244	0.122	0.122	
4/26/2016	03:15	1.65	07:05	3.33	2.50	02:05	0.67	06:35	2.96	1.83	03:15	0.023	06:35	0.258	0.120	0.120	
4/27/2016	02:25	1.68	07:20	3.49	2.51	02:35	0.77	07:20	3.08	1.85	02:25	0.027	07:20	0.291	0.121	0.121	
4/28/2016	03:20	1.55	06:35	3.48	2.49	02:45	0.69	06:35	3.12	1.83	03:20	0.022	06:35	0.294	0.119	0.119	
4/29/2016	03:10	1.67	07:15	3.48	2.54	02:10	0.70	07:15	2.89	1.82	02:20	0.024	07:15	0.272	0.120	0.120	
4/30/2016	03:50	1.71	11:20	3.87	2.62	03:30	0.72	13:15	3.25	1.97	03:50	0.027	13:15	0.348	0.138	0.138	
5/1/2016	03:15	1.55	10:30	3.47	2.49	02:40	0.73	12:20	3.18	2.04	03:15	0.024	10:00	0.291	0.135	0.135	
5/2/2016	02:25	1.75	21:30	3.42	2.53	02:25	0.92	21:30	3.06	1.97	02:25	0.033	21:30	0.281	0.128	0.128	
5/3/2016	02:45	1.62	06:50	3.74	2.51	02:45	0.73	06:50	3.11	1.80	02:45	0.024	06:50	0.322	0.118	0.118	
5/4/2016	02:30	1.61	20:15	3.96	2.78	03:00	0.57	20:45	2.90	2.16	03:00	0.020	20:10	0.323	0.164	0.164	
5/5/2016	01:05	1.64	06:30	3.80	2.45	01:15	0.68	06:30	3.18	1.76	01:15	0.023	06:30	0.336	0.112	0.112	
5/6/2016	02:30	1.56	15:55	3.65	2.51	03:30	0.64	15:55	3.06	1.73	03:30	0.020	15:55	0.307	0.114	0.114	0.34
5/7/2016	02:50	1.60	09:15	3.32	2.55	02:50	0.72	08:50	2.92	1.90	02:50	0.023	08:50	0.256	0.128	0.128	0.13
5/8/2016	03:05	1.70	13:05	3.63	2.62	03:05	0.68	12:35	3.05	1.79	03:05	0.024	12:35	0.299	0.126	0.126	
5/9/2016	03:00	1.68	06:25	3.49	2.55	03:00	0.61	21:30	2.86	1.75	03:00	0.021	20:20	0.261	0.117	0.117	
5/10/2016	02:35	1.63	06:40	3.91	2.50	02:45	0.70	06:40	3.14	1.76	03:00	0.024	06:40	0.344	0.115	0.115	
5/11/2016	03:15	1.57	20:05	3.76	2.59	03:15	0.60	20:55	2.85	1.71	03:15	0.019	20:50	0.293	0.118	0.118	
5/12/2016	02:15	1.67	21:20	3.65	2.62	03:10	0.63	21:20	2.93	1.75	02:50	0.024	21:20	0.293	0.122	0.122	
5/13/2016	01:55	1.56	06:25	3.33	2.53	01:55	0.64	06:55	2.91	1.80	01:55	0.020	06:25	0.253	0.119	0.119	
5/14/2016	02:35	1.67	12:05	3.53	2.62	04:20	0.73	14:10	2.89	1.83	04:20	0.025	12:05	0.275	0.127	0.127	
5/15/2016	03:50	1.70	20:20	3.58	2.67	03:05	0.71	14:30	2.89	1.92	03:05	0.025	10:35	0.264	0.138	0.138	
5/16/2016	03:15	1.68	19:50	3.49	2.53	03:50	0.69	19:50	2.86	1.77	03:50	0.024	19:50	0.271	0.117	0.117	
5/17/2016	01:55	1.62	20:40	3.59	2.55	01:55	0.68	21:05	3.00	1.71	01:55	0.022	20:40	0.280	0.115	0.115	
5/18/2016	02:20	1.68	06:40	3.48	2.58	02:20	0.69	22:00	2.91	1.71	02:20	0.024	21:10	0.267	0.116	0.116	
5/19/2016	02:20	1.62	20:55	3.52	2.59	02:30	0.51	21:35	2.96	1.61	02:30	0.019	21:35	0.283	0.112	0.112	
5/20/2016	02:55	1.61	07:10	3.56	2.55	02:30	0.65	06:45	2.79	1.56	02:55	0.021	06:45	0.251	0.104	0.104	
5/21/2016	03:45	1.76	14:40	3.50	2.65	03:50	0.64	13:10	2.91	1.78	03:50	0.024	13:00	0.254	0.126	0.126	
5/22/2016	03:40	1.63	20:40	3.54	2.65	05:05	0.64	10:40	2.88	1.80	03:40	0.022	10:40	0.262	0.129	0.129	
5/23/2016	02:20	1.63	20:40	3.60	2.60	03:00	0.68	06:50	2.96	1.75	02:20	0.023	20:50	0.261	0.121	0.121	
5/24/2016	02:00	1.70	20:30	3.58	2.62	02:15	0.67	06:45	2.79	1.64	02:15	0.024	06:45	0.273	0.114	0.114	
5/25/2016	02:05	1.75	06:30	3.68	2.63	02:30	0.71	21:15	2.95	1.71	02:15	0.026	21:15	0.287	0.119	0.119	
5/26/2016	03:00	1.65	21:15	3.63	2.57	03:00	0.67	21:20	2.85	1.69	03:00	0.023	21:15	0.276	0.114	0.114	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	
5/27/2016	03:10	1.62	06:40	3.48	2.55	02:45	0.72	06:20	2.89	1.72	02:40	0.024	06:40	0.265	0.114	0.114	
5/28/2016	04:20	1.67	11:15	3.60	2.62	03:10	0.67	12:45	2.82	1.81	03:10	0.023	11:15	0.276	0.125	0.125	
5/29/2016	03:20	1.73	10:55	3.30	2.57	03:35	0.71	11:20	2.83	1.73	04:30	0.026	10:55	0.242	0.117	0.117	
5/30/2016	04:15	1.83	11:00	4.02	2.77	03:10	0.68	11:00	3.25	1.86	03:10	0.027	11:00	0.369	0.142	0.142	
5/31/2016	03:30	1.85	20:55	3.77	2.59	02:55	0.76	20:55	3.09	1.70	03:30	0.031	20:55	0.323	0.116	0.116	
6/1/2016	03:10	1.66	20:30	3.56	2.58	01:25	0.73	20:35	2.93	1.75	03:10	0.025	20:35	0.278	0.119	0.119	
6/2/2016	03:15	1.71	22:10	3.95	2.66	03:15	0.78	22:10	2.94	1.72	03:15	0.028	22:10	0.326	0.121	0.121	
6/3/2016	03:10	1.65	06:55	3.46	2.62	02:55	0.63	06:40	2.93	1.62	02:55	0.022	06:40	0.268	0.112	0.112	
6/4/2016	03:25	1.78	11:35	3.66	2.70	04:25	0.71	11:10	2.76	1.69	04:25	0.027	11:25	0.265	0.123	0.123	
6/5/2016	03:35	1.86	10:20	3.81	2.72	03:35	0.72	12:35	2.92	1.82	03:35	0.028	12:35	0.281	0.132	0.132	
6/6/2016	03:30	1.66	07:00	3.55	2.54	02:55	0.67	07:00	2.83	1.68	03:30	0.023	07:00	0.274	0.112	0.112	
6/7/2016	02:15	1.76	19:30	3.42	2.61	02:15	0.77	06:25	2.87	1.81	02:15	0.028	06:25	0.249	0.124	0.124	
6/8/2016	02:10	1.80	21:10	3.41	2.58	02:45	0.76	20:40	2.95	1.74	02:30	0.030	20:40	0.269	0.118	0.118	
6/9/2016	03:10	1.72	21:10	3.71	2.63	01:45	0.72	06:40	2.83	1.70	03:10	0.026	21:10	0.259	0.118	0.117	

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			7.261	0.51
Avg	2.57	1.79	0.121	

Site Commentary

Site Information

SF_Bound3	
Pipe Dimensions	8.00" x 8.00"
Silt Level	0.00"

Overview

Site SF_Bound3 functioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows swift moving velocity with shallow depth.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This line is located upstream of location SF_Bas01. A review of balancing indicated no problems (See SF_Bas01 Site Commentary For More Details).

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 28% full at its recorded peak of 2.26 inches and approximately 17% full during its recorded average depth of 1.39 inches.

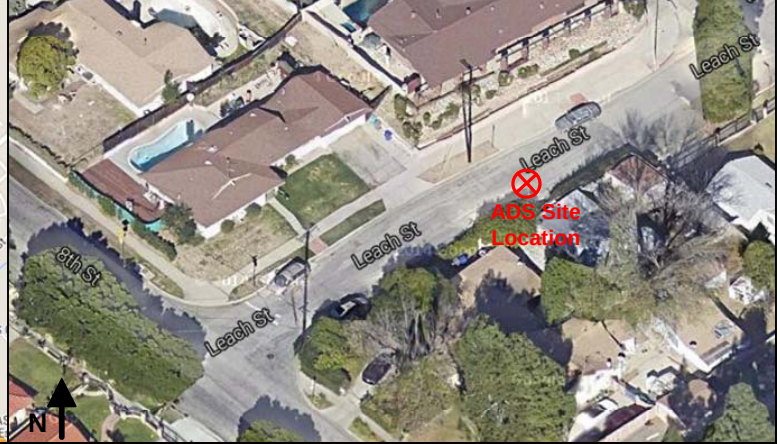
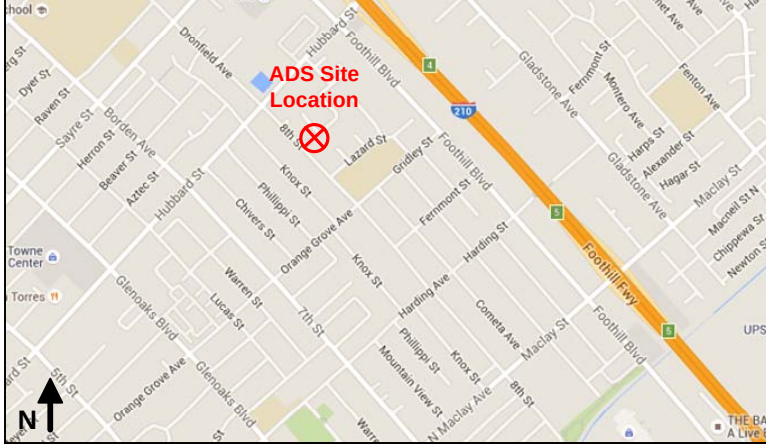
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.39	2.71	0.072
Minimum	0.77	0.47	0.009
Maximum	2.41	5.53	0.284
Time of Minimum	4/17/2016 12:15 PM	6/3/2016 1:35 AM	6/3/2016 1:35 AM
Time of Maximum	4/28/2016 8:30 PM	4/24/2016 9:25 AM	4/24/2016 9:25 AM

Data Quality

Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF_Bound 3		Install Date: 04/01/16		Monitor Type		Peak Doppler	
Address/Location: 8 th & Leach; South on Leach		Monitor Model		Triton			
		Data Acquisition		Manual/Wireless Collect			
		Manhole ID					
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		8.00 "
					Pipe Width:		8.00 "



Investigation Information:				Manhole Information:			
Date/Time of Investigation:		04/01/16		Manhole Depth:		7'	
Site Hydraulics:		Good smooth flow		Manhole Material / Condition		Precast/Good	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition:		VCP/Good	
Upstream Manhole:		Not investigated		Land Use:	Residential ☒	Commercial ☐	Industrial ☐
Downstream Manhole:		Not investigated		Oxygen: 20.9	H2S: 0	LEL: 0	CO: 0
Depth of Flow:	1.25	+/-	0.25	Safety Notes: 2 man crew required; No special requirements			
Range (Air DOF):		+/-					
Peak Velocity:	1.81		fps				
Silt:	0.00		Inches				

Other Information:							
		Cross Section				Plan	

Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard	Trunk		x		
Sensors Devices:	Ultrasonic/Pressure/Velocit	Lift / Pump Station		x		
Surcharge Height:	0	WWTP		x		
Rain Gauge Zone:		Other		x		

Additional Site Information / Comments:	
Standard Traffic Control with No Safety Concerns	

SCATTERGRAPH REPORT

SF_Bound3

Flow Monitor

SF_Bound3

Pipe Height
8.00 in

Report Period

4/11/2016
To
6/9/2016

Legend

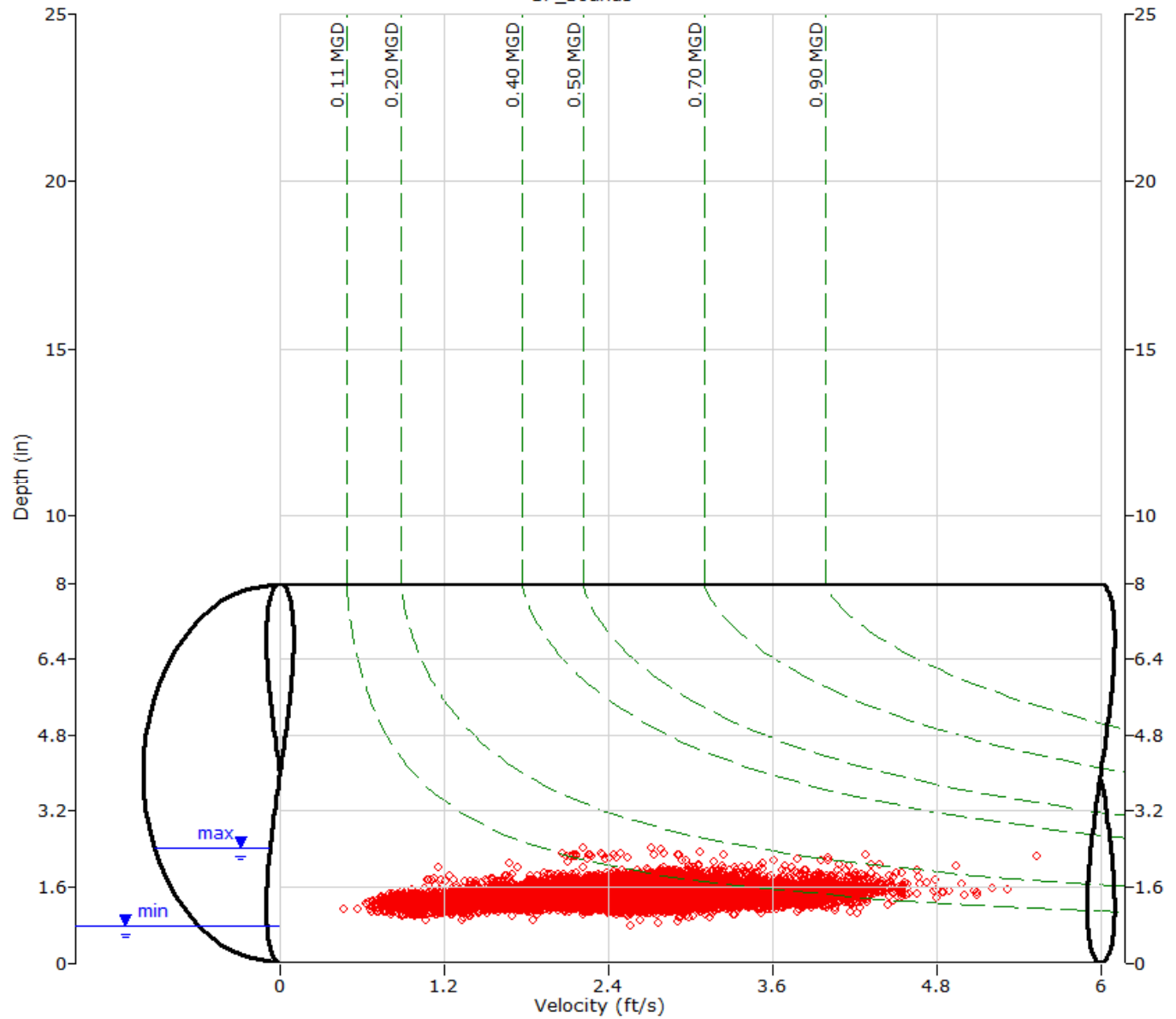
○ Depth - Velocity

--- Iso-Q™

--- Silt

▼ Min-Max Depth

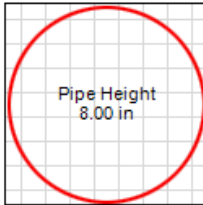
AGS ENVIRONMENTAL SERVICES



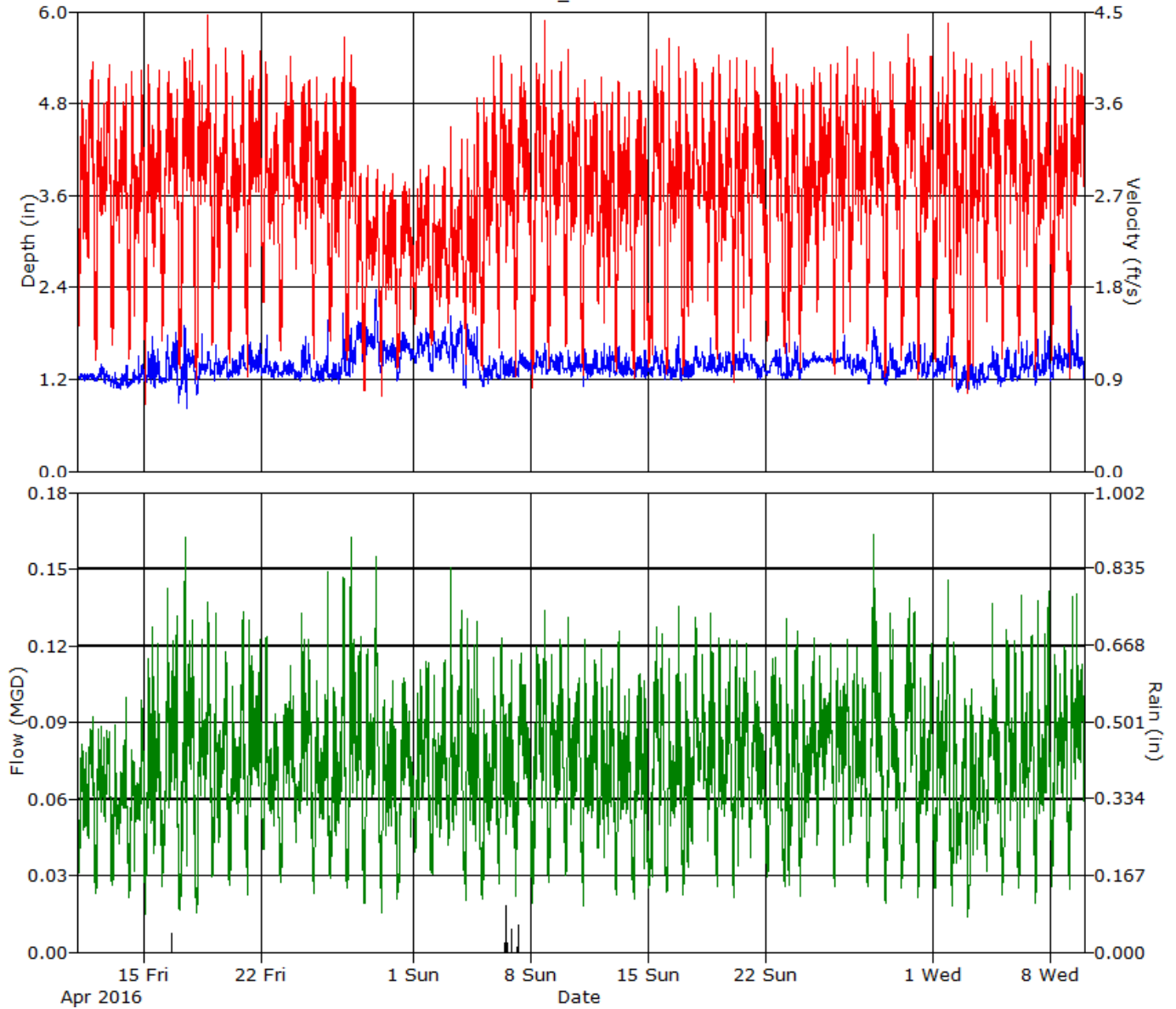
HYDROGRAPH REPORT

SF_Bound3

Flow Monitor
SF_Bound3



Report Period
4/11/2016
To
6/9/2016



Daily Tabular Report For The Period 4/11/2016 - 6/9/2016
SF_Bound3, Pipe Height: 8 in
Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	11:15	1.16	10:10	1.31	1.23	02:40	1.10	20:15	4.25	2.87	02:40	0.024	19:20	0.098	0.063	0.063	
4/12/2016	15:25	1.02	10:25	1.40	1.25	02:45	0.97	20:00	4.18	2.80	02:45	0.020	10:25	0.097	0.063	0.063	
4/13/2016	11:35	1.00	21:55	1.66	1.18	01:15	1.06	15:55	4.25	2.71	01:15	0.021	21:55	0.137	0.057	0.057	
4/14/2016	00:20	1.08	15:15	1.70	1.22	03:30	0.89	20:40	4.20	2.68	03:30	0.017	20:40	0.112	0.059	0.059	
4/15/2016	14:45	1.09	16:15	2.12	1.28	01:20	0.64	21:20	4.29	2.70	01:25	0.014	12:35	0.167	0.065	0.065	
4/16/2016	23:50	1.06	19:40	2.05	1.35	01:55	1.16	16:10	4.08	2.86	01:55	0.023	19:40	0.160	0.075	0.075	0.04
4/17/2016	12:15	0.77	10:35	2.28	1.31	03:15	0.88	17:15	4.80	2.82	03:20	0.015	10:35	0.227	0.072	0.072	
4/18/2016	02:00	1.00	10:30	1.83	1.32	03:10	0.81	18:45	5.01	2.86	03:10	0.013	18:50	0.157	0.073	0.073	
4/19/2016	04:30	1.18	06:30	1.68	1.36	02:15	1.09	18:10	4.32	2.76	02:15	0.025	06:30	0.140	0.072	0.072	
4/20/2016	17:55	1.16	19:20	1.95	1.37	01:40	1.01	20:55	4.23	2.78	01:40	0.025	19:20	0.164	0.073	0.073	
4/21/2016	17:25	1.21	08:45	1.94	1.43	03:30	0.91	12:30	4.65	2.87	03:30	0.022	08:45	0.155	0.079	0.079	
4/22/2016	17:05	1.19	07:35	2.08	1.34	02:15	1.31	21:55	4.31	2.73	02:15	0.032	07:35	0.165	0.069	0.069	
4/23/2016	03:25	1.20	15:00	1.70	1.32	03:20	0.77	10:50	4.80	2.80	03:25	0.017	14:20	0.139	0.069	0.069	
4/24/2016	07:10	1.14	09:25	2.23	1.36	23:25	1.56	09:25	5.53	3.03	23:25	0.034	09:25	0.284	0.079	0.079	
4/25/2016	05:35	1.14	22:25	2.15	1.30	02:40	1.00	21:15	4.23	2.78	02:40	0.020	22:25	0.195	0.068	0.068	
4/26/2016	11:00	1.14	20:25	2.18	1.34	02:10	1.15	21:35	4.41	2.78	02:10	0.026	20:25	0.189	0.071	0.071	
4/27/2016	05:35	1.15	19:55	2.08	1.58	01:20	0.95	14:30	4.89	2.51	02:50	0.021	07:20	0.177	0.081	0.081	
4/28/2016	02:45	1.29	20:30	2.41	1.70	03:35	0.71	21:45	3.30	2.10	01:45	0.017	18:50	0.171	0.077	0.077	
4/29/2016	03:40	1.20	18:50	1.80	1.51	03:30	0.67	18:50	3.68	2.08	03:30	0.014	18:50	0.140	0.063	0.063	
4/30/2016	02:05	1.17	10:05	1.97	1.54	01:55	0.72	09:20	3.19	2.11	01:55	0.015	09:20	0.133	0.067	0.067	
5/1/2016	23:50	1.37	12:45	1.93	1.62	03:50	1.39	22:25	3.45	2.29	23:50	0.037	19:20	0.141	0.076	0.076	
5/2/2016	03:45	1.29	20:00	1.89	1.59	03:45	0.89	22:45	3.48	2.12	03:45	0.021	22:45	0.140	0.070	0.070	
5/3/2016	10:25	1.22	06:25	2.06	1.65	04:25	1.31	06:25	4.38	2.22	04:25	0.034	06:25	0.202	0.076	0.076	
5/4/2016	03:55	1.08	19:55	1.95	1.51	14:45	0.82	20:55	4.43	2.27	03:40	0.019	06:05	0.154	0.070	0.070	
5/5/2016	05:00	1.05	13:45	1.56	1.29	01:40	0.85	20:45	4.24	2.60	04:15	0.017	19:50	0.121	0.062	0.062	
5/6/2016	12:05	1.17	21:40	1.59	1.34	02:45	1.20	21:40	4.56	2.83	02:50	0.026	21:40	0.145	0.072	0.072	0.34
5/7/2016	02:00	1.20	13:55	1.71	1.38	03:55	0.90	11:30	4.84	2.84	03:55	0.021	14:50	0.146	0.075	0.075	0.13
5/8/2016	17:15	1.24	21:25	1.90	1.43	03:40	0.78	21:05	5.32	2.76	03:40	0.018	21:05	0.163	0.076	0.076	
5/9/2016	17:50	1.20	05:15	1.66	1.40	02:25	0.92	19:15	4.98	2.80	02:25	0.023	19:15	0.169	0.076	0.076	
5/10/2016	09:30	1.17	15:55	1.71	1.38	03:35	0.96	05:25	4.78	2.80	03:35	0.024	05:25	0.141	0.073	0.073	
5/11/2016	04:00	1.10	20:10	1.81	1.37	04:00	0.77	20:10	4.36	2.63	04:00	0.014	20:10	0.167	0.069	0.069	
5/12/2016	07:20	1.20	09:40	1.69	1.39	09:10	0.80	13:25	4.35	2.68	09:10	0.022	13:25	0.135	0.071	0.071	
5/13/2016	13:40	1.15	17:25	1.79	1.35	02:50	0.84	05:55	4.20	2.68	02:50	0.019	05:55	0.144	0.069	0.069	
5/14/2016	19:20	1.14	19:00	1.76	1.35	02:35	0.75	12:55	4.19	2.57	04:25	0.017	12:55	0.122	0.066	0.066	
5/15/2016	06:00	1.19	11:35	1.72	1.38	02:05	0.78	22:40	4.54	2.76	02:05	0.018	20:55	0.152	0.073	0.073	
5/16/2016	08:55	1.16	18:50	1.82	1.34	02:55	0.91	06:40	5.09	2.70	03:40	0.022	20:40	0.155	0.068	0.068	
5/17/2016	00:55	1.16	22:50	1.75	1.35	02:15	0.89	18:55	4.86	2.73	02:55	0.021	21:50	0.149	0.070	0.070	
5/18/2016	22:15	1.22	17:40	1.89	1.43	14:45	1.24	17:40	4.55	2.95	14:45	0.033	17:40	0.186	0.081	0.081	
5/19/2016	03:55	1.10	16:20	1.57	1.39	03:55	0.76	20:50	4.38	2.72	03:55	0.014	20:50	0.135	0.073	0.073	
5/20/2016	00:10	1.21	16:55	1.95	1.43	03:35	0.81	07:20	4.57	2.68	03:35	0.020	16:55	0.140	0.074	0.074	
5/21/2016	17:45	1.18	09:55	1.62	1.37	02:25	1.13	12:10	4.54	2.82	02:25	0.032	09:55	0.147	0.072	0.072	
5/22/2016	19:20	1.23	14:25	1.78	1.38	04:30	1.02	12:10	4.36	2.83	04:30	0.024	14:30	0.147	0.075	0.075	
5/23/2016	05:15	1.18	17:45	1.89	1.37	09:20	0.76	06:35	4.47	2.63	09:20	0.016	17:45	0.171	0.070	0.070	
5/24/2016	03:15	1.19	21:00	1.67	1.41	01:25	0.82	21:00	4.57	2.69	01:30	0.018	21:00	0.156	0.073	0.073	
5/25/2016	01:20	1.41	21:10	1.57	1.46	01:15	1.26	11:00	4.49	2.98	01:15	0.034	21:00	0.131	0.084	0.084	
5/26/2016	18:25	1.30	16:25	1.97	1.46	02:00	0.90	20:45	4.41	2.80	02:00	0.025	16:40	0.145	0.079	0.079	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
5/27/2016	04:55	1.24	19:10	1.66	1.39	00:20	1.32	19:10	4.41	2.95	00:20	0.039	19:10	0.149	0.078	0.078	
5/28/2016	05:15	1.11	10:00	2.06	1.43	01:55	1.09	20:30	4.35	2.85	02:15	0.023	10:00	0.199	0.081	0.081	
5/29/2016	04:10	1.12	11:05	1.75	1.34	04:10	0.83	11:05	4.79	2.71	04:10	0.016	11:05	0.176	0.069	0.069	
5/30/2016	15:45	1.17	13:35	1.88	1.41	04:40	0.84	21:15	4.73	2.93	04:40	0.019	13:35	0.182	0.081	0.081	
5/31/2016	14:25	1.17	05:25	1.75	1.38	02:15	0.70	20:05	5.09	2.74	02:15	0.015	21:30	0.158	0.072	0.072	
6/1/2016	15:35	1.17	20:30	1.94	1.38	03:25	0.83	20:30	4.65	2.84	03:25	0.019	20:30	0.196	0.076	0.076	
6/2/2016	11:20	1.03	06:25	1.52	1.26	00:40	0.74	21:05	4.46	2.62	03:30	0.017	06:15	0.121	0.060	0.060	
6/3/2016	15:40	1.04	08:25	2.11	1.25	01:35	0.47	21:55	4.33	2.63	01:35	0.009	21:55	0.129	0.060	0.060	
6/4/2016	21:55	1.10	12:00	2.02	1.33	04:05	1.29	12:50	5.21	2.97	04:05	0.028	12:00	0.222	0.075	0.075	
6/5/2016	00:10	1.08	20:55	1.80	1.32	02:25	0.89	20:55	4.67	2.85	02:25	0.018	20:55	0.178	0.072	0.072	
6/6/2016	00:35	1.14	14:30	1.80	1.40	01:40	0.93	20:15	5.07	2.87	01:40	0.021	20:15	0.151	0.078	0.078	
6/7/2016	02:50	1.11	19:35	2.06	1.38	02:30	0.91	06:15	4.45	2.76	02:50	0.018	19:35	0.188	0.074	0.074	
6/8/2016	00:00	1.17	04:35	1.85	1.43	01:50	0.93	21:00	4.28	2.79	01:50	0.022	06:40	0.136	0.078	0.078	
6/9/2016	23:35	1.15	05:00	2.22	1.48	02:45	0.88	20:45	4.51	2.92	00:50	0.023	08:50	0.157	0.085	0.085	

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			4.328	0.51
Avg	1.39	2.71	0.072	

Site Commentary

Site Information

SF_Bound432	
Pipe Dimensions	8.00" x 8.00"
Silt Level	0.00"

Overview

Site SF_Bound432 functioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows flow in this line remained free flowing throughout the study period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This line is located upstream of location SF_Bas02. A review of balancing indicated no problems (See SF_Bas02 Site Commentary For More Details).

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 30% full at its recorded peak of 2.42 inches and approximately 22% full during its recorded average depth of 1.76 inches.

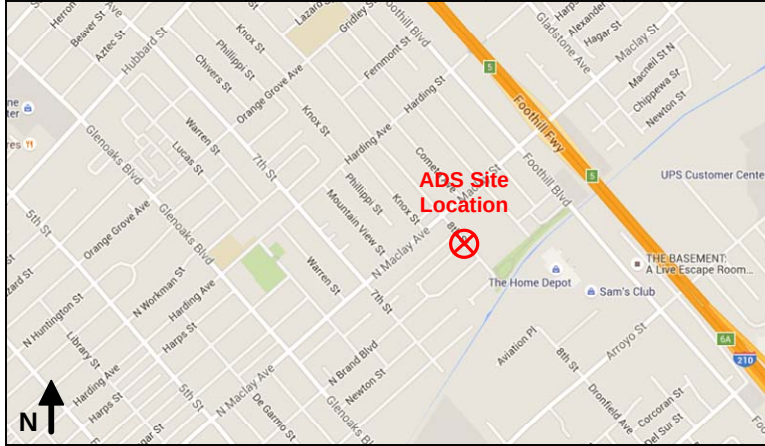
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.76	0.95	0.037
Minimum	0.99	0.42	0.008
Maximum	2.89	1.67	0.123
Time of Minimum	5/15/2016 4:55 AM	4/18/2016 3:20 AM	5/11/2016 2:50 AM
Time of Maximum	5/6/2016 4:00 PM	5/6/2016 4:00 PM	5/6/2016 4:00 PM

Data Quality

Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

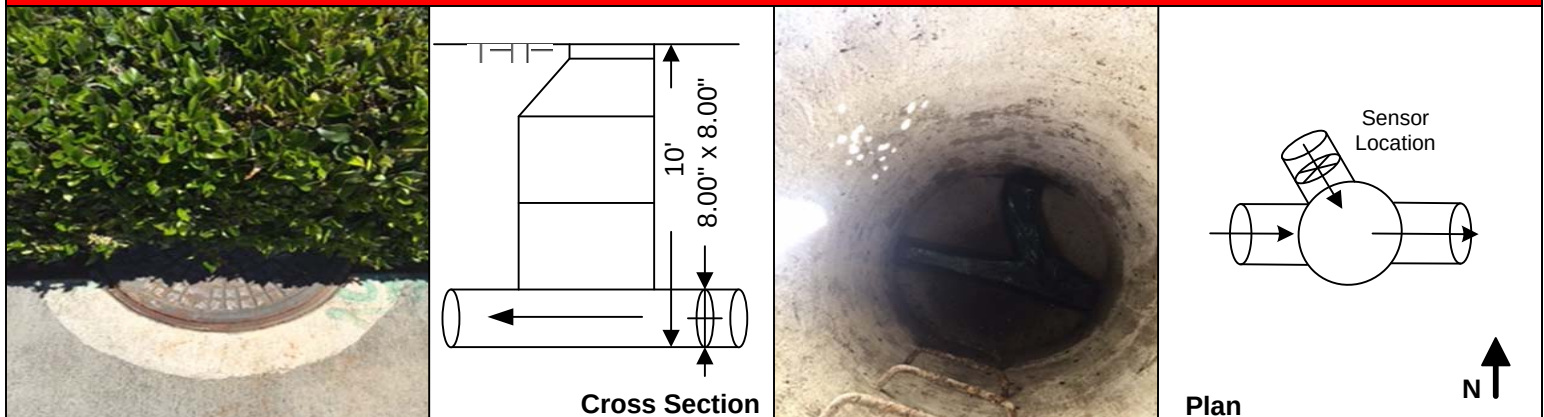
Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF_Bound432		Install Date: 04/01/16		Monitor Type		Peak Doppler	
Address/Location: 8 th and Macneil; North on sidewalk of 8 th St				Monitor Model		Triton	
				Data Acquisition		Manual/Wireless Collect	
				Manhole ID			
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		8.00 "
					Pipe Width:		8.00 "



Investigation Information: Manhole Information:

Date/Time of Investigation:		04/01/16		Manhole Depth:		10'	
Site Hydraulics:		Good flow with curved exit		Manhole Material / Condition		Precast/Good	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition:		VCP/Good	
Upstream Manhole:		Not investigated		Land Use:	Residential ☒	Commercial ☐	Industrial ☐
Downstream Manhole:		Not investigated		Oxygen: 20.9	H2S: 0	LEL: 0	CO: 0
Depth of Flow:	1.75	+/- 0.25		Safety Notes: 2 man crew required; No special requirements			
Range (Air DOF):	+/-						
Peak Velocity:	1.18	fps					
Silt:	0.00	Inches					

Other Information:



Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard	Trunk		x		
Sensors Devices:	Ultrasonic/Pressure/Velocit	Lift / Pump Station		x		
Surcharge Height:	0	WWTP		x		
Rain Gauge Zone:		Other		x		

Additional Site Information / Comments:

Standard Traffic Control with No Safety Concerns

SCATTERGRAPH REPORT

SF_Bound432

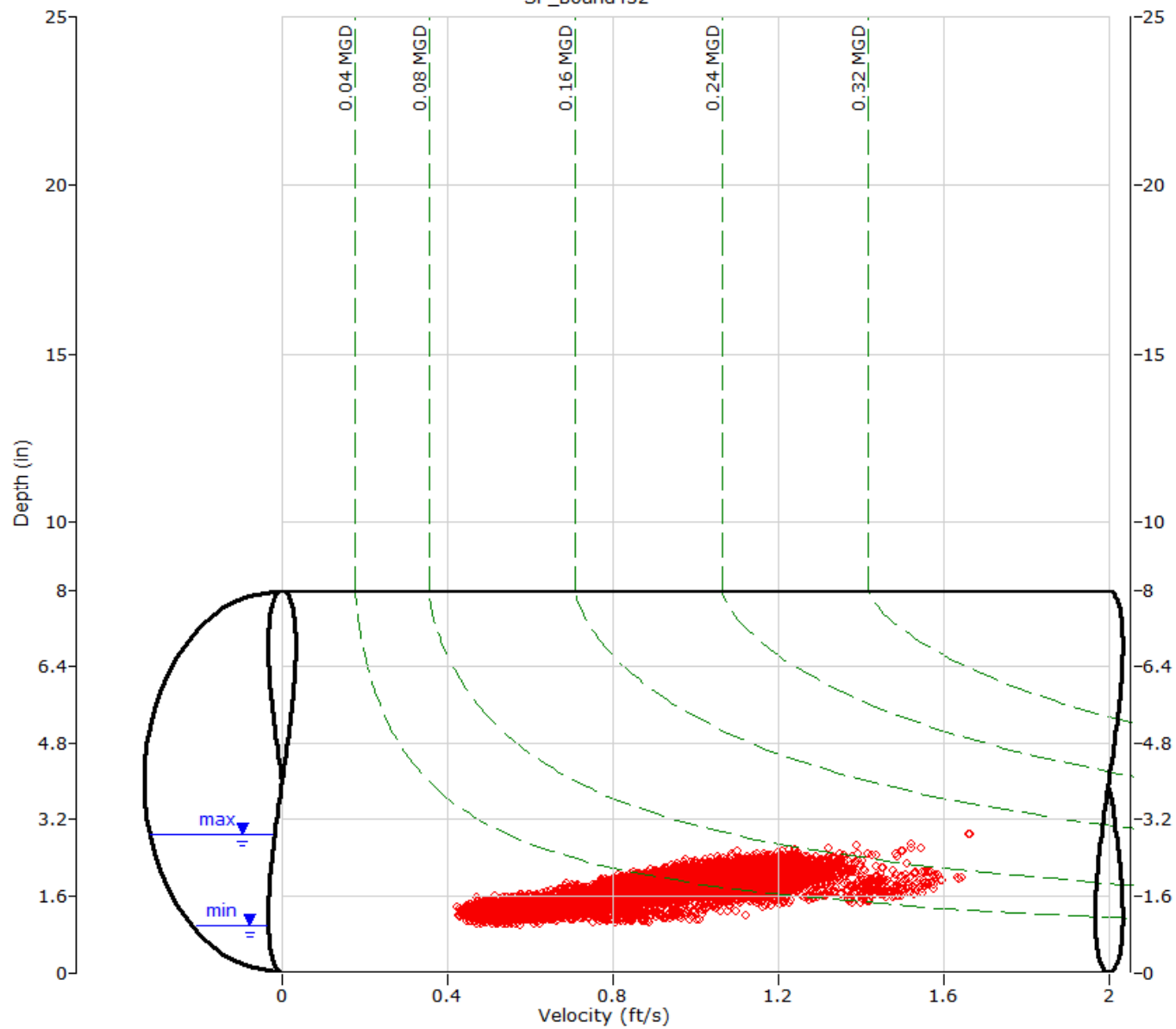
Flow Monitor
SF_Bound432

Pipe Height
8.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
○ Depth - Velocity
--- Iso-Q™
--- Silt
▼ Min-Max Depth

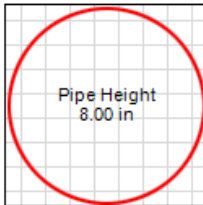
AGS ENVIRONMENTAL
SERVICES



HYDROGRAPH REPORT

SF_Bound432

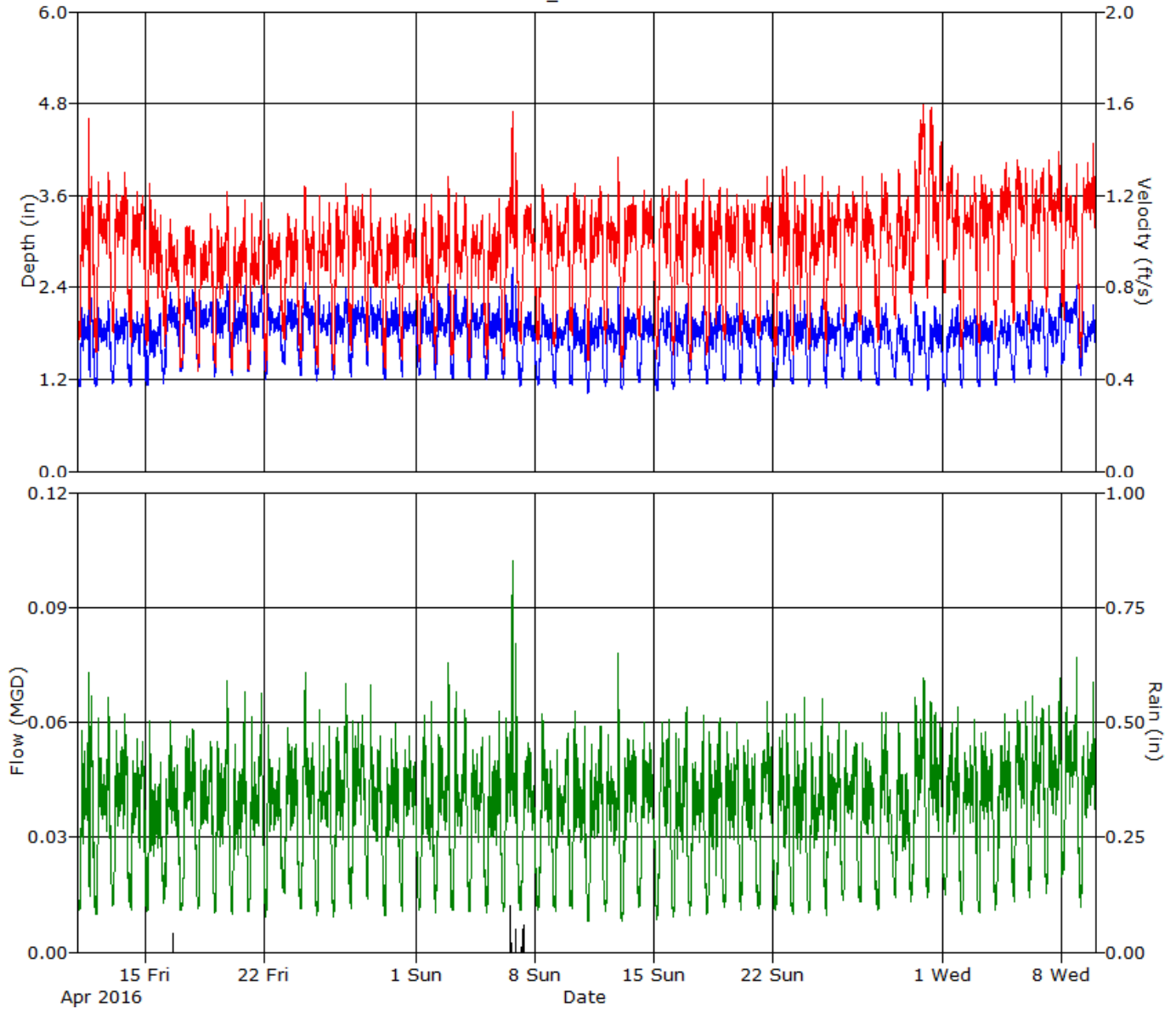
Flow Monitor
SF_Bound432



Report Period
4/11/2016
To
6/9/2016



AGS ENVIRONMENTAL SERVICES



Daily Tabular Report For The Period 4/11/2016 - 6/9/2016

SF_Bound432, Pipe Height: 8 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	17:20	1.10	20:50	2.37	1.68	03:30	0.56	17:10	1.57	0.96	03:30	0.011	17:10	0.075	0.035	0.035	
4/12/2016	02:05	1.09	20:50	2.32	1.70	04:15	0.51	20:50	1.32	0.98	02:45	0.010	20:50	0.071	0.037	0.037	
4/13/2016	02:20	1.13	15:55	2.40	1.72	03:30	0.59	19:30	1.34	1.01	02:20	0.011	15:55	0.076	0.038	0.038	
4/14/2016	02:40	1.11	20:30	2.21	1.68	04:25	0.56	13:10	1.25	0.97	04:25	0.011	13:10	0.063	0.035	0.035	
4/15/2016	03:30	1.11	21:20	2.19	1.64	03:00	0.55	07:35	1.25	0.91	04:20	0.011	07:35	0.061	0.032	0.032	
4/16/2016	02:55	1.13	13:30	2.47	1.83	04:35	0.53	11:25	1.11	0.85	02:30	0.012	13:30	0.065	0.034	0.034	0.04
4/17/2016	03:00	1.24	20:10	2.53	1.89	03:00	0.44	10:45	1.12	0.84	03:00	0.010	20:10	0.068	0.036	0.036	
4/18/2016	04:00	1.33	12:35	2.42	1.89	03:20	0.42	20:35	1.16	0.83	03:15	0.011	12:35	0.061	0.035	0.035	
4/19/2016	03:15	1.21	20:25	2.56	1.89	04:10	0.45	20:25	1.24	0.85	03:20	0.010	20:25	0.077	0.037	0.037	
4/20/2016	03:25	1.26	21:35	2.50	1.86	03:40	0.43	21:35	1.25	0.83	03:40	0.010	21:35	0.075	0.035	0.035	
4/21/2016	02:45	1.28	20:25	2.57	1.89	02:35	0.44	20:25	1.23	0.85	02:45	0.010	20:25	0.077	0.036	0.036	
4/22/2016	03:25	1.19	21:10	2.32	1.83	03:20	0.43	21:10	1.14	0.86	03:20	0.009	21:10	0.062	0.035	0.035	
4/23/2016	05:50	1.39	10:05	2.44	1.86	04:20	0.57	10:05	1.18	0.88	05:50	0.015	10:05	0.069	0.036	0.036	
4/24/2016	04:10	1.23	09:55	2.58	1.86	04:10	0.47	09:55	1.32	0.88	04:10	0.010	09:55	0.083	0.037	0.037	
4/25/2016	03:25	1.18	06:45	2.37	1.80	04:30	0.44	06:45	1.23	0.88	03:25	0.009	06:45	0.069	0.035	0.035	
4/26/2016	03:05	1.19	21:50	2.44	1.84	03:10	0.44	19:25	1.27	0.91	03:05	0.009	19:25	0.073	0.038	0.038	
4/27/2016	03:10	1.21	17:15	2.38	1.87	03:25	0.52	18:50	1.28	0.94	03:10	0.011	18:50	0.071	0.039	0.039	
4/28/2016	02:40	1.36	07:25	2.40	1.91	04:00	0.51	07:15	1.23	0.90	02:40	0.014	07:25	0.070	0.038	0.038	
4/29/2016	03:25	1.17	18:50	2.46	1.80	03:25	0.43	18:50	1.23	0.85	03:25	0.009	18:50	0.072	0.034	0.034	
4/30/2016	03:35	1.23	14:15	2.31	1.85	03:45	0.47	08:40	1.18	0.90	03:35	0.010	08:40	0.062	0.037	0.037	
5/1/2016	04:40	1.23	09:10	2.37	1.83	03:30	0.47	21:10	1.21	0.86	03:30	0.010	21:10	0.068	0.035	0.035	
5/2/2016	03:10	1.22	21:30	2.65	1.86	02:55	0.47	21:30	1.39	0.92	03:05	0.010	21:30	0.091	0.039	0.039	
5/3/2016	04:10	1.20	19:25	2.40	1.85	03:35	0.49	21:05	1.22	0.90	03:05	0.011	07:30	0.068	0.037	0.037	
5/4/2016	02:45	1.20	10:10	2.37	1.83	02:40	0.47	10:10	1.23	0.88	02:40	0.010	10:10	0.069	0.036	0.036	
5/5/2016	04:15	1.18	20:55	2.46	1.80	03:15	0.48	20:20	1.26	0.88	03:15	0.010	20:55	0.072	0.035	0.035	
5/6/2016	02:10	1.19	16:00	2.89	1.81	03:15	0.48	16:00	1.67	0.98	03:15	0.010	16:00	0.123	0.041	0.041	0.34
5/7/2016	02:00	1.06	13:45	2.31	1.68	01:55	0.53	15:55	1.21	0.94	01:55	0.010	13:45	0.065	0.034	0.034	0.13
5/8/2016	04:05	1.12	11:45	2.24	1.70	03:35	0.52	11:45	1.27	0.94	03:35	0.010	11:45	0.066	0.035	0.035	
5/9/2016	04:25	1.09	21:45	2.33	1.68	02:15	0.52	21:45	1.27	0.94	02:15	0.010	21:45	0.069	0.034	0.034	
5/10/2016	03:30	1.11	21:40	2.28	1.67	03:30	0.58	07:30	1.25	0.97	03:30	0.011	21:45	0.065	0.035	0.035	
5/11/2016	01:30	1.00	20:05	2.27	1.68	02:50	0.47	20:05	1.33	0.96	02:50	0.008	20:05	0.070	0.035	0.035	
5/12/2016	04:10	1.10	21:30	2.48	1.71	02:50	0.52	07:30	1.41	0.95	02:50	0.010	21:30	0.083	0.035	0.035	
5/13/2016	02:10	1.07	12:00	2.29	1.72	02:00	0.45	17:40	1.23	0.95	02:00	0.008	12:00	0.064	0.036	0.036	
5/14/2016	02:50	1.15	10:05	2.21	1.73	01:40	0.57	10:25	1.23	0.97	01:40	0.012	10:15	0.062	0.036	0.036	
5/15/2016	04:55	0.99	16:55	2.35	1.70	03:20	0.48	18:20	1.28	0.95	04:05	0.008	16:55	0.071	0.036	0.036	
5/16/2016	03:25	1.07	22:15	2.22	1.71	03:15	0.50	22:15	1.31	0.94	03:25	0.009	22:15	0.067	0.035	0.035	
5/17/2016	02:40	1.10	21:25	2.40	1.74	02:40	0.46	21:25	1.36	0.92	02:40	0.009	21:25	0.077	0.035	0.035	
5/18/2016	04:00	1.13	20:35	2.42	1.72	04:00	0.49	20:35	1.32	0.92	04:00	0.009	20:35	0.076	0.035	0.035	
5/19/2016	03:15	1.16	20:30	2.20	1.75	02:55	0.56	06:35	1.36	0.96	02:35	0.012	06:35	0.065	0.037	0.037	
5/20/2016	02:20	1.14	13:20	2.27	1.73	02:15	0.54	09:35	1.25	0.95	02:20	0.011	13:20	0.066	0.036	0.036	
5/21/2016	04:25	1.11	16:45	2.35	1.74	05:05	0.56	16:45	1.35	0.98	05:05	0.011	16:45	0.075	0.038	0.038	
5/22/2016	02:25	1.10	14:10	2.31	1.65	02:35	0.47	15:45	1.41	0.94	03:20	0.011	14:10	0.075	0.033	0.033	
5/23/2016	04:20	1.13	20:35	2.28	1.73	04:20	0.50	20:55	1.30	0.94	04:20	0.010	20:35	0.068	0.036	0.036	
5/24/2016	03:00	1.11	21:40	2.28	1.69	03:00	0.52	21:50	1.30	0.94	03:00	0.010	21:40	0.069	0.034	0.034	
5/25/2016	03:25	1.09	11:05	2.30	1.71	03:25	0.50	21:35	1.31	0.97	03:25	0.009	11:05	0.068	0.036	0.036	
5/26/2016	03:45	1.19	06:55	2.30	1.73	04:10	0.61	06:55	1.25	1.00	03:45	0.013	06:55	0.067	0.037	0.037	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)							Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total	
5/27/2016	04:30	1.17	17:30	2.21	1.68	03:05	0.61	07:30	1.33	0.97	03:05	0.013	17:30	0.062	0.035	0.035		
5/28/2016	05:20	1.12	16:40	2.28	1.68	05:10	0.54	10:00	1.39	0.97	05:10	0.010	10:00	0.073	0.035	0.035		
5/29/2016	04:45	1.19	19:05	2.17	1.62	04:45	0.66	10:40	1.33	0.98	04:45	0.014	19:05	0.063	0.033	0.033		
5/30/2016	04:15	1.09	11:10	2.47	1.65	04:15	0.65	20:35	1.64	1.18	04:15	0.012	22:05	0.080	0.042	0.042		
5/31/2016	03:05	1.05	14:35	2.36	1.67	01:50	0.72	07:45	1.60	1.18	03:10	0.014	14:35	0.075	0.042	0.042		
6/1/2016	03:50	1.10	13:50	2.34	1.68	02:40	0.75	12:55	1.38	1.09	04:15	0.015	13:50	0.072	0.039	0.039		
6/2/2016	03:45	1.08	09:45	2.18	1.72	04:15	0.51	21:45	1.31	1.00	04:15	0.009	21:45	0.063	0.038	0.038		
6/3/2016	04:05	1.10	22:15	2.18	1.69	02:55	0.54	22:15	1.34	1.02	04:05	0.010	22:15	0.067	0.037	0.037		
6/4/2016	04:05	1.11	12:40	2.28	1.65	03:05	0.56	17:35	1.42	1.05	03:05	0.011	12:40	0.071	0.037	0.037		
6/5/2016	04:50	1.13	21:20	2.19	1.76	04:55	0.62	10:35	1.38	1.08	04:55	0.012	10:35	0.067	0.041	0.041		
6/6/2016	03:30	1.24	07:50	2.24	1.81	02:45	0.60	22:15	1.36	1.07	03:30	0.013	07:30	0.069	0.043	0.043		
6/7/2016	03:20	1.20	22:15	2.37	1.79	03:20	0.64	19:45	1.41	1.10	03:20	0.014	22:15	0.075	0.043	0.043		
6/8/2016	00:50	1.38	21:00	2.46	1.95	03:15	0.58	21:00	1.36	1.05	03:15	0.018	21:00	0.080	0.046	0.046		
6/9/2016	03:00	1.21	21:35	2.20	1.75	03:00	0.46	21:30	1.45	1.07	03:00	0.010	21:35	0.073	0.040	0.040		

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			2.201	0.51
Avg	1.76	0.95	0.037	

Site Commentary

Site Information

SF_Bound595alt	
Pipe Dimensions	14.88" x 14.88"
Silt Level	0.00"

Overview

Site SF_Bound595alt functioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. This is an alternate location. The original location was relocated due to client request. Review of the scattergraph shows that flows remained free flowing throughout the period. Due to the low flow conditions with respect to the size of the pipe, this data set is of slightly lower confidence than typical.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This line is located upstream of location SF_Bas04. A review of balancing indicated minimal net flows (See SF_Bas04 Site Commentary For More Details).

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 6% full at its recorded peak of .94 inches and approximately 3% full during its recorded average depth of .51 inches.

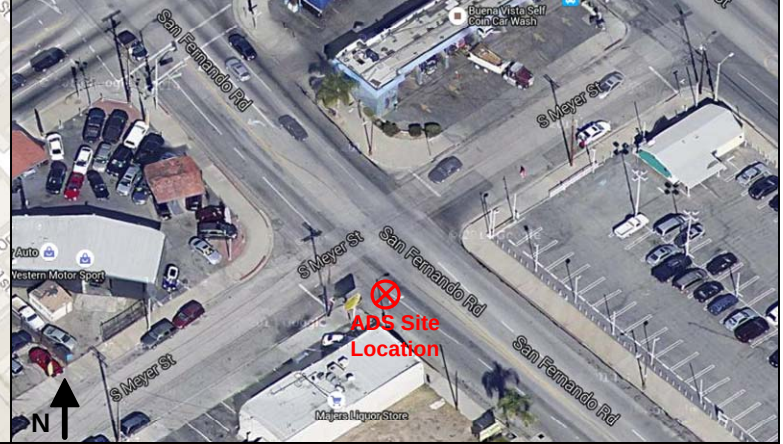
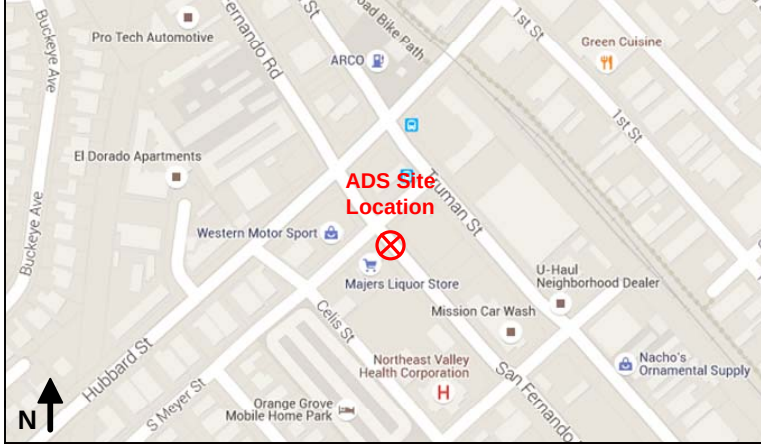
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	0.51	1.33	0.013
Minimum	0.11	0.25	0.000
Maximum	1.25	3.21	0.098
Time of Minimum	5/25/2016 2:30 PM	6/4/2016 5:00 AM	5/25/2016 7:40 PM
Time of Maximum	5/25/2016 2:50 AM	6/1/2016 12:20 PM	5/25/2016 2:50 AM

Data Quality

Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF_Bound595alt		Install Date: 04/06/16		Monitor Type		Peak Doppler	
Address/Location: San Fernando Rd & Meyer				Monitor Model		Triton	
				Data Acquisition		Manual/Wireless Collect	
				Manhole ID			
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		14.88"
					Pipe Width:		14.88"



Investigation Information:				Manhole Information:			
Date/Time of Investigation:		04/06/16 14:41		Manhole Depth:		10'	
Site Hydraulics:		Little to no flow during installation		Manhole Material / Condition		Brick/Good	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition:		VCP/Good	
Upstream Manhole:		Not investigated		Land Use:	Residential ☒	Commercial ☐	Industrial ☐
Downstream Manhole:		Not investigated		Oxygen: 20.9	H2S: 0	LEL: 0	CO: 0
Depth of Flow:	0.50	+/-	0.25	Safety Notes: 2 man crew, high traffic, arrow board required			
Range (Air DOF):		+/-					
Peak Velocity:	0.01	fps					
Silt:	0.00	Inches					

Other Information:			
	Cross Section		Plan

Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard	Trunk		x		
Sensors Devices:	Ultrasonic/Pressure/Velocit	Lift / Pump Station		x		
Surcharge Height:	0	WWTP		x		
Rain Gauge Zone:		Other		x		

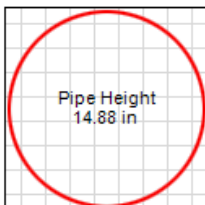
Additional Site Information / Comments:

Standard Traffic Control with No Safety Concerns

SCATTERGRAPH REPORT

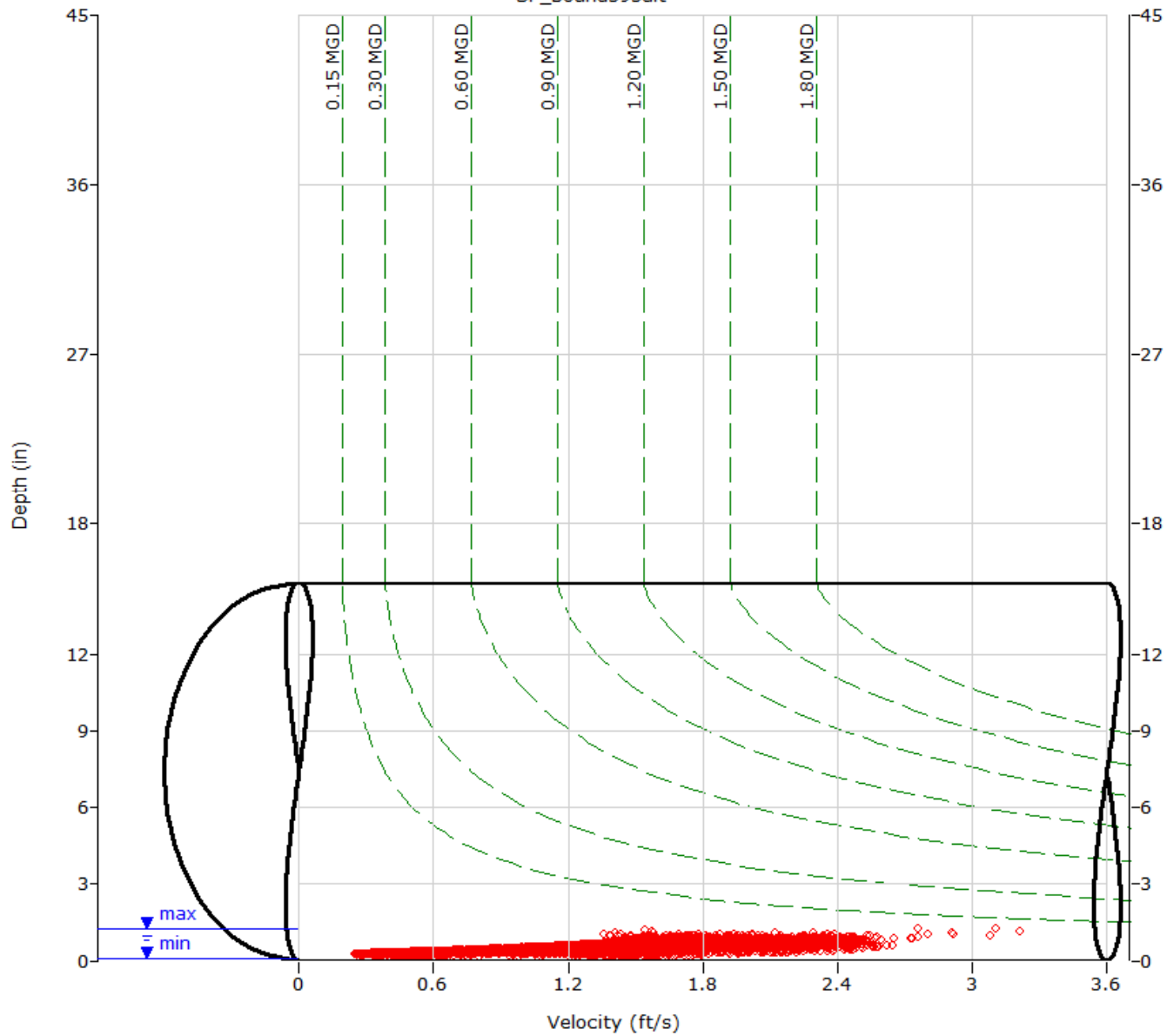
SF_Bound595alt

Flow Monitor
SF_Bound595alt



Report Period
4/11/2016
To
6/9/2016

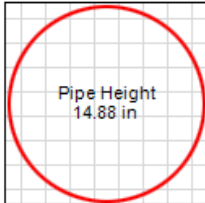
Legend
○ Depth - Velocity
--- Iso-Q™
--- Silt
▼ Min-Max Depth



HYDROGRAPH REPORT

SF_Bound595alt

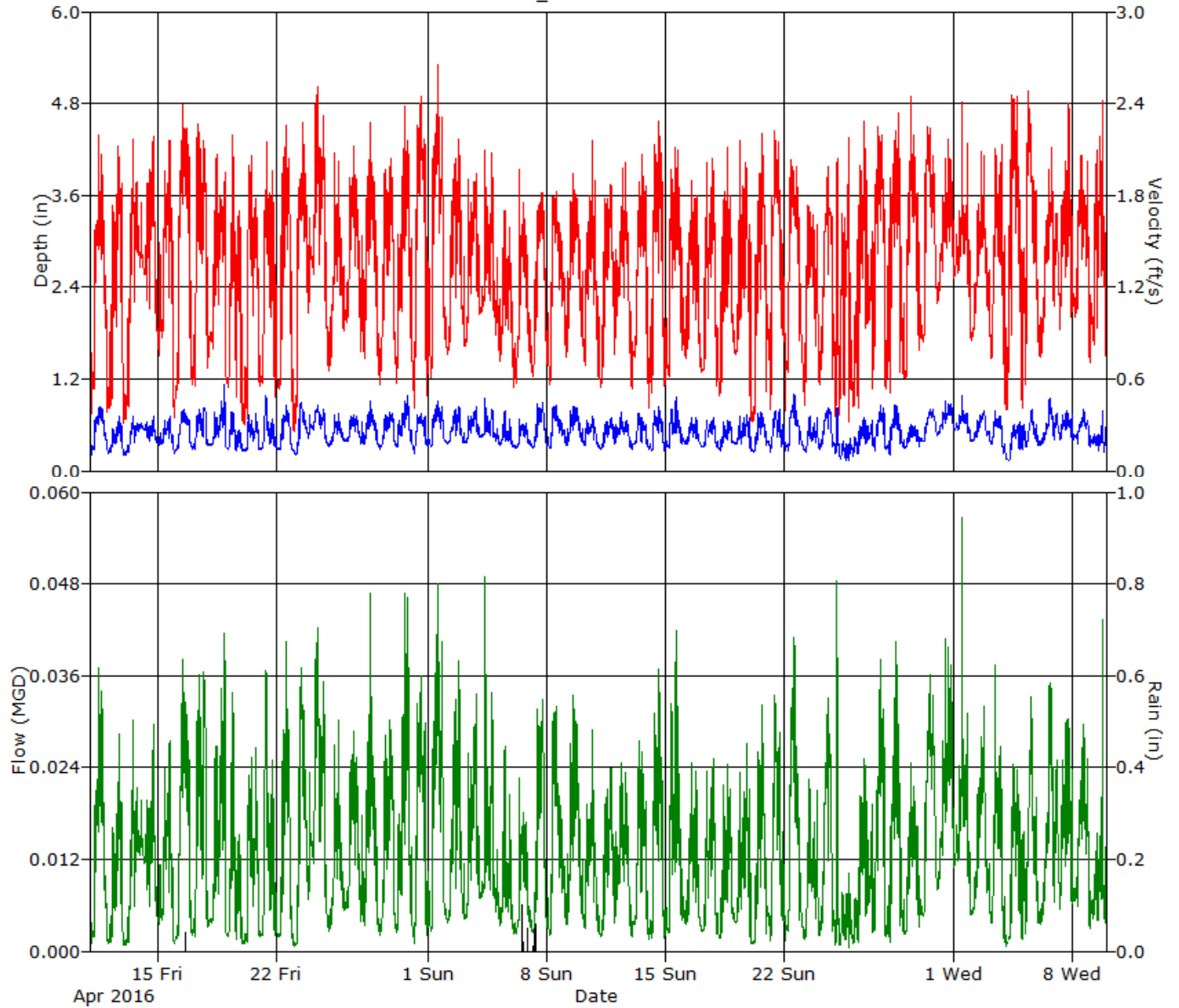
Flow Monitor
SF_Bound595alt



Report Period
4/11/2016
To
6/9/2016



AGS ENVIRONMENTAL SERVICES



Daily Tabular Report For The Period 4/11/2016 - 6/9/2016

SF_Bound595alt, Pipe Height: 14.88 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	02:30	0.20	12:55	0.91	0.54	02:55	0.36	12:55	2.76	1.26	02:55	0.001	12:55	0.054	0.014	0.014	
4/12/2016	03:45	0.20	18:35	0.75	0.41	01:15	0.31	18:30	2.26	1.15	02:50	0.001	18:30	0.033	0.009	0.009	
4/13/2016	00:00	0.20	13:30	0.72	0.44	02:30	0.28	13:10	2.36	1.17	02:30	0.001	13:10	0.032	0.010	0.010	
4/14/2016	13:00	0.35	18:45	0.73	0.53	23:50	0.78	18:35	2.41	1.48	23:50	0.004	18:45	0.034	0.014	0.014	
4/15/2016	23:50	0.24	18:25	0.74	0.45	23:25	0.27	18:25	2.29	1.32	23:25	0.001	18:25	0.033	0.010	0.010	
4/16/2016	00:45	0.23	14:20	0.97	0.52	00:45	0.40	19:55	2.52	1.47	00:45	0.001	14:20	0.041	0.016	0.016	0.04
4/17/2016	06:05	0.28	17:10	0.85	0.53	02:40	0.48	11:35	2.40	1.41	06:05	0.002	11:35	0.040	0.015	0.015	
4/18/2016	04:00	0.33	23:05	1.18	0.56	01:00	0.51	23:30	2.53	1.37	01:00	0.002	23:20	0.057	0.015	0.015	
4/19/2016	15:20	0.25	11:05	0.79	0.43	23:55	0.33	11:05	2.24	1.11	23:55	0.001	11:05	0.036	0.008	0.008	
4/20/2016	02:15	0.25	09:10	0.79	0.45	05:20	0.29	09:55	2.33	1.17	05:10	0.001	09:55	0.033	0.010	0.010	
4/21/2016	01:30	0.28	09:50	0.99	0.47	23:05	0.44	10:55	2.22	1.20	23:05	0.002	10:35	0.039	0.011	0.011	
4/22/2016	23:25	0.27	14:55	0.91	0.50	23:40	0.32	14:55	2.34	1.28	23:40	0.001	14:55	0.046	0.013	0.013	
4/23/2016	04:55	0.20	08:20	0.96	0.51	02:45	0.25	14:50	2.37	1.33	03:00	0.001	08:20	0.039	0.014	0.014	
4/24/2016	23:55	0.38	11:55	0.90	0.64	22:50	0.84	10:35	2.53	1.73	22:50	0.005	12:00	0.048	0.022	0.022	
4/25/2016	03:15	0.31	16:10	0.78	0.47	03:15	0.64	11:10	2.51	1.19	03:15	0.003	16:10	0.034	0.010	0.010	
4/26/2016	23:55	0.38	13:55	0.76	0.53	23:55	0.83	13:55	2.29	1.41	23:55	0.004	13:55	0.034	0.013	0.013	
4/27/2016	06:20	0.34	14:15	1.06	0.54	06:20	0.73	14:15	2.91	1.40	06:20	0.003	14:15	0.072	0.014	0.014	
4/28/2016	03:55	0.28	21:30	0.78	0.52	03:55	0.56	19:00	2.46	1.31	03:55	0.002	19:00	0.036	0.013	0.013	
4/29/2016	02:55	0.32	18:25	1.00	0.59	03:25	0.46	14:20	2.53	1.41	03:25	0.002	18:25	0.054	0.017	0.017	
4/30/2016	04:05	0.23	19:00	0.80	0.50	04:05	0.39	13:05	2.53	1.49	04:05	0.001	19:00	0.040	0.015	0.015	
5/1/2016	03:35	0.32	13:45	0.91	0.59	03:35	0.47	13:35	2.73	1.57	03:35	0.002	13:45	0.050	0.019	0.019	
5/2/2016	04:05	0.35	19:20	0.87	0.54	04:05	0.76	19:20	2.26	1.39	04:05	0.004	19:20	0.042	0.014	0.014	
5/3/2016	01:25	0.37	19:40	0.87	0.55	02:35	0.70	19:40	2.15	1.34	02:35	0.004	19:40	0.040	0.014	0.014	
5/4/2016	23:30	0.38	08:50	1.24	0.53	23:30	0.86	08:50	2.76	1.28	23:30	0.005	08:50	0.086	0.012	0.012	
5/5/2016	23:45	0.32	12:35	0.82	0.45	05:50	0.70	15:00	1.75	1.10	05:50	0.003	12:35	0.029	0.008	0.008	
5/6/2016	04:40	0.30	09:00	0.70	0.44	00:25	0.46	09:00	2.00	1.11	03:55	0.002	09:00	0.027	0.008	0.008	0.34
5/7/2016	04:55	0.30	10:20	0.97	0.54	04:55	0.61	18:45	1.82	1.22	04:55	0.002	12:35	0.034	0.013	0.013	0.13
5/8/2016	04:45	0.29	13:05	0.88	0.56	04:10	0.42	11:15	1.95	1.28	04:10	0.002	11:15	0.035	0.014	0.014	
5/9/2016	05:15	0.33	09:30	0.86	0.58	04:05	0.69	13:45	1.95	1.35	04:05	0.003	13:55	0.035	0.015	0.015	
5/10/2016	06:50	0.32	15:55	0.73	0.50	23:20	0.64	20:05	2.89	1.26	06:50	0.003	15:55	0.031	0.011	0.011	
5/11/2016	04:25	0.28	19:00	0.72	0.46	01:40	0.47	09:25	2.13	1.19	04:25	0.002	18:55	0.028	0.010	0.010	
5/12/2016	23:50	0.29	08:20	0.78	0.50	23:50	0.56	11:35	2.30	1.29	23:50	0.002	15:35	0.028	0.011	0.011	
5/13/2016	23:30	0.28	10:00	0.79	0.48	23:55	0.37	14:55	2.31	1.27	23:55	0.001	14:55	0.032	0.011	0.011	
5/14/2016	22:50	0.26	14:45	0.99	0.50	00:00	0.37	14:15	2.37	1.31	00:00	0.001	14:45	0.052	0.013	0.013	
5/15/2016	00:00	0.27	15:00	0.98	0.53	05:40	0.52	09:35	2.37	1.35	00:00	0.002	09:35	0.051	0.014	0.014	
5/16/2016	06:20	0.34	17:55	0.71	0.48	00:00	0.62	19:55	2.25	1.23	00:00	0.003	13:10	0.029	0.010	0.010	
5/17/2016	02:35	0.31	20:40	0.71	0.47	08:10	0.50	10:40	2.24	1.23	08:10	0.002	10:40	0.028	0.010	0.010	
5/18/2016	05:05	0.27	09:30	0.74	0.44	04:50	0.42	09:30	2.44	1.14	04:50	0.001	09:30	0.035	0.009	0.009	
5/19/2016	23:45	0.30	08:40	0.83	0.47	23:50	0.44	08:35	2.36	1.23	23:45	0.002	19:15	0.035	0.010	0.010	
5/20/2016	06:50	0.24	13:45	0.81	0.46	05:10	0.31	17:05	2.44	1.15	05:15	0.001	17:05	0.037	0.010	0.010	
5/21/2016	04:10	0.24	17:10	0.87	0.50	05:00	0.31	12:00	2.34	1.42	05:00	0.001	16:10	0.039	0.013	0.013	
5/22/2016	06:10	0.24	13:30	1.06	0.57	01:55	0.34	13:30	2.12	1.38	01:55	0.001	13:30	0.052	0.016	0.016	
5/23/2016	07:10	0.21	10:55	0.71	0.44	06:45	0.29	13:35	1.93	1.15	07:15	0.001	11:05	0.024	0.009	0.009	
5/24/2016	02:15	0.28	14:50	0.88	0.52	20:50	0.48	13:20	2.43	1.21	02:15	0.002	13:20	0.044	0.013	0.013	
5/25/2016	14:30	0.11	02:50	1.25	0.29	19:40	0.27	02:50	3.11	1.03	19:40	0.000	02:50	0.098	0.005	0.005	
5/26/2016	01:40	0.19	16:20	0.76	0.42	01:20	0.33	18:05	2.34	1.19	01:20	0.001	18:20	0.030	0.009	0.009	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)							Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total	
5/27/2016	08:10	0.26	21:15	0.90	0.53	23:50	0.42	21:10	2.73	1.53	23:50	0.002	21:10	0.051	0.015	0.015		
5/28/2016	05:15	0.19	15:10	0.88	0.50	00:15	0.36	17:40	2.37	1.41	05:10	0.001	15:10	0.043	0.014	0.014		
5/29/2016	03:20	0.30	14:10	0.62	0.43	01:30	0.53	11:20	2.50	1.42	03:20	0.002	11:35	0.026	0.010	0.010		
5/30/2016	00:00	0.31	18:25	0.83	0.59	00:05	0.71	10:30	2.37	1.56	00:00	0.003	18:45	0.037	0.018	0.018		
5/31/2016	00:25	0.45	12:30	0.95	0.67	02:05	1.06	12:30	2.54	1.53	02:05	0.007	12:30	0.053	0.020	0.020		
6/1/2016	23:55	0.40	12:20	1.14	0.62	23:05	0.97	12:20	3.21	1.46	23:55	0.006	12:20	0.089	0.017	0.017		
6/2/2016	01:05	0.38	12:10	0.80	0.56	01:05	0.85	12:10	2.60	1.35	01:05	0.005	12:10	0.042	0.014	0.014		
6/3/2016	22:20	0.22	10:20	1.03	0.52	22:10	0.46	10:20	2.81	1.41	22:10	0.001	10:20	0.066	0.014	0.014		
6/4/2016	03:50	0.12	21:25	0.75	0.40	05:00	0.25	13:00	2.65	1.50	03:15	0.001	14:00	0.028	0.011	0.010		
6/5/2016	01:10	0.28	14:40	0.81	0.50	01:10	0.34	11:20	2.54	1.54	01:10	0.001	14:05	0.038	0.013	0.013		
6/6/2016	00:25	0.33	16:55	0.96	0.55	04:20	0.59	18:50	2.38	1.30	04:20	0.003	18:50	0.039	0.014	0.014		
6/7/2016	08:20	0.40	16:25	0.79	0.60	08:20	0.89	18:50	2.48	1.53	08:20	0.005	18:50	0.034	0.017	0.017		
6/8/2016	07:50	0.35	16:40	0.80	0.55	00:35	0.95	13:00	2.31	1.47	07:15	0.005	16:40	0.030	0.014	0.014		
6/9/2016	22:10	0.23	18:50	1.00	0.40	00:45	0.46	18:50	3.08	1.38	00:45	0.002	18:50	0.070	0.009	0.009		

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			0.770	0.51
Avg	0.51	1.33	0.013	

Site Commentary

Site Information

SF_Bound6	
Pipe Dimensions	8.00" x 8.00"
Silt Level	0.00"

Overview

Site SF_Bound6 functioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows swift moving velocity with shallow depth.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This line is located upstream of location SF_Bas01. A review indicated balancing is tight (See SF_Bas01 Site Commentary For More Details).

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 20% full at its recorded peak of 1.62 inches and approximately 15% full during its recorded average depth of 1.16 inches.

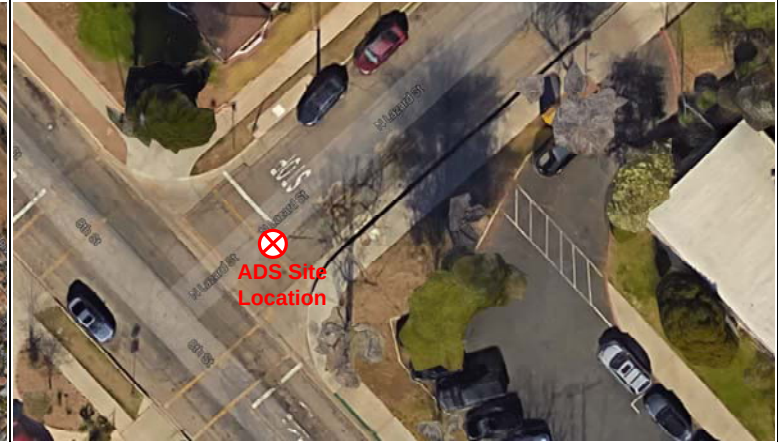
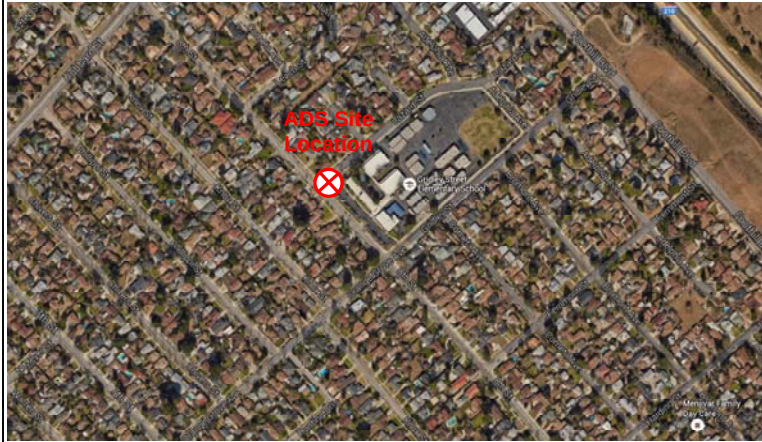
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.16	3.73	0.076
Minimum	0.90	0.00	0.013
Maximum	2.55	7.01	0.174
Time of Minimum	5/28/2016 5:20 AM	5/7/2016 10:30 PM	6/3/2016 2:55 AM
Time of Maximum	5/14/2016 3:25 AM	5/22/2016 8:50 PM	5/22/2016 8:15 PM

Data Quality

Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF Bound6		Install Date: 4/6/16		Monitor Type		Peak Doppler	
Address/Location: 8 th & Lazard (Located S. on Lazard)				Monitor Model		Triton	
				Data Acquisition		Manual/Wireless Collect	
				Manhole ID			
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		8.00 "
					Pipe Width:		8.00 "



Investigation Information:				Manhole Information:			
Date/Time of Investigation:		4/1/16@ 1000		Manhole Depth:		15'	
Site Hydraulics:		Low, good straight through flow		Manhole Material / Condition		Precast/OK	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition: VCP/Good			
Upstream Manhole:		Not investigated		Land Use:	Residential ☒	Commercial ☐	Industrial ☐
Downstream Manhole:		Not investigated		Oxygen: 20.9	H2S: 0	LEL: 0	CO: 0
Depth of Flow:	1.25 " +/- 0.13"			Safety Notes: 2 man crew required and one blower is to be operated at all times.			
Range (Air DOF):	+/-						
Peak Velocity:	4.60 fps						
Silt:	0.00 Inches						

Other Information:			
	Cross Section		Plan

Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard	Trunk	☐	☒	☐	
Sensors Devices:	Ultrasonic/Pressure/Veloccity	Lift / Pump Station	☐	☒	☐	
Surcharge Height:	0	WWTP	☐	☒	☐	
Rain Gauge Zone:		Other	☐	☒	☐	

Additional Site Information / Comments:	
Standard Traffic Control with No Safety Concerns	

SCATTERGRAPH REPORT

SF_Bound6

Flow Monitor

SF_Bound6

Pipe Height

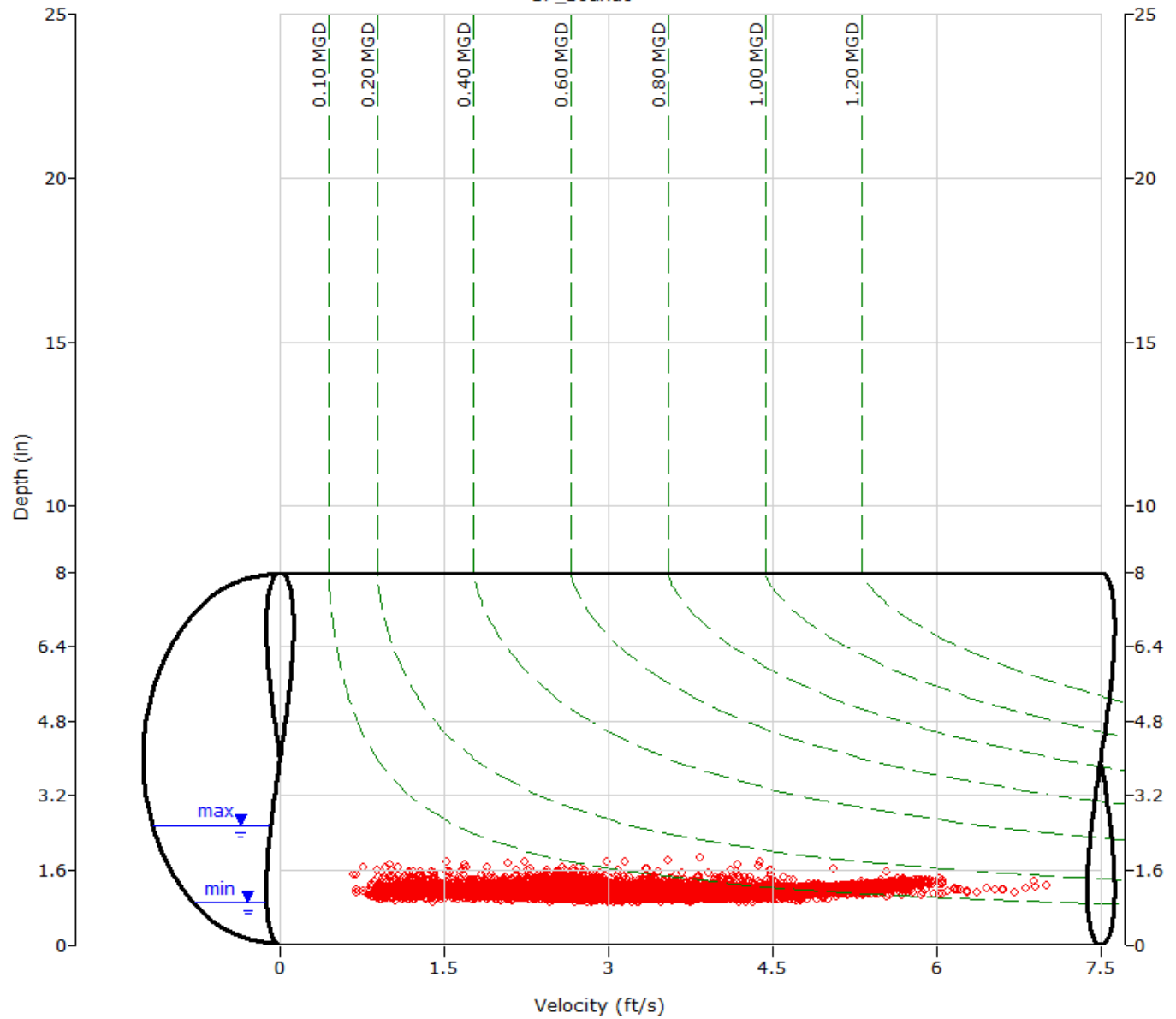
8.00 in

Report Period

4/11/2016
To
6/9/2016

Legend

- Depth - Velocity
- - - Iso-Q™
- - - Silt
- ▼ Min-Max Depth



HYDROGRAPH REPORT

SF_Bound6

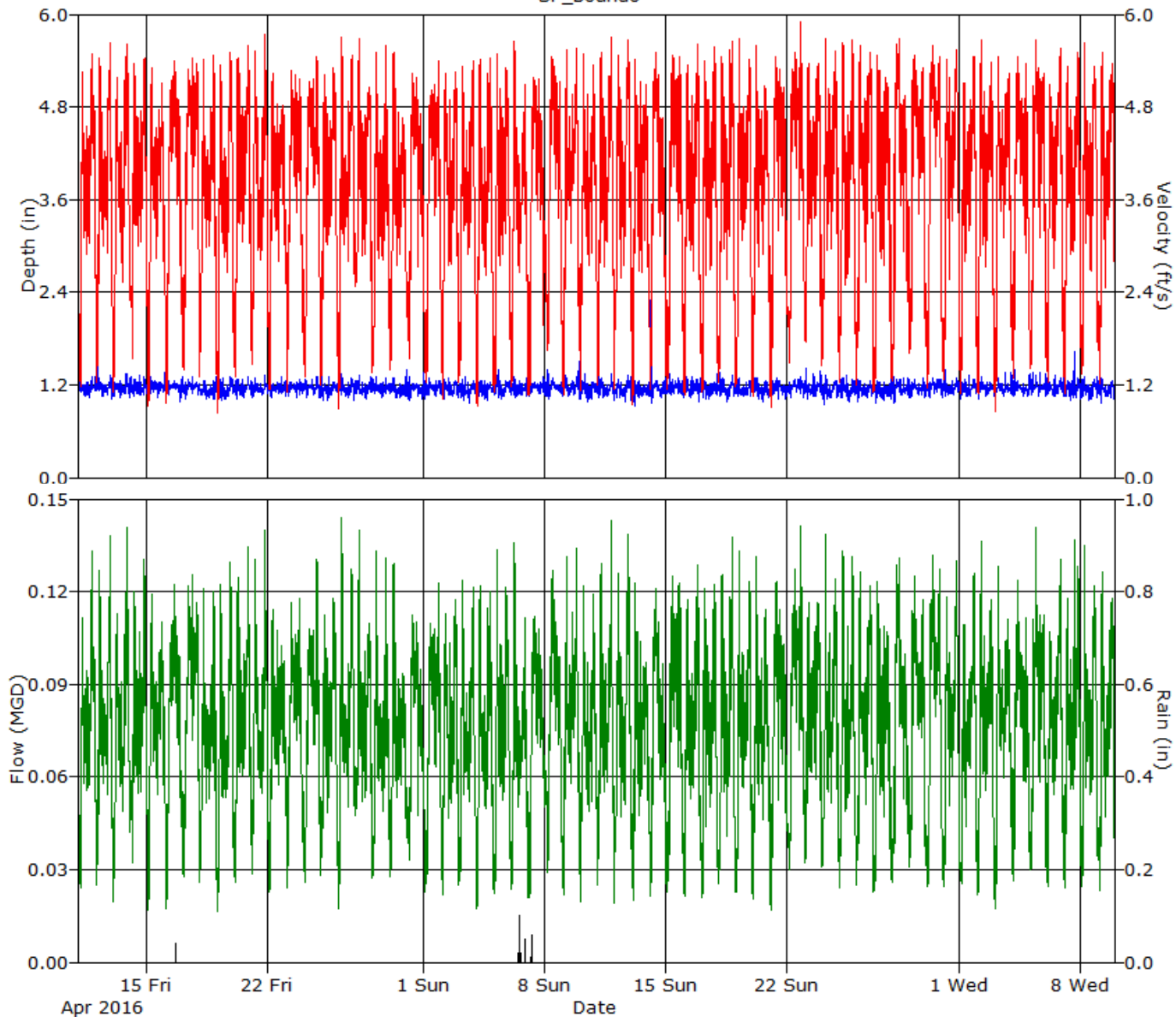
Flow Monitor
SF_Bound6

Pipe Height
8.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
— Depth
— Velocity
— Quantity
— Rain

AGS ENVIRONMENTAL
SERVICES



Daily Tabular Report For The Period 4/11/2016 - 6/9/2016

SF_Bound6, Pipe Height: 8 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	08:10	0.98	23:30	1.45	1.16	04:05	1.17	20:10	5.82	3.64	04:10	0.022	20:10	0.151	0.074	0.074	
4/12/2016	05:05	0.94	04:05	1.78	1.18	01:35	1.13	17:15	6.11	3.69	01:35	0.020	20:45	0.139	0.076	0.076	
4/13/2016	01:45	0.96	19:40	1.52	1.16	02:10	1.05	17:45	6.60	3.73	02:10	0.018	20:55	0.151	0.076	0.076	
4/14/2016	00:10	0.99	11:20	1.52	1.17	04:10	1.16	14:15	5.86	3.81	03:55	0.022	14:15	0.154	0.078	0.078	
4/15/2016	03:05	0.97	02:05	1.48	1.16	03:15	0.86	13:45	5.42	3.62	03:05	0.014	20:55	0.123	0.074	0.074	
4/16/2016	22:20	0.96	01:25	1.57	1.17	02:25	0.83	15:25	5.87	3.88	02:25	0.015	15:25	0.149	0.080	0.080	0.04
4/17/2016	00:25	0.97	06:25	1.37	1.17	04:05	1.23	14:10	5.96	3.93	04:05	0.025	14:10	0.143	0.081	0.081	
4/18/2016	11:30	0.95	16:35	1.43	1.14	01:30	1.19	20:35	5.64	3.69	01:30	0.023	20:45	0.126	0.073	0.073	
4/19/2016	08:45	0.97	02:55	1.59	1.15	02:30	0.82	21:45	5.87	3.54	02:30	0.014	20:00	0.153	0.071	0.071	
4/20/2016	11:25	0.96	04:25	1.39	1.16	00:40	1.00	22:35	6.17	3.83	00:40	0.019	06:30	0.135	0.078	0.078	
4/21/2016	02:55	0.98	14:30	1.34	1.16	01:00	0.99	10:25	6.05	3.78	03:25	0.026	20:30	0.147	0.077	0.077	
4/22/2016	23:40	0.96	19:55	1.53	1.16	01:45	0.77	14:15	5.74	3.69	01:45	0.015	14:15	0.138	0.074	0.074	
4/23/2016	17:00	0.94	20:00	1.46	1.16	03:15	1.05	19:35	6.05	3.85	05:05	0.022	19:35	0.159	0.079	0.079	
4/24/2016	06:35	0.98	04:35	1.49	1.17	04:25	1.09	14:45	6.54	3.82	03:15	0.022	20:35	0.147	0.079	0.079	
4/25/2016	00:10	0.97	02:15	1.58	1.17	01:35	1.10	18:30	5.50	3.70	01:25	0.021	19:30	0.126	0.075	0.075	
4/26/2016	15:05	0.98	06:00	1.63	1.16	03:00	0.89	20:45	5.89	3.65	03:00	0.014	06:40	0.173	0.075	0.075	
4/27/2016	00:15	0.95	02:55	1.50	1.16	01:30	2.29	16:35	6.37	3.84	01:45	0.042	06:30	0.141	0.078	0.078	
4/28/2016	00:30	0.96	14:10	1.48	1.17	01:55	1.18	20:15	5.78	3.63	01:55	0.023	20:15	0.138	0.074	0.074	
4/29/2016	16:35	0.91	16:25	1.53	1.15	00:50	1.28	06:50	5.54	3.56	01:35	0.025	06:50	0.131	0.071	0.071	
4/30/2016	02:45	0.95	01:05	1.44	1.16	03:25	1.21	15:15	6.21	3.79	03:25	0.024	15:15	0.129	0.076	0.076	
5/1/2016	17:00	0.92	00:10	1.54	1.17	04:35	0.93	21:40	5.97	3.72	05:00	0.018	21:40	0.150	0.077	0.077	
5/2/2016	13:20	0.97	04:10	1.72	1.16	02:35	0.94	18:45	5.92	3.59	02:35	0.020	18:45	0.150	0.072	0.072	
5/3/2016	15:35	0.91	14:15	1.50	1.14	01:35	1.10	21:15	5.60	3.55	01:35	0.022	21:15	0.135	0.070	0.070	
5/4/2016	01:35	0.95	04:00	1.61	1.15	01:30	0.85	18:10	5.61	3.50	03:10	0.016	18:10	0.132	0.071	0.071	
5/5/2016	03:40	0.98	05:00	1.48	1.17	01:55	0.71	12:00	6.91	3.51	01:55	0.013	12:00	0.151	0.072	0.072	
5/6/2016	23:20	0.95	23:45	1.47	1.14	03:30	1.17	09:35	5.77	3.46	03:15	0.023	06:45	0.139	0.069	0.069	0.34
5/7/2016	23:45	0.97	23:40	1.56	1.16	22:30	0.00	11:15	5.74	3.66	02:45	0.016	11:15	0.138	0.075	0.075	0.13
5/8/2016	00:55	0.97	04:05	1.66	1.17	04:40	1.08	13:10	5.79	3.92	04:40	0.019	13:10	0.144	0.081	0.081	
5/9/2016	01:20	0.97	05:05	1.66	1.17	02:20	1.03	15:50	5.91	3.74	02:20	0.020	15:50	0.149	0.077	0.077	
5/10/2016	12:35	0.91	00:15	1.75	1.14	03:10	0.97	18:00	5.73	3.62	01:45	0.017	18:00	0.129	0.072	0.072	
5/11/2016	13:00	0.95	03:25	1.52	1.15	01:55	1.14	21:00	5.90	3.67	01:25	0.022	21:35	0.150	0.074	0.074	
5/12/2016	04:30	0.95	05:00	1.43	1.14	01:40	1.02	18:20	5.95	3.77	01:40	0.017	21:15	0.150	0.076	0.076	
5/13/2016	05:15	0.91	03:05	1.66	1.14	03:10	0.76	22:30	5.90	3.63	03:15	0.015	09:30	0.139	0.072	0.072	
5/14/2016	03:00	0.91	03:25	2.55	1.17	02:40	0.98	12:05	6.17	3.71	03:45	0.019	11:50	0.137	0.075	0.075	
5/15/2016	07:05	0.96	00:55	1.61	1.17	01:45	1.09	09:10	5.85	3.74	01:45	0.021	09:10	0.149	0.077	0.077	
5/16/2016	10:10	0.95	08:25	1.60	1.16	02:45	1.00	13:55	6.72	3.64	02:45	0.020	16:55	0.144	0.074	0.074	
5/17/2016	05:35	0.96	04:30	1.56	1.16	00:40	0.95	22:20	6.19	3.66	03:00	0.020	19:55	0.147	0.074	0.074	
5/18/2016	14:30	0.91	04:00	1.53	1.16	01:55	0.87	17:20	6.61	3.72	01:55	0.017	21:20	0.162	0.075	0.075	
5/19/2016	23:50	0.97	06:00	1.61	1.14	03:20	0.94	13:00	6.81	3.70	03:20	0.020	13:00	0.145	0.074	0.074	
5/20/2016	10:45	0.91	08:35	1.52	1.14	02:35	1.00	17:00	5.73	3.66	02:35	0.018	19:30	0.135	0.073	0.073	
5/21/2016	06:05	0.96	05:55	1.52	1.15	01:50	0.86	17:00	5.77	3.81	01:45	0.015	11:20	0.139	0.078	0.078	
5/22/2016	00:10	0.97	18:55	1.48	1.18	04:55	1.18	20:50	7.01	4.01	04:55	0.026	20:15	0.174	0.084	0.084	
5/23/2016	16:50	0.97	16:05	1.60	1.16	02:45	1.63	09:50	5.98	3.86	02:40	0.032	16:05	0.144	0.079	0.079	
5/24/2016	09:00	0.94	00:40	1.54	1.14	03:15	1.05	21:45	5.82	3.83	03:20	0.021	07:25	0.140	0.076	0.076	
5/25/2016	04:20	0.96	12:40	1.49	1.14	02:20	1.06	20:25	6.03	3.64	02:20	0.020	20:25	0.142	0.073	0.073	
5/26/2016	03:40	0.92	01:45	1.43	1.14	01:20	1.19	20:55	5.76	3.85	01:25	0.024	20:55	0.132	0.076	0.076	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)							Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total	
5/27/2016	05:25	0.91	23:45	1.40	1.14	04:05	0.88	10:25	6.46	3.67	04:05	0.018	10:25	0.138	0.073	0.073		
5/28/2016	05:20	0.90	03:00	1.55	1.15	02:55	0.70	12:35	6.06	3.80	02:55	0.015	12:35	0.146	0.076	0.076		
5/29/2016	06:45	0.97	07:10	1.48	1.16	03:20	1.36	09:40	6.03	3.91	03:20	0.026	21:30	0.137	0.079	0.079		
5/30/2016	01:00	0.96	07:55	1.70	1.16	04:00	1.04	11:40	5.94	3.94	04:00	0.021	11:40	0.154	0.081	0.081		
5/31/2016	09:55	0.98	04:25	1.46	1.16	03:05	1.08	21:05	5.85	3.83	03:05	0.021	21:05	0.141	0.077	0.077		
6/1/2016	10:50	0.97	09:00	1.46	1.15	01:55	1.06	17:05	5.78	3.61	03:55	0.020	17:05	0.137	0.073	0.073		
6/2/2016	13:30	0.96	15:25	1.44	1.16	02:40	0.93	18:30	5.76	3.70	02:45	0.019	18:30	0.139	0.076	0.076		
6/3/2016	15:10	0.97	16:15	1.78	1.16	03:15	0.68	09:10	5.54	3.69	02:55	0.013	06:50	0.132	0.074	0.074		
6/4/2016	18:25	0.98	05:20	1.79	1.16	03:35	1.21	10:10	5.78	3.82	01:55	0.025	10:10	0.147	0.077	0.077		
6/5/2016	00:30	0.98	16:10	1.76	1.18	02:30	1.35	11:35	5.90	3.88	02:55	0.027	16:10	0.162	0.081	0.081		
6/6/2016	12:15	0.96	00:45	1.65	1.17	02:15	0.89	15:30	5.65	3.79	02:20	0.016	20:45	0.133	0.078	0.078		
6/7/2016	09:50	0.91	16:35	1.86	1.17	02:45	0.99	17:25	5.62	3.79	02:45	0.020	16:35	0.153	0.077	0.077		
6/8/2016	12:40	0.91	04:55	1.56	1.15	03:40	1.33	20:45	5.68	3.79	02:55	0.024	20:45	0.139	0.076	0.076		
6/9/2016	05:05	0.91	01:45	1.40	1.14	03:25	1.03	18:05	5.76	3.75	03:25	0.020	06:25	0.130	0.075	0.075		

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			4.536	0.51
Avg	1.16	3.73	0.076	

Site Commentary

Site Information

SF_Bound817	
Pipe Dimensions	7.00" x 8.00"
Silt Level	0.00"

Overview

Site SF_Bound817 functioned under normal conditions during the period Monday, April 11, 2016 to Thursday, June 09, 2016 . No surcharge conditions were experienced at this location. Review of the scattergraph shows that flows remained free flowing throughout the data period.

Flow depth and velocity measurements recorded by the flow monitor are consistent with field confirmations conducted to date and support the relative accuracy of the flow monitor at this location.

This line is located upstream of location SF_Bas4A. A review of balancing indicated no problems (See SF_Bas4A Site Commentary For More Details).

Observations

Average flow depth, velocity, and quantity data observed during Monday, April 11, 2016 to Thursday, June 09, 2016 , along with observed minimum and maximum data, are provided in the following table. The values presented are based on 5-minute data. In regards to depth, this site flows at 27% full at its recorded peak of 1.87 inches and approximately 16% full during its recorded average depth of 1.14 inches.

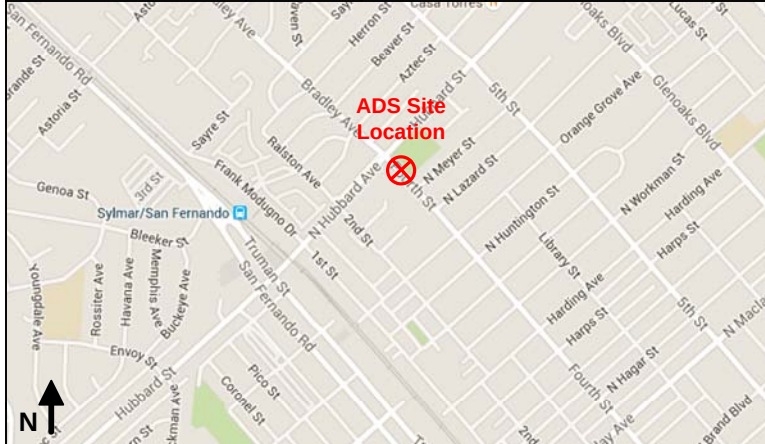
Observed Flow Conditions			
Item	Depth (in)	Velocity (ft/s)	Quantity (MGD)
Average	1.14	1.04	0.023
Minimum	0.66	0.26	0.003
Maximum	2.72	2.42	0.109
Time of Minimum	5/31/2016 5:05 AM	5/5/2016 3:35 AM	5/5/2016 3:35 AM
Time of Maximum	4/29/2016 7:40 PM	4/25/2016 1:30 PM	4/25/2016 1:30 PM

Data Quality

Data uptime observed during the Monday, April 11, 2016 to the Thursday, June 09, 2016 monitoring period is provided in the table below. Based upon the quality and consistency of the observed flow depth and velocity data, the Continuity equation was used to calculate flow rate and quantities during the monitoring period.

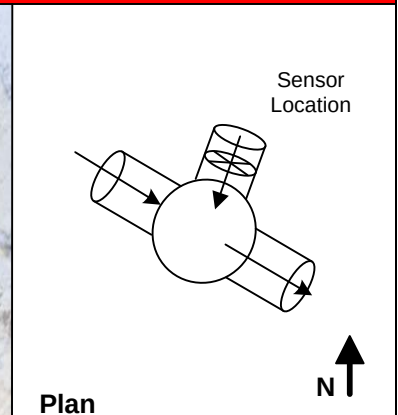
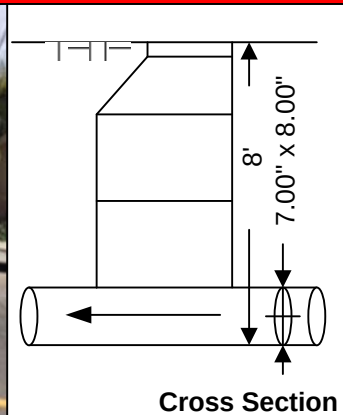
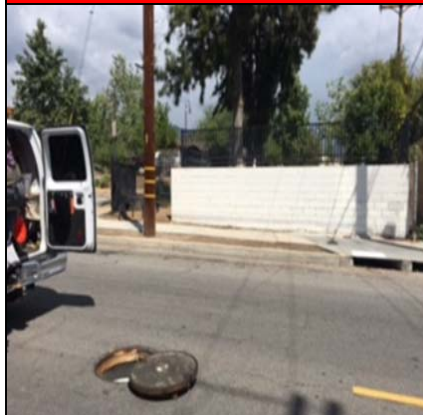
Percent Uptime	
Depth (in)	100
Velocity (ft/s)	100
Quantity (MGD)	100

Project Name: San Fernando TFM 2016		City: San Fernando		Agency: San Fernando		FM Initials: SK	
Site Name: SF_Bound817		Install Date: 03/30/16		Monitor Type		Peak Doppler	
Address/Location: 2024 Fourth St		Monitor Model		Triton			
		Data Acquisition		Manual/Wireless Collect			
		Manhole ID					
Access: Drive	Type of System:	Sanitary ☒	Storm ☐	Combined ☐	Pipe Height:		7.00 "
					Pipe Width:		8.00 "



Investigation Information:				Manhole Information:			
Date/Time of Investigation:		03/30/16 13:10		Manhole Depth:		8'	
Site Hydraulics:		Low/Slow straight through flow		Manhole Material / Condition		Precast/Good	
Upstream Input: (L/S, P/S)		--		Pipe Material / Condition:		VCP/Good	
Upstream Manhole:		Not investigated		Land Use:	Residential ☐	Commercial ☐	Industrial ☐ Trunk ☐
Downstream Manhole:		Not investigated		Oxygen: 20.9	H2S: 0	LEL: 0	CO: 0
Depth of Flow:	1.00	+/-	0.25	Safety Notes: 2 man crew required; No special requirements			
Range (Air DOF):	+/-						
Peak Velocity:	1.50	fps					
Silt:	0.00	Inches					

Other Information:



Installation Information		Backup	Yes	No	?	Distance
Installation Type:	Standard	Trunk		x		
Sensors Devices:	Ultrasonic/Pressure/Veloc	Lift / Pump Station		x		
Surcharge Height:	0	WWTP		x		
Rain Gauge Zone:		Other		x		

Additional Site Information / Comments:

Standard Traffic Control with No Safety Concerns

SCATTERGRAPH REPORT

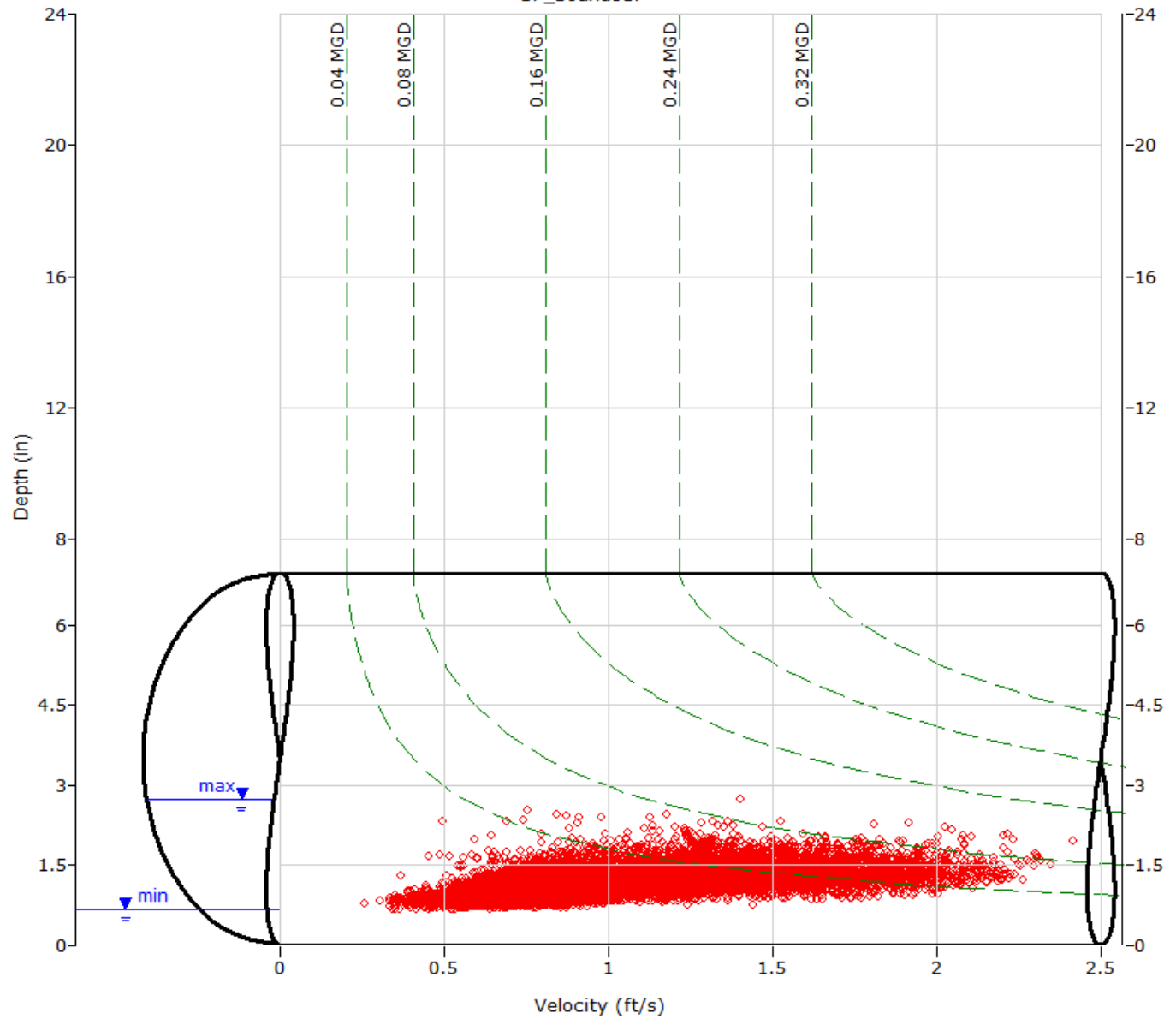
SF_Bound817

Flow Monitor
SF_Bound817

Pipe Height
7.00 in

Report Period
4/11/2016
To
6/9/2016

Legend
○ Depth - Velocity
--- Iso-Q™
--- Silt
▼ Min-Max Depth

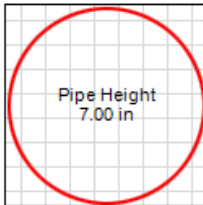


AGS ENVIRONMENTAL SERVICES

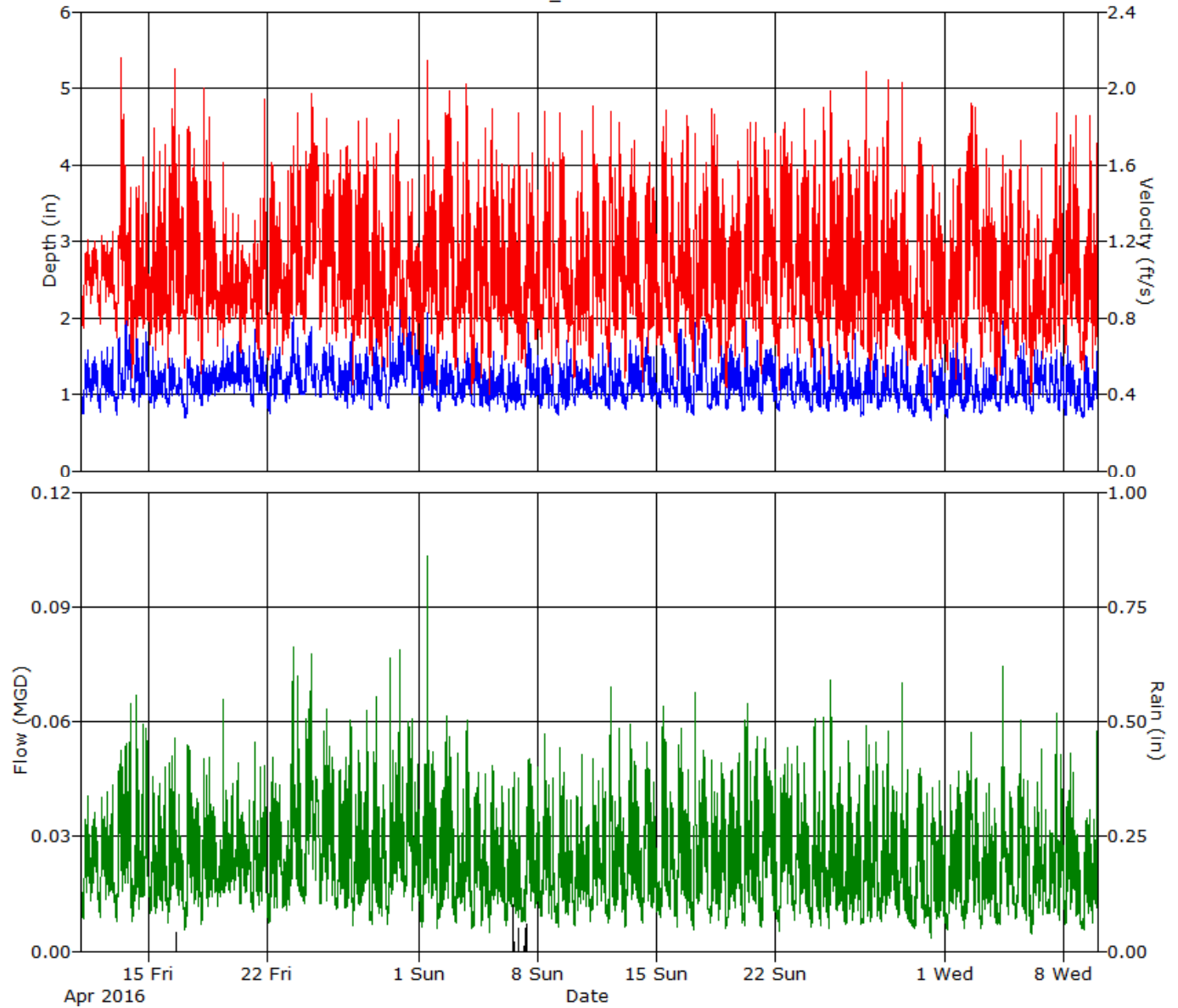
HYDROGRAPH REPORT

SF_Bound817

Flow Monitor
SF_Bound817



Report Period
4/11/2016
To
6/9/2016



Daily Tabular Report For The Period 4/11/2016 - 6/9/2016

SF_Bound817, Pipe Height: 7 in

Daily Tabular Report

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)						Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total
4/11/2016	04:20	0.71	06:45	1.90	1.09	04:20	0.72	17:55	1.29	0.99	04:20	0.007	06:45	0.054	0.020	0.020	
4/12/2016	04:35	0.76	14:10	1.97	1.15	04:35	0.76	17:40	1.30	1.02	04:35	0.009	14:10	0.057	0.023	0.023	
4/13/2016	03:45	0.72	17:20	2.45	1.29	14:15	0.68	09:00	2.19	1.13	03:45	0.007	22:35	0.087	0.030	0.030	
4/14/2016	11:20	0.82	22:55	2.26	1.23	02:30	0.41	10:45	1.99	0.95	02:30	0.006	22:55	0.100	0.024	0.024	
4/15/2016	08:05	0.71	06:55	1.78	1.11	03:30	0.47	07:00	2.19	1.03	03:30	0.007	17:05	0.071	0.022	0.022	
4/16/2016	02:00	0.83	12:10	1.84	1.10	04:05	0.53	06:50	2.31	1.16	04:05	0.007	06:50	0.080	0.024	0.024	0.04
4/17/2016	04:05	0.67	14:10	1.69	1.09	03:35	0.34	14:10	2.13	1.18	03:35	0.004	14:10	0.078	0.026	0.026	
4/18/2016	04:00	0.85	06:35	1.72	1.13	03:35	0.36	08:20	2.19	1.09	03:35	0.005	10:15	0.058	0.024	0.024	
4/19/2016	00:25	0.99	10:20	1.94	1.26	03:10	0.49	10:20	1.90	0.95	03:10	0.009	10:20	0.085	0.024	0.024	
4/20/2016	19:25	0.99	09:25	1.93	1.27	11:55	0.55	12:15	1.65	0.95	17:10	0.010	09:25	0.062	0.024	0.024	
4/21/2016	04:30	0.77	06:30	1.87	1.20	16:40	0.55	21:30	2.18	1.01	04:30	0.009	23:05	0.064	0.024	0.024	
4/22/2016	04:50	0.75	14:20	1.85	1.17	04:15	0.37	05:30	2.13	0.99	04:15	0.005	09:20	0.068	0.023	0.023	
4/23/2016	04:25	0.88	13:00	2.19	1.23	04:10	0.51	13:00	2.02	1.07	04:10	0.008	13:00	0.107	0.027	0.027	
4/24/2016	06:45	0.92	12:35	1.98	1.26	01:50	0.68	15:00	2.26	1.30	06:45	0.012	10:15	0.090	0.033	0.033	
4/25/2016	03:00	0.95	13:30	1.96	1.27	06:10	0.53	13:30	2.42	1.16	06:10	0.010	13:30	0.109	0.030	0.030	
4/26/2016	17:10	0.77	21:50	1.89	1.14	14:55	0.60	16:55	2.24	1.06	17:10	0.010	21:50	0.086	0.024	0.024	
4/27/2016	02:20	0.86	00:05	1.82	1.18	02:15	0.41	10:15	2.12	1.03	02:15	0.006	22:45	0.068	0.024	0.024	
4/28/2016	05:05	0.78	10:35	2.12	1.18	18:25	0.50	06:35	1.94	0.96	05:05	0.006	20:35	0.085	0.023	0.023	
4/29/2016	03:25	0.80	19:40	2.72	1.26	02:25	0.51	15:00	2.25	1.05	03:25	0.007	06:50	0.106	0.027	0.027	
4/30/2016	14:45	0.96	10:15	2.13	1.42	14:55	0.52	13:05	1.81	0.99	14:55	0.009	13:05	0.074	0.030	0.030	
5/1/2016	04:05	0.85	10:50	2.32	1.23	03:30	0.36	11:15	2.22	1.06	03:30	0.005	11:15	0.108	0.027	0.027	
5/2/2016	05:10	0.77	19:25	1.70	1.12	02:05	0.45	13:20	2.15	1.16	02:00	0.006	19:25	0.074	0.026	0.026	
5/3/2016	05:05	0.83	19:20	1.82	1.12	03:15	0.41	19:10	2.28	1.01	03:15	0.006	19:20	0.090	0.022	0.022	
5/4/2016	05:10	0.78	10:05	2.12	1.10	01:35	0.39	21:00	2.25	0.99	01:35	0.006	21:00	0.069	0.021	0.021	
5/5/2016	03:40	0.77	09:15	1.70	1.08	03:35	0.26	06:40	2.09	1.03	03:35	0.003	22:00	0.062	0.021	0.021	
5/6/2016	02:40	0.75	07:20	1.65	1.02	21:20	0.47	20:25	2.12	1.01	03:30	0.006	13:55	0.061	0.019	0.019	0.34
5/7/2016	04:15	0.80	10:05	2.22	1.14	01:05	0.44	23:40	2.30	0.95	02:05	0.006	23:40	0.086	0.022	0.022	0.13
5/8/2016	23:20	0.79	00:30	1.84	1.08	18:45	0.41	09:15	2.09	1.04	03:30	0.006	09:15	0.077	0.022	0.022	
5/9/2016	00:35	0.74	17:15	2.39	1.09	04:40	0.48	09:45	2.08	1.03	04:40	0.005	17:15	0.067	0.022	0.022	
5/10/2016	04:50	0.84	07:50	1.57	1.14	04:45	0.36	23:15	1.92	0.97	04:45	0.005	07:50	0.057	0.021	0.021	
5/11/2016	15:00	0.90	19:10	2.21	1.15	01:45	0.39	07:55	2.30	1.08	01:35	0.007	19:10	0.079	0.024	0.024	
5/12/2016	04:50	0.80	07:00	2.04	1.12	04:20	0.40	18:50	2.22	1.09	04:20	0.005	07:00	0.101	0.024	0.024	
5/13/2016	04:15	0.80	09:50	1.93	1.15	03:20	0.40	07:40	2.11	1.06	03:20	0.005	10:05	0.084	0.024	0.024	
5/14/2016	02:45	0.88	09:55	2.04	1.18	03:55	0.41	07:35	1.84	1.00	03:55	0.006	19:15	0.073	0.024	0.024	
5/15/2016	05:40	0.81	20:05	1.86	1.11	13:40	0.55	08:50	2.08	1.05	05:40	0.008	08:50	0.088	0.023	0.023	
5/16/2016	19:45	0.75	10:55	2.29	1.18	04:20	0.42	20:00	2.15	1.06	04:20	0.006	10:55	0.108	0.025	0.025	
5/17/2016	04:00	0.71	22:00	2.52	1.24	04:00	0.45	23:05	2.21	1.01	04:00	0.005	06:55	0.076	0.026	0.026	
5/18/2016	11:40	0.79	20:10	2.07	1.07	18:15	0.49	09:55	2.12	1.08	03:50	0.006	20:10	0.078	0.022	0.022	
5/19/2016	03:55	0.79	09:15	2.06	1.18	03:40	0.31	20:10	2.04	0.98	03:40	0.004	20:10	0.079	0.024	0.024	
5/20/2016	03:20	0.76	05:45	2.19	1.14	20:35	0.44	08:50	2.23	1.09	04:45	0.006	08:50	0.102	0.025	0.025	
5/21/2016	05:00	0.74	23:15	2.45	1.20	02:45	0.47	10:35	2.09	1.08	02:45	0.006	23:15	0.072	0.027	0.027	
5/22/2016	05:25	0.79	17:50	1.74	1.12	05:20	0.41	14:25	2.32	1.13	05:20	0.005	14:25	0.078	0.025	0.025	
5/23/2016	03:10	0.82	09:25	1.80	1.09	03:15	0.56	16:50	2.02	1.10	03:15	0.007	09:25	0.071	0.023	0.023	
5/24/2016	03:45	0.77	18:40	2.12	1.12	15:50	0.35	08:50	2.08	0.98	15:50	0.005	08:50	0.094	0.022	0.022	
5/25/2016	03:45	0.77	18:55	1.82	1.06	14:45	0.40	19:30	2.06	1.10	03:40	0.005	18:55	0.079	0.023	0.023	
5/26/2016	02:45	0.77	17:50	2.31	1.04	04:00	0.48	20:35	2.17	1.03	02:45	0.006	20:35	0.076	0.021	0.021	

Date	Depth (in)					Velocity (ft/s)					Quantity (MGD - Total MG)							Rain (in)
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total	Total	
5/27/2016	01:30	0.71	21:55	1.87	1.09	15:35	0.45	08:15	2.31	1.04	01:30	0.006	08:15	0.085	0.023	0.023		
5/28/2016	01:35	0.79	23:00	1.90	1.10	12:15	0.45	15:40	2.28	1.04	05:40	0.006	15:40	0.076	0.022	0.022		
5/29/2016	21:20	0.77	12:00	1.96	1.06	23:25	0.45	12:55	2.20	0.95	23:25	0.006	12:00	0.083	0.019	0.019		
5/30/2016	04:45	0.71	22:35	1.83	0.97	19:00	0.44	11:30	2.10	0.97	04:45	0.006	22:35	0.064	0.018	0.018		
5/31/2016	05:05	0.66	17:20	1.73	1.01	05:10	0.35	17:20	2.01	0.92	05:10	0.003	17:20	0.077	0.018	0.018		
6/1/2016	03:40	0.68	17:20	2.11	1.09	15:45	0.37	21:05	2.25	0.92	03:30	0.005	21:05	0.070	0.020	0.020		
6/2/2016	17:10	0.76	06:10	1.63	1.05	03:45	0.39	14:10	2.26	1.22	03:45	0.005	12:45	0.058	0.024	0.024		
6/3/2016	02:20	0.73	14:15	1.58	1.03	04:30	0.46	10:30	2.03	1.00	04:30	0.005	14:15	0.064	0.019	0.019		
6/4/2016	04:05	0.77	10:20	2.00	1.11	05:45	0.34	14:20	2.15	0.96	05:45	0.004	10:20	0.077	0.021	0.021		
6/5/2016	19:55	0.78	15:35	2.01	1.14	04:15	0.50	21:40	2.17	1.01	19:40	0.007	12:10	0.074	0.023	0.023		
6/6/2016	03:45	0.73	16:35	1.72	1.13	01:20	0.39	13:25	1.79	0.86	03:40	0.004	16:35	0.065	0.019	0.019		
6/7/2016	18:15	0.77	23:40	1.85	1.11	04:00	0.46	13:35	2.24	0.99	04:00	0.007	13:35	0.077	0.021	0.021		
6/8/2016	03:15	0.72	06:15	2.00	1.01	03:10	0.55	17:30	2.00	1.05	03:10	0.006	12:30	0.072	0.020	0.020		
6/9/2016	04:00	0.69	23:25	1.86	1.03	00:50	0.42	11:50	2.35	0.96	04:35	0.005	23:25	0.083	0.019	0.019		

Report Summary For The Period 4/11/2016 - 6/9/2016

	Depth (in)	Velocity (ft/s)	Quantity (MGD - Total MG)	Rain (in)
Total			1.394	0.51
Avg	1.14	1.04	0.023	