

APPENDIX A

Villalobos and Associates (V&A) 2018 Flow Monitoring Program

City of South San Francisco 2017/18 Master Plan Flow Monitoring Services



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Date:

August 2018

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V&A Project No. 17-0325

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Appendix A-1. Flow Monitoring Sites: Data, Graphs, Information

Abbreviations and Acronyms

Abbreviations/Acronyms	Definition
ADWF	Average Dry Weather Flow
AVG.	Average
CCTV	Closed-Circuit Television
CDEC	California Data Exchange Center
CIP	Capital Improvement Program
CO	Carbon Monoxide
CWOP	Citizen Weather Observing Program
DIA.	Diameter
d/D.....	Depth/Diameter Ratio
FT.	Feet
FM.....	Flow Monitor
GPD.....	Gallons per Day
GPM	Gallons per Minute
GWl	Groundwater Infiltration
H2S	Hydrogen Sulfide
IN.	Inch
I/I.....	Inflow and Infiltration
IDM	Inch-Diameter Mile
IDW	Inverse Distance Weighting
LEL.....	Lower Explosive Limit
MAX.....	Maximum
MGD.....	Million Gallons per Day
MIN.	Minimum
NOAA.....	National Oceanic and Atmospheric Administration
N/A	Not applicable
PF.....	Peaking Factor
PS	Pump Station
Q	Flow Rate
RDI.....	Rainfall-Dependent Infiltration
RG	Rain Gauge
SSO	Sanitary Sewer Overflow
V&A	V&A Consulting Engineers, Inc.
WEF.....	Water Environment Federation
WRCC	Western Regional Climate Center

Terms and Definitions

Term	Definition
Average dry weather flow (ADWF)	Average flow rate or pattern from days without noticeable inflow or infiltration response. ADWF usage patterns for weekdays and weekends differ and must be computed separately. ADWF is expressed as a numeric average and may include the influence of normal groundwater infiltration (not related to a rain event).
Basin	Sanitary sewer collection system upstream of a given location (often a flow meter), including all pipelines, inlets, and appurtenances. Also refers to the ground surface area near and enclosed by pipelines. A basin may refer to the entire collection system upstream from a flow meter or exclude separately monitored basins upstream.
Depth/diameter (d/D) ratio	Depth of water in a pipe as a fraction of the pipe's diameter. A measure of fullness of the pipe used in capacity analysis.
Design storm	A theoretical storm event of a given duration and intensity that aligns with historical frequency records of rainfall events. For example, a 10-year, 24-hour design storm is a storm event wherein the volume of rain that falls in a 24-hour period would historically occur once every 10 years. Design storm events are used to predict I/I response and are useful for modeling how a collection system will react to a given set of storm event scenarios.
Infiltration and inflow	Infiltration and inflow (I/I) rates are calculated by subtracting the ADWF flow curve from the instantaneous flow measurements taken during and after a storm event. Flow in excess of the baseline consists of inflow, rainfall-responsive infiltration, and rainfall-dependent infiltration. Total I/I is the total sum in gallons of additional flow attributable to a storm event.
Infiltration, groundwater	Groundwater infiltration (GWI) is groundwater that enters the collection system through pipe defects. GWI depends on the depth of the groundwater table above the pipelines as well as the percentage of the system that is submerged. The variation of groundwater levels and subsequent groundwater infiltration rates is seasonal by nature. On a day-to-day basis, groundwater infiltration rates are relatively steady and will not fluctuate greatly.
Infiltration, rainfall-dependent	Rainfall-dependent infiltration (RDI) is similar to groundwater infiltration but occurs as a result of storm water. The storm water percolates into the soil, submerges more of the pipe system, and enters through pipe defects. RDI is the slowest component of storm-related infiltration and inflow, beginning gradually and often lasting 24 hours or longer. The response time depends on the soil permeability and saturation levels.
Inflow	Inflow is defined as water discharged into the sewer system, including private sewer laterals, from direct connections such as downspouts, yard and area drains, holes in manhole covers, cross-connections from storm drains, or catch basins. Inflow creates a peak flow problem in the sewer system and often dictates the required capacity of downstream pipes and transport facilities to carry these peak instantaneous flows. Overflows are often attributable to high inflow rates.
Peak Wet Weather Flow	The highest daily flow during and immediately after a significant storm event. Includes sanitary flow, infiltration and inflow.
Peaking factor (PF)	PF is the ratio of peak measured flow to average dry weather flow. This ratio expresses the degree of fluctuation in flow rate over the monitoring period and is used in capacity analysis.
Surcharge	When the flow level is higher than the crown of the pipe, then the pipeline is said to be in a surcharged condition. The pipeline is surcharged when the d/D ratio is greater than 1.0.
Synthetic hydrograph	A set of algorithms has been developed to approximate the actual I/I hydrograph. The synthetic hydrograph is developed strictly using rainfall data and response parameters representing response time, recession coefficient and soil saturation.

Executive Summary

Scope and Purpose

V&A Consulting Engineers Inc. (V&A) has completed sanitary sewer flow monitoring within the City of South San Francisco (City). Flow monitoring was performed over four months (three wet months and one dry month consecutively) from February 26, 2018 to June 28, 2018 at eleven open-channel flow monitoring sites. There were three general purposes of this study to support Akel Engineering Group, Inc's (Akel Engineering) update of the City master plan:

1. Establish the baseline sanitary flows at the flow monitoring sites
2. Establish the peak flow condition during the rainfall events
3. Quantify inflow/infiltration (I/I) at the applicable flow monitoring sites

Rainfall Monitoring

There were three rainfall events that occurred during the monitoring period. All three rainfall events were classified as less than 1-year rainfall events at the three rain gauges (RG) except for at RG South, Rain Event 1 (February 28 - March 3, 2018) and Rain Event 3 (April 5-7, 2018) were classified as a 1.5 year 12-hr and 1.5 year 2-day rain events respectively. Additionally, for the flow monitoring period (February 28 - April 7, 2018) at RG South was classified as a 2-year 45-day rainfall event.

The rainfall events were of sufficient strength to elicit an I/I response from the flow monitoring sites suitable for I/I analysis.

Monitoring Sites

The flow monitoring site locations were approved to be the same as the sites monitored in 2008 by V&A¹. There was one additional site, Site 11, selected by Akel Engineering. The sites are listed in Table ES-1 and shown in Figure ES-1.

¹ V&A project no. 08-0600, "South San Francisco Sanitary Sewer Flow Monitoring" report submitted January 2009. Similar sites, often a few manholes upstream or downstream, were monitored for the 1999 study, however these sites were not located within a night of field reconnaissance. The 1999 study was "City of South San Francisco Infiltration and Inflow Study" by Carollo Engineers.

Table ES-1. List of Monitoring Sites

Monitoring Site	Pipe Diameter (in.)	Manhole #	Location
Site 1	22.5	WD2594	210 Baden Avenue, east of Linden Avenue
Site 2	33	WD2633	27 S. Linden Avenue, north of Colma Creek Canal
Site 3	27	WL2659	1460 San Mateo Avenue, north of PS.
Site 4	15	WH1494	40 Chestnut Avenue, south of Mission Road
Site 5	15	WF980	1303 Mission Avenue, north of Isabelle Way
Site 6	18	WE1489	920 Mission Road, east of Oak Avenue.
Site 7	18	WL2882	141 South Linden Avenue, northwest of Tanforan Avenue.
Site 8	12.5	WH1559	North end of Memorial Drive.
Site 9	12	WH1570	Memorial Drive and West Orange Avenue
Site 10	15	WL2651	South Linden Avenue and South Canal Street, south of Colma Creek Canal
Site 11	15	Not Given	245 South Spruce Avenue, southwest of Myrtle Avenue

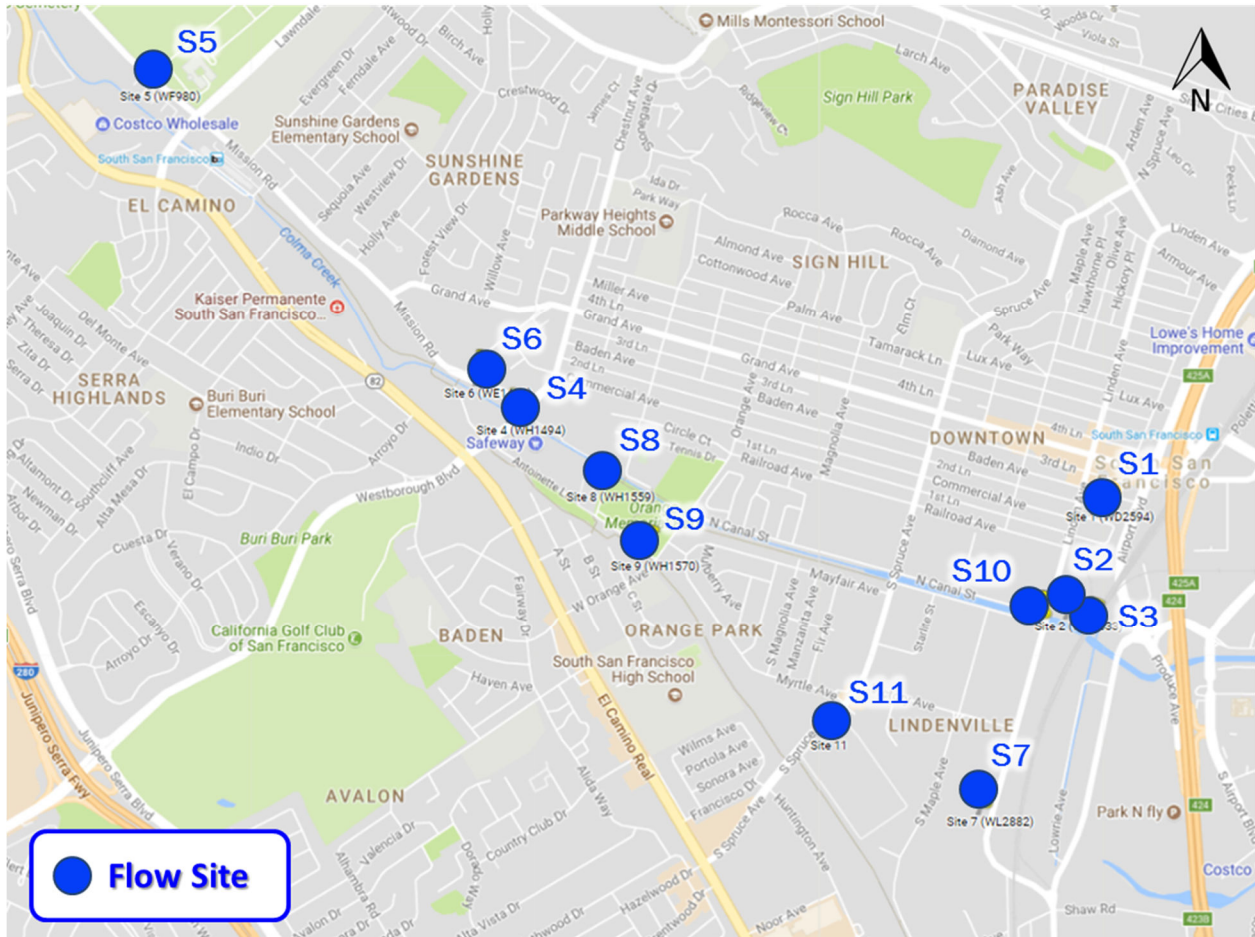


Figure ES-1. Map of Flow Monitoring Sites

Site Flow Monitoring and Capacity Results

Table ES-2 summarizes the peak recorded flows, levels, d/D ratios, and peaking factors per site during the flow monitoring period. Results of note have been shaded in **RED**. Capacity analysis data is presented on a site-by-site basis and represents the hydraulic conditions only at the site locations; hydraulic conditions in other areas of the collection system will differ.

- Peaking Factor:** Peaking factor is defined as the peak measured flow divided by the average dry weather flow (ADWF). Peaking factors are influenced by many factors including size and topography of tributary area, flow attenuation, flow restrictions, characteristics of I/I entering the collection system, and hydraulic features such as pump stations. For this report, peaking factors are reported and peaking factors above 6 are highlighted. The City's 1999 Study referred to the WEF Manual of Practice FD-6 and ASCE Manual No. 62 suggesting typical peaking factor ratios ranging between 3 and 4, with higher values indicative pronounced I/I flows.
- d/D Ratio:** The d/D ratio is the peak measured depth of flow (d) divided by the pipe diameter (D). The d/D ratio for each site was computed based on the maximum depth of flow for the study. Standards for d/D ratio vary from agency to agency, but typically range between $d/D \leq 0.5$ and $d/D \leq 0.75$.

Table ES-2. Capacity Analysis Summary

Monitoring Basin	ADWF (mgd)	Peak Measured Flow (mgd)	Peaking Factor	Pipe Diameter, D (IN)	Max Depth, d (IN)	Max d/D Ratio	Surcharge above Pipe Crown (IN)
Site 1	0.685	7.103	10.4	22.5	28.12	1.25	5.6
Site 2	3.213	17.083	5.3	33	48.25	1.46	15.3
Site 3	0.078	0.835	10.7	27	28.42	1.05	1.42
Site 4	0.137	1.313	9.6	15	8.58	0.57	--
Site 5	0.266	1.836	6.9	15	9.7	0.65	--
Site 6	1.200	5.146	4.3	18	14.52	0.81	--
Site 7	0.537	2.204	4.1	18	23.67	1.32	5.7
Site 8	0.133	0.372	2.8	12.5	12.29	0.98	--
Site 9	0.084	0.768	9.2	12	7.34	0.61	--
Site 10	0.132	1.216	9.2	15	64.23	4.28	49.2
Site 11	0.347	3.059	8.8	15	53.97	3.60	39.0

Figure ES-2 illustrates a flow schematic of the peak flow condition at the flow monitoring sites. The following capacity analysis results are noted:

- **Peaking Factors**
 - More than half the sites had peaking factors greater than 6.
 - Considering that Site 3 and Site 9 peaking factors may have been skewed by low ADWFs, Sites 1, 4, 10, and 11 had the highest peaking factors.
- **d/D Ratio:**
 - More than half the sites (6 of 11) surcharged during the flow monitoring period.
 - Site 10 and 11 surcharged the most with more than 3 feet above pipe crown. Site 11 may be of concern due to the following reasons:
 - Shallow and small diameter manhole
 - Site 11 has two effluents; the main effluent was flowing at approximately 80%*d/D*
 - There were grease and rags, and ¼ to ½-inch of sediment during some site visits. See Appendix A for site and pipe photos.
 - Located on a major road (South Spruce Avenue) and close to Centennial Way Trail and a creek.

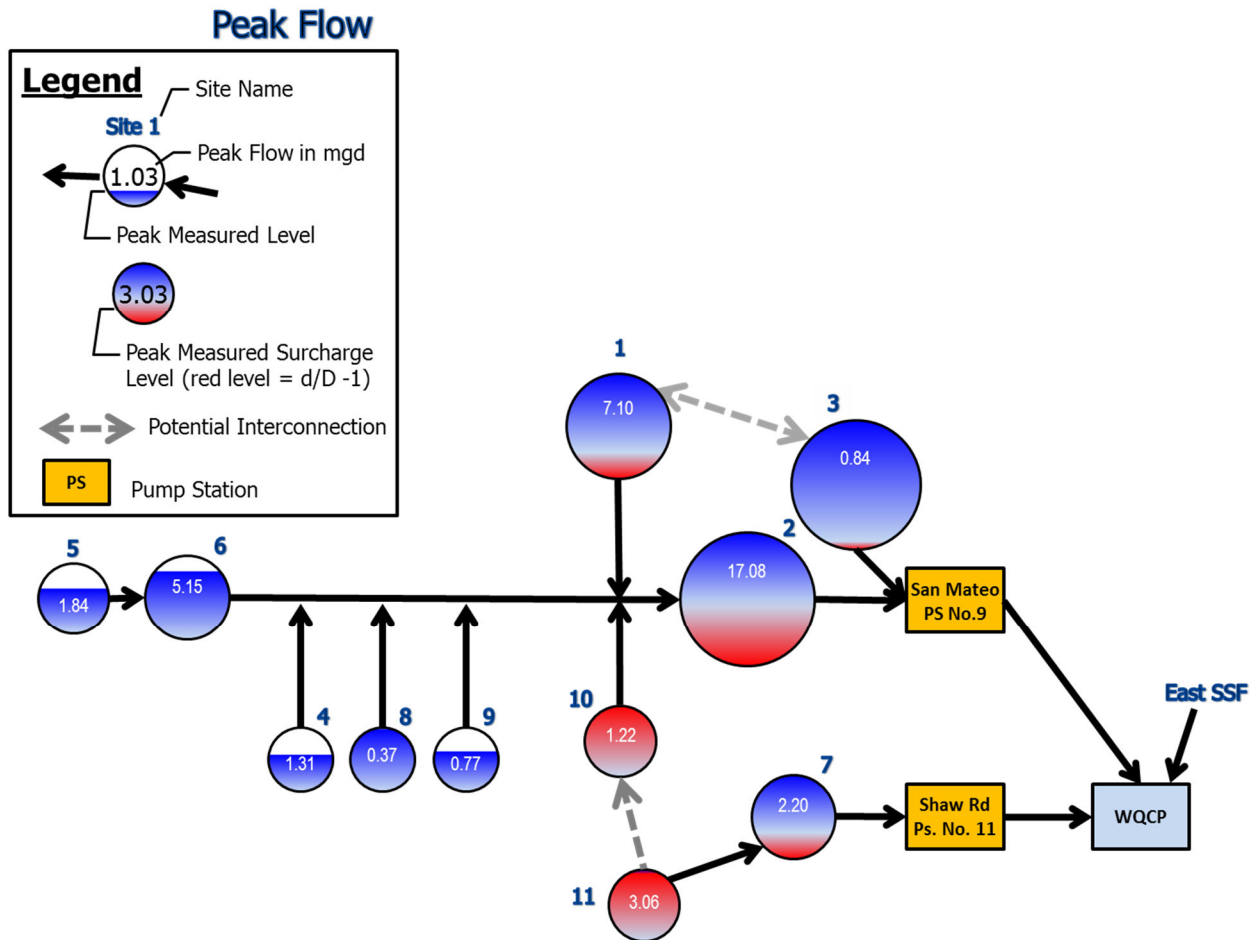


Figure ES-2. Peak Measured Flow Schematic

Infiltration and Inflow Analysis

Table ES-3 summarizes the site-by-site I/I results for this study. Results of note have been highlighted in **RED**. Please refer to the I/I Methods section for more information on rainfall-dependent infiltration (RDI) and inflow analysis and ranking methods.

- Basin 7 and 10 were combined for I/I analysis ranking as there is an overflow from Site 11 to Site 10 and some of the flow is diverted from Basin 7 to Basin 10.
- Site 2 is downstream of Site 10 and five additional sites; the overflow complication and subtraction uncertainties were too high to isolate Basin 2 for I/I analysis so it has been excluded.

Table ES-3. I/I Analysis Summary

Monitoring Site	ADWF (mgd)	Peak Inflow Rate (mgd)	RDI Rate (mgd)	Combined I/I (gallons)	Inflow Rank	RDI Ranking	Combined I/I Rank
Basin 1	0.685	3.862	0.391	5,678,000	3	2	1
Basin 3	0.078	0.524	0.041	536,000	6	4	5
Basin 4	0.137	1.114	0.040	1,221,000	4	6	3
Basin 5	0.266	1.097	0.077	845,000	6	5	9
Basin 6	0.934	3.201	0.242	5,044,000	5	3	4
Basin 8	0.133	0.266	0.019	479,000	8	9	8
Basin 9	0.084	0.741	0.018	345,000	1	7	6
Basin 11	0.347	2.714	0.083	2,202,000	2	8	6
Basin 7 + Basin 10	0.322	0.513	0.361	3,159,000	9	1	2

The following I/I analysis results are noted:

- Inflow:** Basins 9, 11, and 1 had the highest normalized peak I/I rates, an indicator of high inflow within the isolated monitoring basin.
- RDI:** Basins 7+10, 1, and 6 had the highest normalized RDI rates. Basin 7 and 10 may have been affected by the Site 11 overflow; inflow may have been attenuated and counted as RDI instead.
- Groundwater Infiltration:** Basin 8 had abnormally high low-to-ADWF flow rates, an indicator of high GWI rate.
- Total I/I:** Basins 1, 7+10, and 4 had the greatest normalized volume of total I/I.

Recommendations

V&A advises that future I/I reduction plans consider the following recommendations:

1. **Master Plan and Model Implementation:** The study results can be used to update the master plan and compare with previous model assumptions and flow monitoring results.
2. **Verify Interconnections and Overflows:** understanding the interconnections and overflows can help with the master plan, basin isolation and I/I analysis.
3. **Capacity Analysis:** Several sites surcharged during the monitoring period. The City may want to analyze the capacity constraints in the updated master plan.
 - a. There may be a bottleneck and capacity issue in the main trunk lines. V&A recommends Akel and City engineers to review the pump station data and run times.
 - b. Site 11 may be of concern as it surcharged 3.25 feet, was a shallower and smaller manhole, has two effluents (one already quite full), had grease, rags and slight sediment, and located on a major road close to a creek.
 - c. V&A had completed multiple small-scale flow monitoring capacity studies for new developments in SSF in the past years. The City may want to review the data and development flows.
4. **Determine I/I Reduction Program:** The City should examine its I/I reduction needs to determine their needs and goals for a future I/I reduction program.
 - a. If peak flows, sanitary sewer overflows, and pipeline capacity issues are of greater concern, then priority can be given to investigate and reduce sources of inflow within the basins with the higher inflow rates. Basins 9, 2, and 11 ranked highest for inflow contribution and should be prioritized for inflow reduction.
 - b. If infiltration and general pipeline deterioration are of greater concern, then the program can be weighted to investigate and reduce sources of infiltration within the basins with the higher RDI and Combined I/I rates. Basins 1, 7+10, 4 and 6 ranked highest for infiltration contribution and should be prioritized for infiltration reduction.
5. **I/I Investigation Methods:** Potential I/I investigation methods include the following:
 - a. smoke testing
 - b. mini-basin flow monitoring
 - c. night-time reconnaissance work to (1) investigate and determine direct point sources of inflow, and (2) determine the areas and/or pipe reaches responsible for high levels of infiltration contribution.
 - d. CCTV inspection
6. **I/I Reduction Cost Effective Analysis:** The City should conduct a study to determine which is more cost-effective: (1) locating the sources of inflow/infiltration and systematically rehabilitating or replacing the faulty pipelines; or (2) continued treatment of the additional rainfall dependent I/I flow.

1 Introduction

1.1 Scope and Purpose

V&A Consulting Engineers Inc. (V&A) has completed sanitary sewer flow monitoring within the City of South San Francisco (City). Flow monitoring was performed over four months (three wet months and one dry month consecutively) from February 26, 2018 to June 28, 2018 at eleven open-channel flow monitoring sites. There were three general purposes of this study to support Akel Engineering Group, Inc's (Akel) update of the City master plan:

1. Establish the baseline sanitary flows at the flow monitoring sites
2. Establish the peak flow condition during the rainfall events
3. Quantify inflow/infiltration (I/I) at the applicable flow monitoring sites

1.2 Flow Monitoring Sites and Sewerage Basins

The flow monitoring site locations were approved to be the same as the sites monitored in 2008 by V&A². There was one additional site, Site 11, selected by Akel Engineering. Information regarding the flow monitoring locations are listed in Table 1-1 and shown in Figure 1-1. Detailed descriptions of the individual flow monitoring sites, including photographs, are included in Appendix A.

Flow monitoring sites are identified as the manholes where the flow meters were secured and the pipelines wherein the flow sensors were placed. Capacity analysis and flow rate information is presented on a site-by-site basis.

Flow monitoring site data may include the flows of one or many drainage basins. Flow monitoring basins are localized areas of a sanitary sewer collection system upstream of a given location (often a flow meter), including all pipelines, inlets, and appurtenances. The basin refers to the ground surface area near and enclosed by the pipelines.

A basin may refer to the entire collection system upstream from a flow meter or may exclude separately monitored basins upstream, requiring basin isolation (subtraction of upstream flows). The I/I analysis results will be presented on an isolated basin basis. The basin isolation calculations are listed in Table 1-2 and the estimated isolated basins are shown in Figure 1-2.

The flow monitoring sites was selected so that the isolated basins mostly match the City basins. The flow monitoring sites may be located a few manholes upstream or downstream the basin outlet for better flow monitoring hydraulics. Additionally, due to how the pipe system was laid out, some City basins cannot be effectively isolated or are split into two, named "A" and "B".

There are still several connectivity verifications pending. There are potential interconnections between Basin 1 and Basin 3 via diversion structures, and there may be a connection to Site 10 from Site 11. There was also an overflow pipe in Site 9 MH, after the FM. The overflow connection was unknown.

² V&A project no. 08-0600, "South San Francisco Sanitary Sewer Flow Monitoring" report submitted January 2009. Similar sites, a few manholes upstream or downstream, were monitored for the 1999 study, however these sites were not located within a night of field reconnaissance. The 1999 study was "City of SSF Infiltration and Inflow Study" by Carollo Engineers.

Table 1-1. List of Flow Monitoring Locations

Monitoring Site	Pipe Diameter (in.)	Manhole #	Location	Access Details
Site 1	22.5	WD2594	210 Baden Avenue, east of Linden Avenue	
Site 2	33	WD2633	27 S. Linden Avenue, north of Colma Creek Canal	Northeast corner of Storm Pump Station #6,
Site 3	27	WL2659	1460 San Mateo Avenue, north of PS.	Pump Station #9. Enter via south gate, near railroad tracks
Site 4	15	WH1494	40 Chestnut Avenue, south of Mission Road	
Site 5	15	WF980	1303 Mission Avenue, north of Isabelle Way	
Site 6	18	WE1489	920 Mission Road, east of Oak Avenue.	Near Mission Glen Condos
Site 7	18	WL2882	141 South Linden Avenue, northwest of Tanforan Avenue.	Exit gate of AT&T yard
Site 8	12.5	WH1559	North end of Memorial Drive.	Parking lot in northwest corner of Orange Memorial Park
Site 9	12	WH1570	Memorial Drive and West Orange Avenue	Southeast corner of Orange Memorial Park
Site 10	15	WL2651	South Linden Avenue and South Canal Street, south of Colma Creek Canal	In Flyers gas station
Site 11	15	Not Given	245 South Spruce Avenue, southwest of Myrtle Avenue	Opposite of Aqua Hand wash & Gas

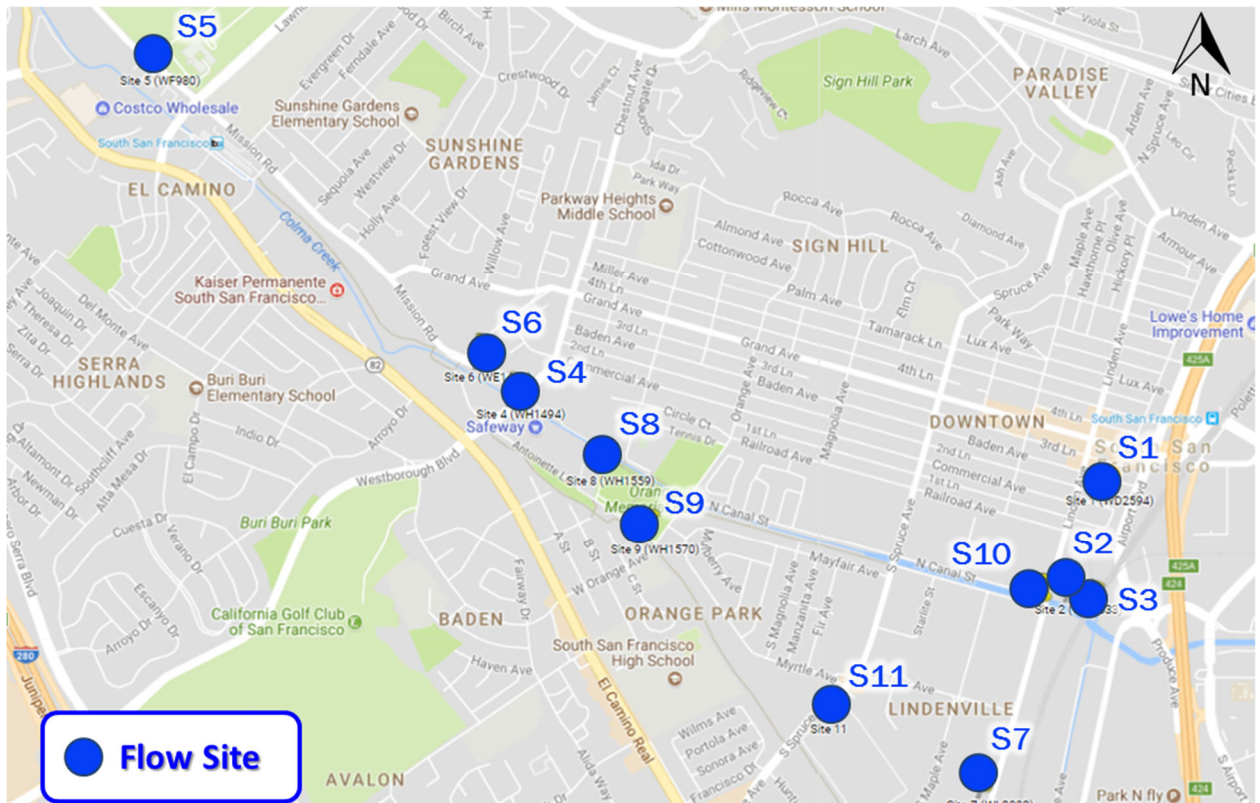


Figure 1-1. Map of Flow Monitoring Sites

Table 1-2. List of Basin Isolation Calculations

Isolated Basin	City Basin ID	Flow Isolation Calculation	Area (Acres)	Notes
Basin 1	B-7A	$= Q_{\text{site1}}$	298	May have interconnections with Basin 3; splits are currently being verified by the City and Akel. Split of City Basin B-7 between Basin 1 and Basin 3 was estimated
Basin 2	B-5 & B-6	$= Q_{\text{site2}} - Q_{\text{site1}} - Q_{\text{site6}} - Q_{\text{site4}} - Q_{\text{site8}} - Q_{\text{site9}} - Q_{\text{site10}}$	521	Too many subtractions, including subtraction of Site 10 that has an overflow upstream, for I/I analysis.
Basin 3	B-7B	$= Q_{\text{site3}}$	397	
Basin 4	B-3	$= Q_{\text{site4}}$	451	
Basin 5	B-1	$= Q_{\text{site5}}$	372	
Basin 6	B-2	$= Q_{\text{site6}} - Q_{\text{site5}}$	448	
Basin 7	B-9A	$= Q_{\text{site7}} - Q_{\text{site11}}$	78	There was an overflow connection to Site 10 from Site 11, bypassing Site 7. The rest of B-9 may be measured by "San Bruno meter 7".
Basin 8	B-4A	$= Q_{\text{site8}}$	83	
Basin 9	B-4B	$= Q_{\text{site9}}$	55	There was an overflow pipe in the MH, after the FM. The overflow connection was unknown.
Basin 10	B-8	$= Q_{\text{site10}}$	117	There is an overflow connection from Site 11
Basin 11	B-10	$= Q_{\text{site11}}$	500	

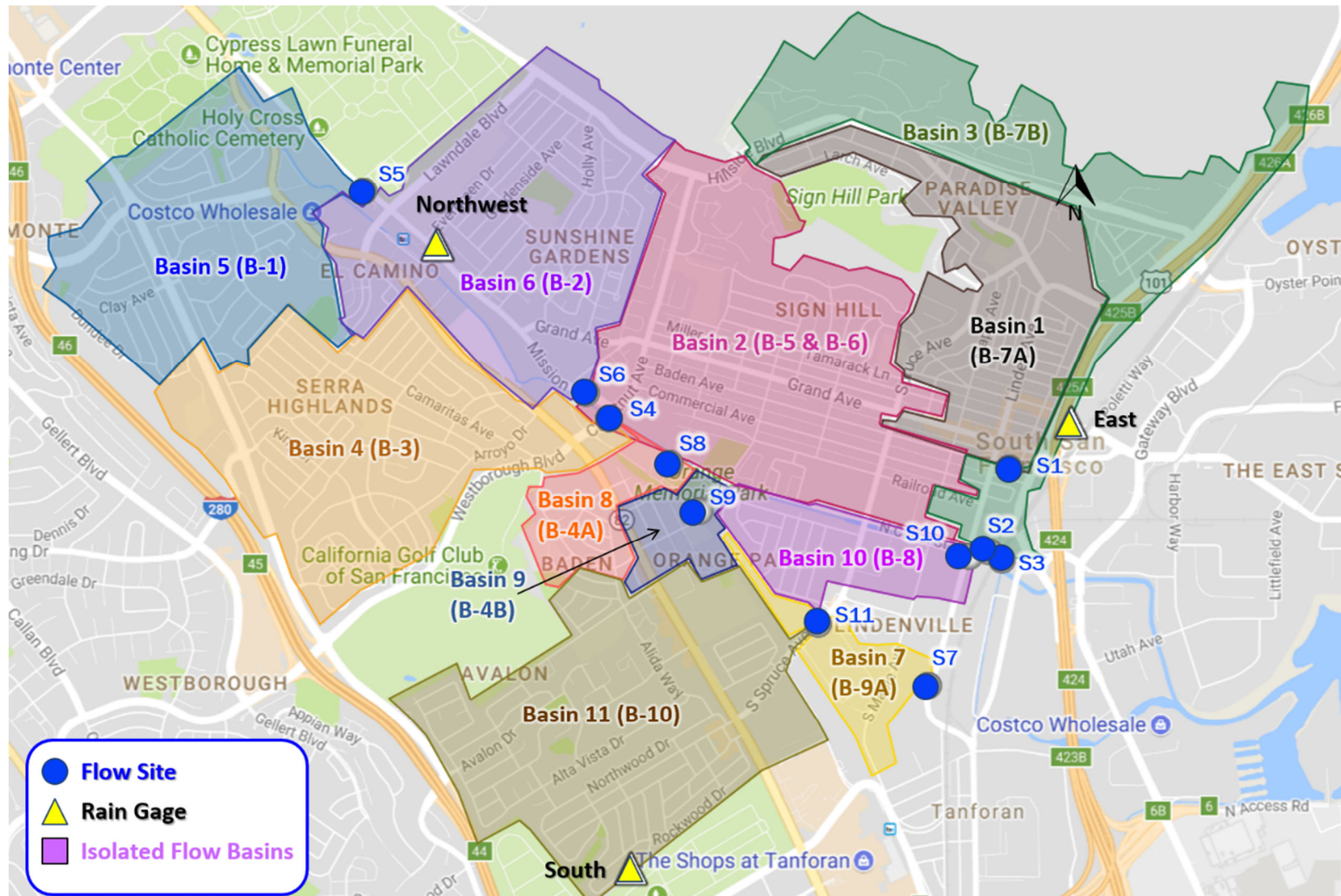


Figure 1-2. Map of Flow Monitoring Basins and Rain Gauges

2 Methods and Procedures

2.1 Confined Space Entry

A confined space (Photo 2-1) is defined as any space that is large enough and so configured that a person can bodily enter and perform assigned work, has limited or restricted means for entry or exit and is not designed for continuous employee occupancy. In general, the atmosphere must be constantly monitored for sufficient levels of oxygen (19.5% to 23.5%), and the presence of hydrogen sulfide (H₂S) gas, carbon monoxide (CO) gas, and lower explosive limit (LEL) levels. A typical confined space entry crew has members with OSHA-defined responsibilities of Entrant, Attendant and Supervisor. The Entrant is the individual performing the work. He or she is equipped with the necessary personal protective equipment needed to perform the job safely, including a personal four-gas monitor (Photo 2-2). If it is not possible to maintain line-of-sight with the Entrant, then more Entrants are required until line-of-sight can be maintained. The Attendant is responsible for maintaining contact with the Entrants to monitor the atmosphere using another four-gas monitor and maintaining records of all Entrants if there is more than one. The Supervisor is responsible for developing the safe work plan for the job at hand prior to entering.



Photo 2-1. Confined Space Entry



Photo 2-2. Typical Personal Four-Gas Monitor

2.2 Flow Meter Installation

V&A installed Isco 2150 and Sigma 910 area-velocity flow meters for temporary metering within the collection system. Isco 2150 and Sigma 910 meters use submerged sensors with a pressure transducer to collect depth readings and an ultrasonic Doppler sensor to determine the average fluid velocity. The ultrasonic sensor emits high-frequency (500 kHz) sound waves, which are reflected by air bubbles and suspended particles in the flow. The sensor receives the reflected signal and determines the Doppler frequency shift, which indicates the estimated average flow velocity. The sensor is typically mounted at a manhole inlet to take advantage of smoother upstream flow conditions. The sensor may be offset to one side to lessen the chances of fouling and sedimentation where these problems are expected to occur. Manual level and velocity measurements were taken during installation of the flow meters and again when they were removed and compared to simultaneous level and velocity readings from the flow meters to ensure proper calibration and accuracy. Figure 2-1 shows a typical installation for a flow meter with a submerged sensor.

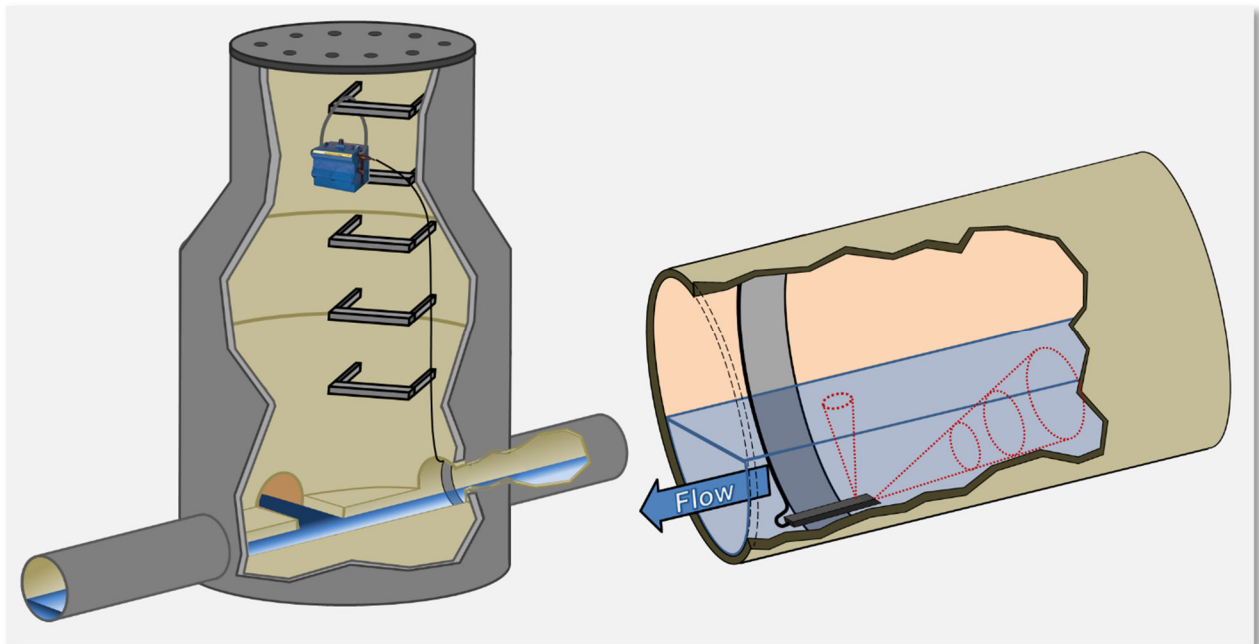


Figure 2-1. Typical Installation for Flow Meter with Submerged Sensor

2.3 Flow Calculation

Data retrieved from the flow meters was placed into a spreadsheet program for analysis. Data analysis included data comparison to field calibration measurements, as well as necessary geometric adjustments as required for sediment (sediment reduces the pipe's wetted cross-sectional area available to carry flow). Area-velocity flow metering uses the continuity equation:

$$Q = v \cdot A = v \cdot (A_T - A_S)$$

where Q : volume flow rate

v : average velocity as determined by the ultrasonic sensor

A : cross-sectional area available to carry flow

A_T : total cross-sectional area with both wastewater and sediment

A_S : cross-sectional area of sediment.

For circular pipe,

$$A_T = \left[\frac{D^2}{4} \cos^{-1} \left(1 - \frac{2d_w}{D} \right) \right] - \left[\left(\frac{D}{2} - d_w \right) \left(\frac{D}{2} \right) \sin \left(\cos^{-1} \left(1 - \frac{2d_w}{D} \right) \right) \right]$$

$$A_S = \left[\frac{D^2}{4} \cos^{-1} \left(1 - \frac{2d_s}{D} \right) \right] - \left[\left(\frac{D}{2} - d_s \right) \left(\frac{D}{2} \right) \sin \left(\cos^{-1} \left(1 - \frac{2d_s}{D} \right) \right) \right]$$

where d_w : distance between wastewater level and pipe invert

d_s : depth of sediment

D : pipe diameter

2.4 Average Dry Weather Flow Determination

For this study, four distinct average dry weather flow (ADWF) curves were established for each Basin location:

- Mondays – Thursdays
- Fridays
- Saturdays
- Sundays

Flows for many of the monitored Basins differ on Friday evenings compared to Mondays through Thursdays. Starting around 7 pm, the flows are often decreased (compared to Monday through Thursday). Similarly, flow patterns for Saturday and Sunday were also separated due to their unique evening flow pattern. This type of differentiation can be important when determining I/I response, especially if a rain event occurs on a Friday, Saturday or Sunday evening.

Figure 2-2 illustrates a sample of varying flow patterns within a typical week dry week³.

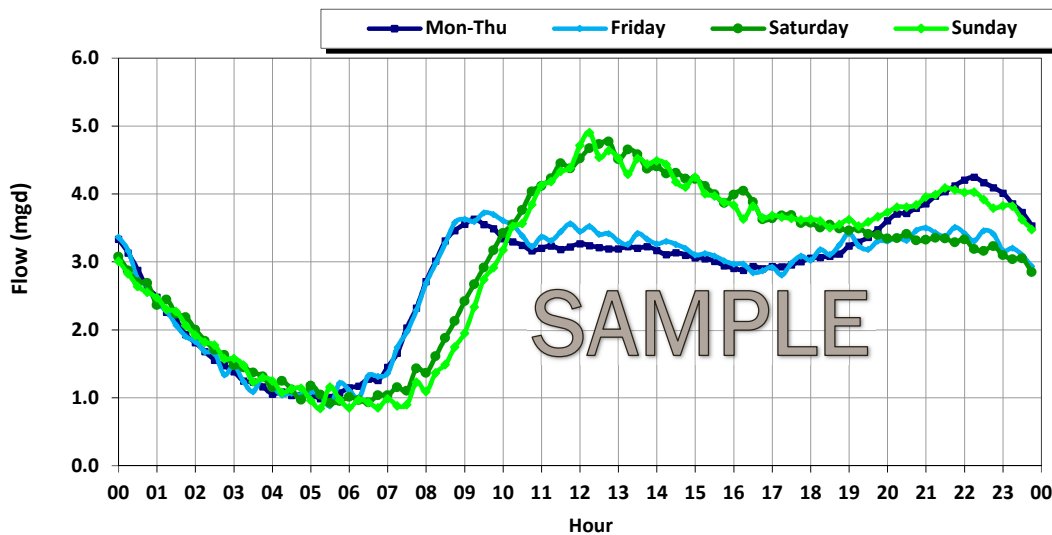


Figure 2-2. Sample ADWF Diurnal Flow Patterns

ADWF curves are taken from “Dry Days”, when RDI had the least impact on the baseline flow. The overall average dry weather flow (ADWF) was calculated per the following equation:

$$ADWF = \left(ADWF_{Mon-Thu} \times \frac{4}{7} \right) + \left(ADWF_{Fri} \times \frac{1}{7} \right) + \left(ADWF_{Sat} \times \frac{1}{7} \right) + \left(ADWF_{Sun} \times \frac{1}{7} \right),$$

³ Holiday flows can be extremely variable. Christmas flows are different from Thanksgiving flows and different from MLK Day flows. V&A does not establish ADWF curves for holidays unless required for I/I analysis, which was not the case for this project. A “typical” holiday (Monday holidays like MLK Day, Presidents’ Day, Memorial Day and Labor Day) can be roughly estimated as a weighted average of 80% Sunday flow and 20% Mon-Thu Flow.

2.5 Flow Attenuation

Flow attenuation in a sewer collection system is the natural process of the reduction of the peak flow rate through redistribution of the same volume of flow over a longer period of time. This occurs as a result of friction (resistance), internal storage and diffusion along the sewer pipes. Fluids are constantly working towards equilibrium. For example, a volume of fluid poured into a static vessel with no outside turbulence will eventually stabilize to a static state, with a smooth fluid surface without peaks and valleys. Attenuation within a sanitary sewer collection system is based upon this concept. A flow profile with a strong peak will tend to stabilize towards equilibrium, as shown in Figure 2-3.

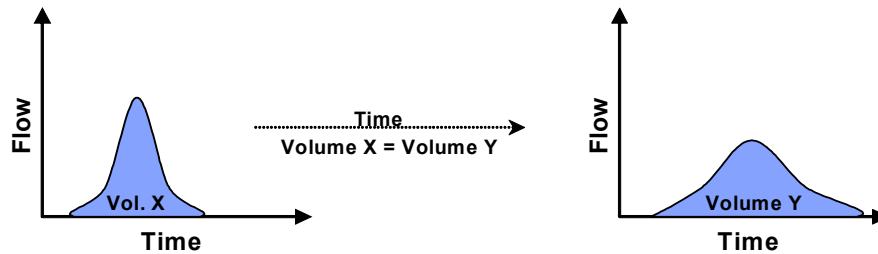


Figure 2-3. Attenuation Illustration

Within a sanitary sewer collection system, each individual basin will have a specific flow profile. As the flows from the basins combine within the trunk sewer lines, the peaks from each basin will (a) not necessarily coincide at the same time, and (b) due to the length and time of travel through the trunk sewers, peak flows will attenuate prior to reaching the treatment facility. The sum of the peak flows of the individual basins within a collection system will usually be greater than the peak flows observed at the treatment facility.

2.6 Inflow / Infiltration Analysis: Definitions and Identification

Inflow and infiltration (I/I) consists of storm water and groundwater that enter the sewer system through pipe defects and improper storm drainage connections and is defined as follows:

2.6.1 Inflow / Infiltration Analysis: Definitions and Identification

- **Inflow:** Storm water inflow is defined as water discharged into the sewer system, including private sewer laterals, from direct connections such as downspouts, yard and area drains, holes in manhole covers, cross-connections from storm drains, or catch basins.
- **Infiltration:** Infiltration is defined as water entering the sanitary sewer system through defects in pipes, pipe joints, and manhole walls, which may include cracks, offset joints, root intrusion points, and broken pipes.

Figure 2-4 illustrates the possible sources and components of I/I.

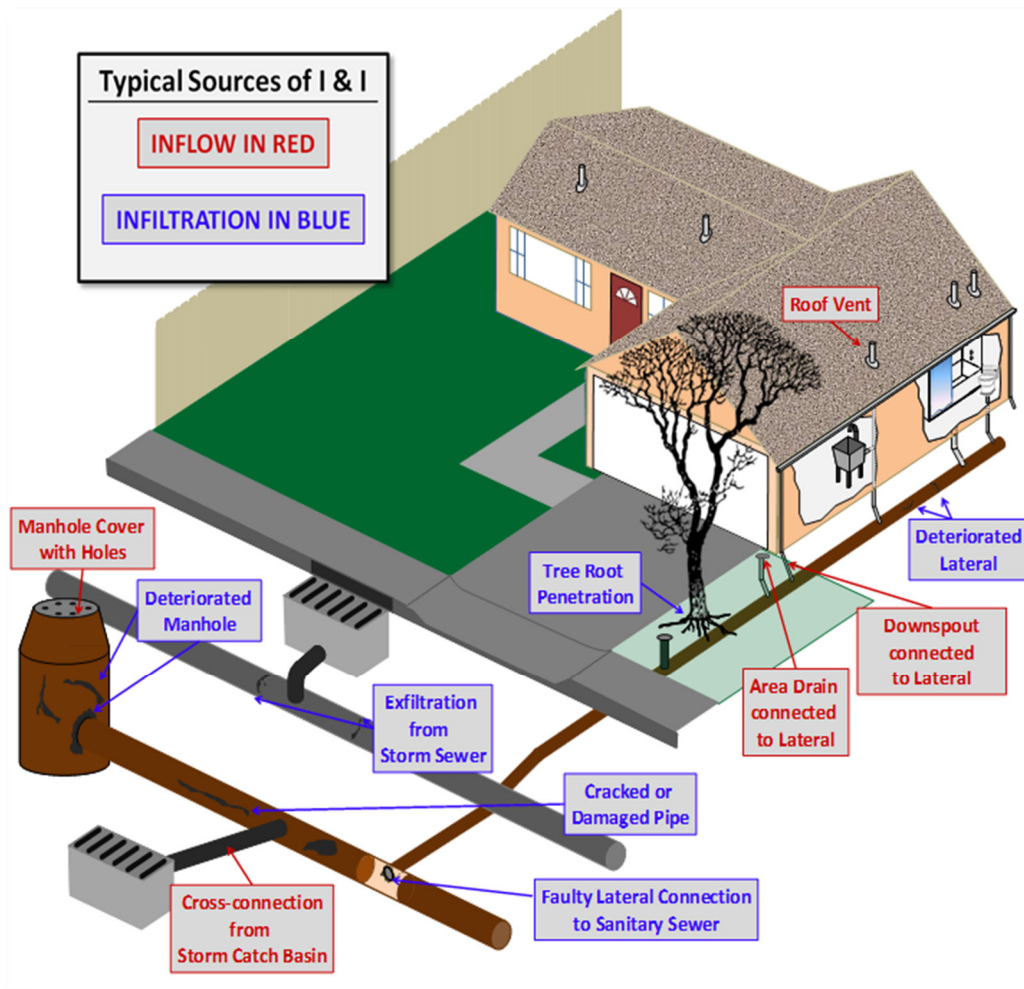


Figure 2-4. Typical Sources of Infiltration and Inflow

2.6.2 Infiltration Components

Infiltration can be further subdivided into components as follows:

- **Groundwater Infiltration:** Groundwater infiltration (GWI) depends on the depth of the groundwater table above the pipelines as well as the percentage of the system submerged. The variation of groundwater levels and subsequent groundwater infiltration rates is seasonal by nature. On a day-to-day basis, groundwater infiltration rates are relatively steady and will not fluctuate greatly.
- **Rainfall-Dependent Infiltration:** This component occurs as a result of storm water and enters the sewer system through pipe defects, as with groundwater infiltration. The storm water first percolates directly into the soil and then migrates to an infiltration point. Typically, the time of concentration for rainfall-related infiltration may be 24 hours or longer, but this depends on the soil permeability and saturation levels.
- **Rainfall-Responsive Infiltration** is storm water which enters the collection system indirectly through pipe defects, but normally in sewers constructed close to the ground surface such as private laterals. Rainfall-responsive infiltration is independent of the groundwater table and reaches defective sewers via the pipe trench in which the sewer is constructed, particularly if the pipe is placed in impermeable soil and bedded and backfilled with a granular material. In this case, the pipe trench serves as a conduit similar to a French drain, conveying storm drainage to defective joints and other openings in the system. This type of infiltration can have a quick response and graphically can look very similar to inflow.

2.6.3 Impact and Cost of Source Detection and Removal

- **Inflow:**
 - **Impact:** This component of I/I creates a peak flow problem in the sewer system and often dictates the required capacity of downstream pipes and transport facilities to carry these peak instantaneous flows. Because the response and magnitude of inflow is tied closely to the intensity of the storm event, the short-term peak instantaneous flows may result in surcharging and overflows within a collection system. Severe inflow may result in sewage dilution, resulting in upsetting the biological treatment (secondary treatment) at the treatment facility.
 - **Cost of Source Identification and Removal:** Inflow locations are usually less difficult to find and less expensive to correct. These sources include direct and indirect cross-connections with storm drainage systems, roof downspouts, and various types of surface drains. Generally, the costs to identify and remove sources of inflow are low compared to potential benefits to public health and safety or the costs of building new facilities to convey and treat the resulting peak flows.
- **Infiltration:**
 - **Impact:** Infiltration typically creates long-term annual volumetric problems. The major impact is the cost of pumping and treating the additional volume of water, and of paying for treatment (for municipalities that are billed strictly on flow volume).
 - **Cost of Source Detection and Removal:** Infiltration sources are usually harder to find and more expensive to correct than inflow sources. Infiltration sources include defects in deteriorated sewer pipes or manholes that may be widespread throughout a sanitary sewer system.

2.6.4 Graphical Identification of I/I

Inflow is usually recognized graphically by large-magnitude, short-duration spikes immediately following a rain event. Infiltration is often recognized graphically by a gradual increase in flow after a wet-weather event. The increased flow typically sustains for a period after rainfall has stopped and then gradually drops off as soils become less saturated and as groundwater levels recede to normal levels. Realtime flows were plotted against ADWF to analyze the I/I response to rainfall events. Figure 2-5 illustrates a sample of how this analysis is conducted and some of the measurements that are used to distinguish infiltration and inflow. Similar graphs were generated for the individual flow monitoring Basins and can be found in Appendix A.

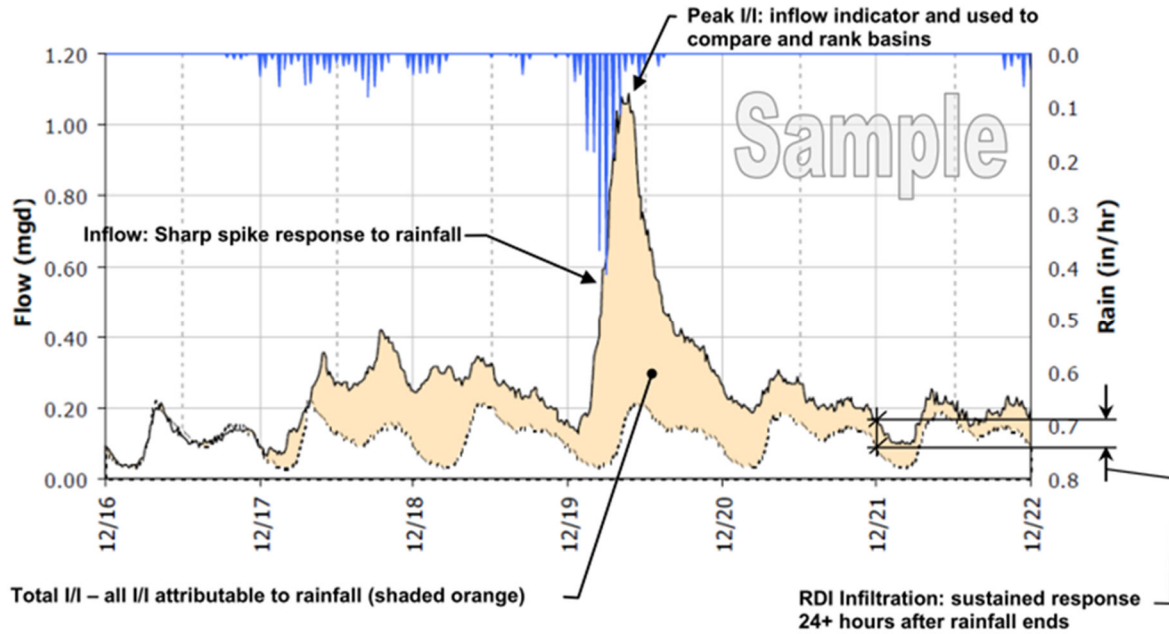


Figure 2-5. Sample Infiltration and Inflow Isolation Graph

2.6.5 Analysis Metrics

After differentiating I/I flows from ADWF flows, various calculations can be made to determine which I/I component (inflow or infiltration) is more prevalent at a particular Basin and to compare the relative magnitudes of the I/I components between drainage basins and between storm events:

- **Inflow – Peak I/I Flow Rate:** Inflow is characterized by sharp, direct spikes occurring during a rainfall event. Peak I/I rates are used for inflow analysis.⁴
- **Groundwater Infiltration (GWI):** GWI analysis is conducted by looking at minimum dry weather flow to average dry weather flow ratios and comparing them to established standards to quantify the rate of excess groundwater infiltration.
- **Rainfall-Dependent Infiltration (RDI):** RDI Analysis is conducted by looking at the infiltration rates at set periods after the conclusion of a storm event. Depending on the particular collection system and the time required for flows to return to ADWF levels, different periods may be examined to determine the basins with the greatest or most sustained rainfall-dependent infiltration rates.
- **Total Infiltration:** The total inflow and infiltration is measured in gallons per Basin and per storm event. Because it is based on total I/I volume, it is an indicator of combined inflow and infiltration and is used to identify the overall volumetric influence of I/I within the monitoring basin.

2.6.6 Normalization Methods

There are three ways to *normalize* the I/I analysis metrics for an “apples-to-apples” comparison amongst the different drainage basins:

- **per-ADWF:** The metric is divided by the established average dry weather flow rate and typically expressed as a ratio. *Peaking Factors* are examples of using ADWF to normalize data from different Basins.
- **per-IDM:** The metric is divided by length of pipe (IDM [inch-diameter mile]) contained within the upstream basin. Final units typically are gallons per day (gpd) per IDM.
- **per-ACRE:** The metric is divided by the acreage of the upstream basin. Final units typically are gallons per day (gpd) per ACRE.

IDM information was not available. The infiltration and inflow indicators were normalized by the per-ADWF and per-ACRE method in this report.⁵ The per-ADWF method was given a higher weighting as the basin acreage was estimated for Basin 1 and Basin 3 with interconnections and parallel pipes.

⁴ I/I flow rate is the real time flow less the estimated average dry weather flow rate. It is an estimate of flows attributable to rainfall. By using peak measured flow rates (inclusive of ADWF), the I/I flow rate would be skewed higher or lower depending on whether the storm event I/I response occurs during low-flow or high-flow hours.

⁵ The 2008 report normalized per-ADWF and the 1999 report normalized per-Acre (also known as “R-value”; ratio between the volume of wet weather flow at a particular monitoring site and the rainfall volume that falls on the upstream tributary service area.)

3 Results and Analysis

3.1 Rainfall Monitoring

3.1.1 Flow Study Rainfall Data

V&A collected rain data from three rain gauges during the flow monitoring period and quality checked the data against multiple other private weather stations (PWS)⁶ that were in the area. See Figure 1-2 for the location of the rain gauges. Table 3-1 and Figure 3-1 show the duration and precipitation of each rainfall event. There was minimal rain after April 18, 2018 and Figure 3-1 only shows until April 18.

Table 3-1. Rainfall Events Definition

Rainfall Event	Date(s)	RG Northwest (in)	RG South (in)	RG East (in)	Average Rainfall (in)
Event 1	February 28 – March 3, 2018	1.11	2.94	1.70	1.92
Event 2	March 12 – 25, 2018	2.13	4.10	2.05	2.76
Event 3	April 5 – 7, 2018	2.34	2.97	1.78	2.36
<i>Flow Monitoring Period Total:</i>		6.38	11.72	6.42	8.11

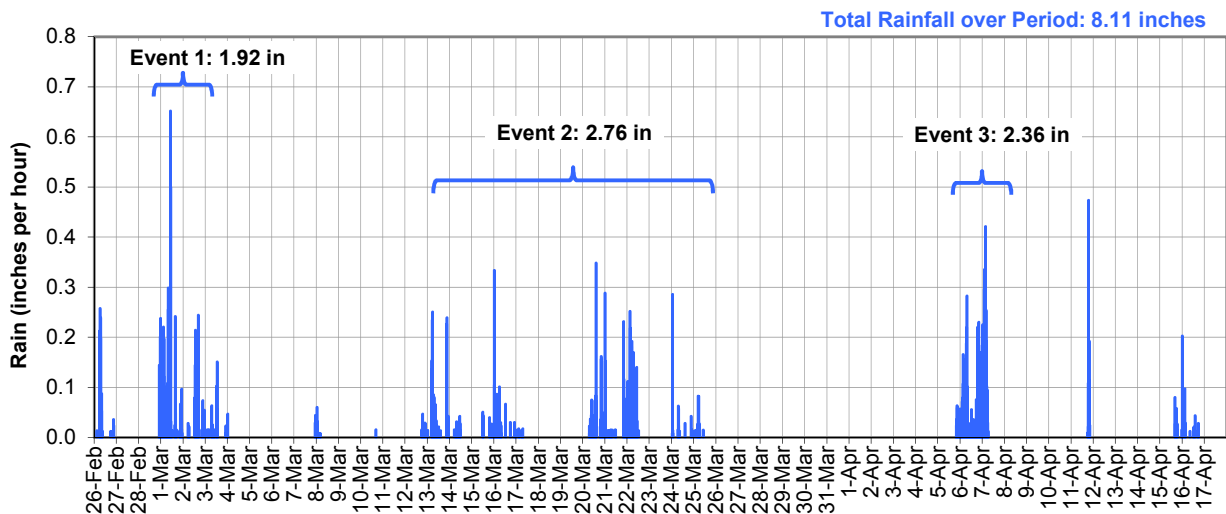


Figure 3-1. Rainfall February 26 – April 18, 2018, Average of 3 Rain Gauges

Historical rain data was taken from the two nearest WRCC stations; SF Mission Dolores and SF WSO Airport (Figure 3-2). Figure 3-3 shows the rainfall accumulation plot for the monitoring period, as well as the historical average rainfall triangulated (see Section 3.1.2.1) to the study area, during the project duration. The total rainfall measured during the monitoring period (8.11 inches) was 50% more than the historical average (5.36 inches).

⁶ National Oceanic and Atmospheric Administration (NOAA) Citizen Weather Observer Program (CWOP) members send data from their PWS to the NOAA MADIS server; the data undergoes quality checking and then is distributed. While V&A has no direct control over the rain gauges, V&A performs additional QA/QC on the data to ensure its suitability for use.



Figure 3-2. Location of Historical Rain Gauges

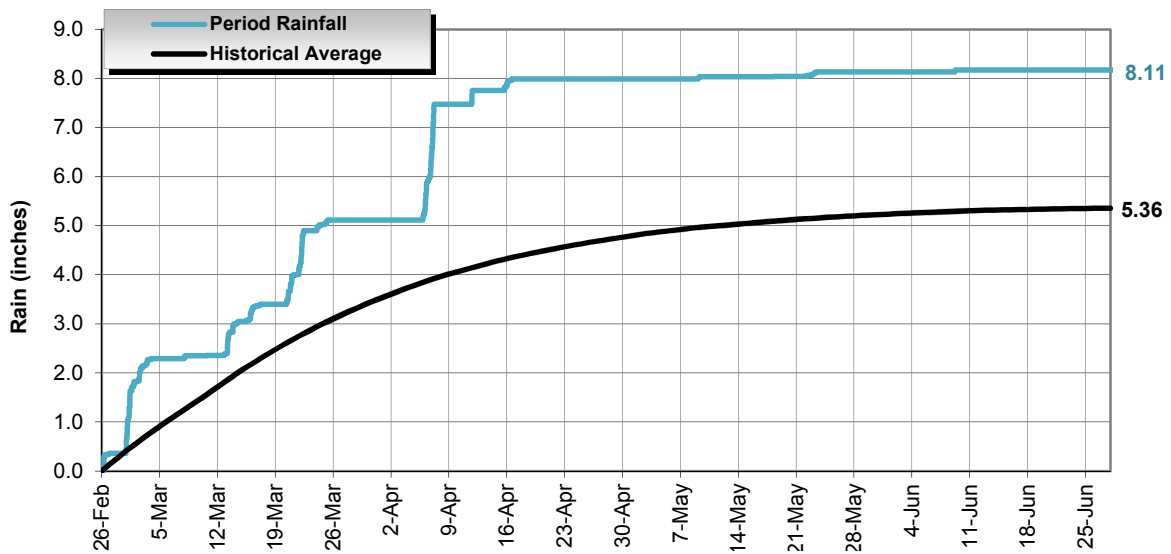


Figure 3-3. Rainfall Accumulation Plot, Average of 3 Rain Gauges

3.1.2 Regional Rainfall Event Classification

It is important to classify the relative size of a major storm event that occurs over the course of a flow monitoring period⁷. Rainfall events are classified by intensity and duration. Based on historical data, frequency contour maps for storm events of given intensity and duration have been developed by the NOAA for all areas within the continental United States (Figure 3-4).

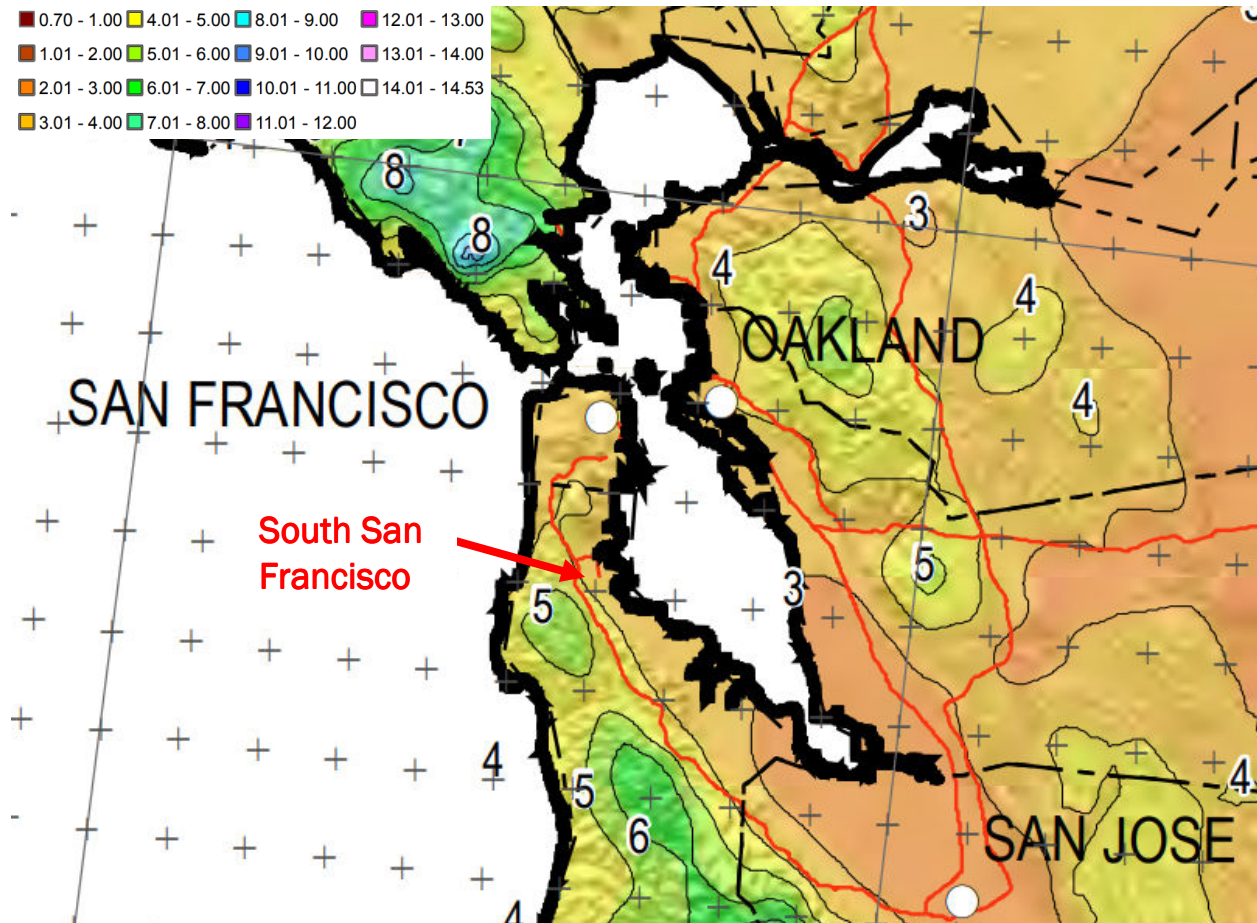


Figure 3-4. NOAA Northern California Rainfall Frequency Map

For example, the NOAA Rainfall Frequency Atlas⁸ classifies a 10-year, 24-hour storm event in South San Francisco at the South rain gauge as **3.84** inches. This means that in any given year, at this specific location, there is a 10% chance that **3.84** inches of rain will fall in any 24-hour period.

From the NOAA frequency maps, for a specific latitude and longitude, the rainfall densities for period durations ranging from 1 hour to 20 days are known for rain events ranging from 1-year to 10-year intensities. These are plotted to develop a rain event frequency map specific to each rainfall monitoring Basin. Superimposing the peak measured densities for the rainfall events on the rain event frequency plot determines the classification of the rainfall event, shown in Figure 3-5 and Figure 3-6.

⁷ Sanitary sewers are often designed to withstand I/I contribution to sanitary flows for specific-sized “design” storm events.

⁸ NOAA Western U.S. Precipitation Frequency Maps Atlas 14, Volume 6, 2011:
<ftp://hdsc.nws.noaa.gov/pub/hdsc/data/sw/ca10y24h.pdf>

The three rain events during the flow monitoring period were classified as less than 1-year rainfall events at the three rain gauges except for:

- Rain Event 1 at RG South: 1.5 year 12-hr rain event
- Rain Event 3 at RG South: 1.5 year 2-day rain event
- Flow Monitoring period at RG South: 2-year 45-day rainfall season

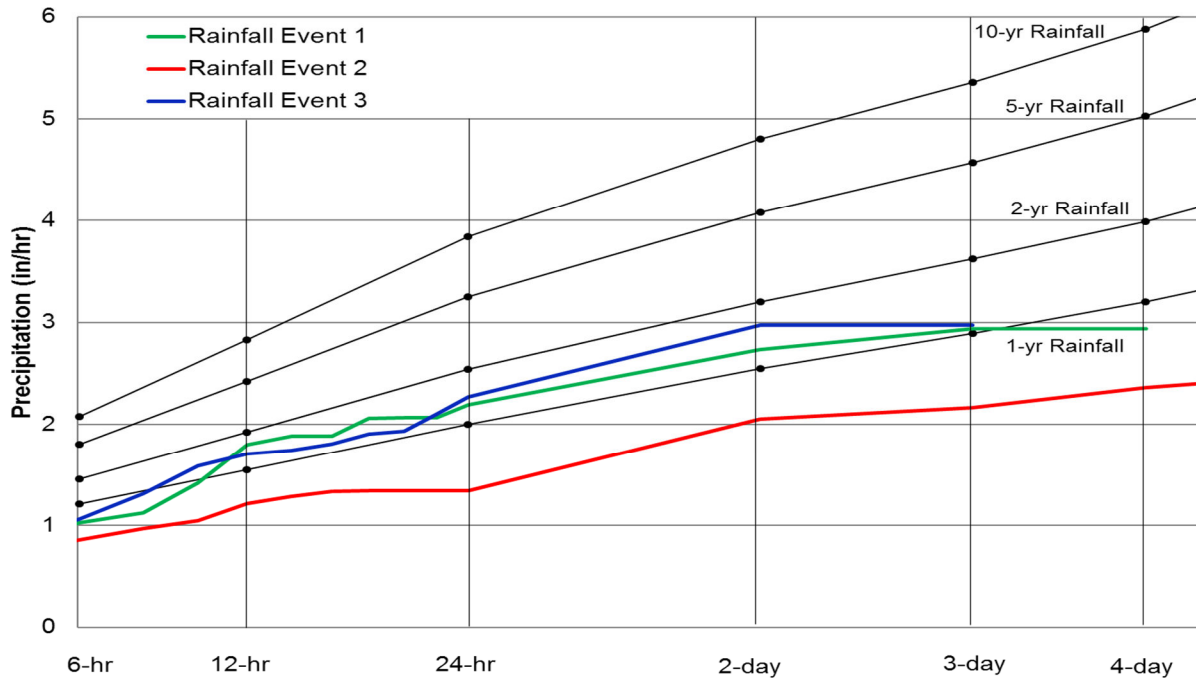


Figure 3-5. Rainfall Event Classification at RG South, 4-days

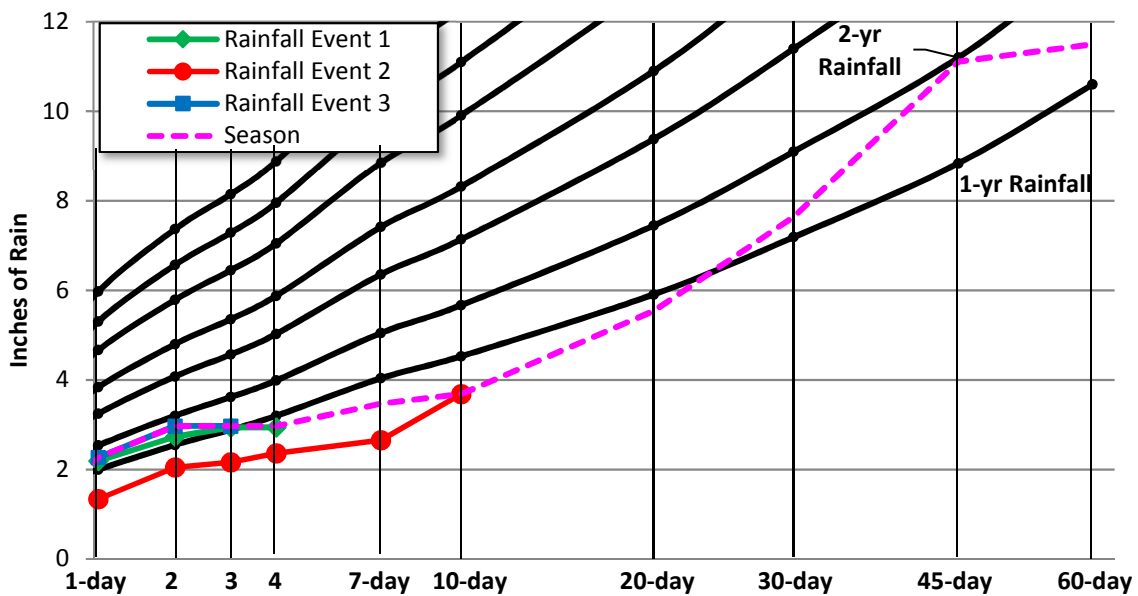


Figure 3-6. Rainfall Event Classification at RG South, 60-days

3.1.2.1 Rain Gauge Triangulation

The rainfall affecting the sanitary sewer collection system basins must be calculated based on the proximity to the rain gauge locations. The mean precipitation for each upstream basin was calculated by taking data from three local rain gauges and using the Inverse Distance Weighting (IDW) method. The IDW is an interpolation method that assumes the influence of each rain gauge location diminishes with distance. The center of an upstream basin⁹ was identified, and a weighted average was taken of the precipitation data from nearby rain gauge locations.

The IDW function is as follows:

$$weight(d) = \frac{1/d^p}{\sum 1/d^p}, \quad \text{where:} \quad d = \text{distance} \quad p = \text{power} (p > 0)$$

The value of p is user defined. The most common choice for hydrological studies of watershed areas is $p = 2$. Figure 3-7 illustrates the IDW method (sample data).

The rain gauge distribution as calculated for each flow monitoring site is shown in Table 3-2.

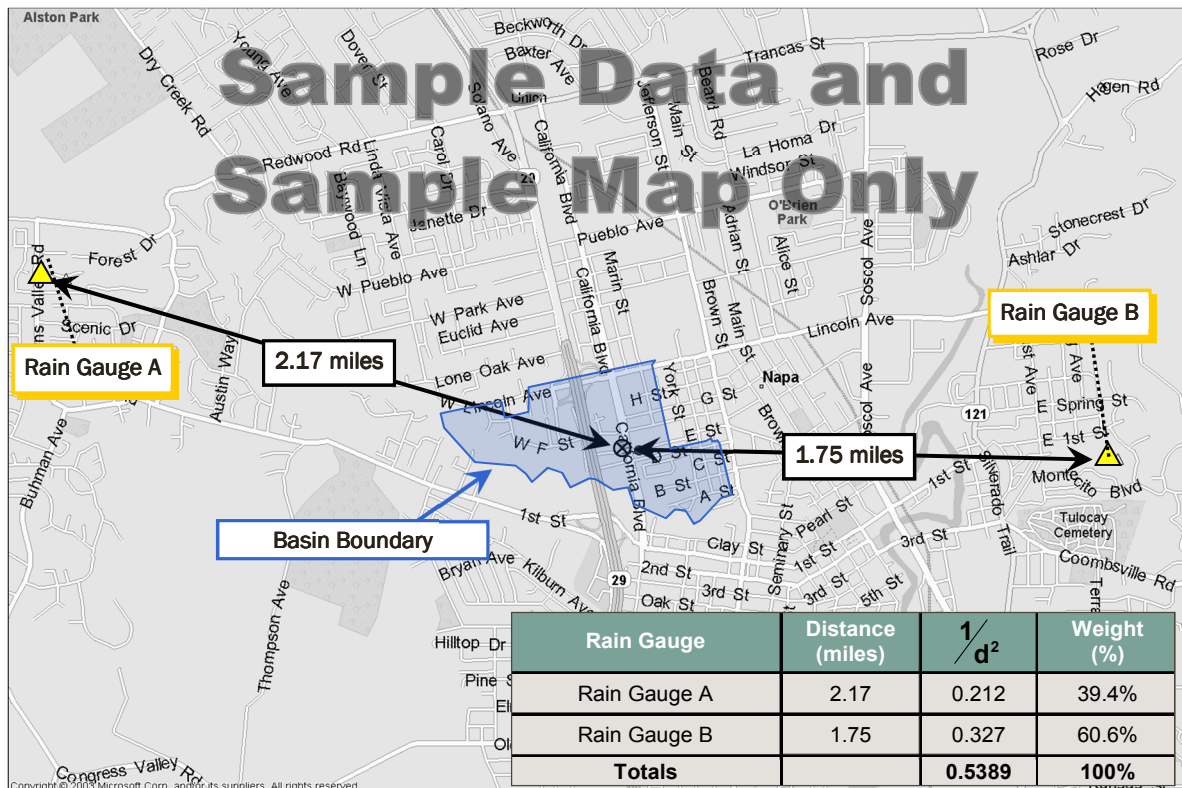


Figure 3-7. Rainfall Inverse Distance Weighting Method

⁹ Note that the full basin upstream of the site was used instead of the isolated basins as the rain data will be compared to the flow at each site

Table 3-2. Rain Gauge Distribution by Flow Monitoring Sites

Monitoring Site	Northwest RG	South RG	East RG
Site 1	0%	0%	100%
Site 2	91%	5%	5%
Site 3	0%	0%	100%
Site 4	79%	14%	7%
Site 5	100%	0%	0%
Site 6	100%	0%	0%
Site 7	7%	84%	9%
Site 8	49%	33%	18%
Site 9	34%	38%	28%
Site 10	15%	25%	61%
Site 11	0%	100%	0%

3.2 Flow Monitoring

3.2.1 Average Flow Analysis

Average dry weather flow (ADWF) curves were established during dry days when I/I had the least impact on the baseline flow. Table 3-3 summarizes the dry weather flow data measured for this study. ADWF curves for each site can be found in *Appendix A*. Figure 3-8 shows a flow schematic highlighting the average daily flows and levels.

Table 3-3. Dry Weather Flow

Site	Sediment (in.)	Mon-Thurs ADWF (MGD)	Friday ADWF (MGD)	Saturday ADWF (MGD)	Sunday ADWF (MGD)	Overall ADWF (MGD)
Site 1	0	0.691	0.667	0.689	0.676	0.685
Site 2	0	3.229	3.161	3.230	3.182	3.213
Site 3	2.75	0.077	0.082	0.079	0.077	0.078
Site 4	0	0.136	0.131	0.147	0.138	0.137
Site 5	0	0.260	0.262	0.278	0.283	0.266
Site 6	0	1.194	1.203	1.211	1.206	1.200
Site 7	0.75	0.578	0.516	0.474	0.461	0.537
Site 8	1.50	0.131	0.129	0.137	0.139	0.133
Site 9	0.25	0.081	0.080	0.088	0.092	0.084
Site 10	0.00	0.135	0.138	0.125	0.116	0.132
Site 11	0.75	0.357	0.338	0.334	0.328	0.347

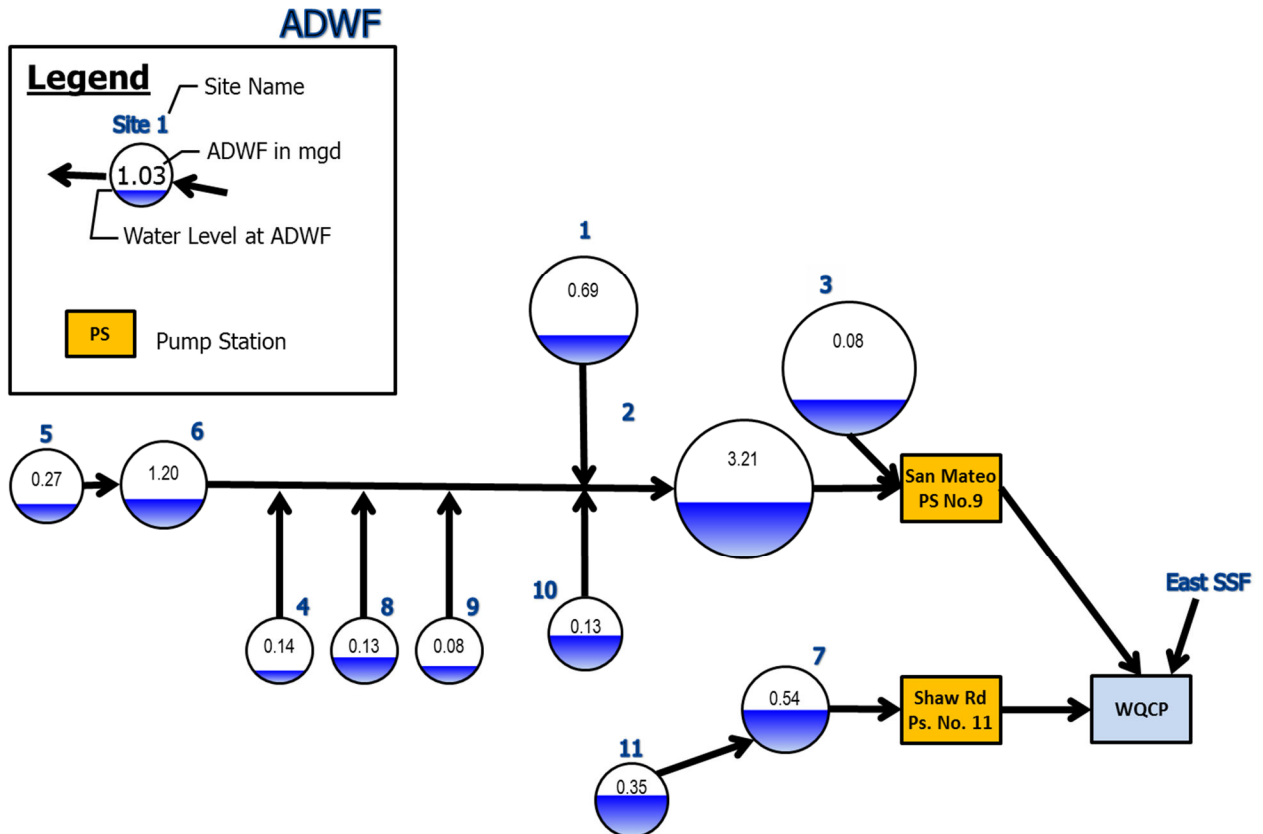


Figure 3-8. Dry Weather Flow Schematic

The following average flow analysis results are noted:

- Most sites had diurnal patterns generally consistent with residential discharge, though possibly with other sources included (commercial, industrial, agricultural, retail).
- Site 3 had constant flow of approximately 0.1 mgd except at 2am to 7am when flows reduced to near zero. This may be related to pump station activity immediately downstream.
- Site 8 typically had a small flow range of approximately 0.08 to 0.18 mgd. See Section 3.3.4 regarding minimal flow as a sign of groundwater infiltration.
- Several sites had abnormally colored flow during some site visits indicative of industrial flows; biotech research is a dominant industry in the City. The strong color had rarely been seen before and may be indicative of constituents that may be of concern. Further investigative methods such as wastewater sampling may be of use to the City.
 - Site 4: 15-inch southwest inlet monitored: pink during most of the study, especially during calibrations on April 27 and May 16, 2018 (Photo 3-1).
 - Site 4: 6-inch southeast inlet, not monitored: purple flow, especially during calibrations on April 27 and May 16, 2018 (Photo 3-2). Probably from laundromat nearby; smells like laundry detergent.
 - Site 7: 10-inch southwest drop inlet, not monitored: red flow during removal on June 26, 2018 (Photo 3-3). The lateral also had offset joints (Photo 3-4). As seen in Photo 3-4, the color was often difficult to capture. Site 7 18-inch northwest inlet, monitored line had blue flow during calibrations on April 27 and May 16, 2018, but no photos captured the color.



Photo 3-1. Site 4 Southwest Influent Monitored, Pink Flow

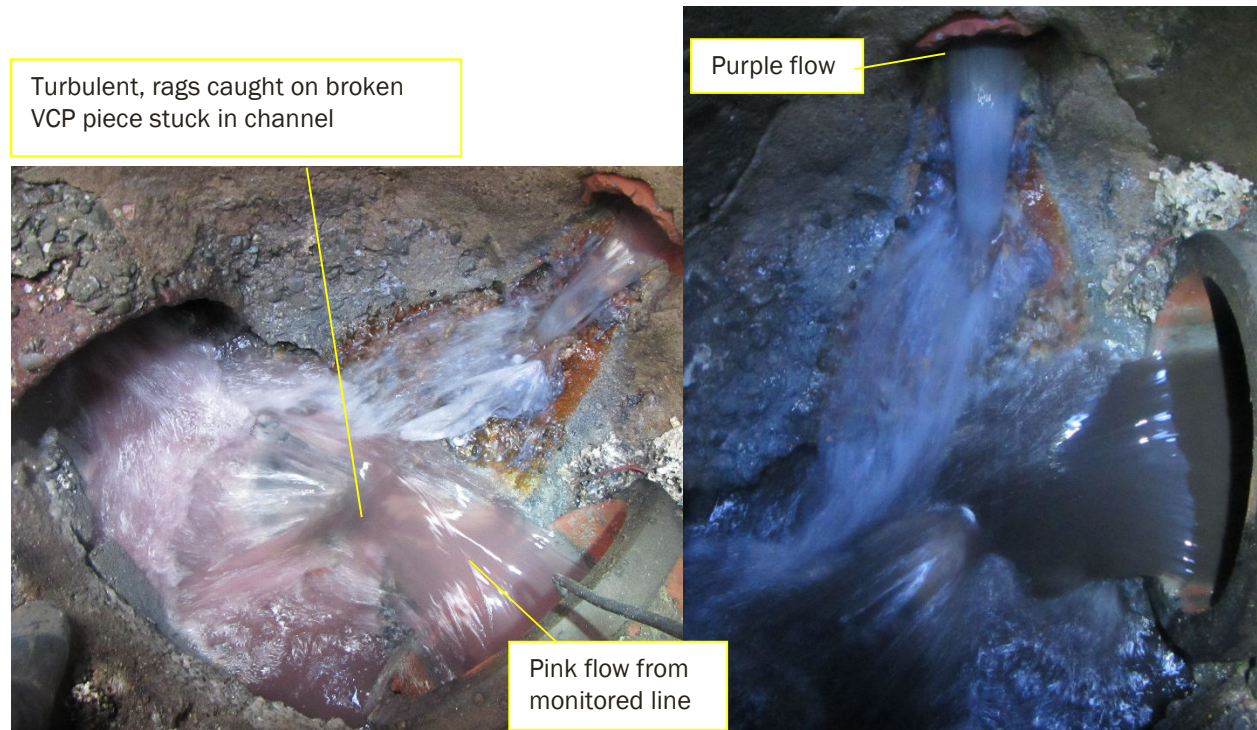


Photo 3-2. Site 4 Plan View during FM removal and installation



Photo 3-3. Site 7 southwest drop inlet, red flow



Photo 3-4. Site 7 southwest drop inlet, offset joints

3.2.2 Peak Measured Flows and Pipeline Capacity Analysis

Peak measured flows and the corresponding flow levels (depths) are important to understand the capacity limitations of a collection system. The peak flows and flow levels reported are from the peak measurements as taken across the entirety of the flow monitoring period. Peak flows and levels may not correspond to a rainfall event. The following capacity analysis terms are defined as follows:

- Peaking Factor:** Peaking factor is defined as the peak measured flow divided by the ADWF. Peaking factors are influenced by many factors including size and topography of tributary area, flow attenuation, flow restrictions, characteristics of I/I entering the collection system, and hydraulic features such as pump stations. For this report, peaking factors are reported and peaking factors above 6 are highlighted. The City's 1999 Study referred to the WEF Manual of Practice FD-6 and ASCE Manual No. 62 suggesting typical peaking factor ratios ranging between 3 and 4, with higher values indicative pronounced I/I flows.
- d/D Ratio:** The d/D ratio is the peak measured depth of flow (d) divided by the pipe diameter (D). Standards for d/D ratio vary from agency to agency, but typically range between $d/D \leq 0.5$ and $d/D \leq 0.75$. The d/D ratio for each Basin was computed based on the maximum depth of flow for the flow monitoring study.

Table 3-4 summarizes the peak recorded flows, levels, d/D ratios, and peaking factors per site during the flow monitoring period. Results of note have been shaded in RED. Figure 3-9 shows a schematic diagram of the peak measured flows with peak flow levels. Figure 3-10 and Figure 3-11 show the peaking factors and d/D ratios respectively.

Capacity analysis data are presented on a site basis and represents the hydraulic conditions only at the site locations; hydraulic conditions in other areas of the collection system will differ.

Table 3-4. Capacity Analysis Summary

Monitoring Basin	ADWF (mgd)	Peak Measured Flow (mgd)	Peaking Factor	Pipe Diameter, D (IN)	Max Depth, d (IN)	Max d/D Ratio	Surcharge above Pipe Crown (IN)
Site 1	0.685	7.103	10.4	22.5	28.12	1.25	5.6
Site 2	3.213	17.083	5.3	33	48.25	1.46	15.3
Site 3	0.078	0.835	10.7	27	28.42	1.05	1.42
Site 4	0.137	1.313	9.6	15	8.58	0.57	--
Site 5	0.266	1.836	6.9	15	9.7	0.65	--
Site 6	1.200	5.146	4.3	18	14.52	0.81	--
Site 7	0.537	2.204	4.1	18	23.67	1.32	5.7
Site 8	0.133	0.372	2.8	12.5	12.29	0.98	--
Site 9	0.084	0.768	9.2	12	7.34	0.61	--
Site 10	0.132	1.216	9.2	15	64.23	4.28	49.2
Site 11	0.347	3.059	8.8	15	53.97	3.60	39.0

The following capacity analysis results are noted:

- **Occurrence**
 - Peak flows and peak levels occurred during Rain Event 1 or Rain Event 3 for all sites except Site 3 peak flow occurred on June 11, 2018 at 13:00. This was probably due to the downstream pump station influence. Site 3 peak level and a similar flow of 0.77 mgd occurred during Rain Event 3.
- **Peaking Factors**
 - More than half the sites had peaking factors greater than 6.
 - Considering that Site 3 and Site 9 peaking factors may have been skewed by low ADWFs, Sites 1, 4, 10, and 11 had the highest peaking factors.
- **d/D Ratio:**
 - More than half the sites surcharged during the flow monitoring period.
 - Site 10 and 11 surcharged the most with more than 3 feet above pipe crown.
 - Most of the manholes were fairly deep; more than 15 feet. The shallowest manholes were Sites 7, 8, 9, and 11; approximately 8 to 15 feet.
 - Site 11: V&A recommends the City check the rim-to-invert depth and any historical flow or maintenance data for Site 11. There were several items of notes regarding Site 11:
 - Site 11 has two effluents; the main effluent was flowing at approximately d/D 80%.
 - During site visits, field crew noticed there were grease and rags, the manhole was of a small diameter, and there was ¼ to ½-inch of sediment during some calibrations See Appendix A for site and pipe photos.
 - Site 11 is located on a major road (South Spruce Avenue) and close to Centennial Way Trail and a creek.
- **Overflow Connections**
 - Site 11: the other effluent/overflow would have been activated at approximately 13 inches channel flow depth. Site 11 reached 53.97 inches flow depth, so the second effluent was definitely activated. See Section 3.3.1 for more details.
 - Site 9: the manhole had an overflow pipe, after the FM. The overflow connection and flow direction were unknown but was not activated during this monitoring period, at least not due to the main influent line. The max depth of the monitored main influent line was 7.34 inches, the overflow would have been activated if the flow depth reached the top of the bench at 10-inch above pipe invert. Notably the pipe channel had a gap near the overflow pipe and there was at least another 6-inches of soft sediment below the invert. This pipe channel gap could be a source of I/I, exfiltration, overflow pipe connection, or sediment buildup.



Photo 3-5. Site 9 Overflow Connection



Photo 3-6. Site 9 Pipe Channel Gap

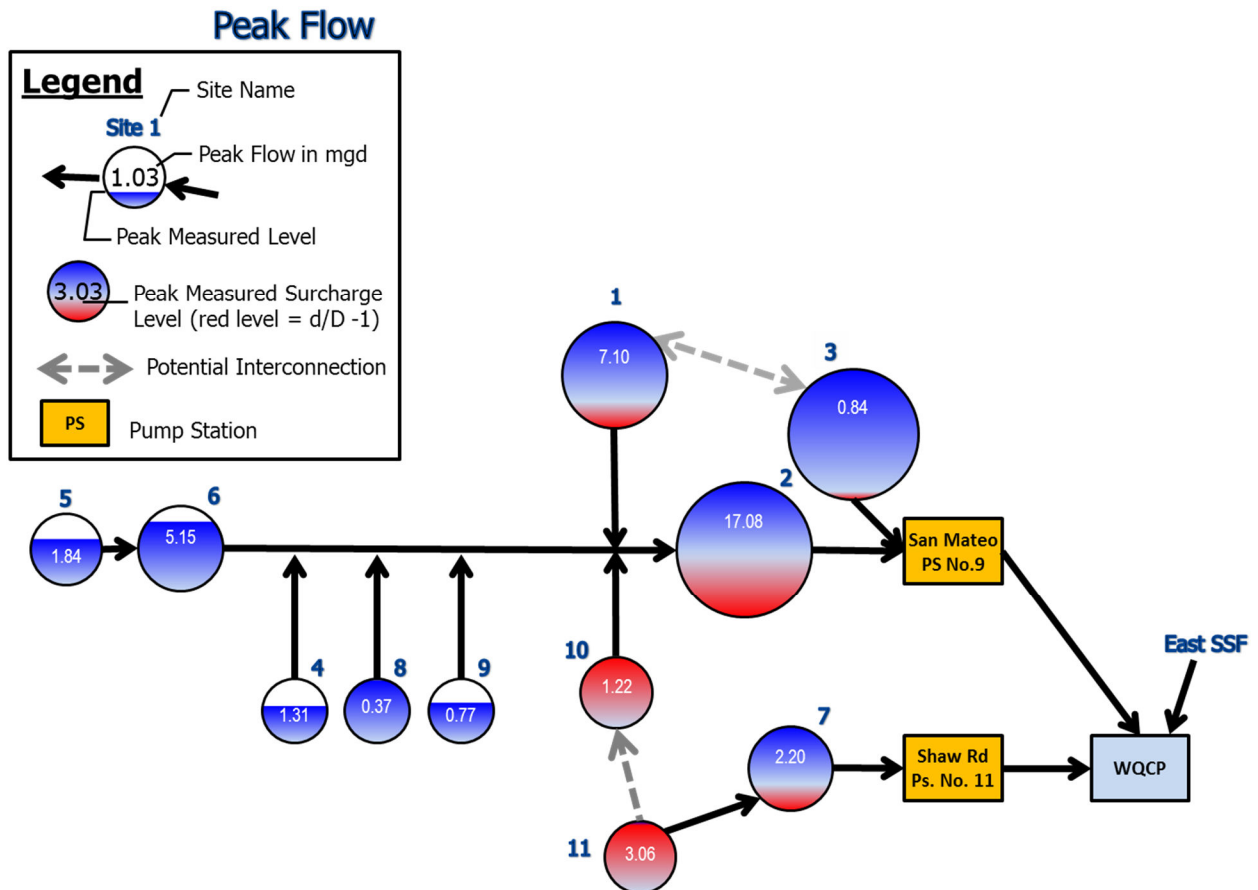


Figure 3-9. Peak Measured Flow Schematic

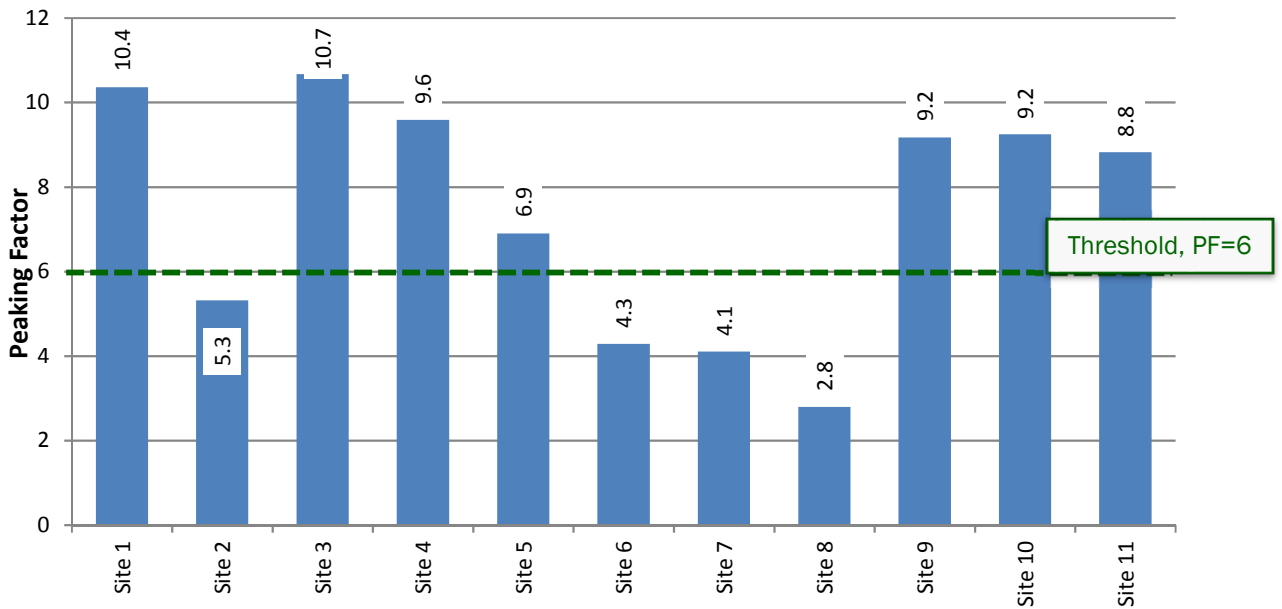


Figure 3-10. Peaking Factors

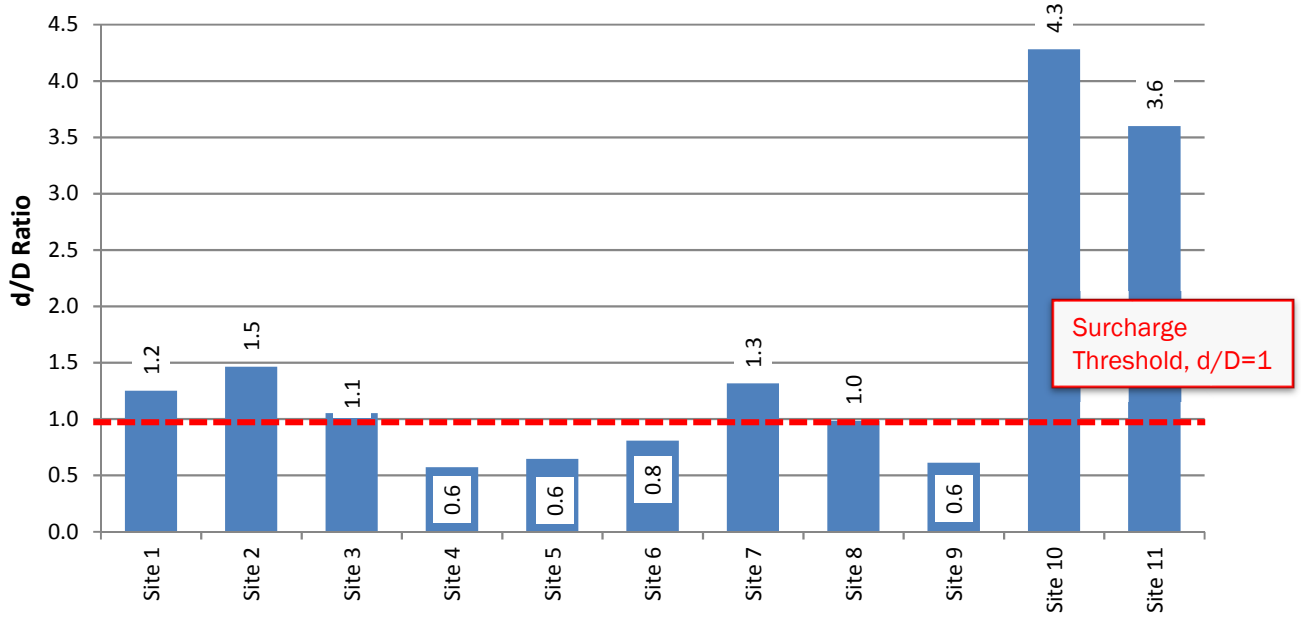


Figure 3-11. d/D Ratios

3.3 Inflow and Infiltration: Results

3.3.1 Preface

I/I analyses are presented on a Basin-by-Basin basis, whereby basins were isolated if there was an upstream flow monitoring site. Data should be used at the discretion of Akel and City engineer especially as there are uncertain interconnections and overflows to be verified. Items relevant to the analysis in this study are noted below and referenced in Figure 3-12:

- **I/I Isolation:** The I/I flow rate is the real-time flow less the estimated average dry weather flow rate (shown below as the **RED** line).
- **Inflow:** Inflow is usually recognized graphically by large-magnitude, short-duration spikes immediately following a rain event. The peak inflow rate is the highest spike in the isolated I/I hydrograph immediately following the evaluated rainfall event.
- **RDI:** RDI is typically taken as the average I/I flow rate measured approximately 24 to 36 hours after the rainfall event has concluded.
- **Combined I/I:** the totalized volume (in gallons) of both inflow and RDI over the course of a rainfall event (shown below as the orange area).
- **Interconnections:**
 - Site 1 and Site 3: flow shifts were not apparent between these two sites during the monitoring period. The Sites performed “regularly” throughout the monitoring period and the I/I trends were similar for small to large rain events. Diversion structures could still have been existent and active; however, Site 3 had such low flows with strong pump station influence that only a major shift would have been detected.
 - Site 7, 10, and 11: at Site 11 there was one main effluent flowing at approximately 80% d/D, and another effluent/overflow that would have been activated at approximately 13 inches channel flow depth (Photo 3-7). This overflow most likely goes to Site 10 or may route back to Site 7. The flow data shows that some overflow went to Site 10; Site 7 has a truncated peak flow less than the upstream Site 11 flow (Figure 3-13). Using synthetic hydrographs of the previous and smaller rainfall I/I response makes it more apparent that this was not simply an attenuation effect and hypothesizes what Site 7 flows could have been if there was no overflow. Basin 7 and Basin 10 was combined for I/I analysis to gain insight into their I/I rankings (Figure 3-14).
 - Site 2 is downstream of Site 10 and 5 additional sites; the overflow complication and subtraction uncertainties were too high to isolate Basin 2 for I/I analysis.

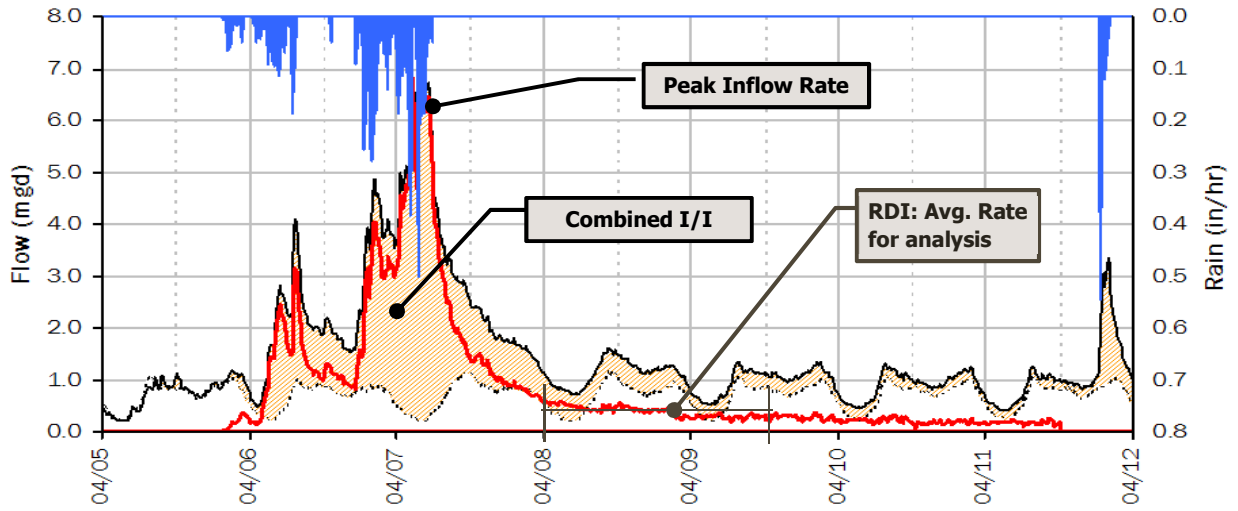


Figure 3-12. Peak Inflow and RDI Rate, Basin 11, Event 3



Photo 3-7. Site 11 Effluents

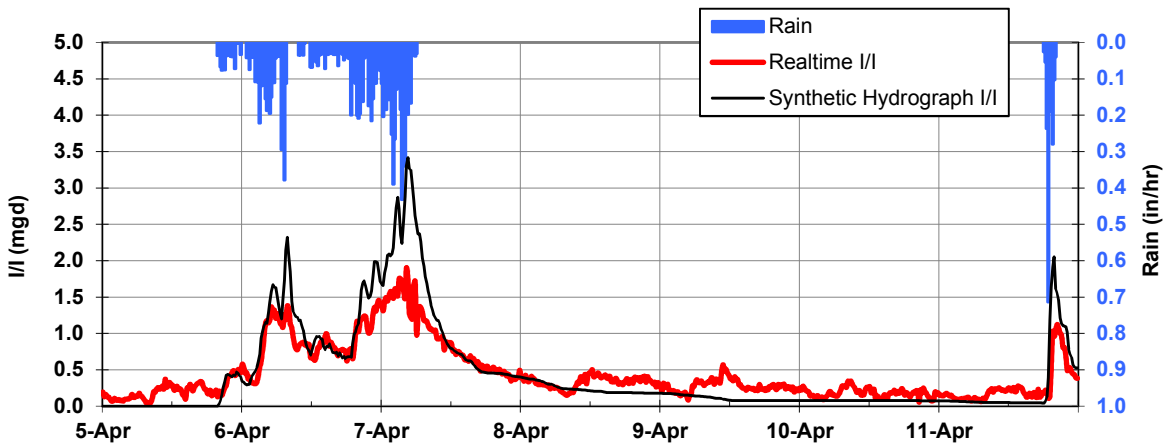
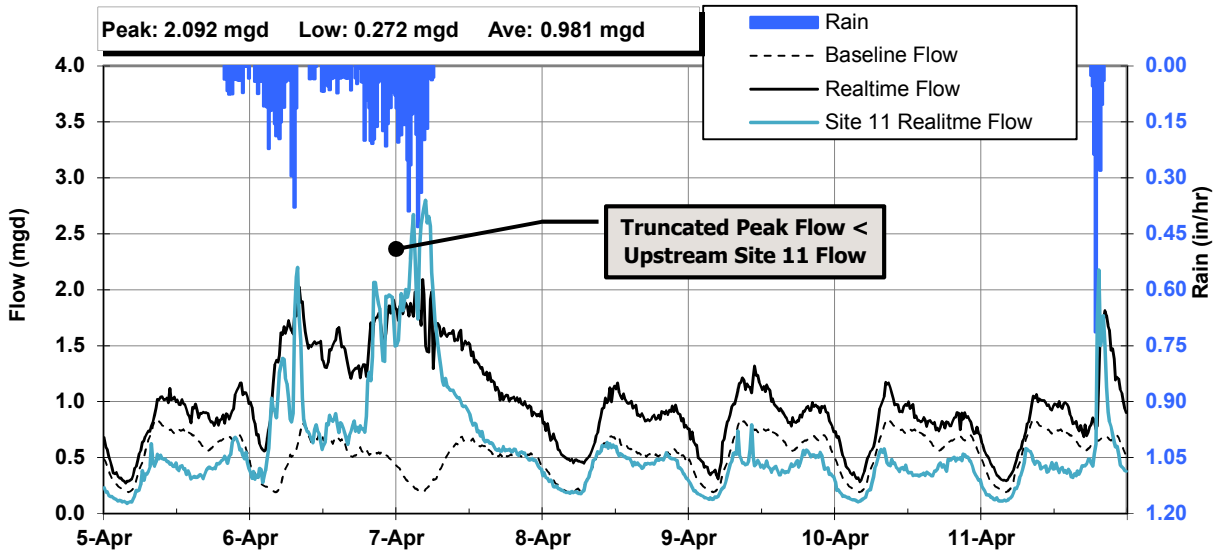


Figure 3-13. I/I Analysis, Site 7, Event 3

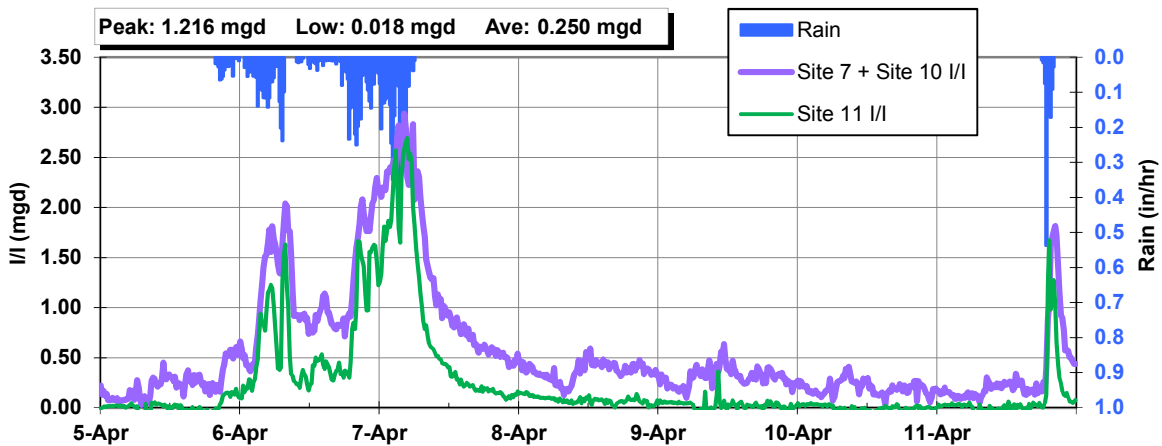


Figure 3-14. Site 7 + Site 10 I/I Analysis, Event 3

3.3.2 Inflow Results Summary

Inflow is storm water discharged into the sewer system through direct connections such as downspouts, area drains, cross-connections to catch basins, etc. These sources transport rain water directly into the sewer system and the corresponding flow rates are tied closely to the intensity of the storm. This component of I/I often causes a peak flow problem in the sewer system and often dictates the required capacity of downstream pipes and transport facilities to carry these peak instantaneous flows.

Inflow results were taken from Event 3 (April 5 - 7, 2018); this was one of the more intensive short-term rainfall event during the monitoring period and occurred when soils were saturated. Table 3-5 summarizes the peak measured inflow analysis results for the relevant flow monitoring basins. Results of note have been shaded in **RED**. Figure 3-15 shows the results of the per Basin inflow analysis. The following results are notes:

- **Inflow:** Basins 9, 11, and 1 had the highest normalized peak I/I rates, an indicator of high inflow upstream from the flow monitoring Basin.
- Only when Site 7 and Site 10 I/I were combined was the peak I/I rate higher than upstream Site 11 peak I/I rate (Figure 3-14). Basins 7 and 10 had a low inflow rate when isolated from Basin 11. If the overflow and upstream basin were not considered, Basin 10 could have been incorrectly interpreted as having a high 8.6 peak inflow per ADWF (placing 2nd).

Table 3-5. Inflow Analysis Summary

Metering Basin	ADWF (mgd)	Peak Inflow Rate (mgd)	Peak Inflow per ADWF	Peak Inflow per Basin Acre (gpd/Acre)	Inflow Rank per ADWF	Inflow Rank per Acre	Overall Inflow Rank
Basin 1	0.685	3.862	5.6	12,958	5	2	3
Basin 3	0.078	0.524	6.7	1,319	4	9	6
Basin 4	0.137	1.114	8.1	2,469	2	8	4
Basin 5	0.266	1.097	4.1	2,950	6	6	6
Basin 6	0.934	3.201	3.4	7,144	7	3	5
Basin 8	0.133	0.266	2.0	3,205	8	5	8
Basin 9	0.084	0.741	8.9	13,475	1	1	1
Basin 11	0.347	2.714	7.8	5,428	3	4	2
Basin 7 + Basin 10	0.322	0.513	1.6	2,632	9	7	9

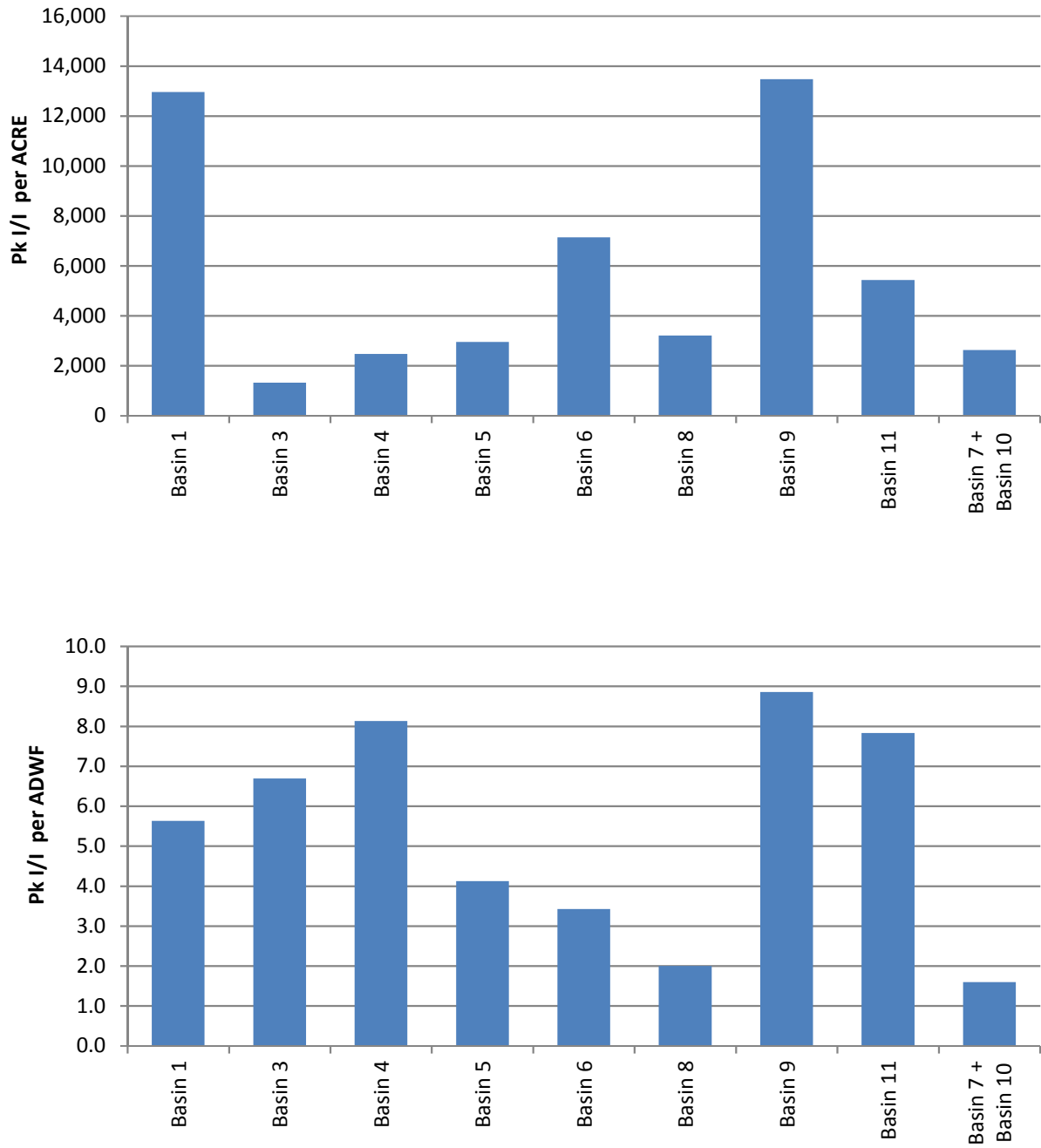


Figure 3-15. Bar Graphs: Inflow Analysis Summary

3.3.3 RDI Results Summary

Infiltration is defined as water entering the sanitary sewer system through defects in pipes, pipe joints, and manhole walls, which may include cracks, offset joints, root intrusion points, and broken pipes. Increased flows into the sanitary sewer system are usually tied to groundwater levels and soil saturation levels. Infiltration sources transport rain water into the system *indirectly*; flow levels in the sanitary system increase gradually, are typically sustained for a period after rainfall has stopped, and then gradually drop off as soils become less saturated and as groundwater levels recede to normal. Infiltration typically creates long-term annual volumetric problems. The major impact is the cost of pumping and treating the additional volume of water, and of paying for treatment (for municipalities that are billed strictly on flow volume).

For this study, the RDI rate used for comparative analysis was measured as the average I/I rate from April 8, 2018 at 00:00 to April 9, 2018 12:00 noon (approximately 24 hours after the conclusion of the April 5 – 7, 2018 rain Event 3).

Table 3-6 summarizes the calculated RDI flow rates (refer to the *I/I Analysis Methods* section for more information on RDI analysis methods). Figure 3-16 shows a bar graph summary. The following RDI analysis results are noted:

- Basins 1, 7+10, and 6 ranked highest for normalized RDI contribution.
- Basin 7 and 10 may have been affected by the Site 11 overflow; the overflow may eventually route back to Site 7, increasing the attenuation time. Additionally, there seems to be a bottleneck occurring in this region that can also attenuate the peak inflow and make it count as RDI instead.

Table 3-6. Basins RDI Analysis Summary

Metering Basin	ADWF (mgd)	RDI Rate (mgd)	RDI per ADWF	RDI per Basin Acre (gpd/ Acre)	RDI Ranking per ADWF	RDI Ranking per Acre	Overall RDI Ranking ^A
Basin 1	0.685	0.391	0.57	1,313	2	2	2
Basin 3	0.078	0.041	0.52	103	3	8	4
Basin 4	0.137	0.040	0.29	88	4	9	6
Basin 5	0.266	0.077	0.29	207	5	6	5
Basin 6	0.934	0.242	0.26	541	6	3	3
Basin 8	0.133	0.019	0.14	225	9	5	9
Basin 9	0.084	0.018	0.22	335	8	4	7
Basin 11	0.347	0.083	0.24	166	7	7	8
Basin 7 + Basin 10	0.32	0.361	1.12	1,849	1	1	1

^A Ranking of 1 represents most RDI after normalization.

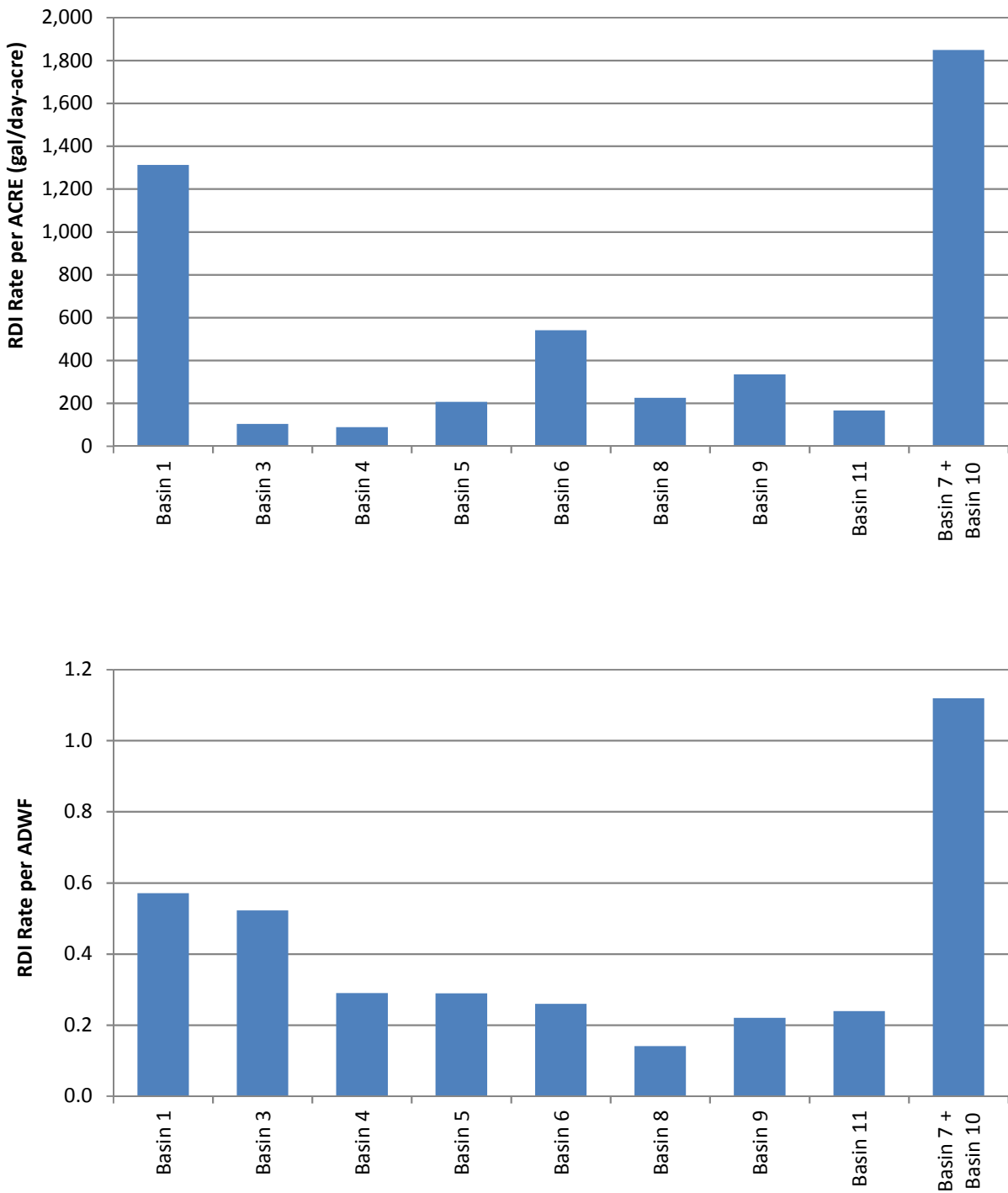


Figure 3-16. Bar Graphs: RDI Analysis Summary

3.3.4 Groundwater Infiltration Results Summary

Dry weather (ADWF) flow can be expected to have a predictable diurnal flow pattern. While each Basin is unique, experience has shown that, given a reasonable volume of flow and typical loading conditions, the daily flows fall into a predictable range when compared to the daily average flow. If a Basin has a large percentage of groundwater infiltration occurring during the periods of dry weather flow measurement, the amplitudes of the peak and low flows will be dampened¹⁰. Figure 3-17 shows a sample of two flow monitoring Basins, both with nearly the same average daily flow, but with considerably different peak and low flows. In this *sample* case, Basin B1 may have a considerable volume of groundwater infiltration.

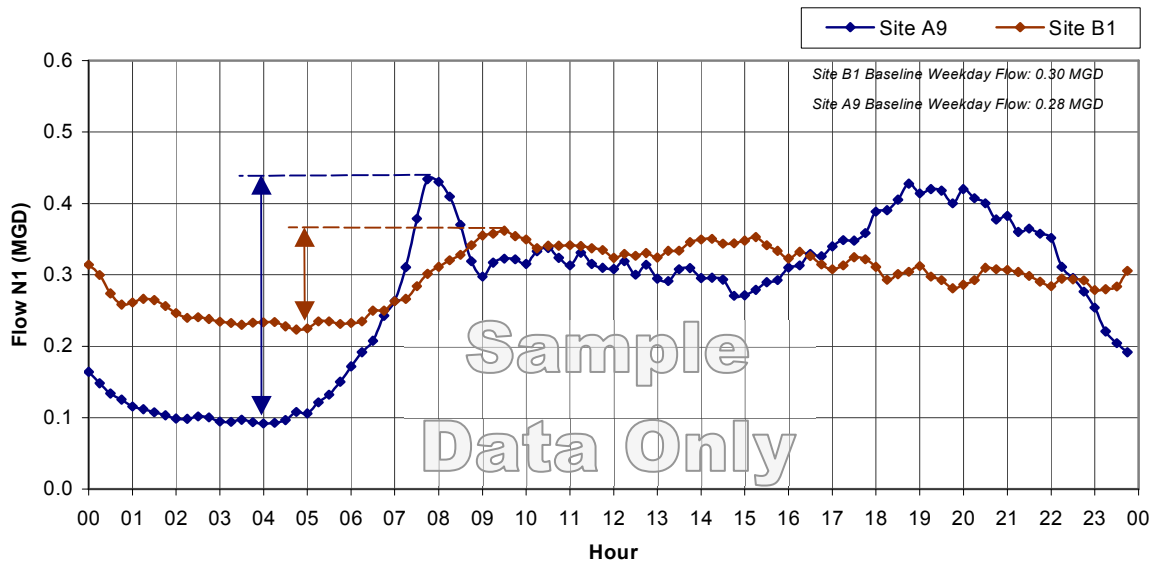


Figure 3-17. Groundwater Infiltration Sample Figure

It can be useful to compare the low-to-ADWF flow ratios for the flow metering sites. A site with abnormal ratios, and with no other reasons to suspect abnormal flow patterns (such as proximity to a pump station, treatment facilities, etc.), has a possibility of higher levels of groundwater infiltration in comparison to the rest of the collection system.

Already identified when ADWF curves were first created in Section 3.2.1, Site 8 had abnormally high low-to-ADWF flow ratios. Figure 3-18 plots the low-to-ADWF flow ratios¹¹ against the ADWF flows for the relevant flow monitoring Sites. The brown dashed line shows “typical” low-to-ADWF ratios per the Water Environment Federation (WEF).

The following GWI results are noted:

- **Groundwater Infiltration:** Site 8 had a GWI rate higher than typical standards.

¹⁰ In an extreme case, perhaps 0.2 mgd of ADWF flow and 2.0 mgd of groundwater infiltration, the peaks and lows would be barely recognizable; the ADWF flow would be nearly a straight line.

¹¹ The Minimum to Average flow ratio is calculated by taking the minimum flow and dividing by the ADWF value (using the Mon-Thu ADWF curve).

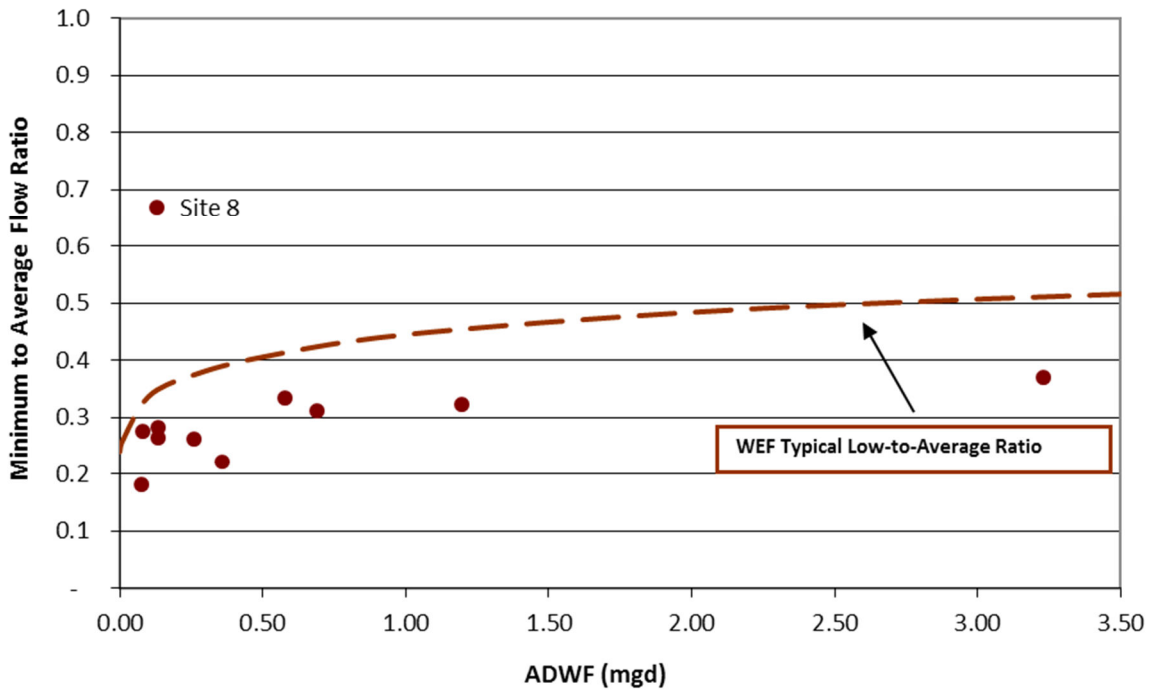


Figure 3-18. Minimum Flow Ratios vs ADWF¹²

¹² Due to attenuation, it should be expected that sites with larger flow volumes should not have quite the peak-to-average and low-to-average flow ratios as sites with lesser flow volumes. This is why the WEF typical trend line's slope is closer to 1.0 as the ADWF increases, as shown in the figure.

3.3.5 Combined I/I Results

Combined I/I analysis considers the totalized volume (in gallons) of both inflow and rainfall-dependent infiltration over the course of a storm event. This study used Event 2, March 12 to 25, 2018, for Combined I/I analysis as Event 2 was the longest duration and largest total rainfall during this monitoring period. Some sites had an I/I response lasting till March 30, four days after the rainfall event concluded (Figure 3-19). Table 3-7 summarizes the combined I/I flow results for Event 2. Results of note have been shaded in **RED**. Figure 3-20 shows a bar graph summary of the results. The following total I/I results are noted:

- **Total I/I:** Basins 1, 7+10, and 4 had the greatest normalized volume of total I/I.

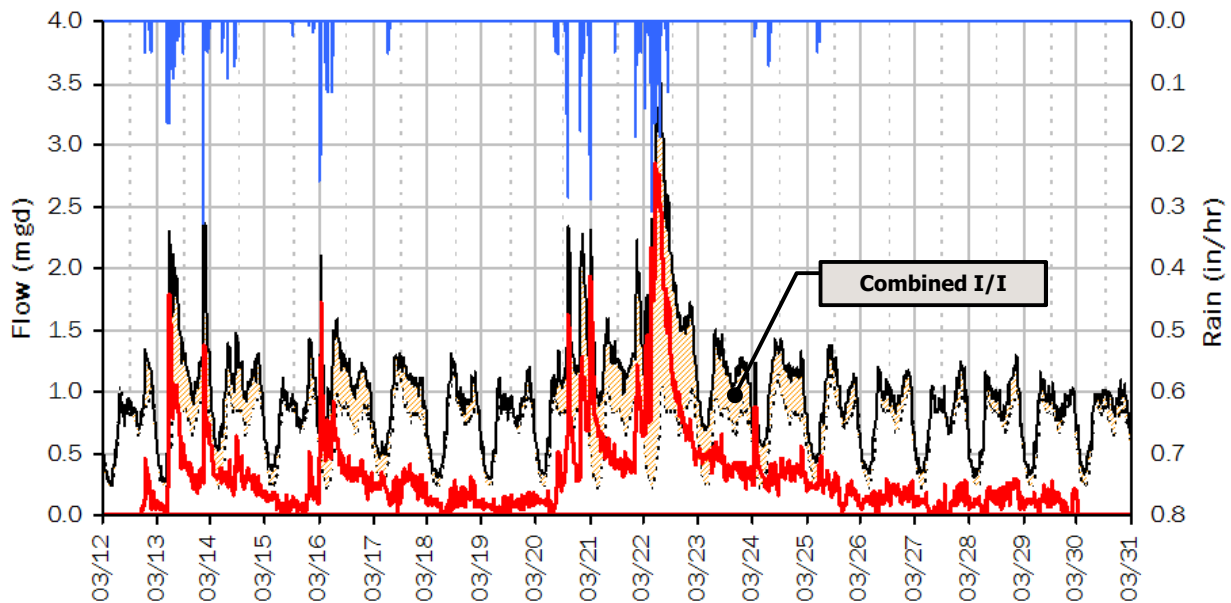


Figure 3-19. Combined I/I Analysis, Site 1, Event 2

Table 3-7. Combined I/I Analysis Summary (March 20-21, 2018)

Monitoring Basin	ADWF (mgd)	Combined I/I (gallons)	Combined I/I per ADWF, per inch rain	R-value (Combined I/I per Basin rain)	Combined I/I Ranking per ADWF per inch rain	Combined I/I Ranking per R-value	Overall Combined I/I Rank
Basin 1	0.685	5,678,000	4.03	34.1%	1	1	1
Basin 3	0.078	536,000	3.33	2.4%	3	9	5
Basin 4	0.137	1,221,000	3.71	4.1%	2	6	3
Basin 5	0.266	845,000	1.49	3.9%	7	8	9
Basin 6	0.934	5,044,000	2.53	19.4%	5	3	4
Basin 8	0.133	479,000	1.31	7.7%	9	5	8
Basin 9	0.084	345,000	1.44	8.1%	8	4	6
Basin 11	0.347	2,202,000	1.56	4.0%	6	7	6
Basin 7 + Basin 10	0.322	3,159,000	3.22	19.6%	4	2	2

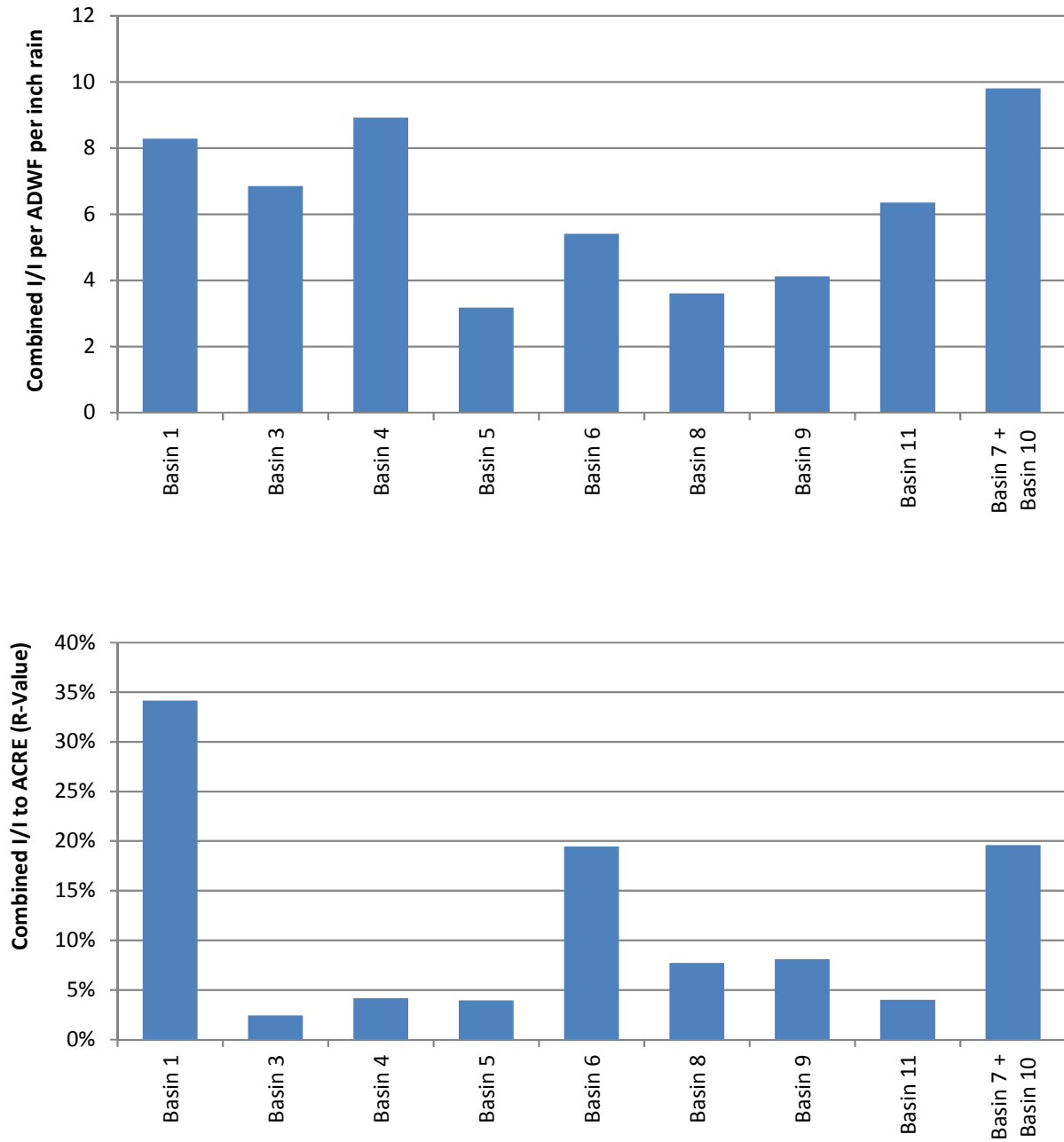


Figure 3-20. Bar Graphs: Combined I/I Analysis Summary

4 Recommendations

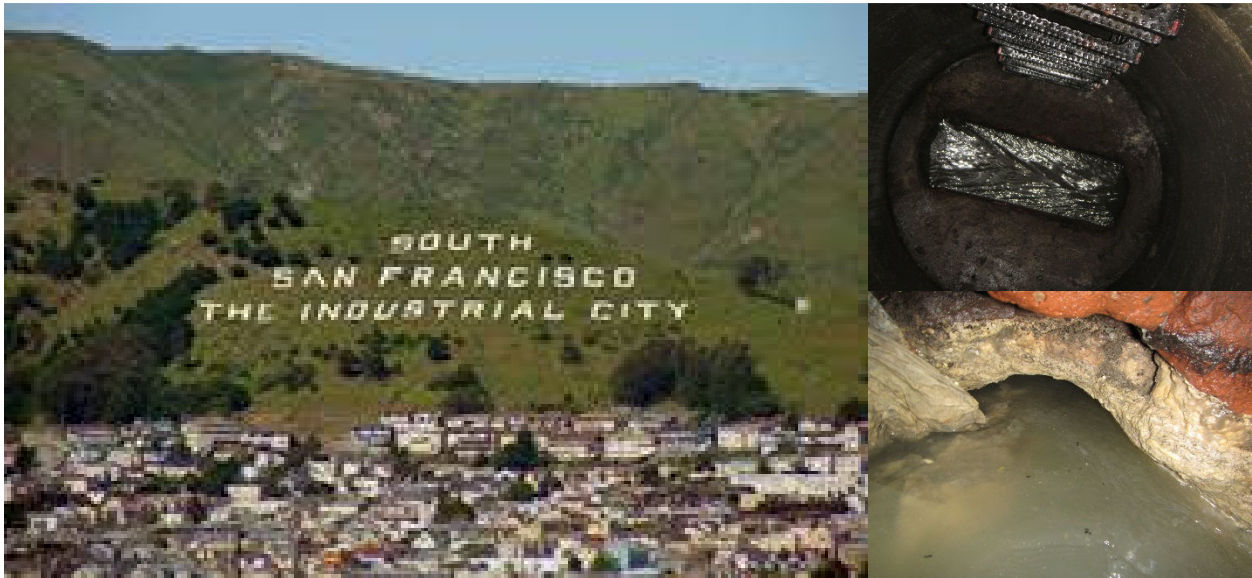
V&A advises that future I/I reduction plans consider the following recommendations:

1. **Master Plan and Model Implementation:** The study results can be used to update the master plan and compare with previous model assumptions and flow monitoring results.
2. **Verify Interconnections and Overflows:** understanding the interconnections and overflows can help with the master plan, basin isolation and I/I analysis.
3. **Capacity Analysis:** Several sites surcharged during the monitoring period. The City may want to analyze the capacity constraints in the updated master plan.
 - a. There may be a bottleneck and capacity issue in the main trunk lines. V&A recommends Akel and City engineers to review the pump station data and run times.
 - b. Site 11 may be of concern as it surcharged 3.25 feet, was a shallower and smaller manhole, has two effluents (one already quite full), had grease, rags and slight sediment, and located on a major road close to a creek.
 - c. V&A had completed multiple small-scale flow monitoring capacity studies for new developments in SSF in the past years. The City may want to review the data and development flows.
4. **Determine I/I Reduction Program:** The City should examine its I/I reduction needs to determine their needs and goals for a future I/I reduction program.
 - a. If peak flows, sanitary sewer overflows, and pipeline capacity issues are of greater concern, then priority can be given to investigate and reduce sources of inflow within the basins with the higher inflow rates. Basins 9, 11, and 1 ranked highest for inflow contribution and should be prioritized for inflow reduction.
 - b. If infiltration and general pipeline deterioration are of greater concern, then the program can be weighted to investigate and reduce sources of infiltration within the basins with the higher RDI and Combined I/I rates. Basins 1, 7+10, 4 and 6 ranked highest for infiltration contribution and should be prioritized for infiltration reduction.
5. **I/I Investigation Methods:** Potential I/I investigation methods include the following:
 - a. smoke testing
 - b. mini-basin flow monitoring
 - c. night-time reconnaissance work to (1) investigate and determine direct point sources of inflow, and (2) determine the areas and/or pipe reaches responsible for high levels of infiltration contribution.
 - d. CCTV inspection
6. **I/I Reduction Cost Effective Analysis:** The City should conduct a study to determine which is more cost-effective: (1) locating the sources of inflow/infiltration and systematically rehabilitating or replacing the faulty pipelines; or (2) continued treatment of the additional rainfall dependent I/I flow.

Appendix A

Flow Monitoring Basin Reports: Data, Graphs, Information

V&A Project No. 17-0325



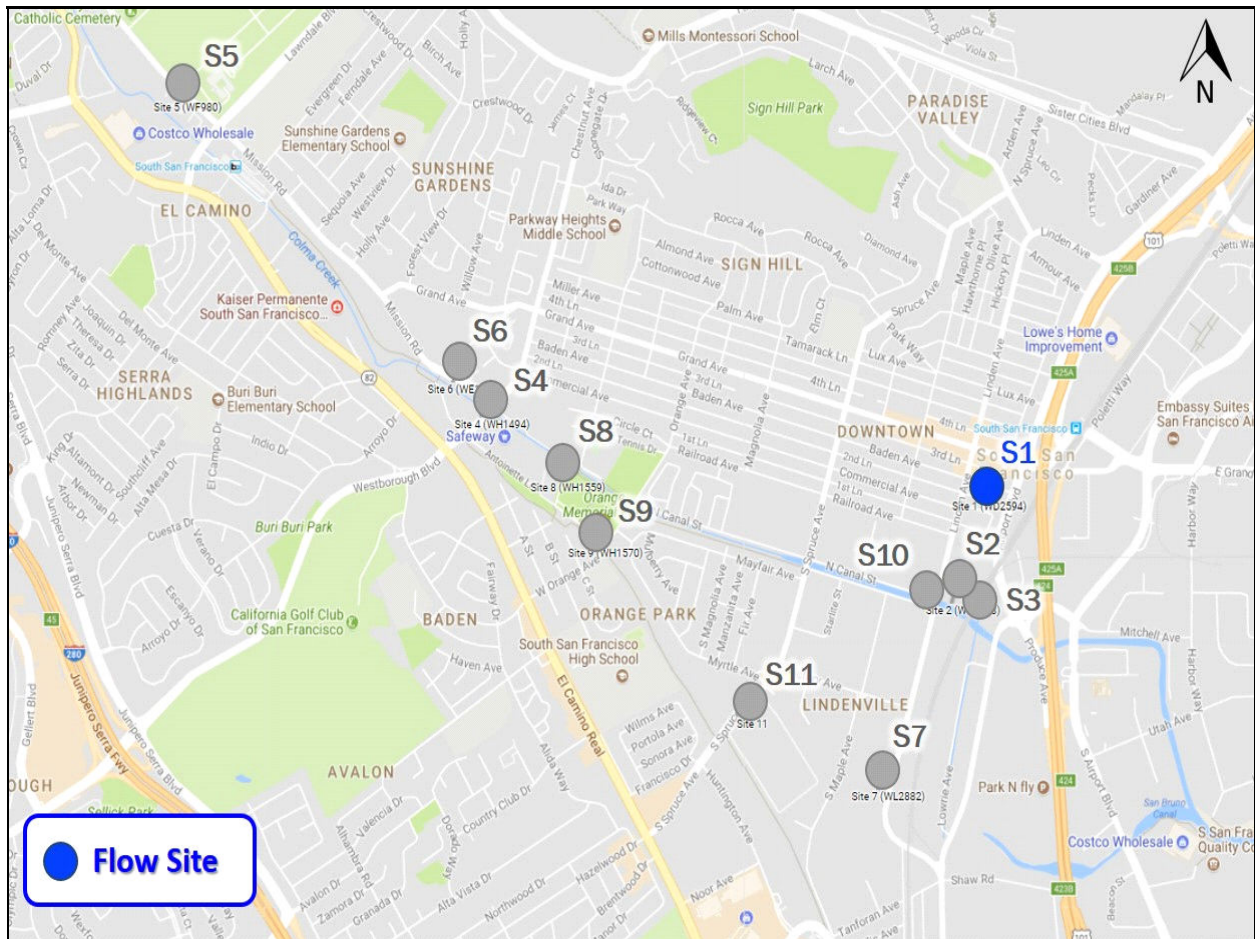
1000 Broadway, Suite 230
Oakland, CA 94607
510.903.6600
510.903.6601, Fax

City of South San Francisco Sanitary Sewer Flow Monitoring February 26- June 28, 2018

Monitoring Site: Site 1

Location: 210 Baden Avenue, east of Linden Avenue

Data Summary Report

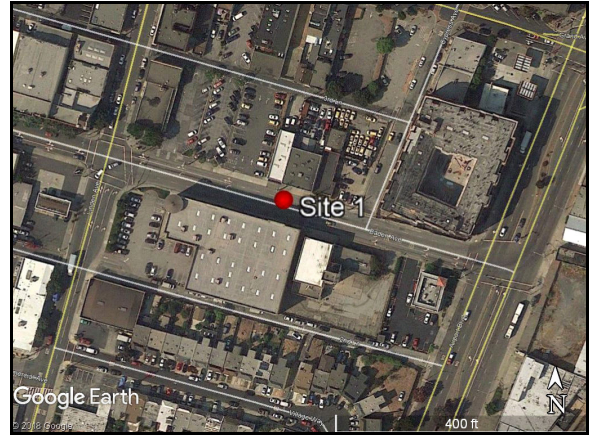


Vicinity Map: Site 1

SITE 1

Site Information

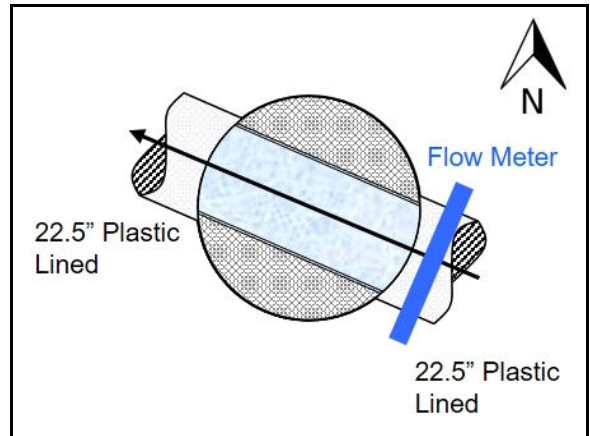
MH ID:	WD2594
Location:	210 Baden Avenue, east of Linden Avenue
Coordinates:	122.4095° W, 37.6540° N
Rim Elevation (Earth):	22 feet
Pipe Diameter:	22.5 inches
Sediment:	0.00 inches
ADWF:	0.685 mgd
Peak Measured Flow:	7.103 mgd



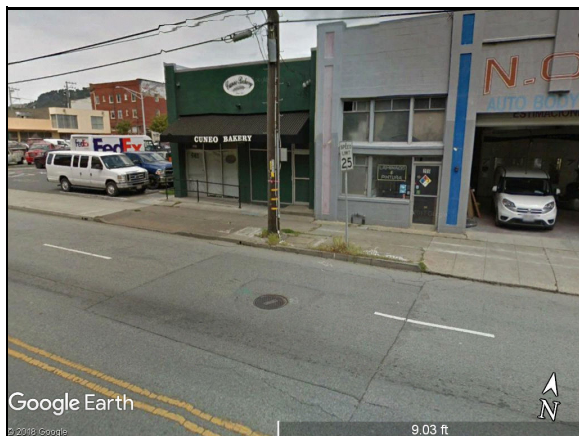
Satellite Map



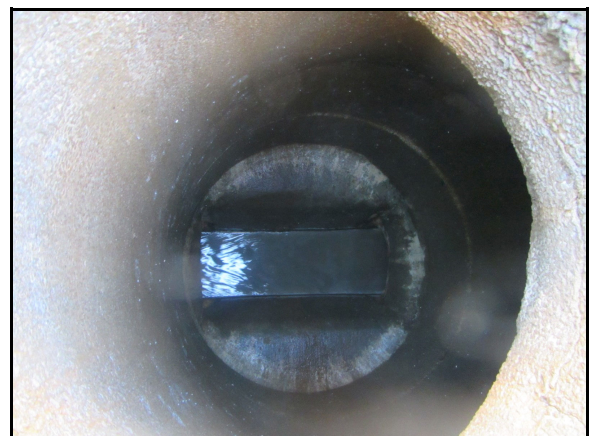
Sewer Map



Flow Sketch



Street View



Plan View

SITE 1

Additional Site Photos

Effluent Pipe



Influent Pipe

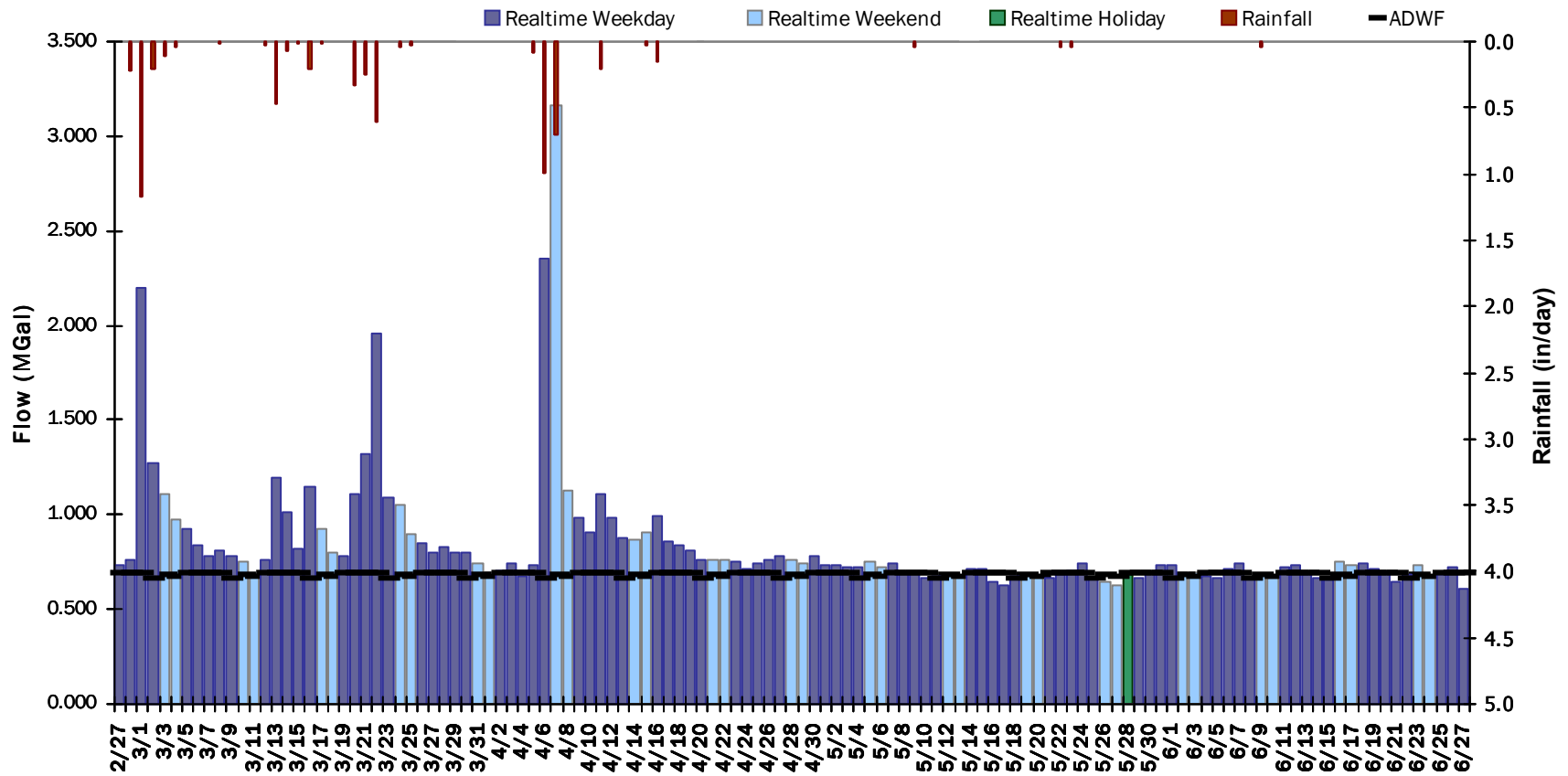


SITE 1

Period Flow Summary: Daily Flow Totals

Avg Period Flow: 0.836 MGal Peak Daily Flow: 3.163 MGal Min Daily Flow: 0.604 MGal

Total Period Rainfall: 6.14 inches



SITE 1

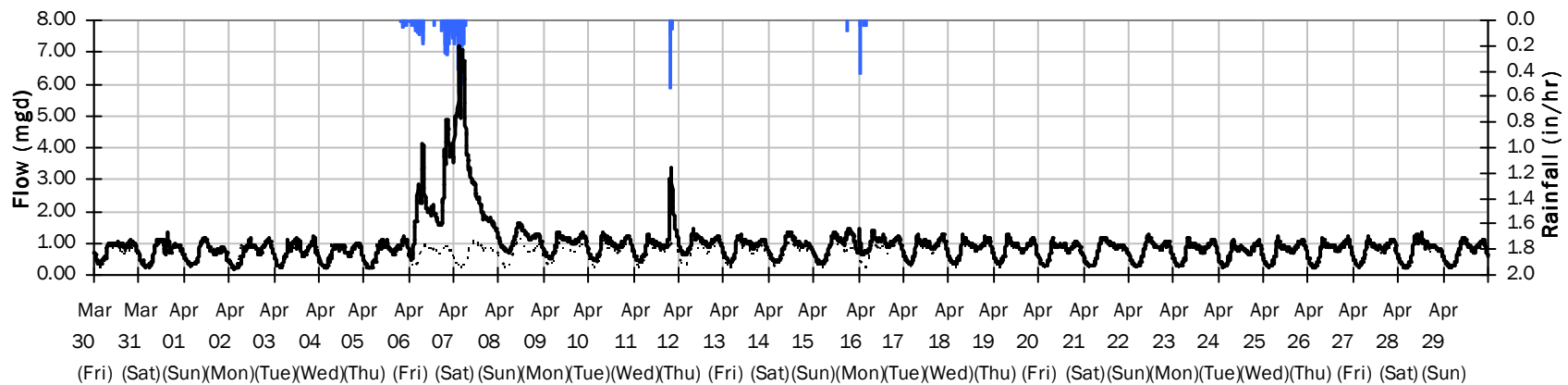
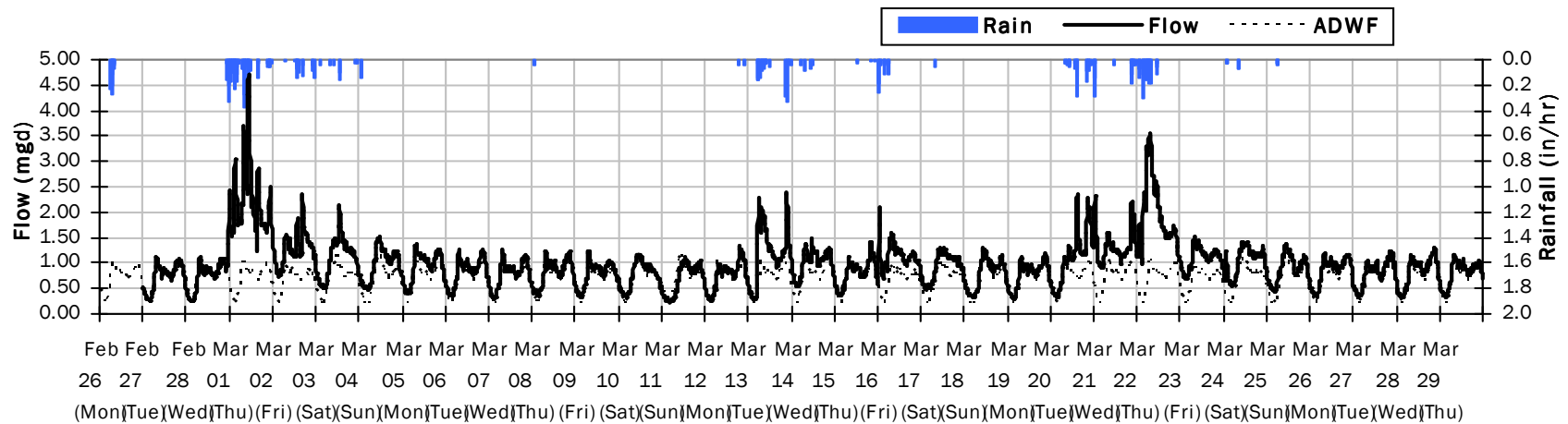
Flow Summary: 2/26/2018 to 4/29/2018

Total Period Rainfall: 6.26 inches

Avg Flow: 0.971 mgd

Peak Flow: 7.103 mgd

Min Flow: 0.202 mgd



SITE 1

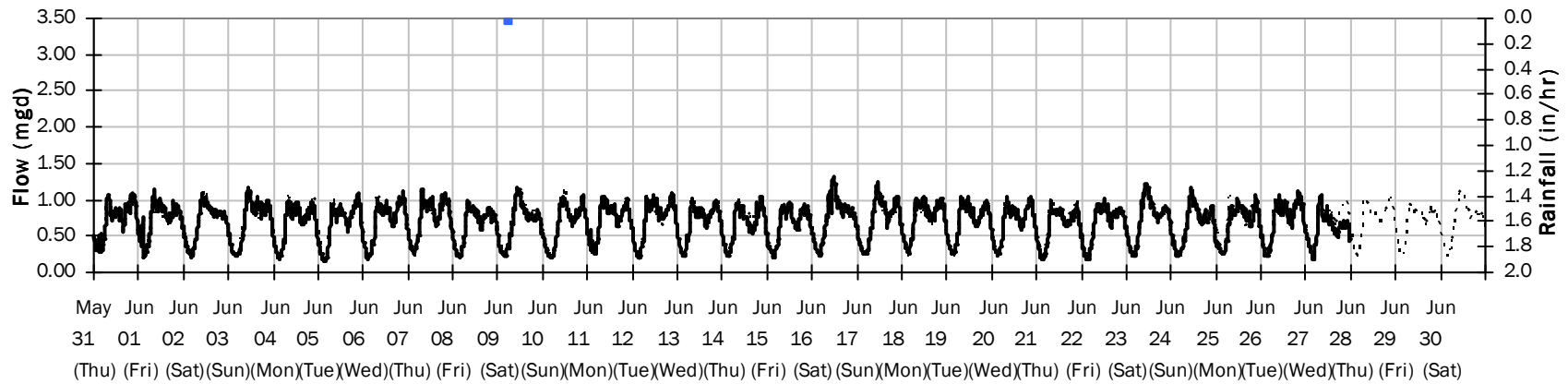
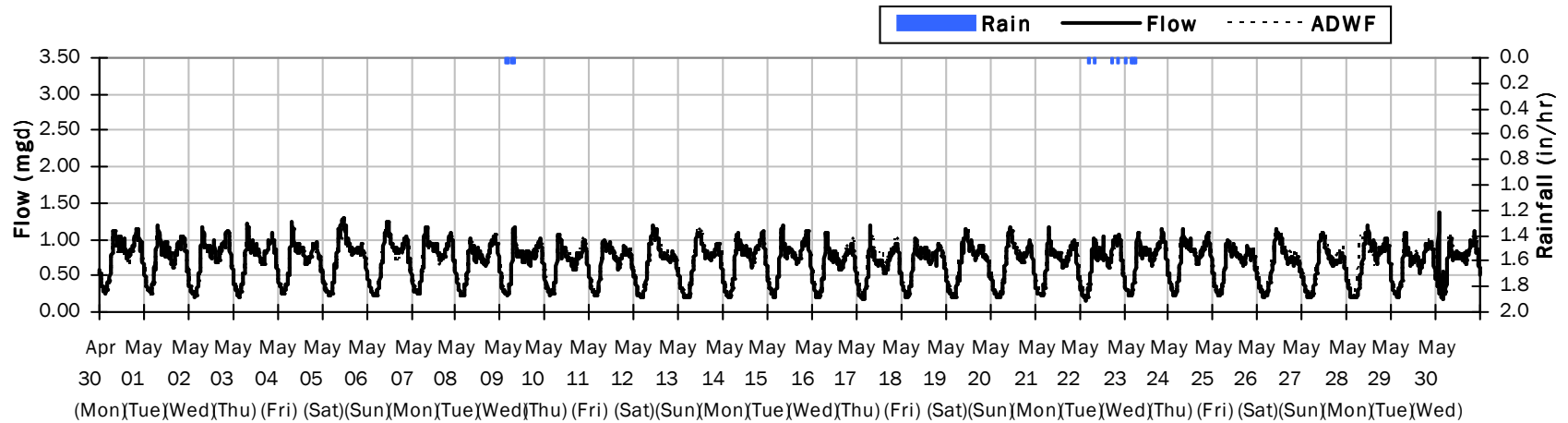
Flow Summary: 4/30/2018 to 6/30/2018

Total Period Rainfall: 0.16 inches

Avg Flow: 0.694 mgd

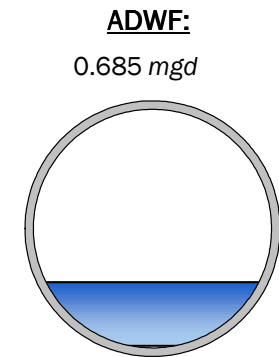
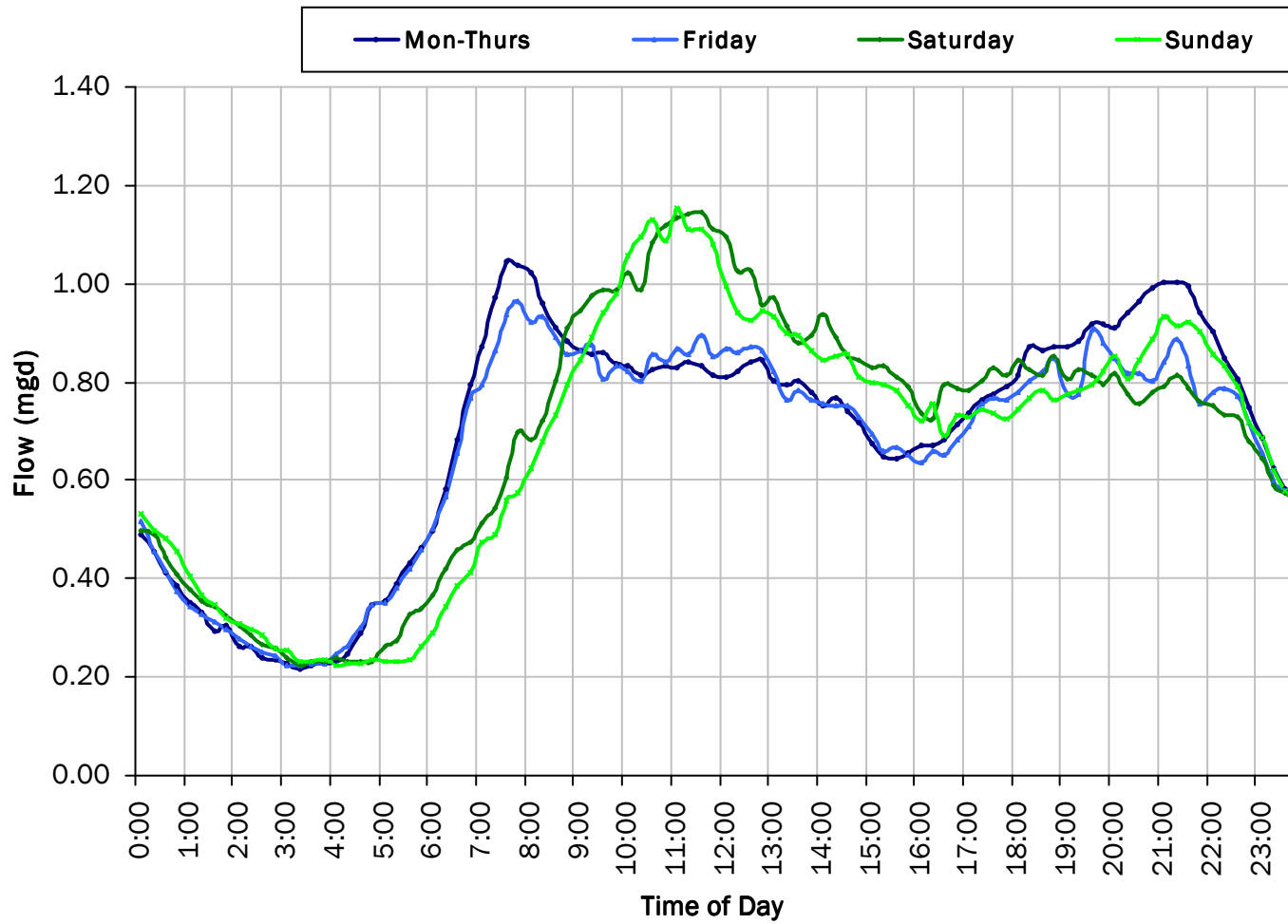
Peak Flow: 1.377 mgd

Min Flow: 0.160 mgd



SITE 1

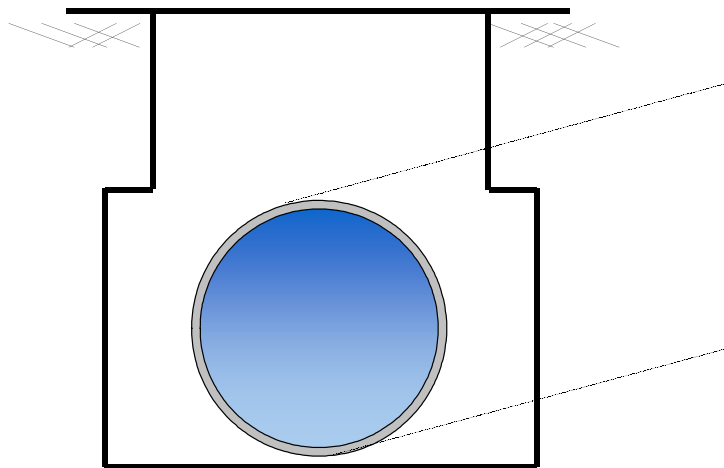
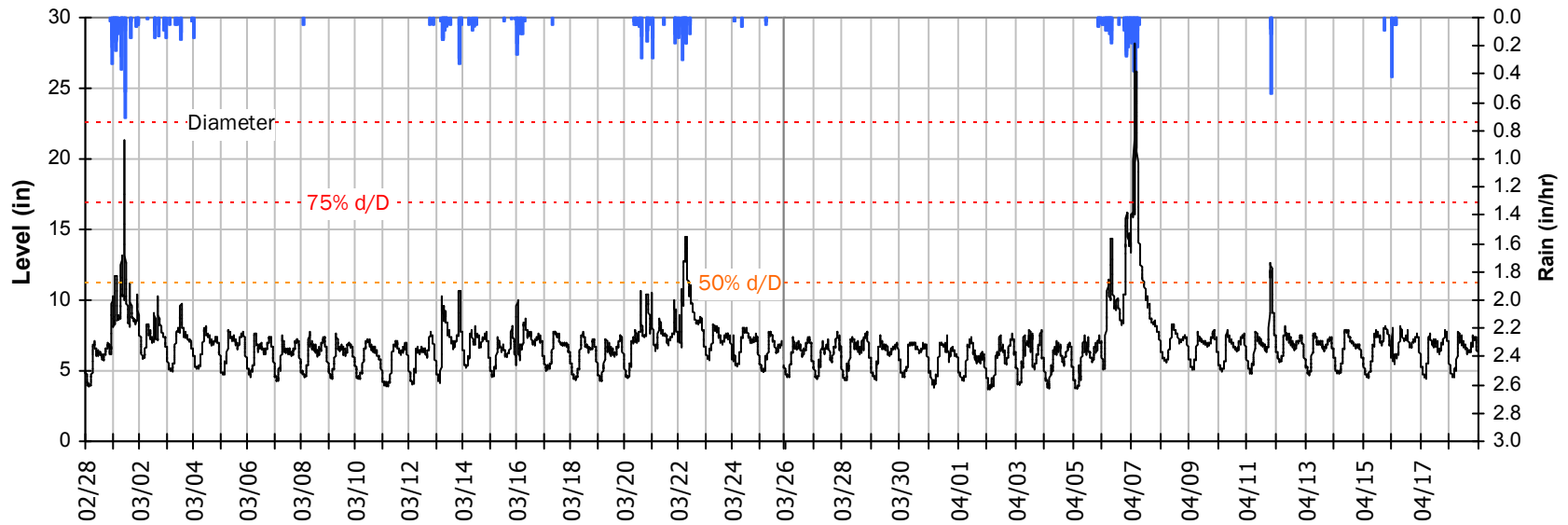
Average Dry Weather Flow Hydrographs



SITE 1

Site Capacity and Surge Summary

Realtime Flow Levels with Rainfall Data over Monitoring (High Capacity) Period



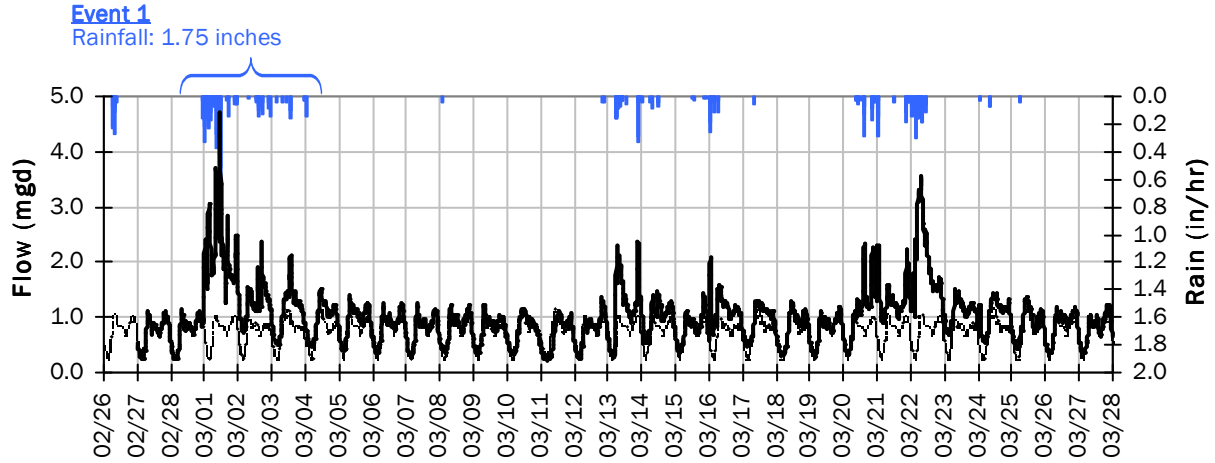
Pipe Diameter:	22.5	inches
Peak Measured Level:	28.1	inches
Peak d/D Ratio:	1.25	

Surcharged 5.6 inches over crown

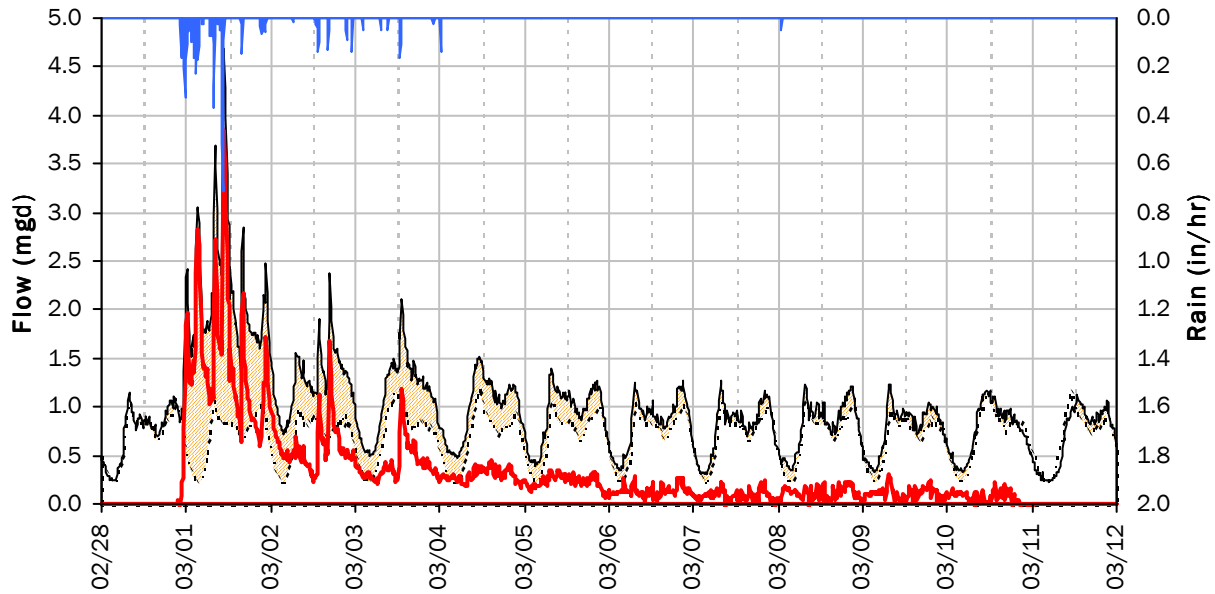
SITE 1

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



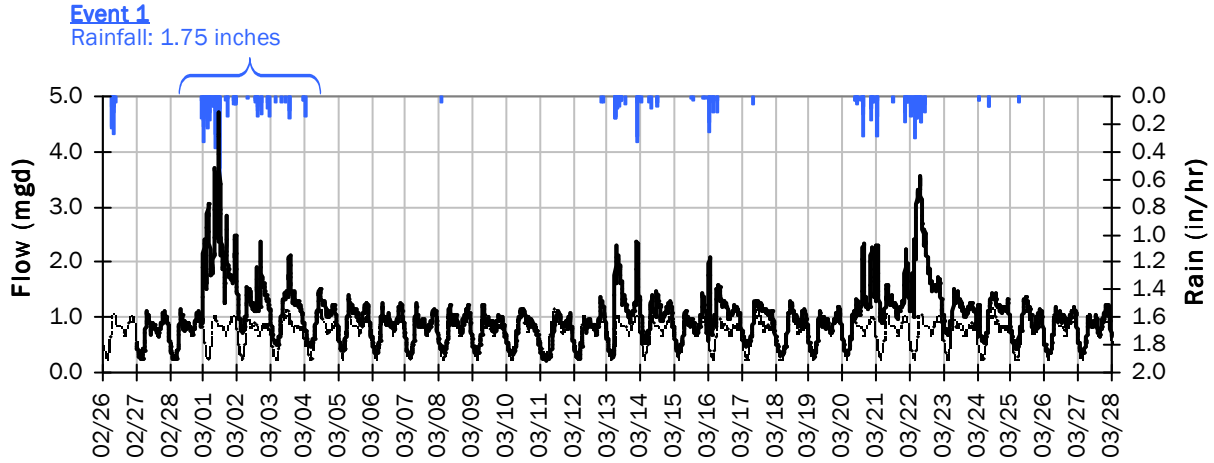
Storm Event I/I Analysis (Rain = 1.75 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	4.70 mgd	Peak I/I Rate:	3.86 mgd
PF:	6.86	Total I/I:	3,581,000 gallons
Peak Level:	21.28 in		
d/D Ratio:	0.95		

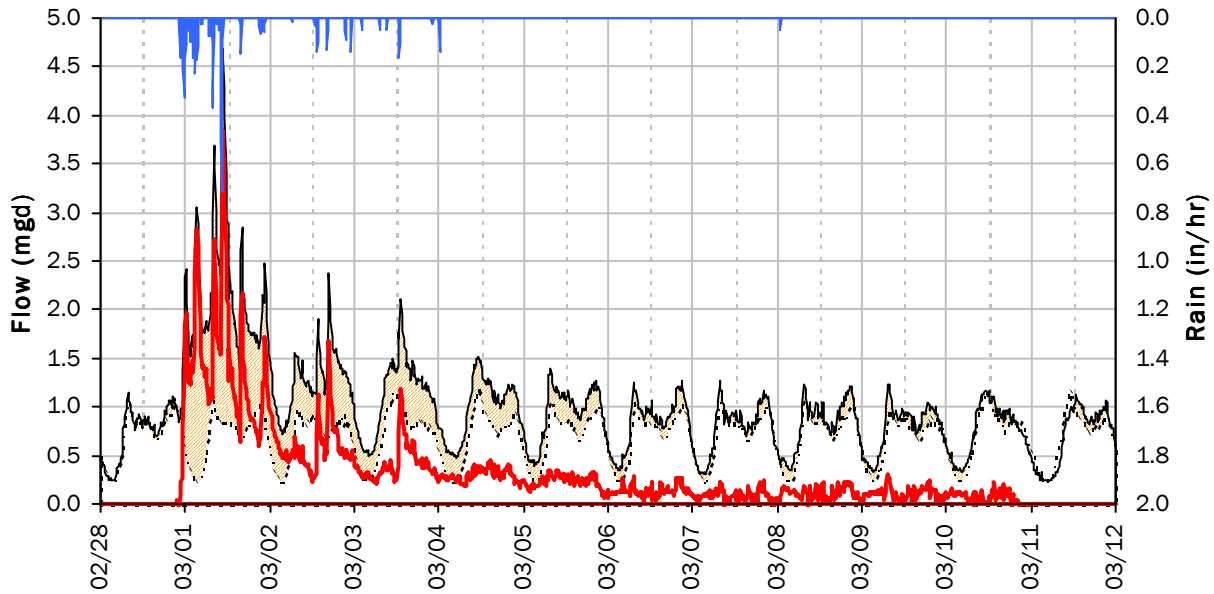
SITE 1

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



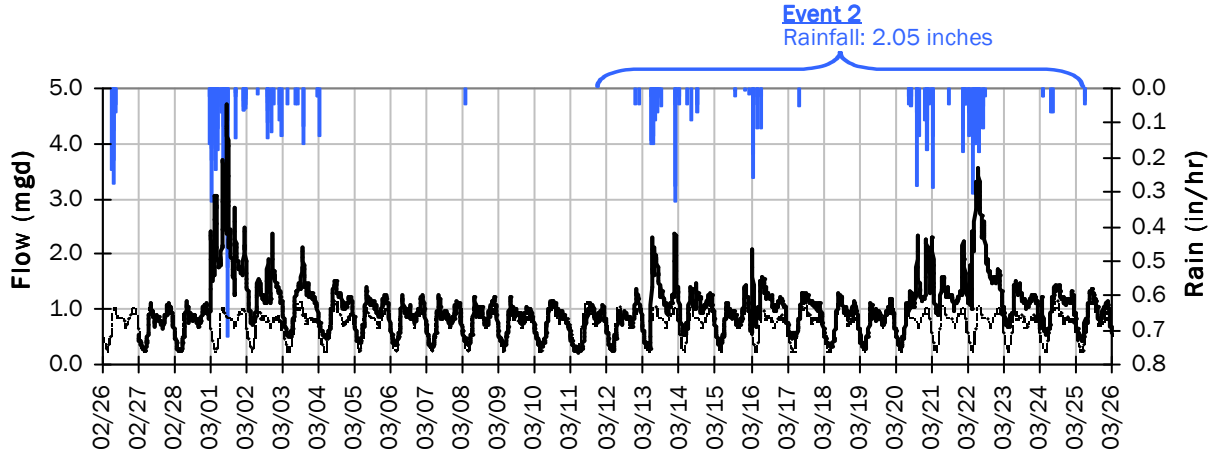
Storm Event I/I Analysis (Rain = 1.75 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	4.70 mgd	Peak I/I Rate:	3.86 mgd
PF:	6.86	Total I/I:	3,581,000 gallons
Peak Level:	21.28 in		
d/D Ratio:	0.95		

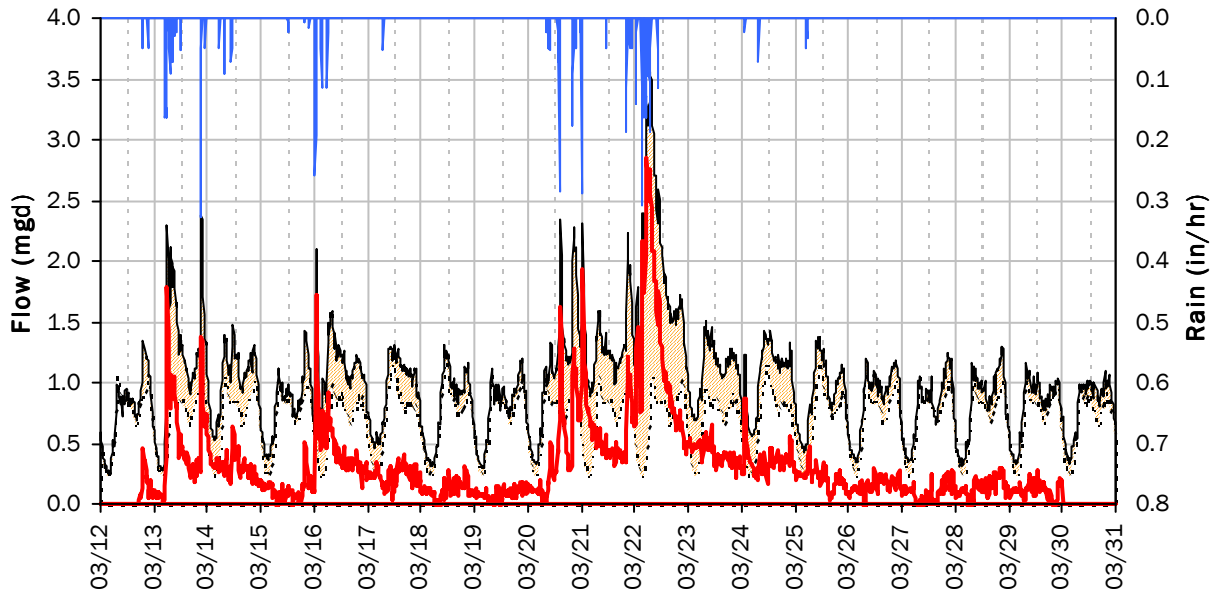
SITE 1

I/I Summary: Event 2

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 2 Detail Graph



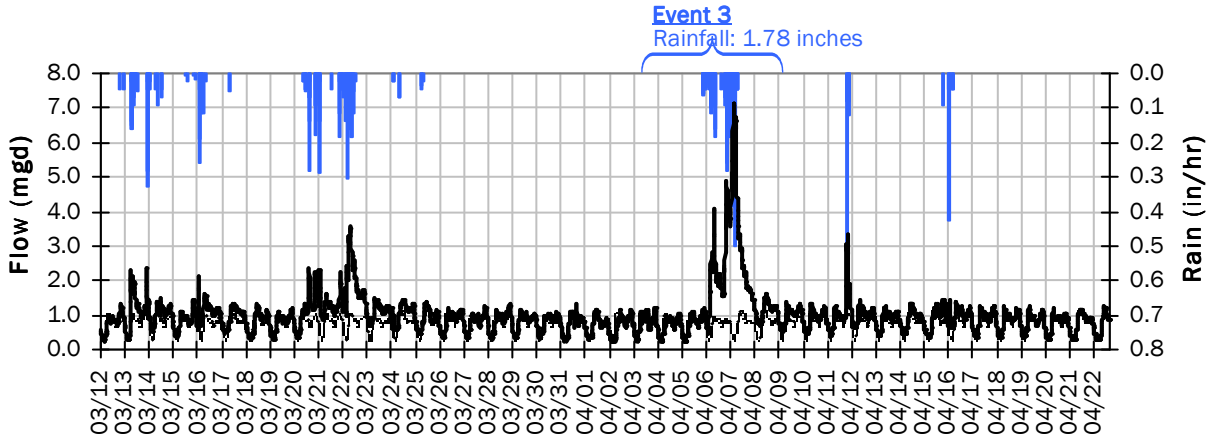
Storm Event I/I Analysis (Rain = 2.05 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	3.56 mgd	Peak I/I Rate:	2.86 mgd
PF:	5.19	Total I/I:	5,678,000 gallons
Peak Level:	14.49 in		
d/D Ratio:	0.64		

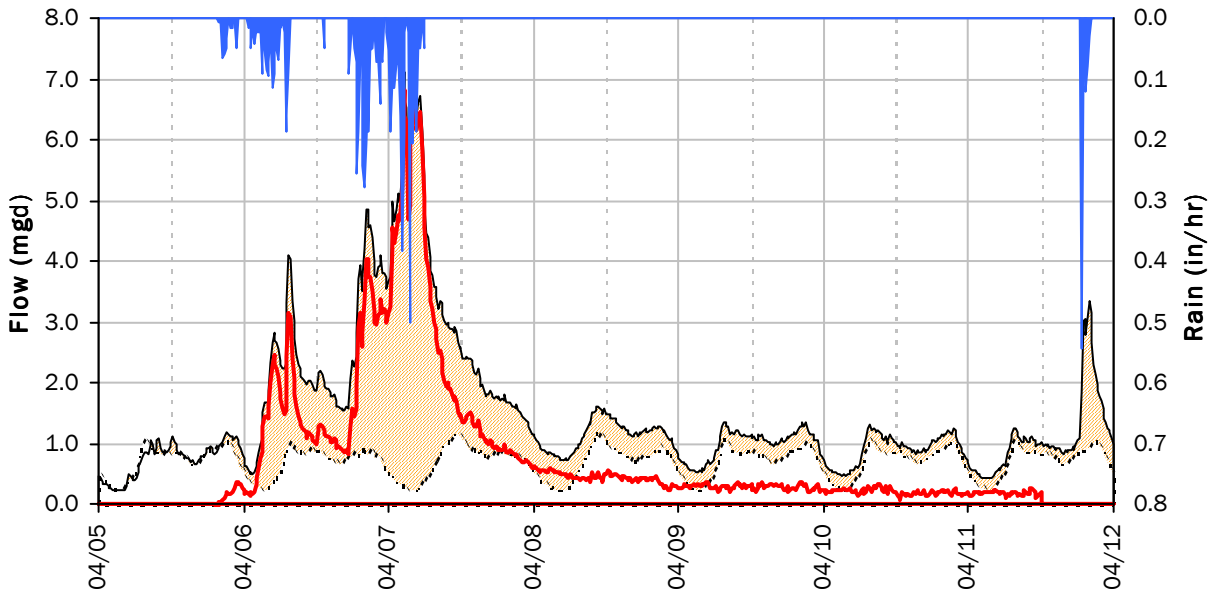
SITE 1

I/I Summary: Event 3

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 3 Detail Graph



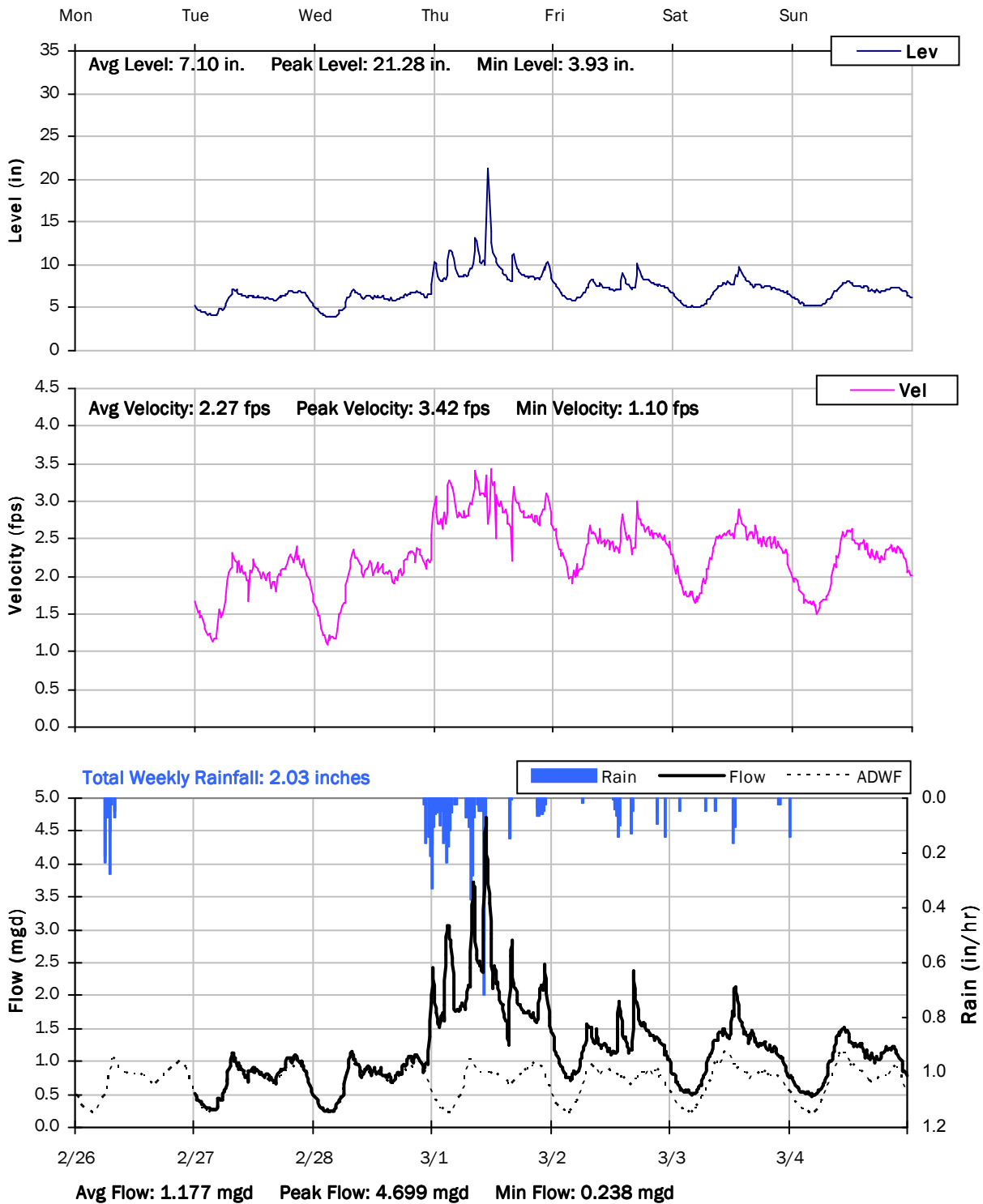
Storm Event I/I Analysis (Rain = 1.78 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	7.10 mgd	Peak I/I Rate:	6.83 mgd
PF:	10.36	Total I/I:	5,199,000 gallons
Peak Level:	28.12 in		
d/D Ratio:	1.25		

SITE 1

Weekly Level, Velocity and Flow Hydrographs

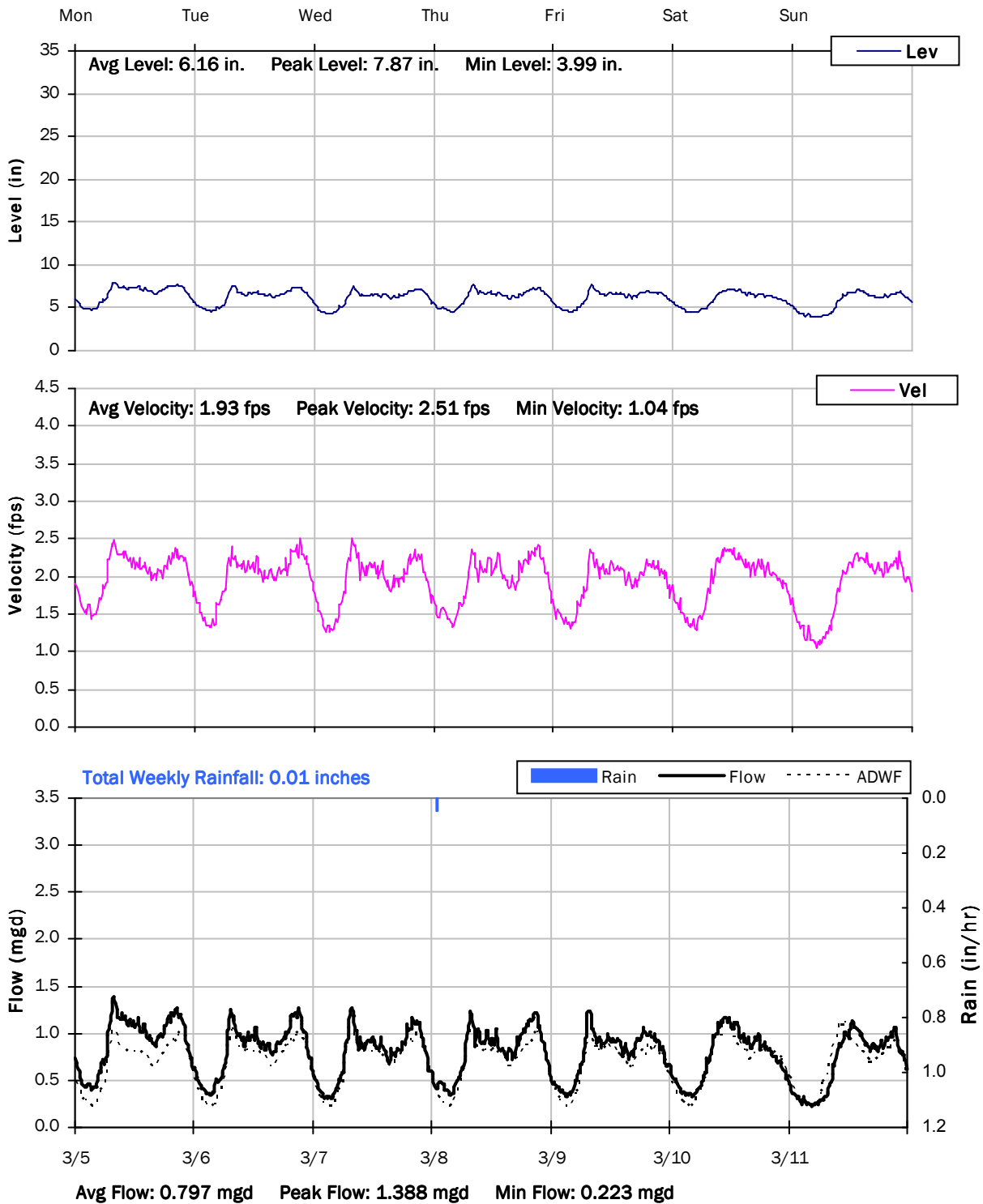
2/26/2018 to 3/5/2018



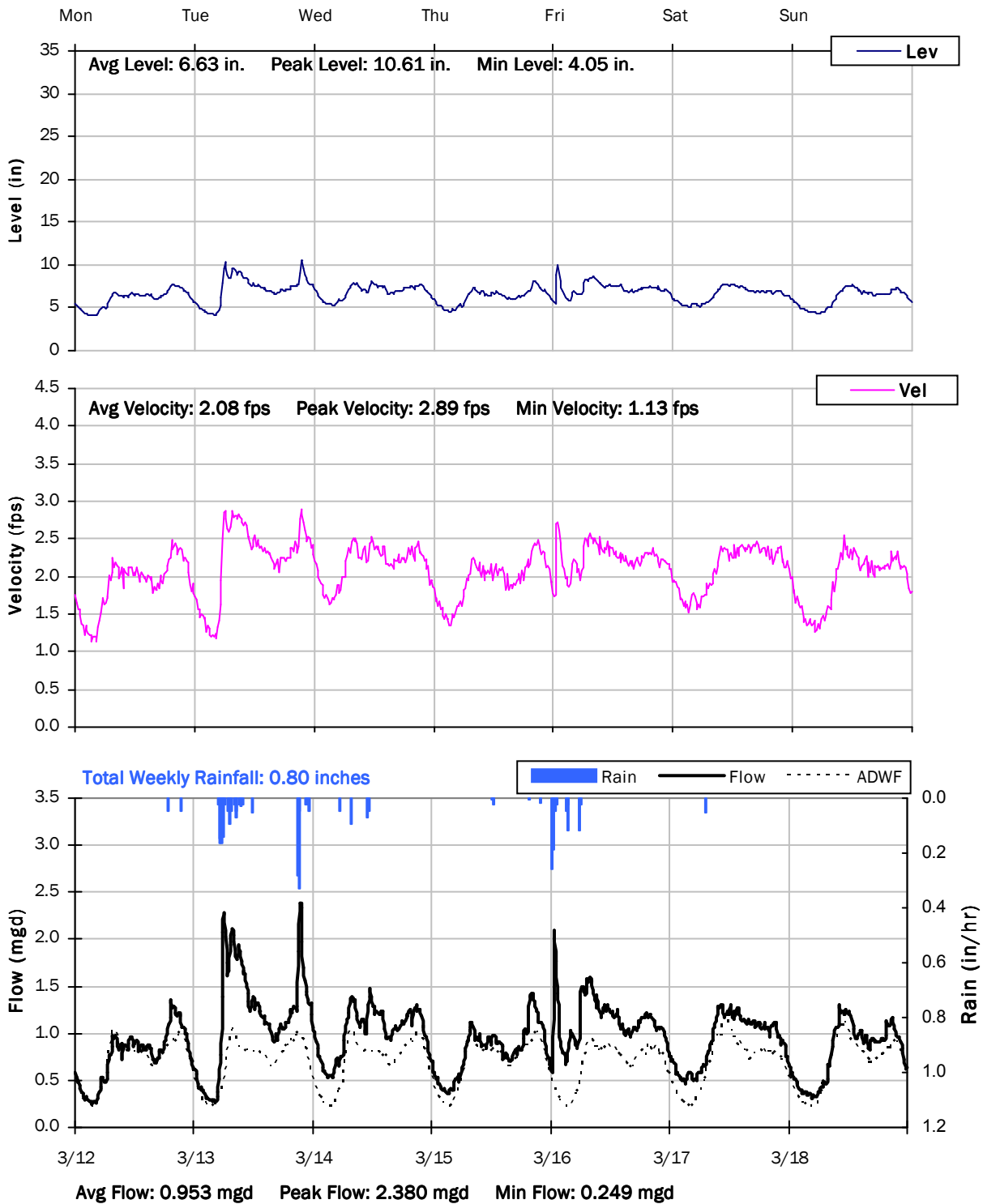
SITE 1

Weekly Level, Velocity and Flow Hydrographs

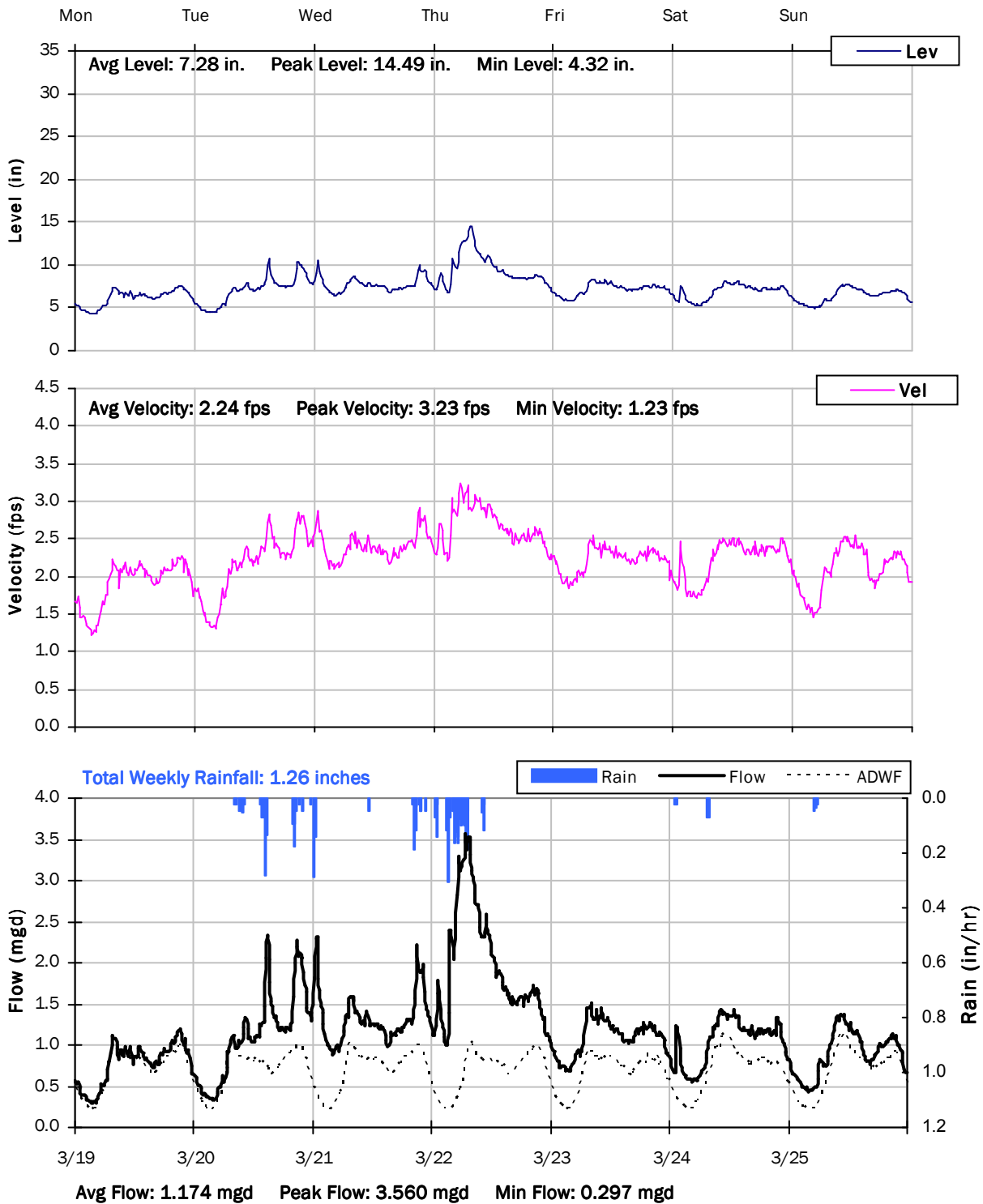
3/5/2018 to 3/12/2018



SITE 1
Weekly Level, Velocity and Flow Hydrographs
3/12/2018 to 3/19/2018



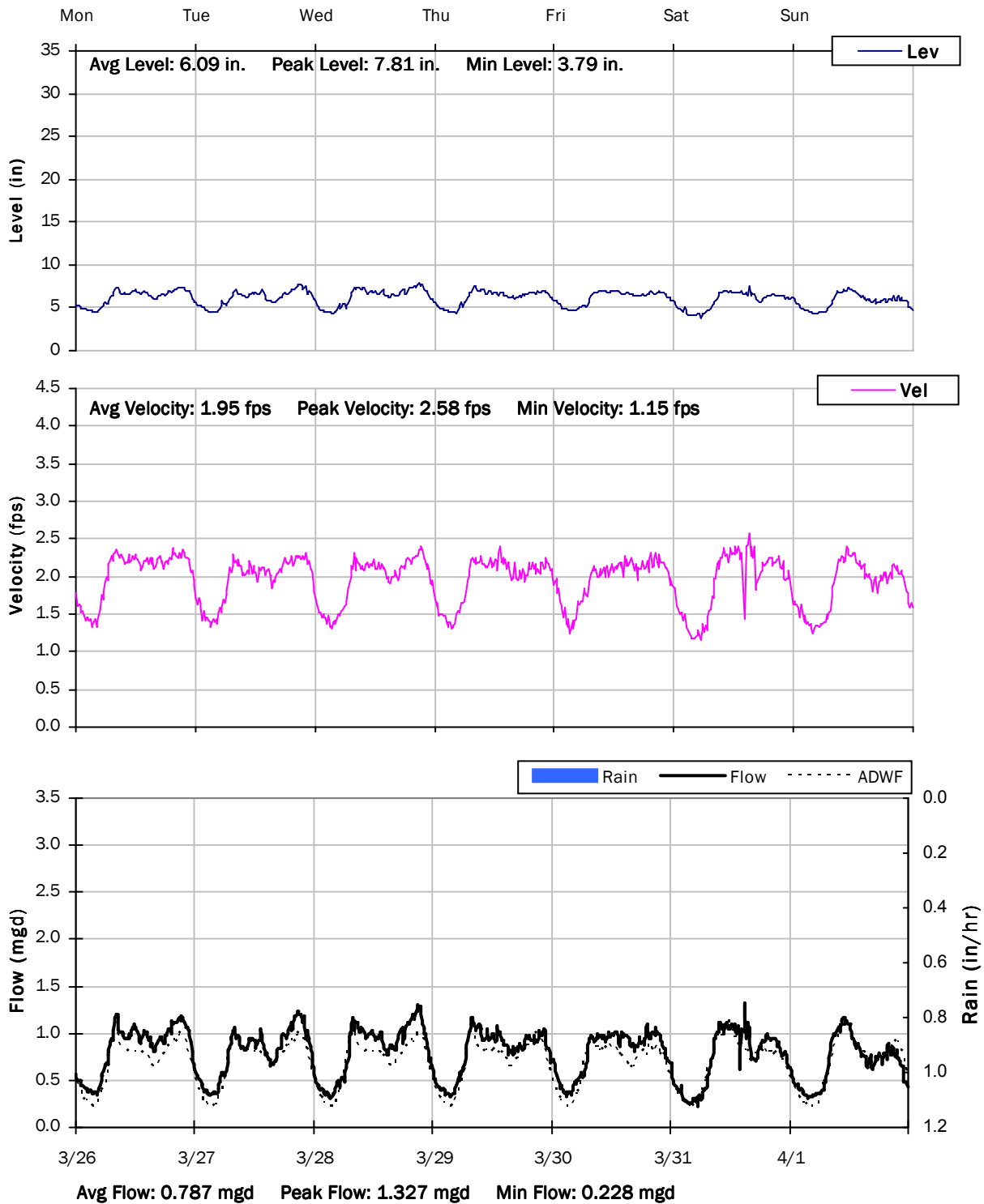
SITE 1
Weekly Level, Velocity and Flow Hydrographs
3/19/2018 to 3/26/2018



SITE 1

Weekly Level, Velocity and Flow Hydrographs

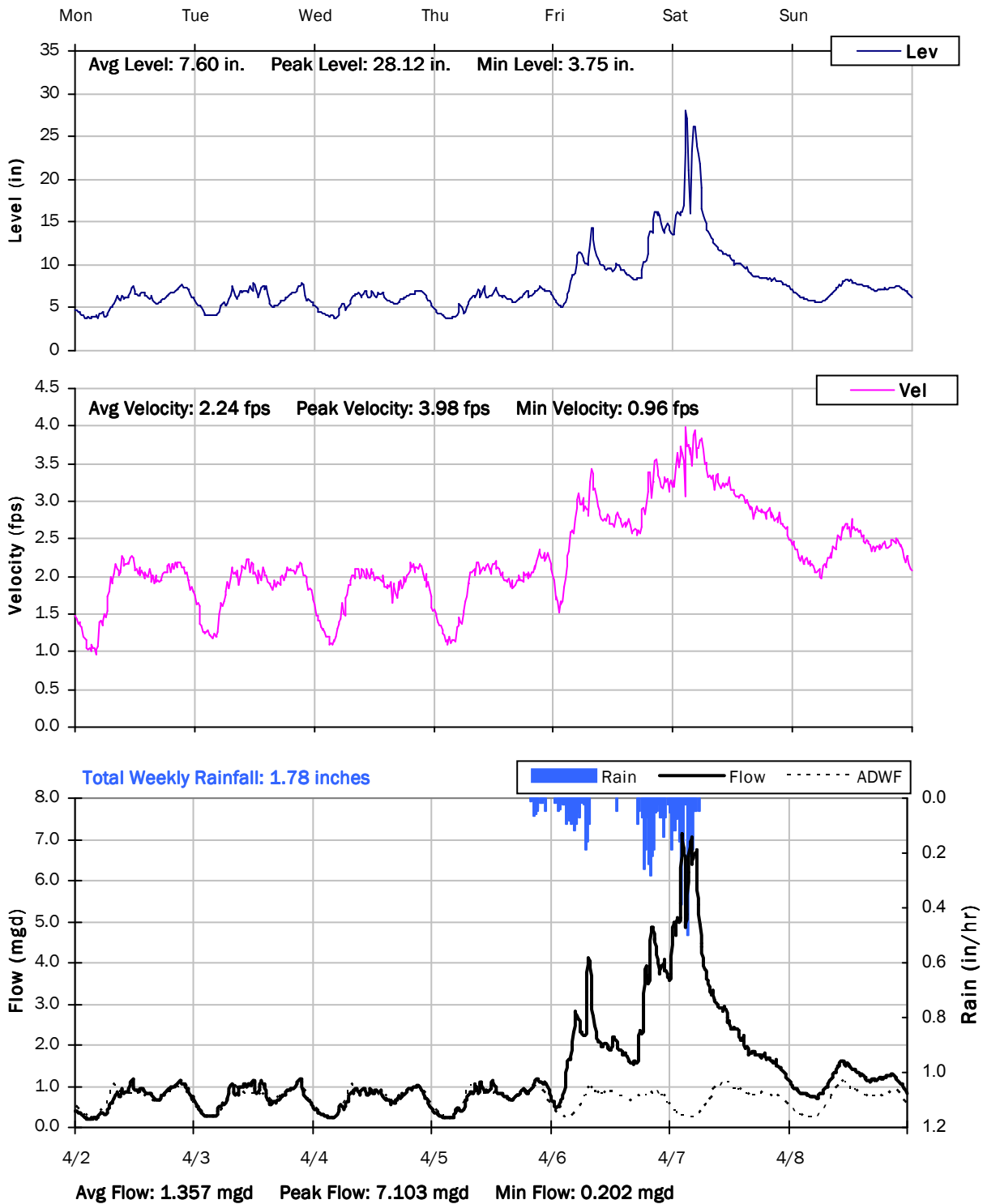
3/26/2018 to 4/2/2018



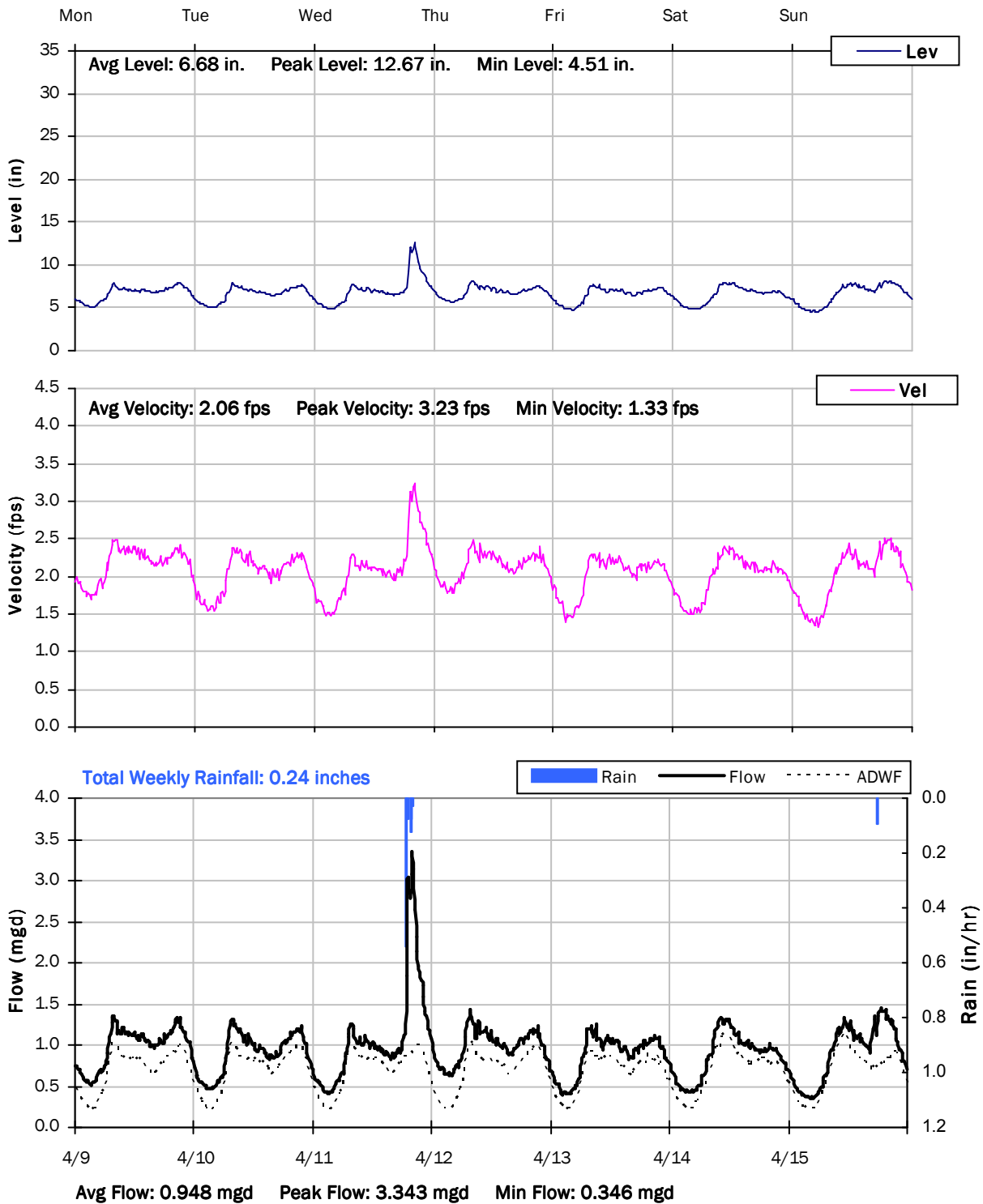
SITE 1

Weekly Level, Velocity and Flow Hydrographs

4/2/2018 to 4/9/2018



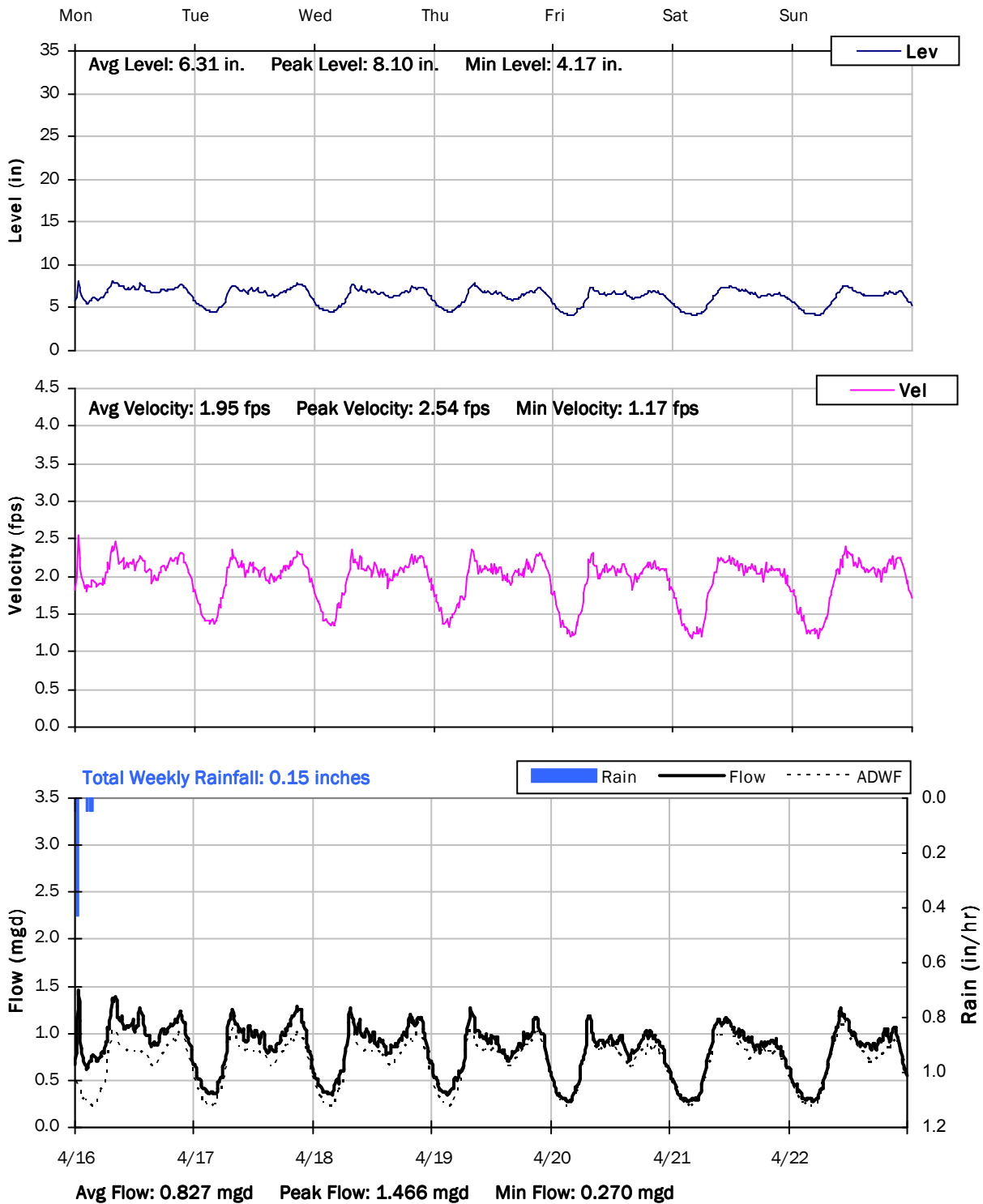
SITE 1
Weekly Level, Velocity and Flow Hydrographs
4/9/2018 to 4/16/2018



SITE 1

Weekly Level, Velocity and Flow Hydrographs

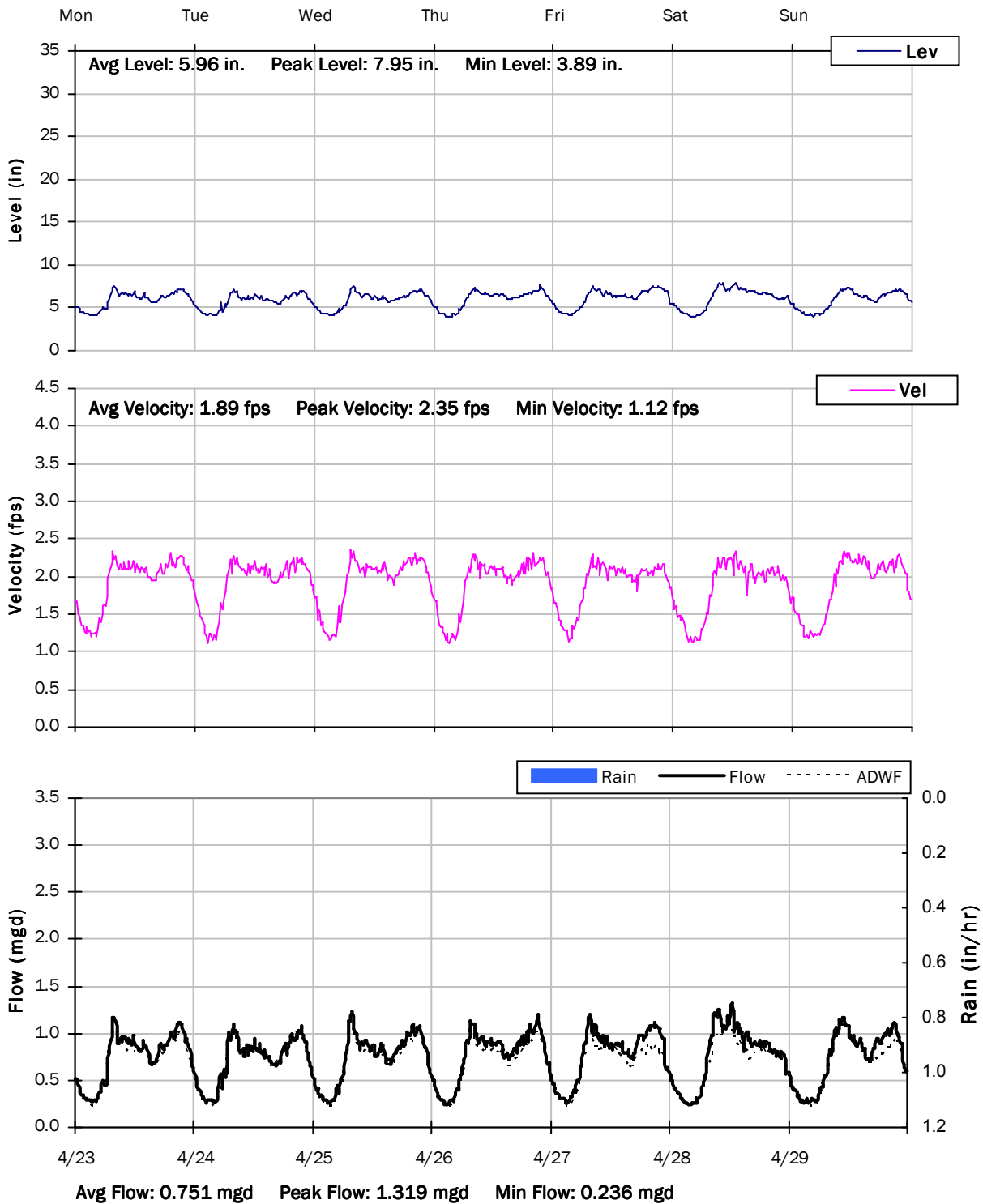
4/16/2018 to 4/23/2018



SITE 1

Weekly Level, Velocity and Flow Hydrographs

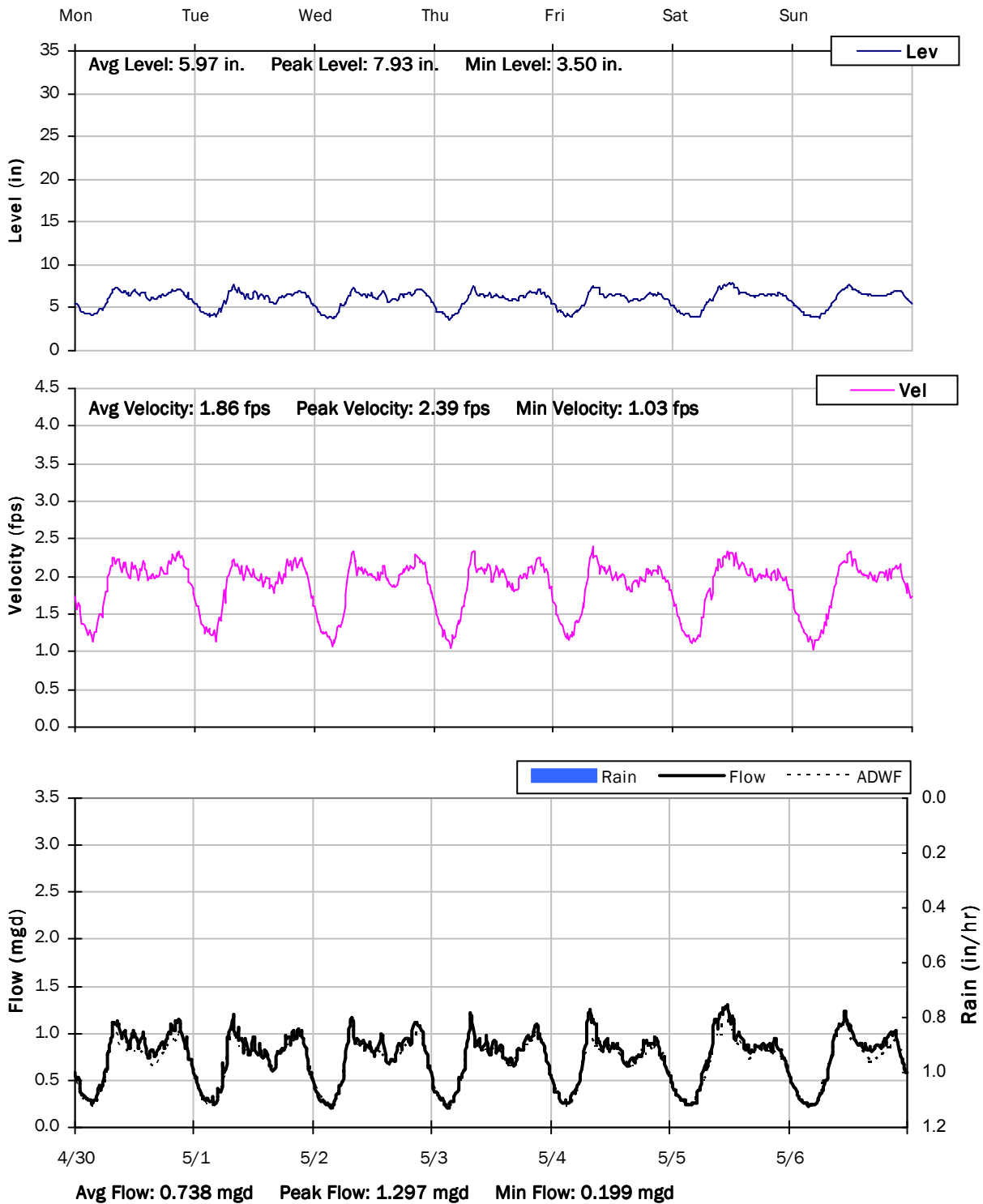
4/23/2018 to 4/30/2018



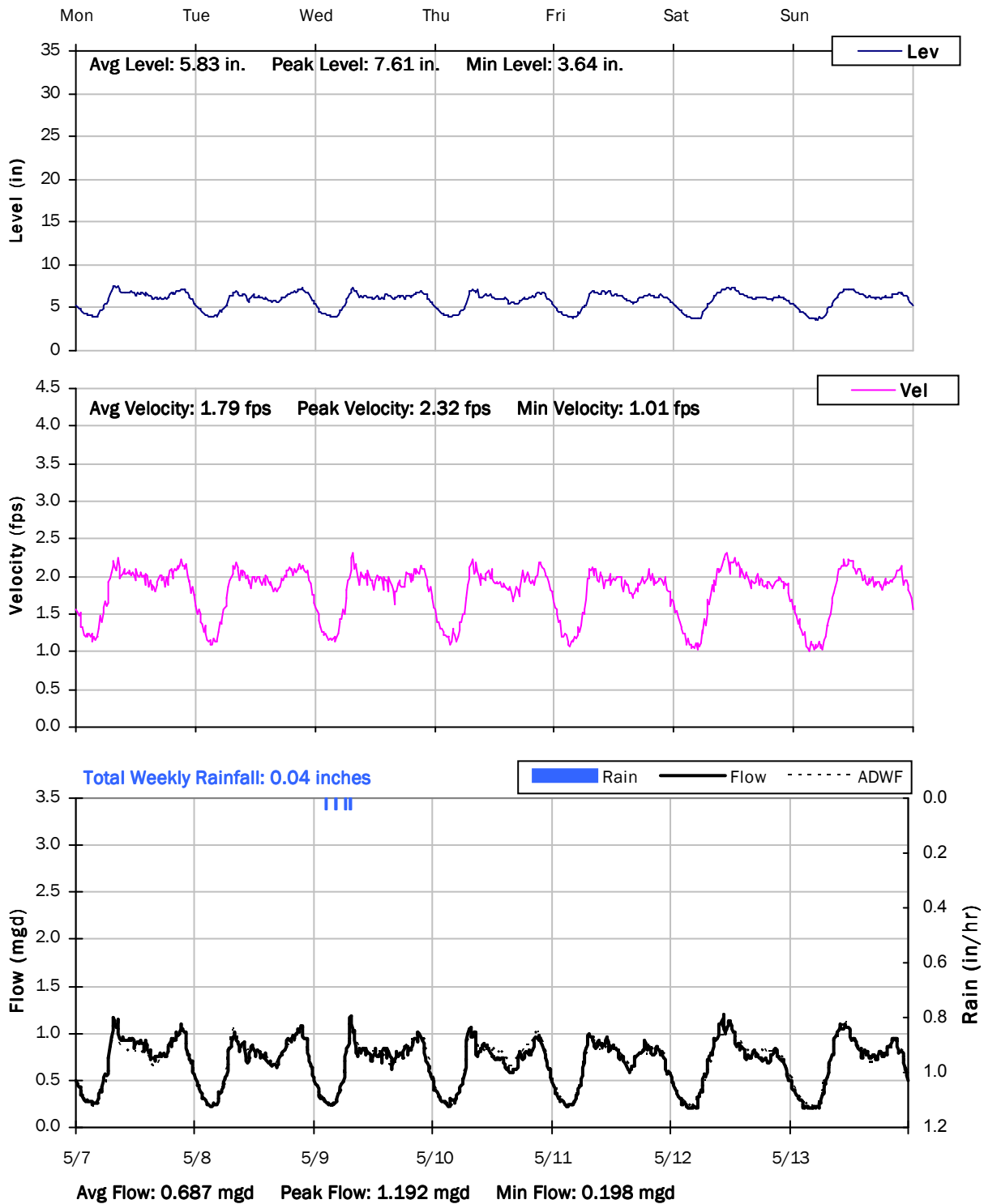
SITE 1

Weekly Level, Velocity and Flow Hydrographs

4/30/2018 to 5/7/2018



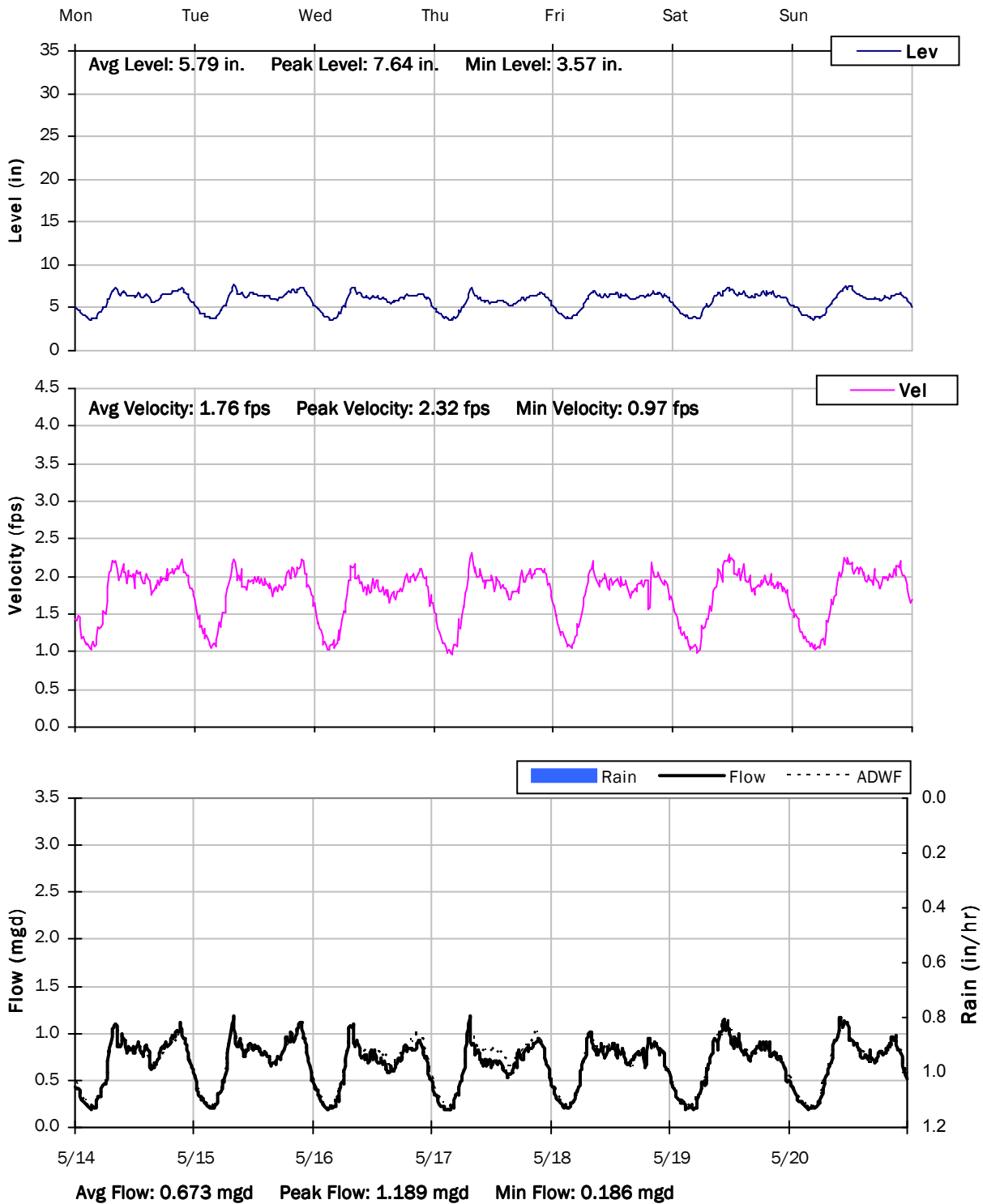
SITE 1
Weekly Level, Velocity and Flow Hydrographs
5/7/2018 to 5/14/2018



SITE 1

Weekly Level, Velocity and Flow Hydrographs

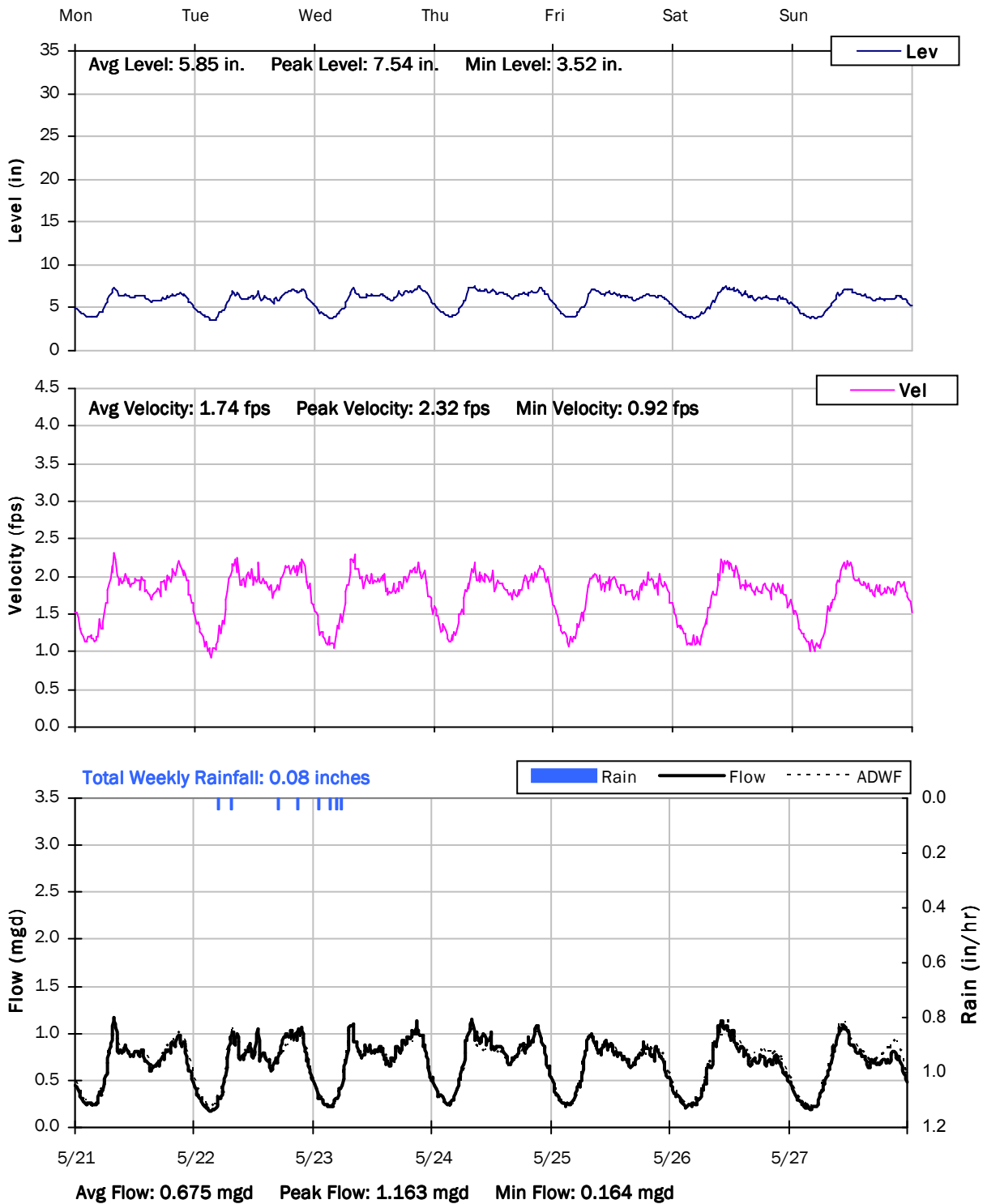
5/14/2018 to 5/21/2018



SITE 1

Weekly Level, Velocity and Flow Hydrographs

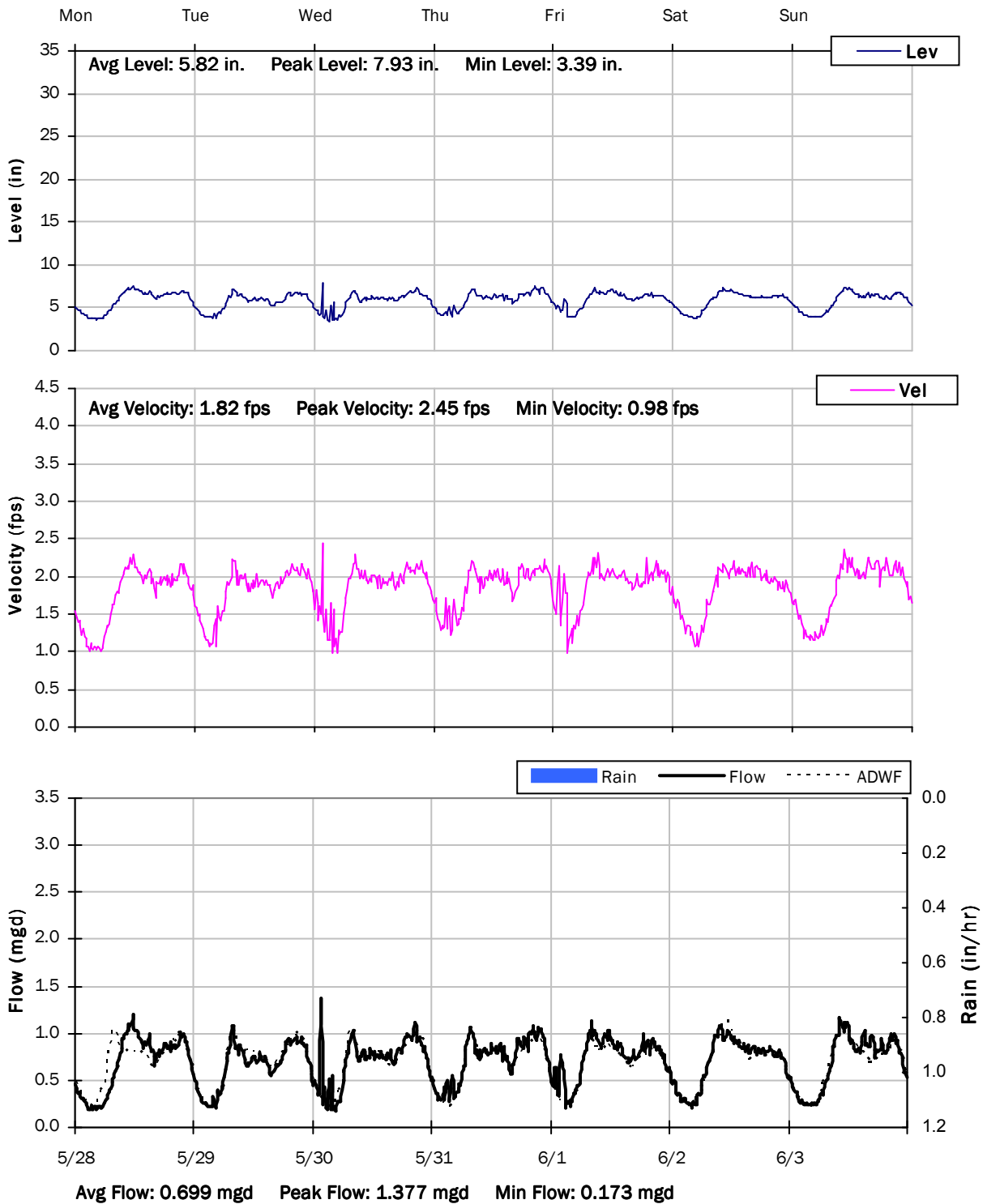
5/21/2018 to 5/28/2018



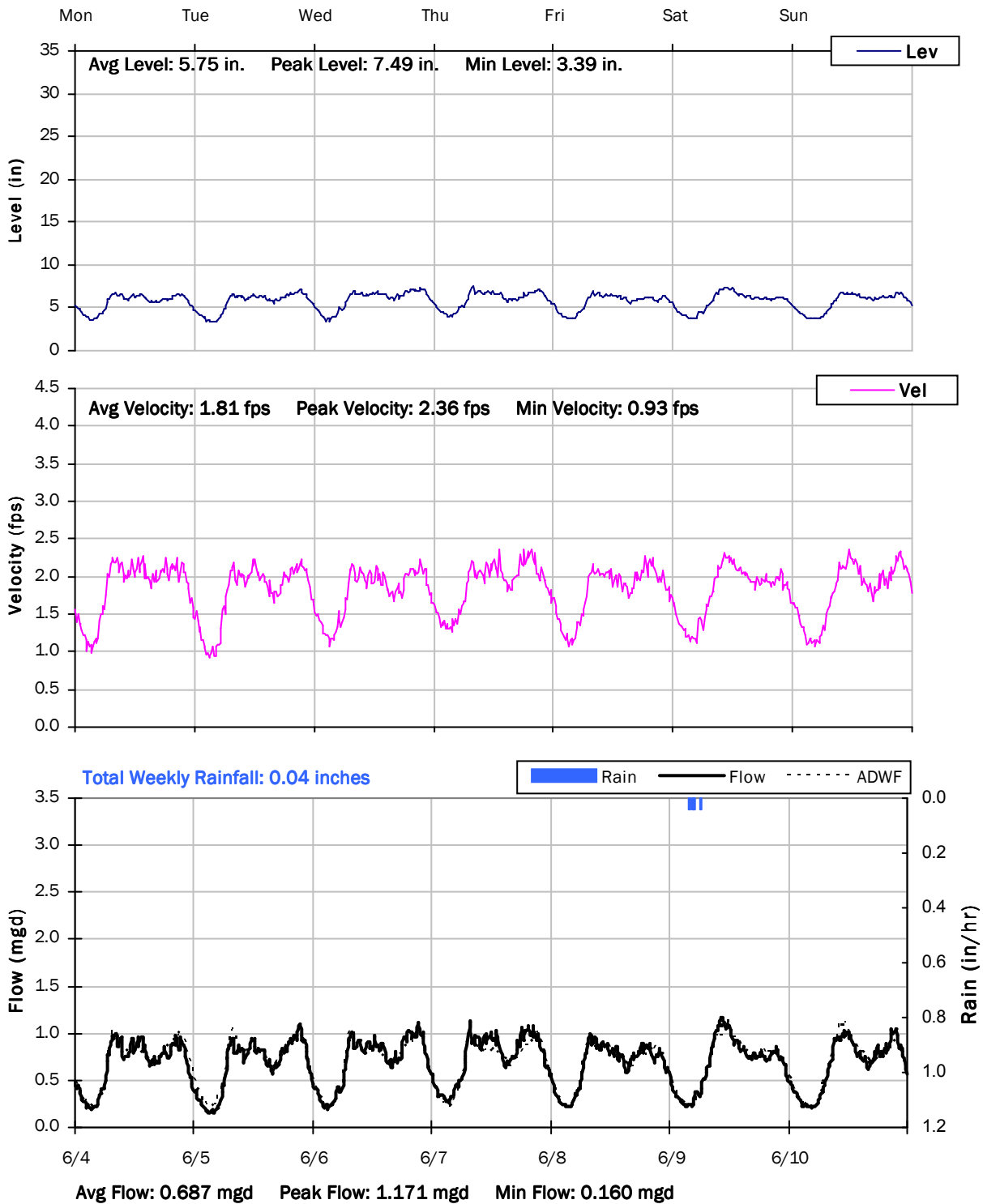
SITE 1

Weekly Level, Velocity and Flow Hydrographs

5/28/2018 to 6/4/2018



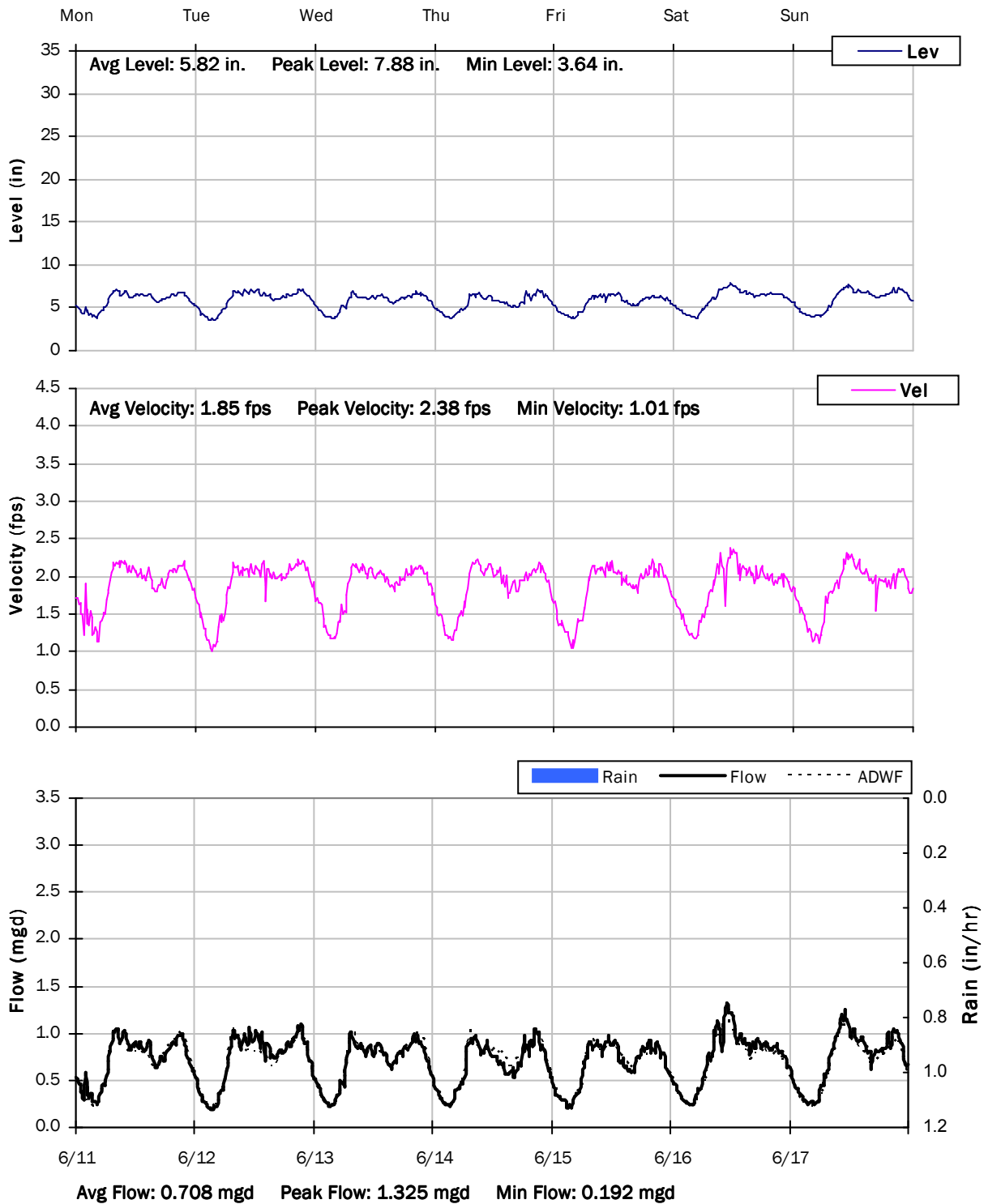
SITE 1
Weekly Level, Velocity and Flow Hydrographs
6/4/2018 to 6/11/2018



SITE 1

Weekly Level, Velocity and Flow Hydrographs

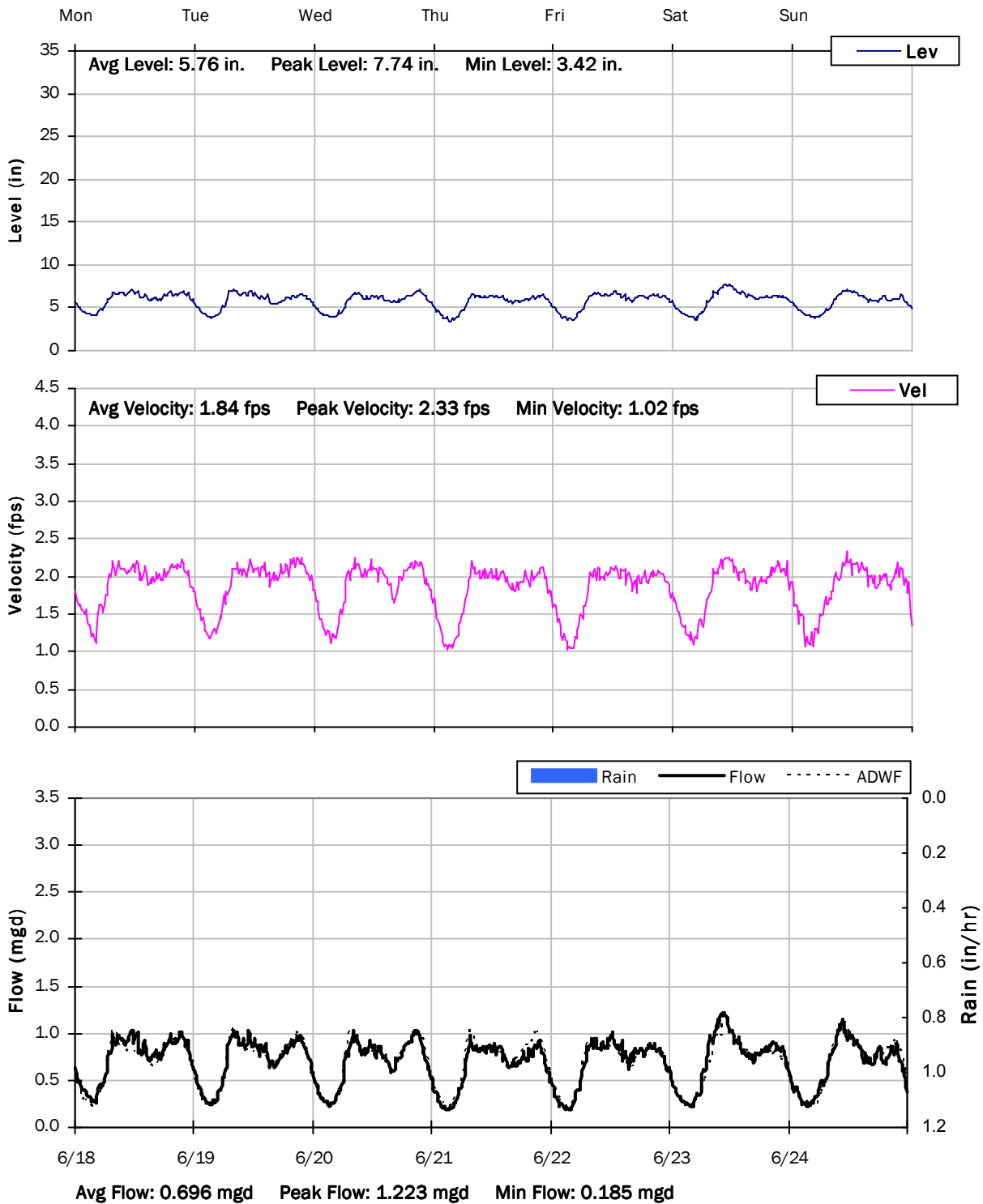
6/11/2018 to 6/18/2018



SITE 1

Weekly Level, Velocity and Flow Hydrographs

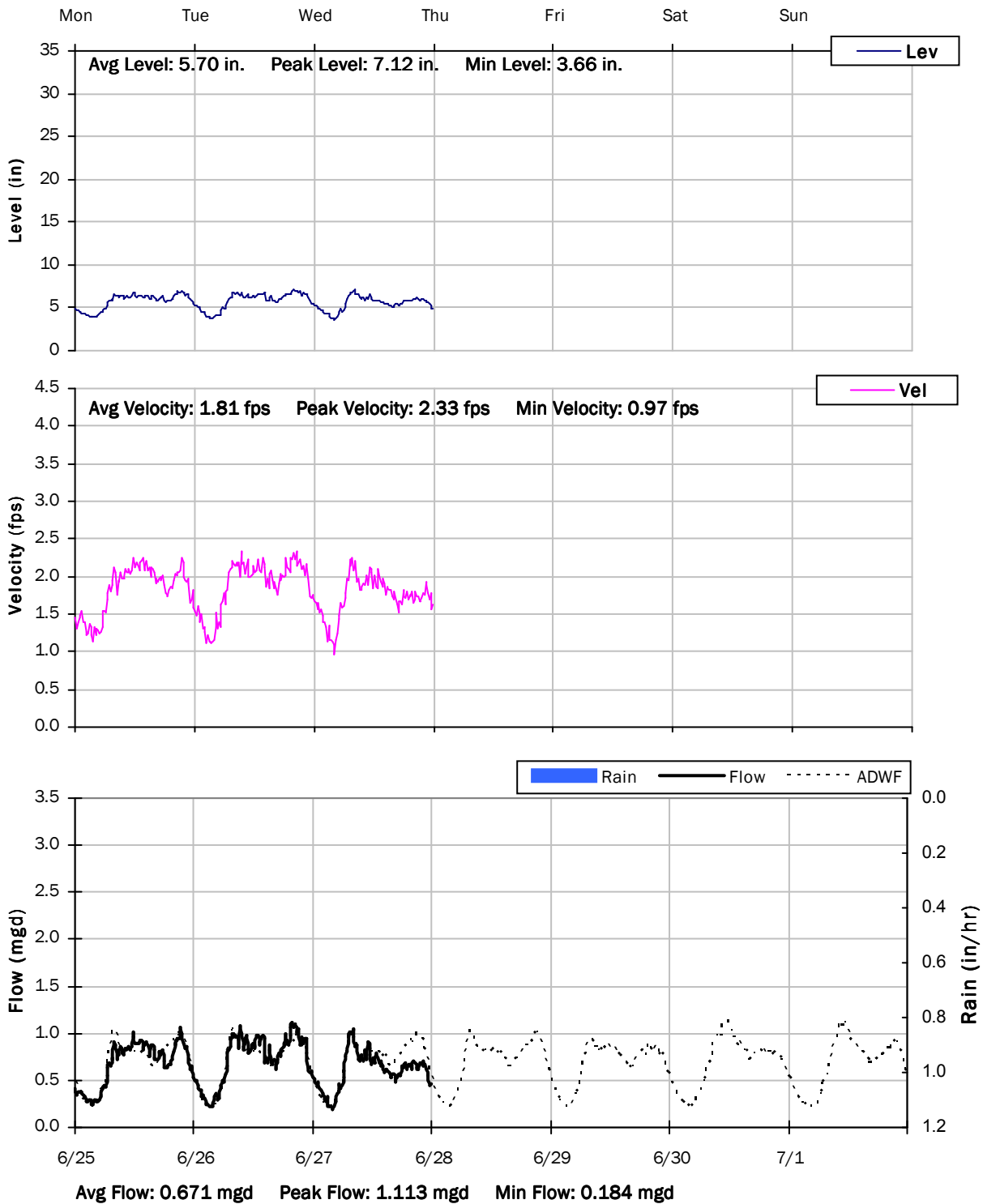
6/18/2018 to 6/25/2018



SITE 1

Weekly Level, Velocity and Flow Hydrographs

6/25/2018 to 7/2/2018

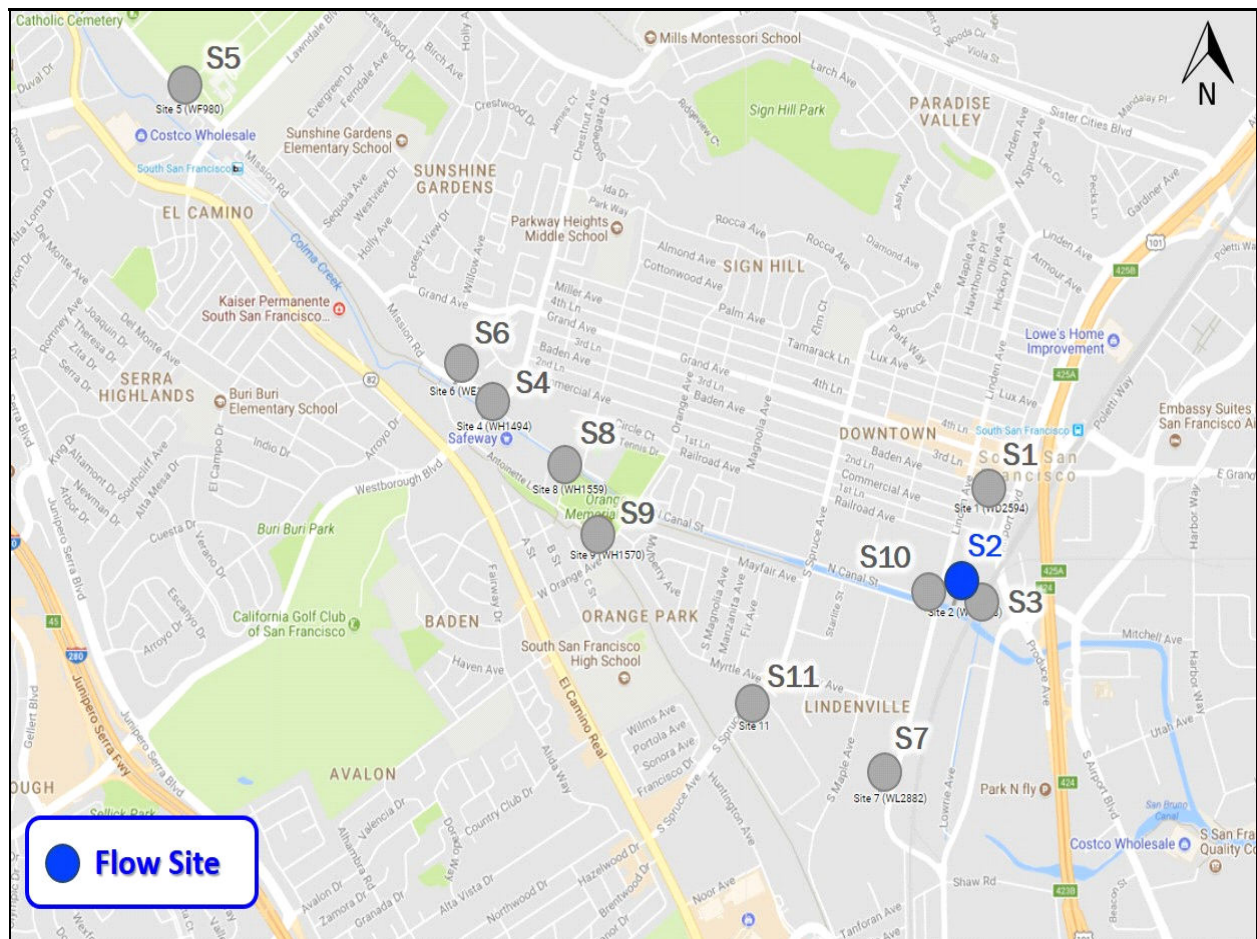


City of South San Francisco Sanitary Sewer Flow Monitoring February 26- June 28, 2018

Monitoring Site: Site 2

Location: Northeast corner of Storm Pump Station #6, 27 S. Linden Ave.

Data Summary Report

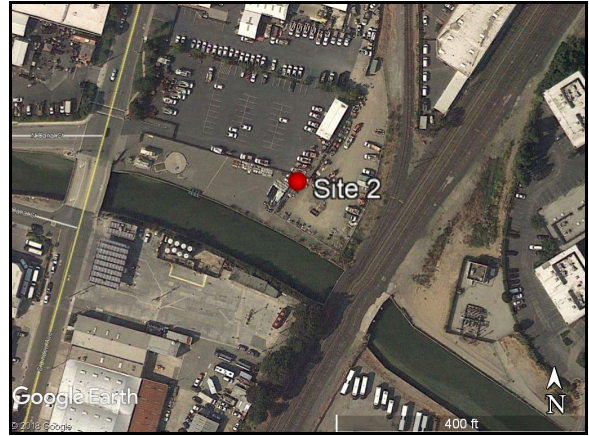


Vicinity Map: Site 2

SITE 2

Site Information

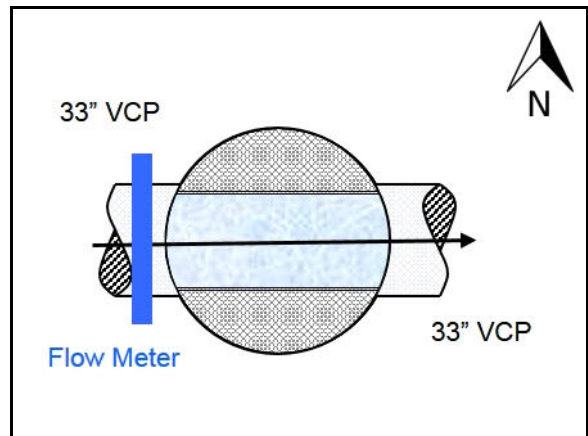
MH ID: WD2633
Location: Northeast corner of Storm Pump Station #6, 27 S. Linden Ave.
Coordinates: 122.4107° W, 37.6502° N
Rim Elevation (Earth): 14 feet
Pipe Diameter: 33 inches
Sediment: 0.00 inches
ADWF: 3.213 mgd
Peak Measured Flow: 17.083 mgd



Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 2

Additional Site Photos

Effluent Pipe



Influent Pipe

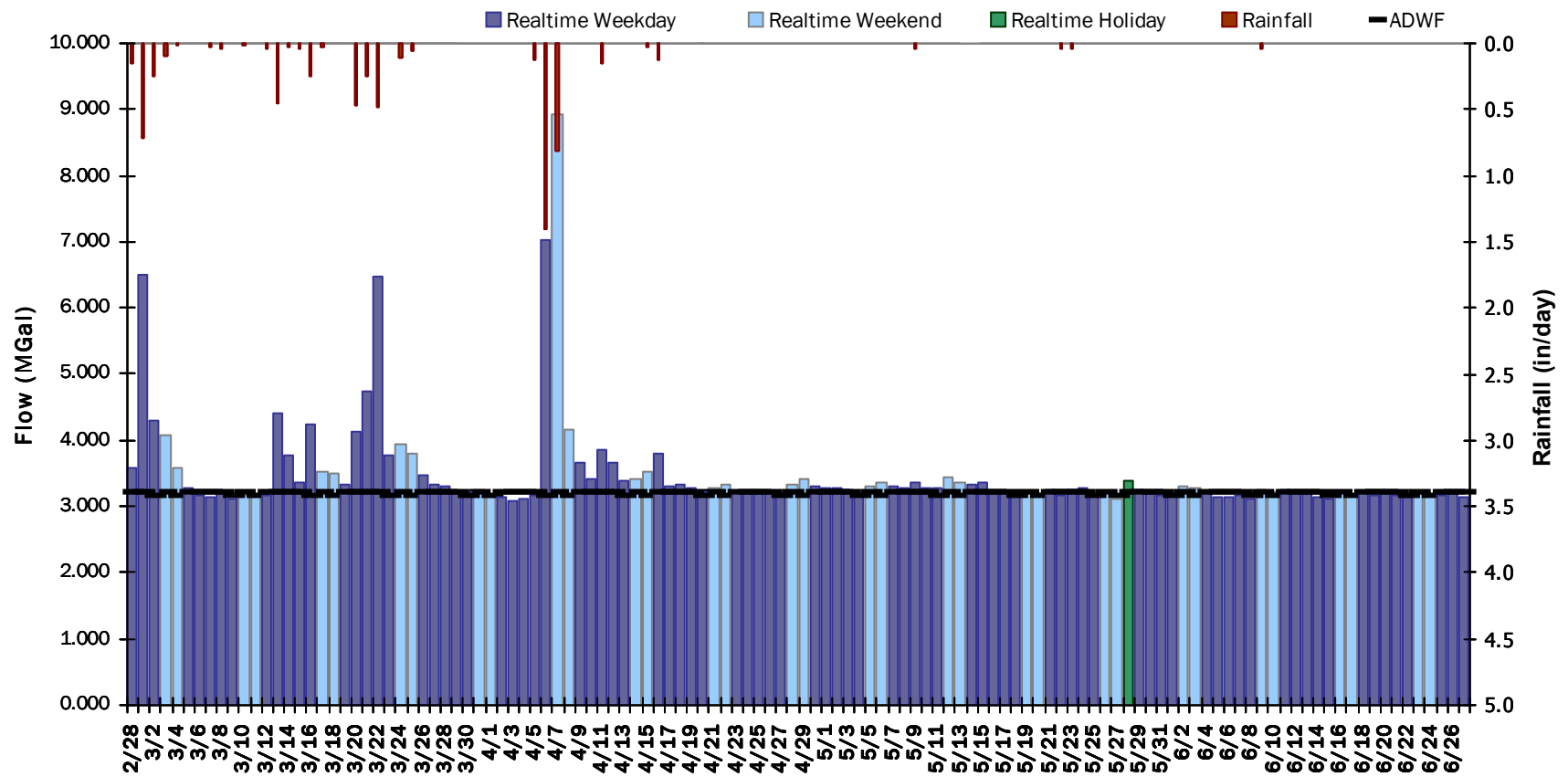


SITE 2

Period Flow Summary: Daily Flow Totals

Avg Period Flow: 3.481 MGal Peak Daily Flow: 8.935 MGal Min Daily Flow: 3.073 MGal

Total Period Rainfall: 6.34 inches



SITE 2

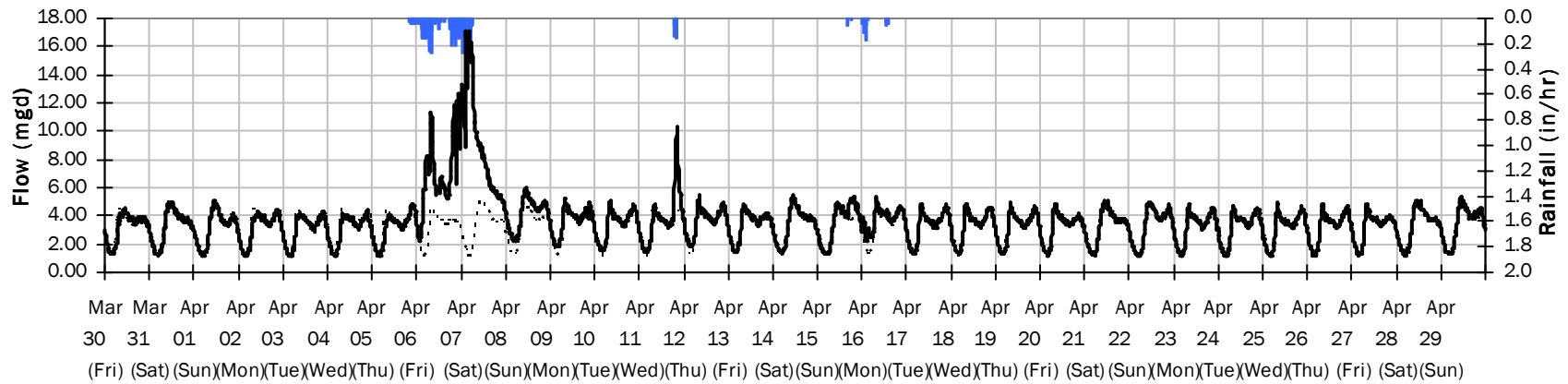
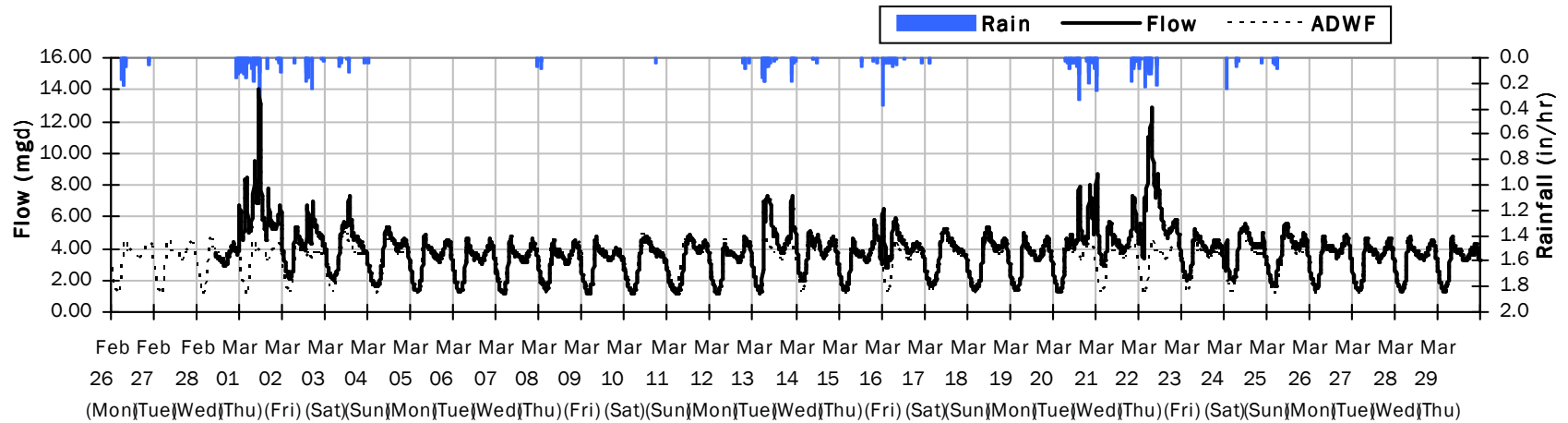
Flow Summary: 2/26/2018 to 4/29/2018

Total Period Rainfall: 6.47 inches

Avg Flow: 3.726 mgd

Peak Flow: 17.083 mgd

Min Flow: 1.120 mgd



SITE 2

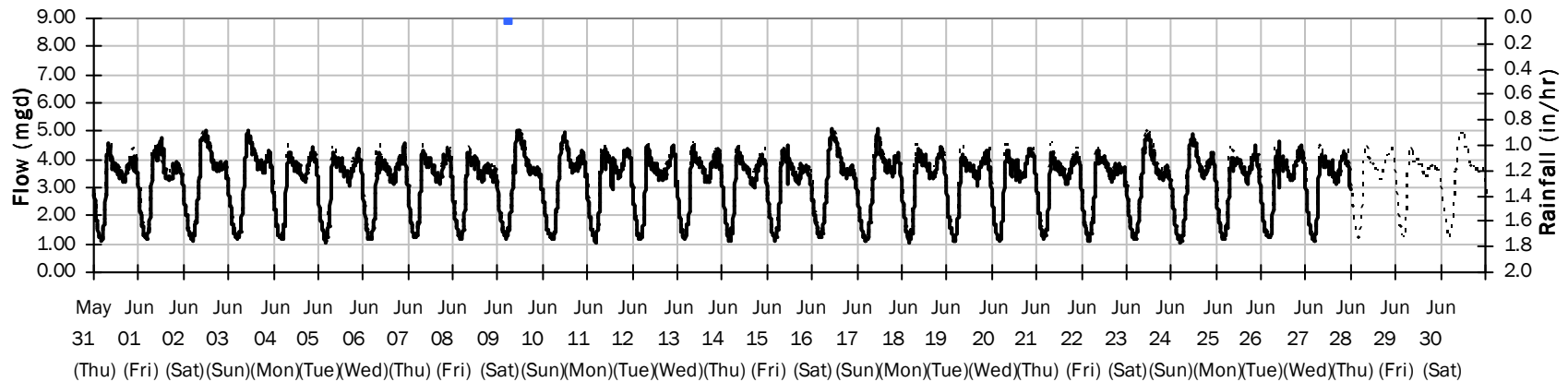
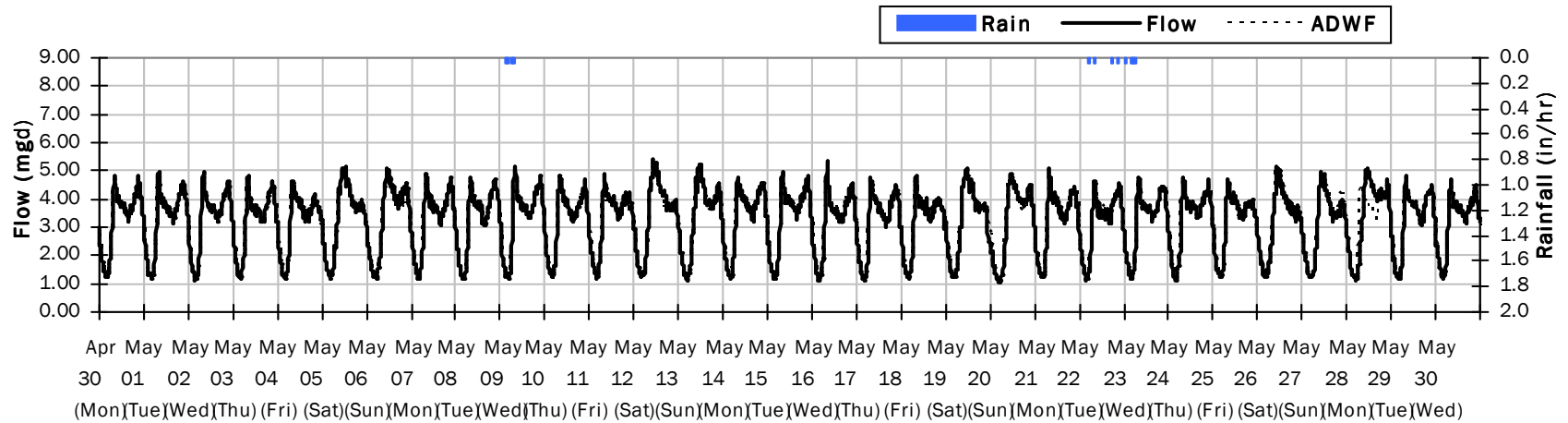
Flow Summary: 4/30/2018 to 6/30/2018

Total Period Rainfall: 0.16 inches

Avg Flow: 3.229 mgd

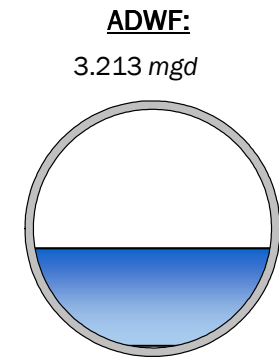
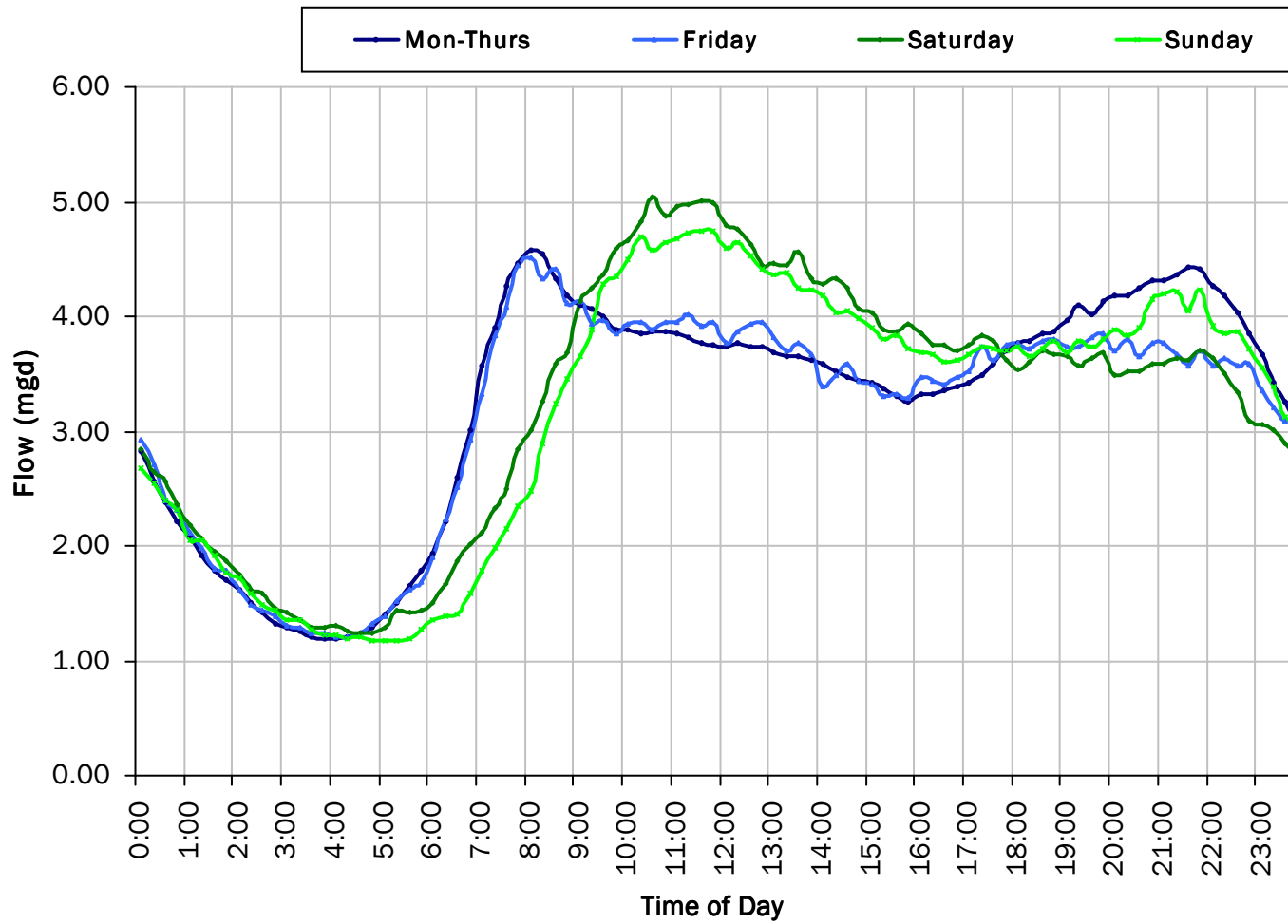
Peak Flow: 5.382 mgd

Min Flow: 1.034 mgd



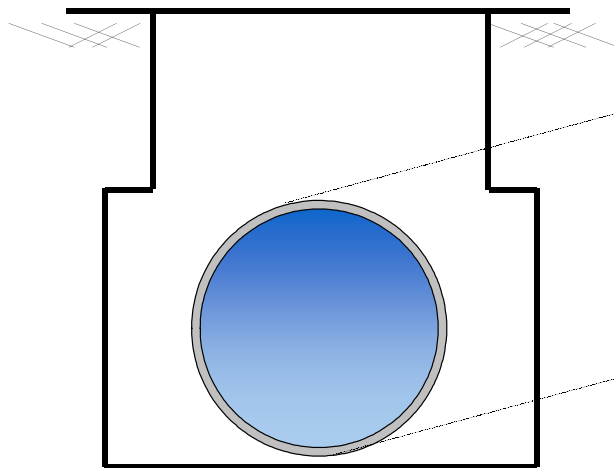
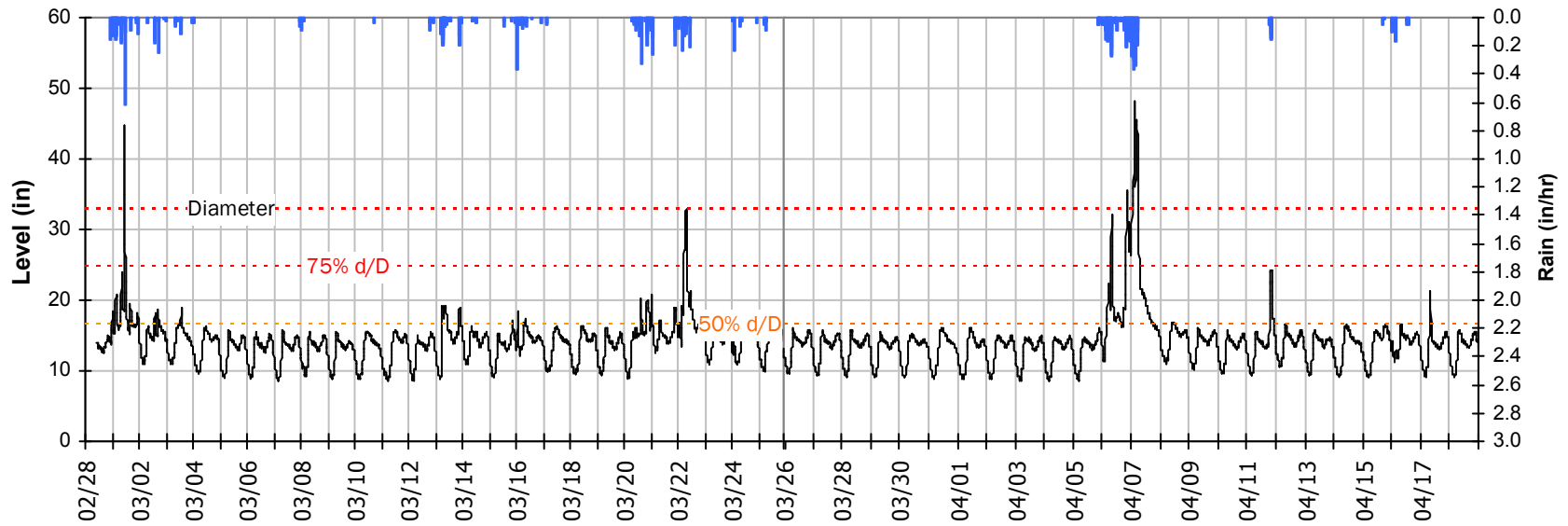
SITE 2

Average Dry Weather Flow Hydrographs



SITE 2 Site Capacity and Surge Summary

Realtime Flow Levels with Rainfall Data over Monitoring (High Capacity) Period



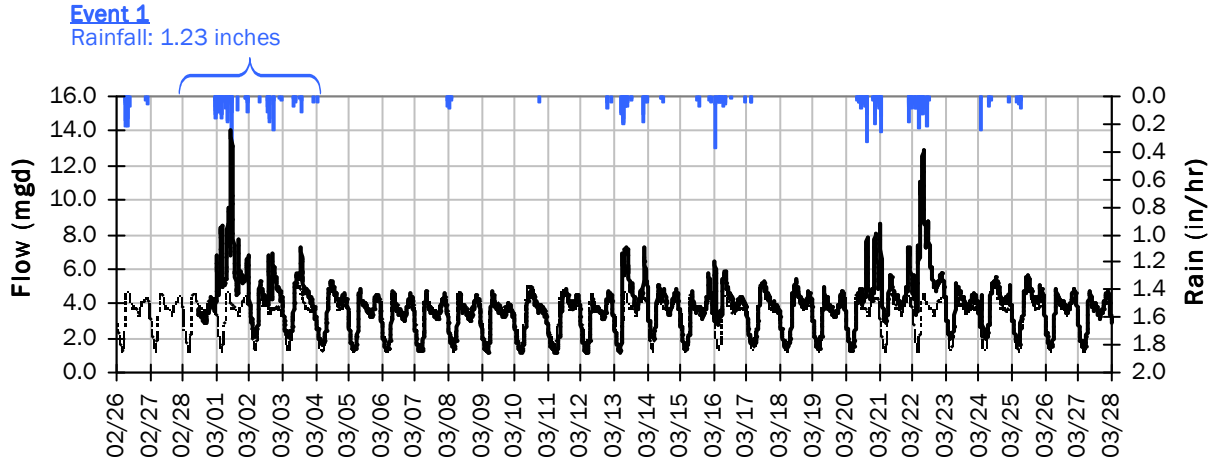
Pipe Diameter: 33 inches
Peak Measured Level: 48.3 inches
Peak d/D Ratio: 1.46

Surcharged 15.3 inches over crown

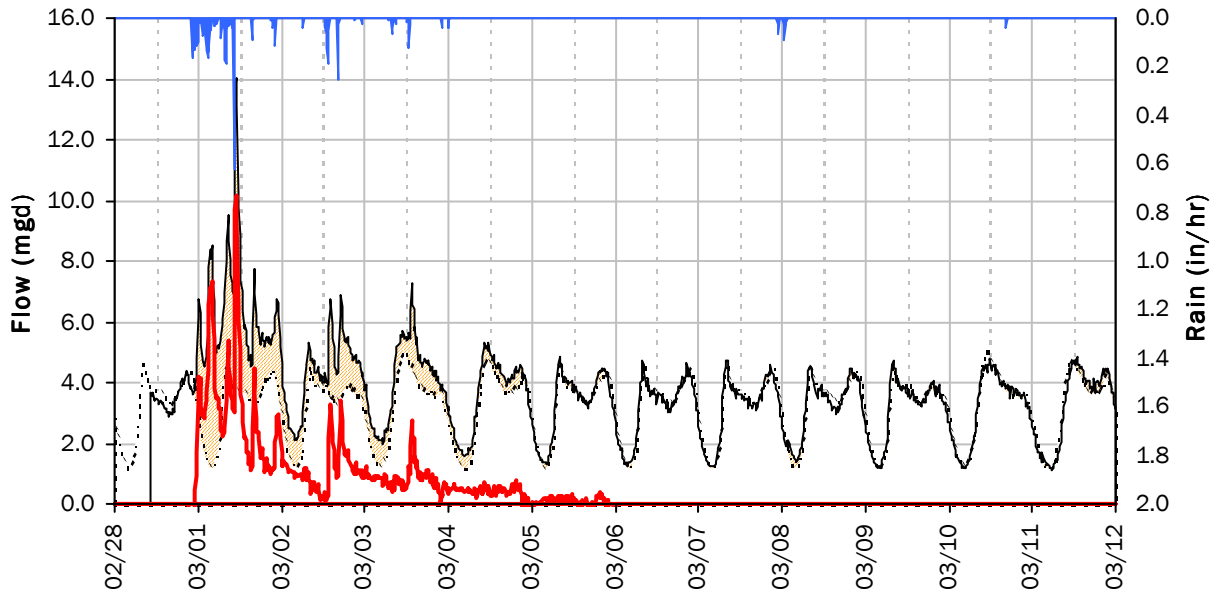
SITE 2

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



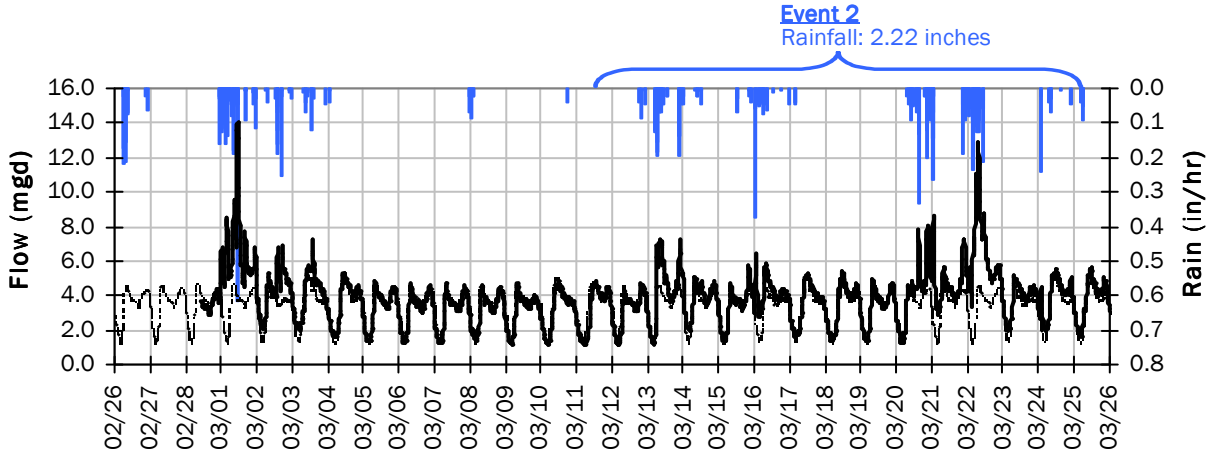
Storm Event I/I Analysis (Rain = 1.23 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	14.02 mgd	Peak I/I Rate:	10.18 mgd
PF:	4.37	Total I/I:	5,773,000 gallons
Peak Level:	44.83 in		
d/D Ratio:	1.36		

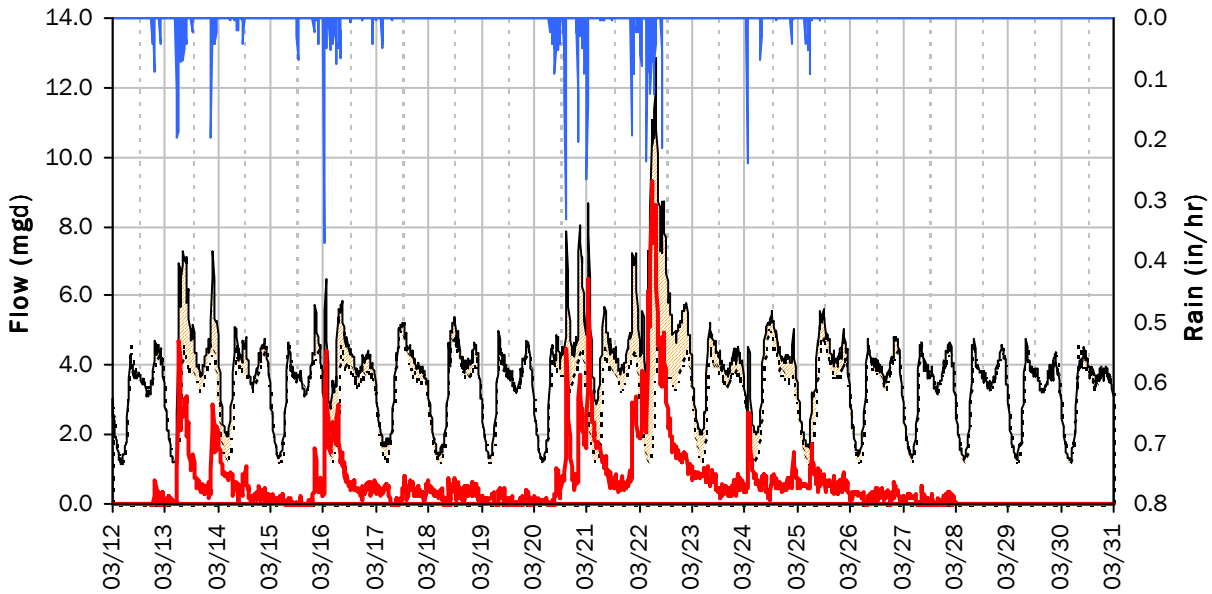
SITE 2

I/I Summary: Event 2

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 2 Detail Graph



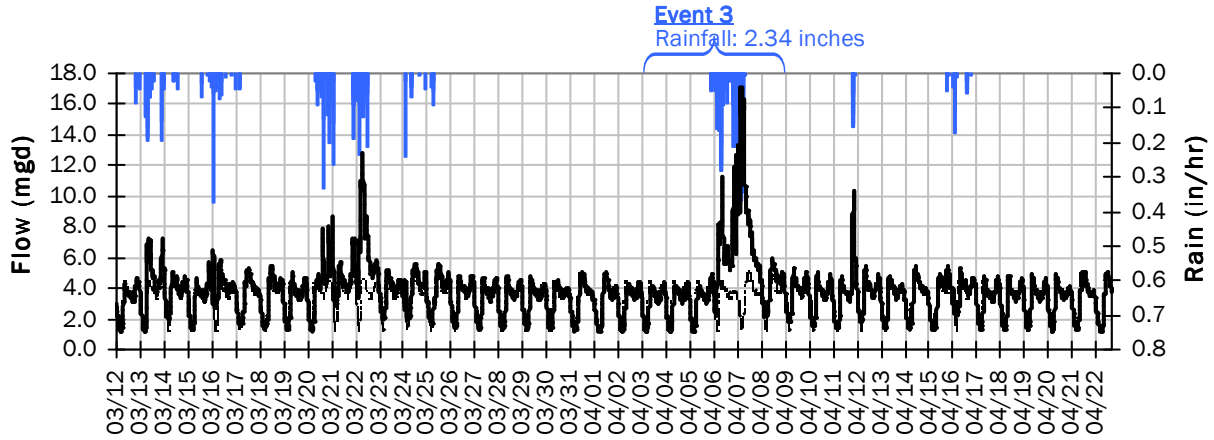
Storm Event I/I Analysis (Rain = 2.22 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	12.88 mgd	Peak I/I Rate:	9.27 mgd
PF:	4.01	Total I/I:	11,696,000 gallons
Peak Level:	32.80 in		
d/D Ratio:	0.99		

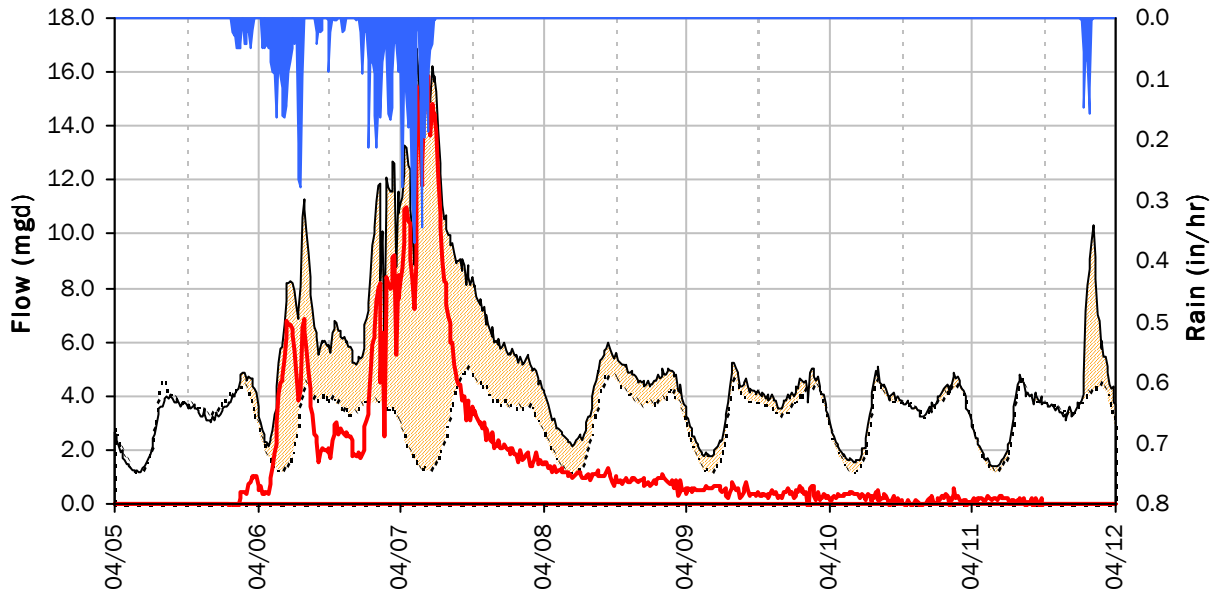
SITE 2

I/I Summary: Event 3

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 3 Detail Graph



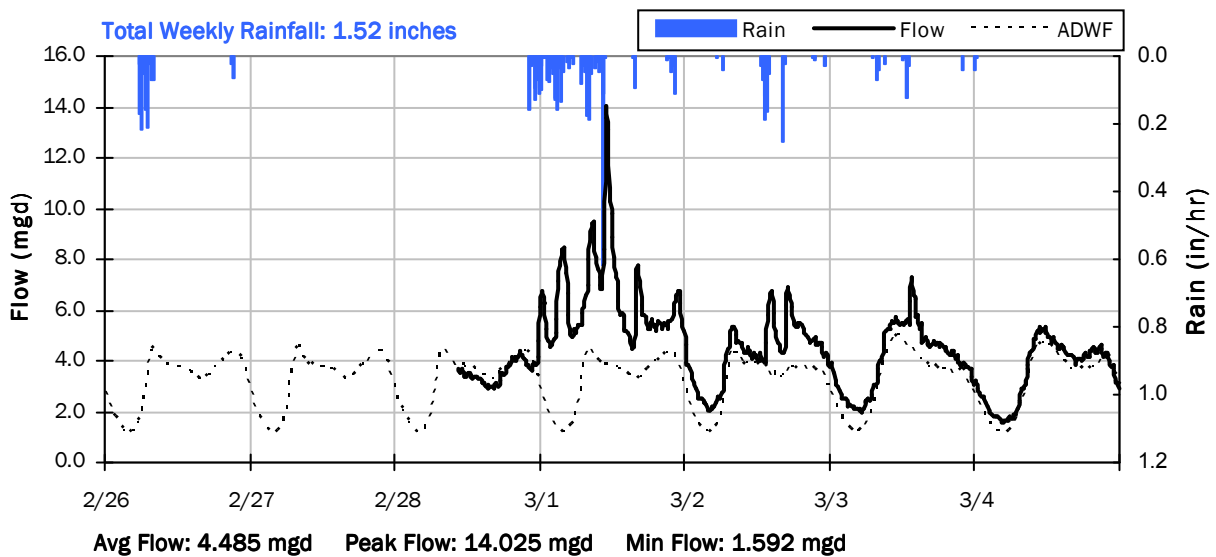
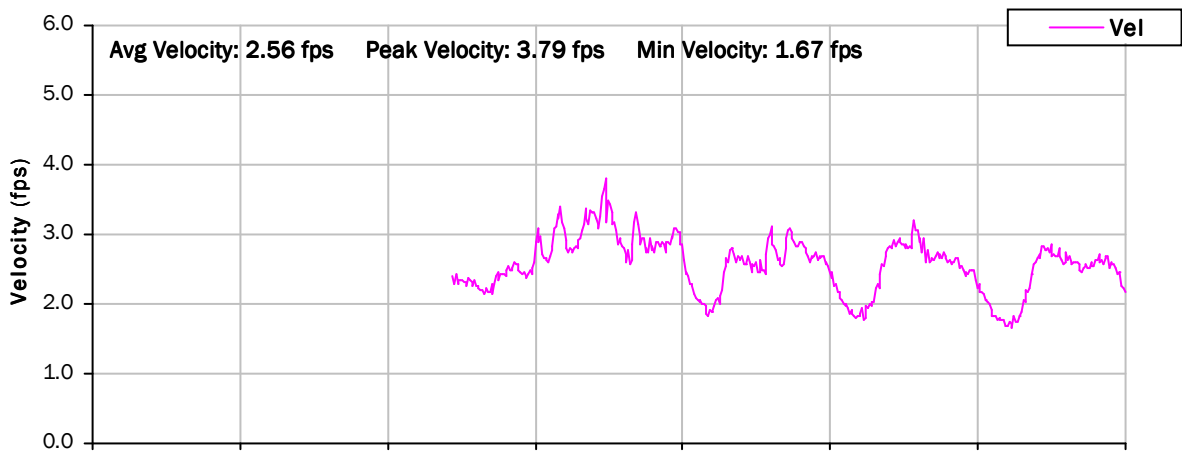
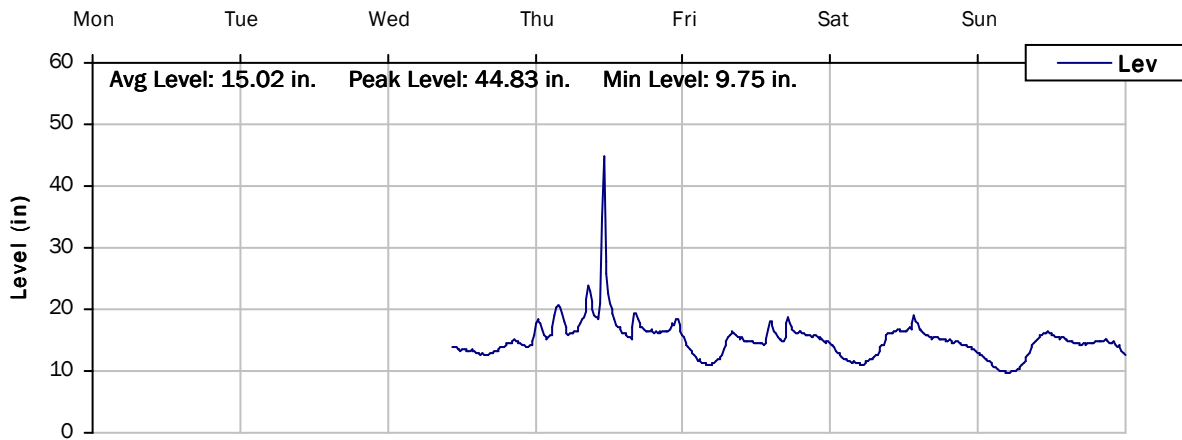
Storm Event I/I Analysis (Rain = 2.34 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	17.08 mgd	Peak I/I Rate:	15.85 mgd
PF:	5.32	Total I/I:	11,304,000 gallons
Peak Level:	48.25 in		
d/D Ratio:	1.46		

SITE 2

Weekly Level, Velocity and Flow Hydrographs

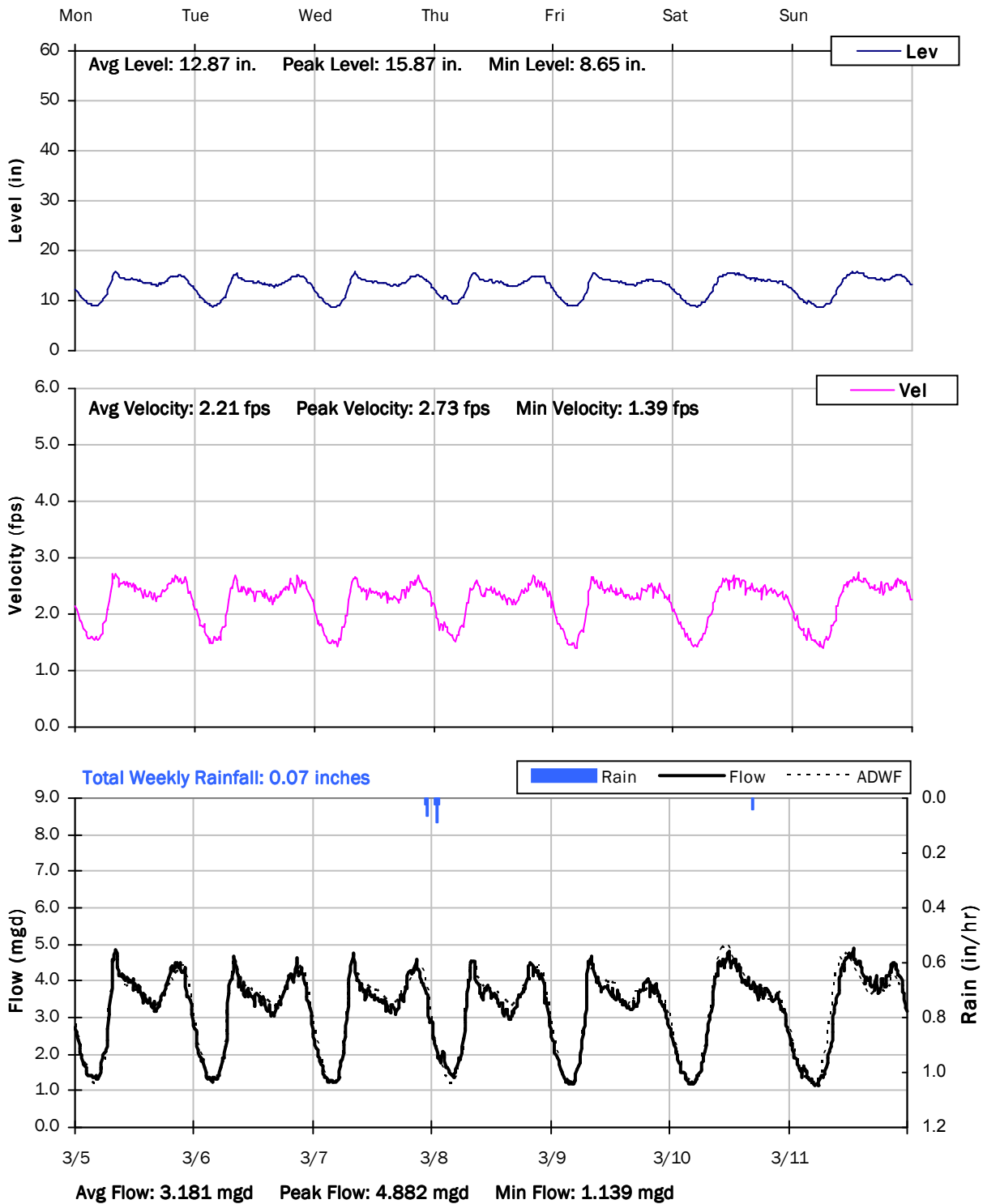
2/26/2018 to 3/5/2018



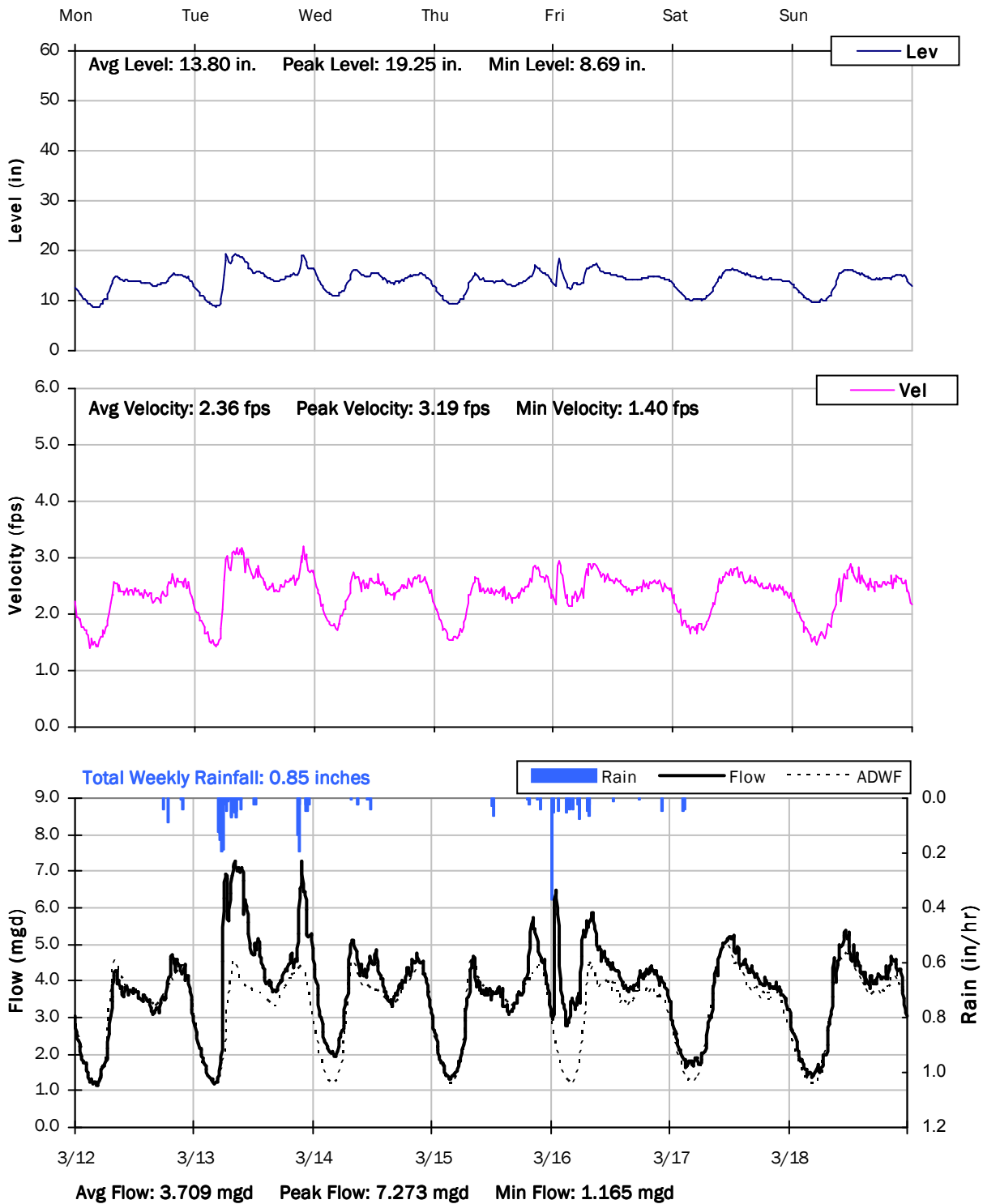
SITE 2

Weekly Level, Velocity and Flow Hydrographs

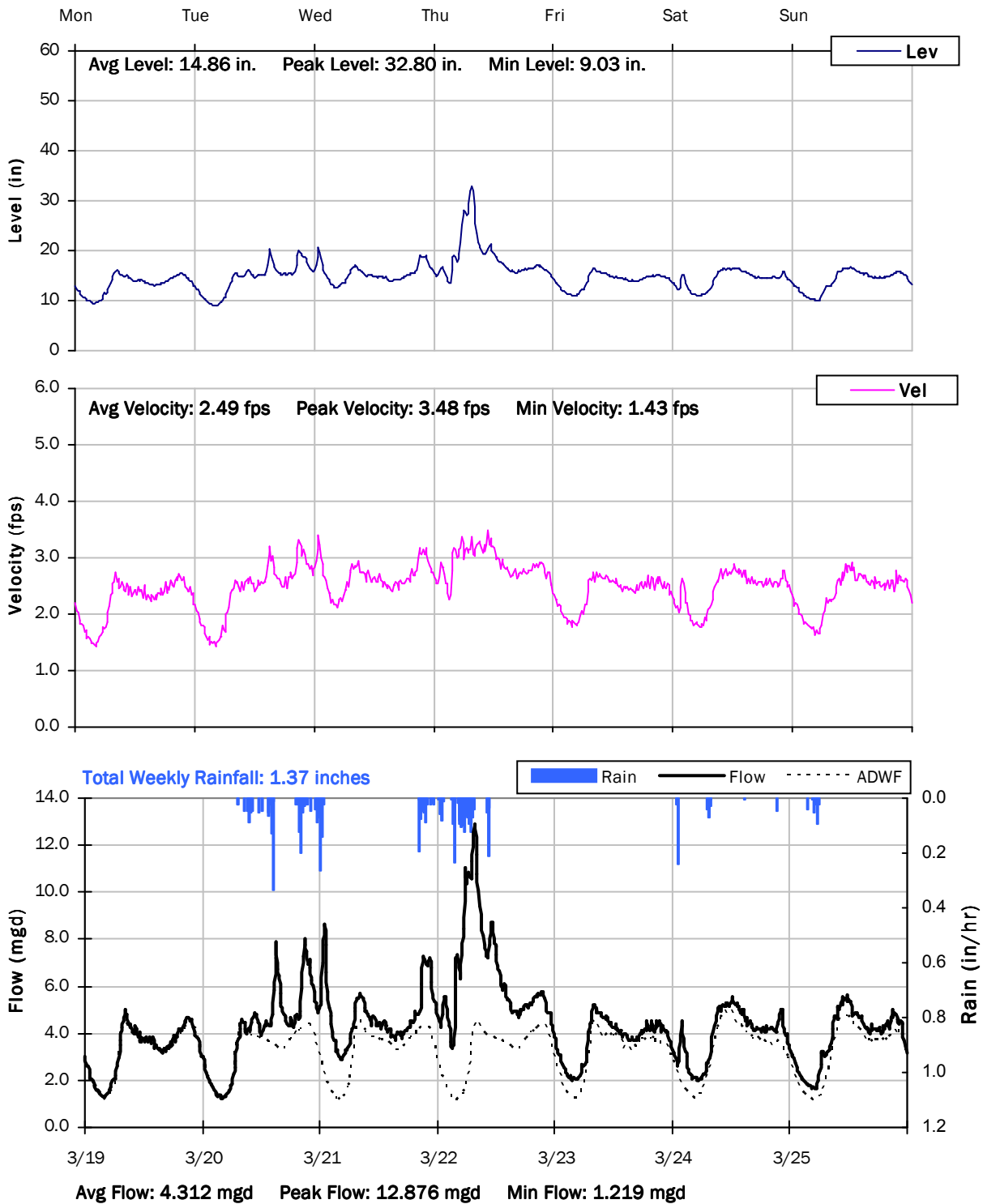
3/5/2018 to 3/12/2018



SITE 2
Weekly Level, Velocity and Flow Hydrographs
3/12/2018 to 3/19/2018



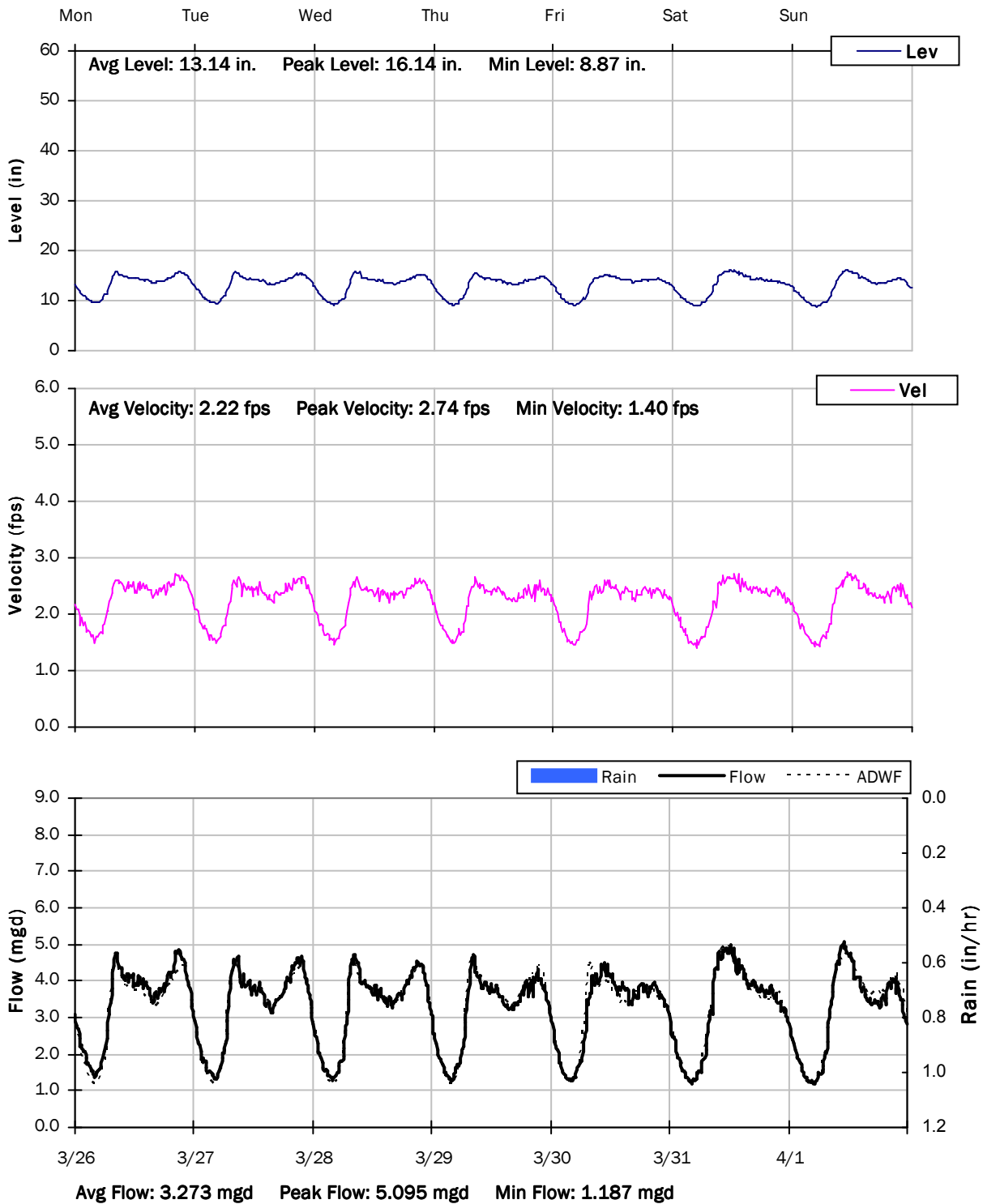
SITE 2
Weekly Level, Velocity and Flow Hydrographs
3/19/2018 to 3/26/2018



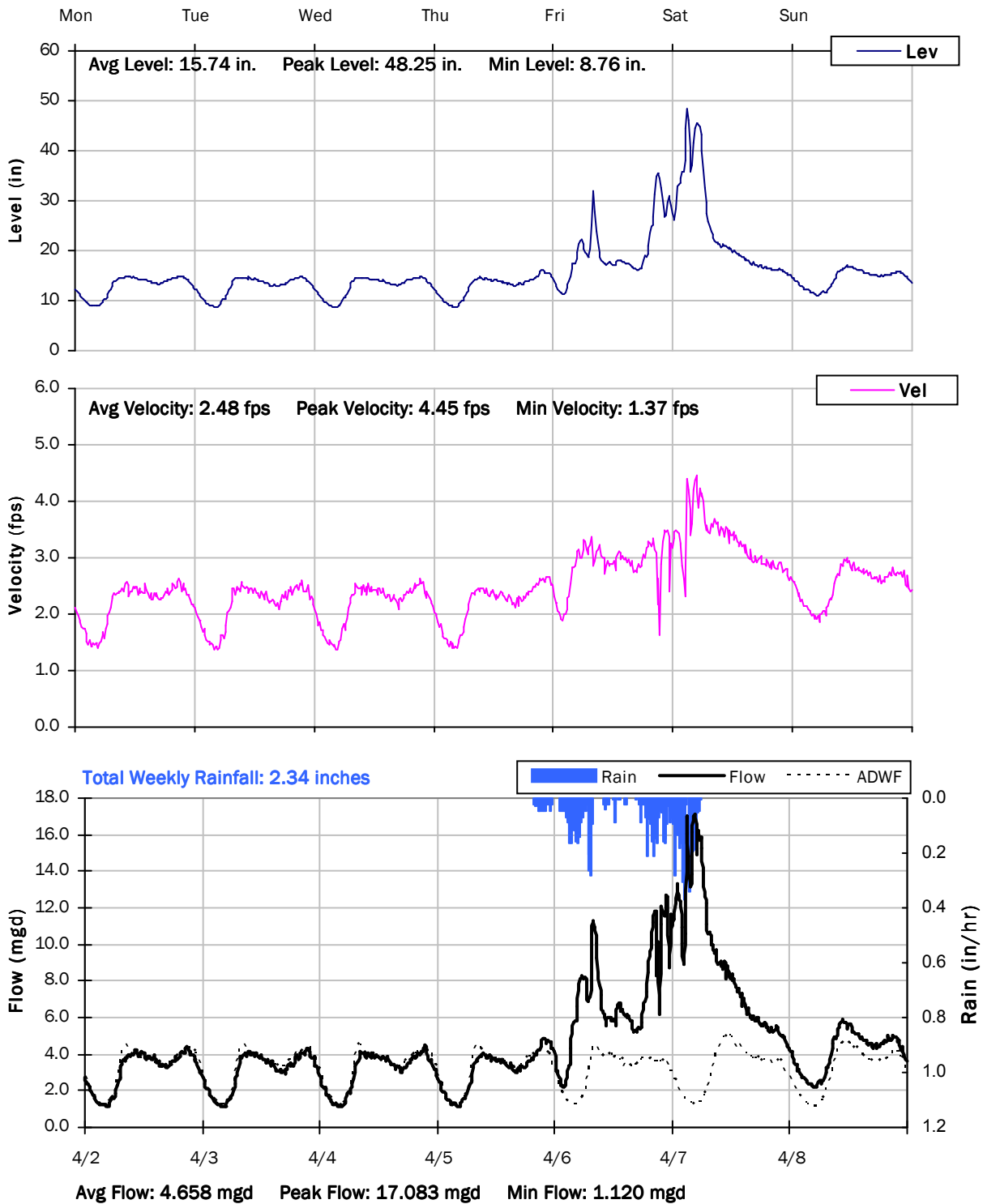
SITE 2

Weekly Level, Velocity and Flow Hydrographs

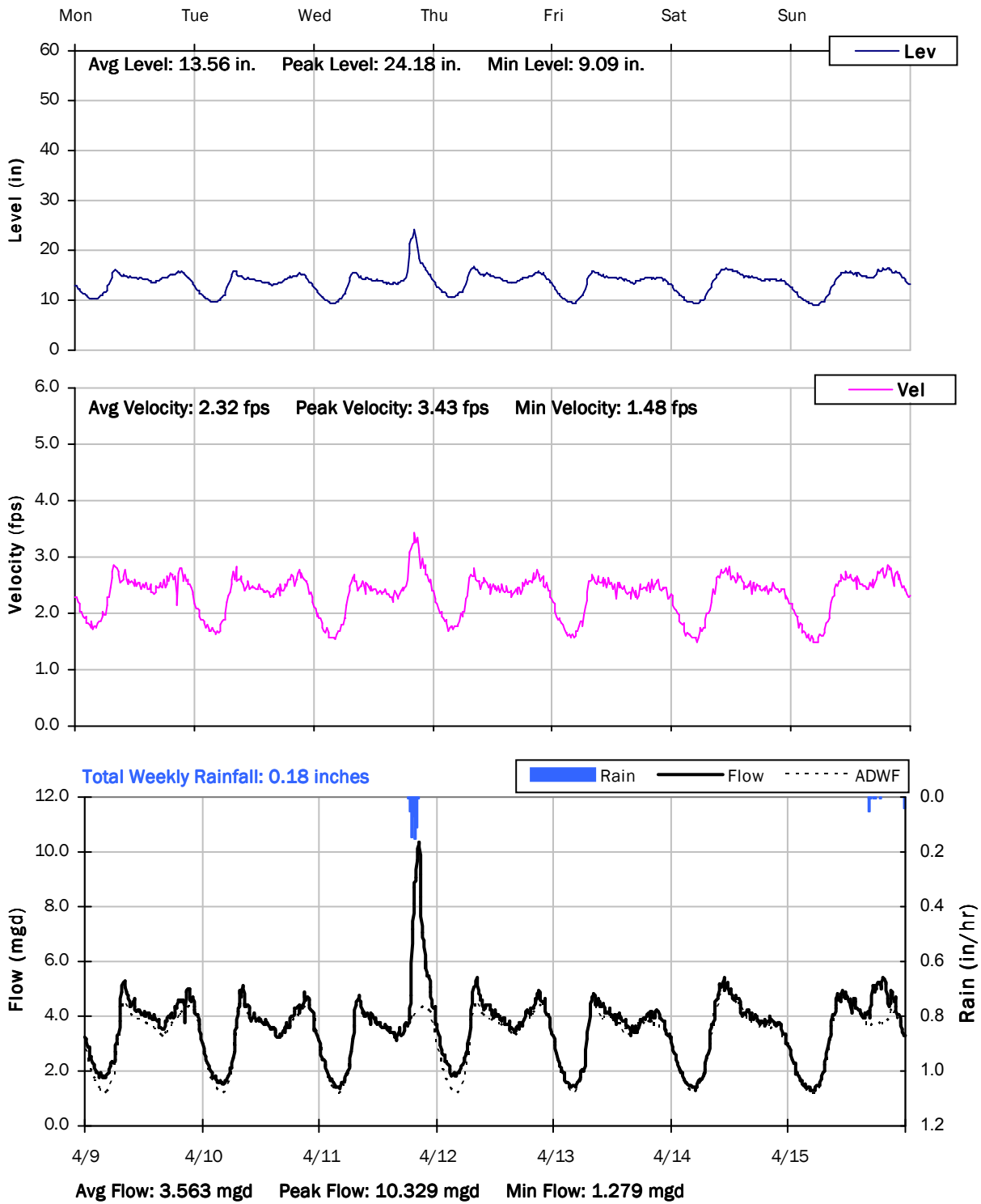
3/26/2018 to 4/2/2018



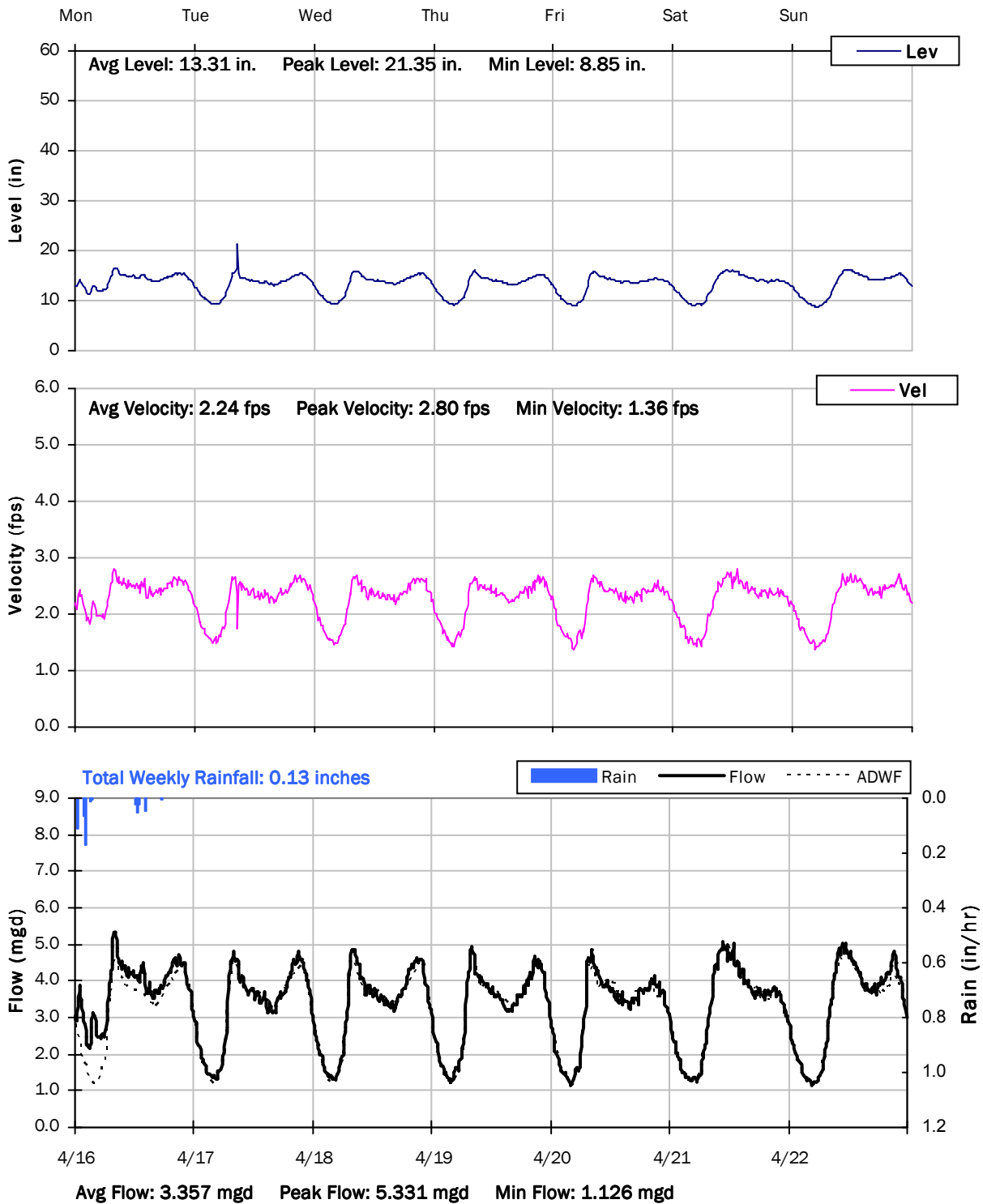
SITE 2
Weekly Level, Velocity and Flow Hydrographs
4/2/2018 to 4/9/2018



SITE 2
Weekly Level, Velocity and Flow Hydrographs
4/9/2018 to 4/16/2018



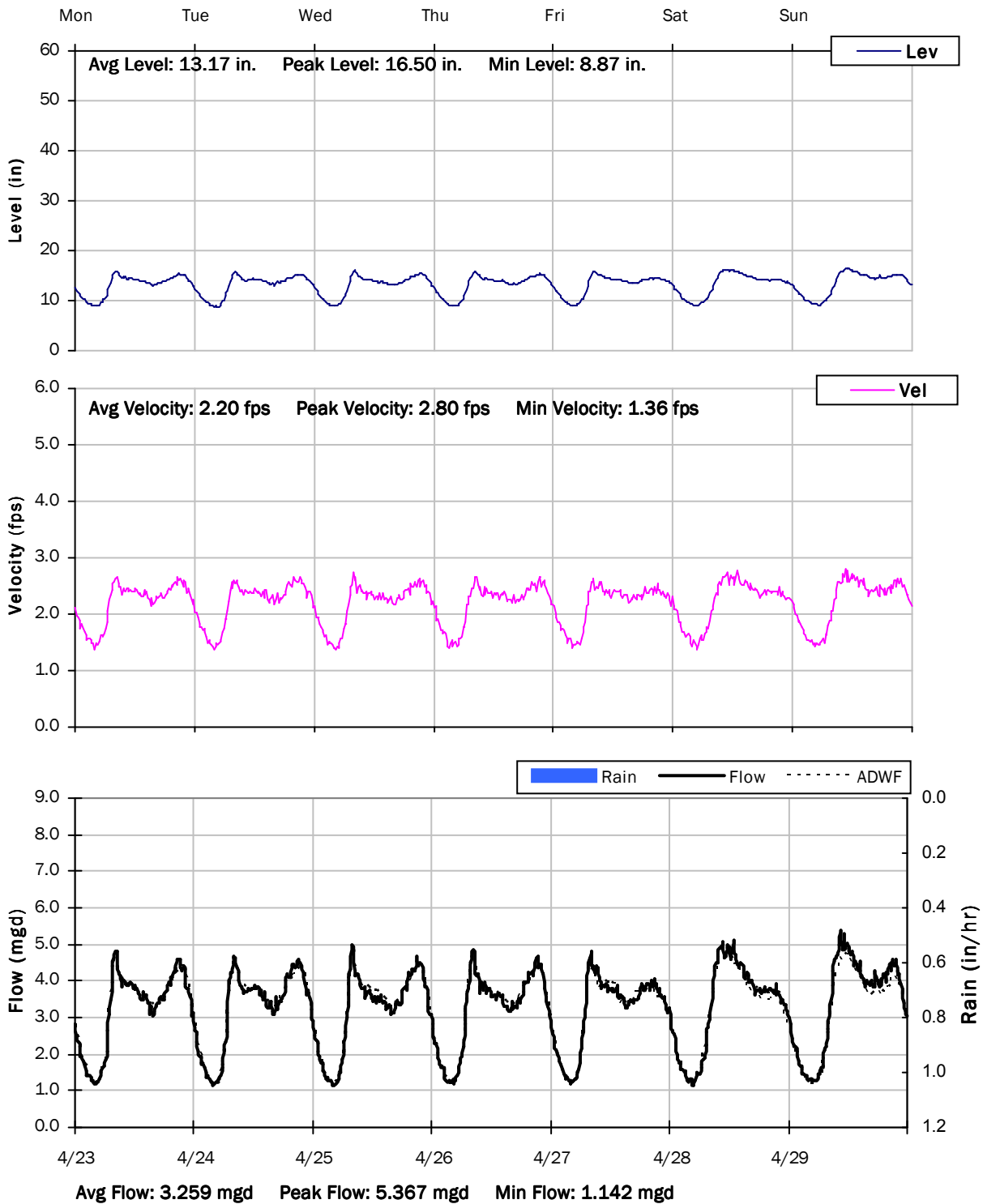
SITE 2
Weekly Level, Velocity and Flow Hydrographs
4/16/2018 to 4/23/2018



SITE 2

Weekly Level, Velocity and Flow Hydrographs

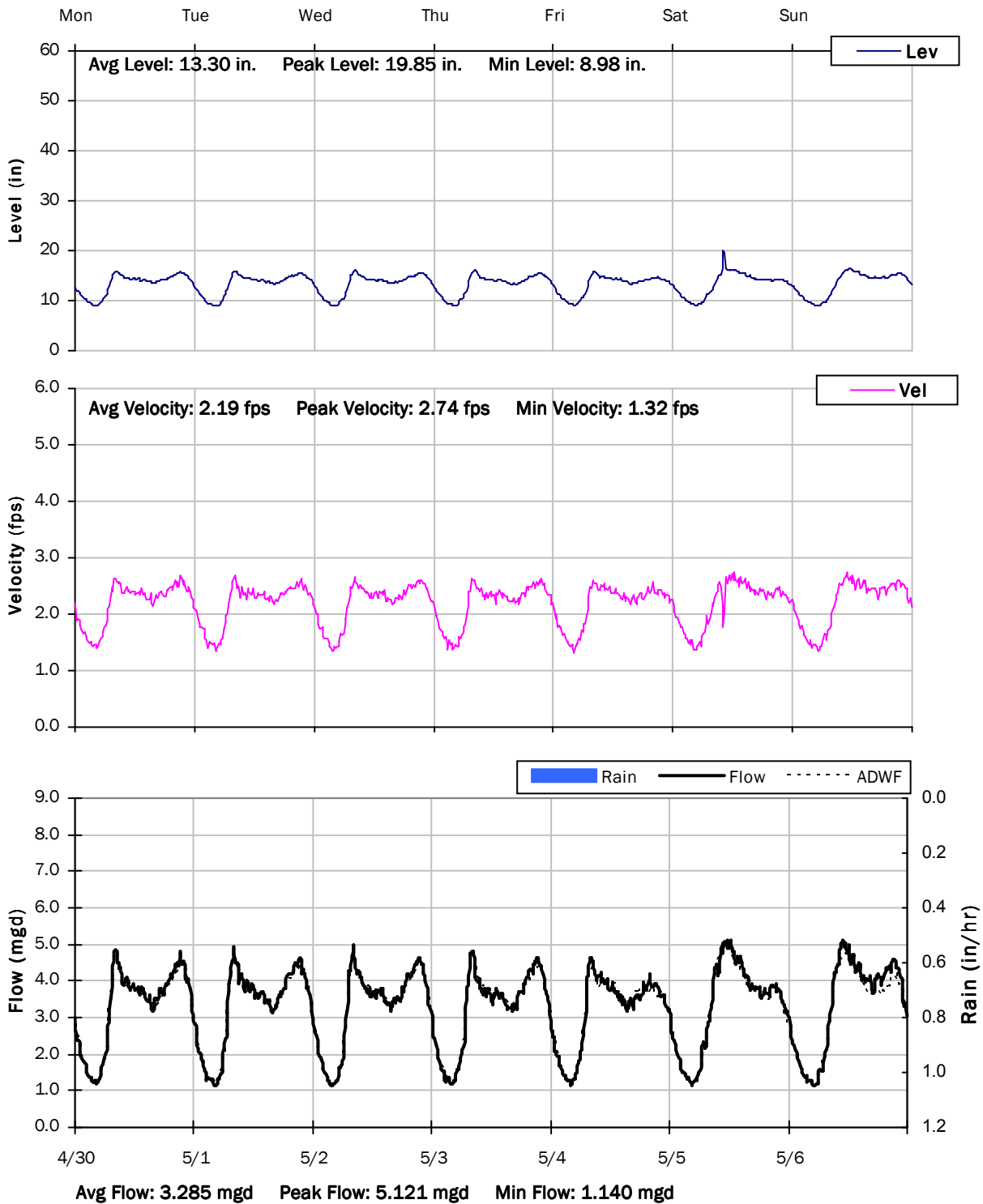
4/23/2018 to 4/30/2018



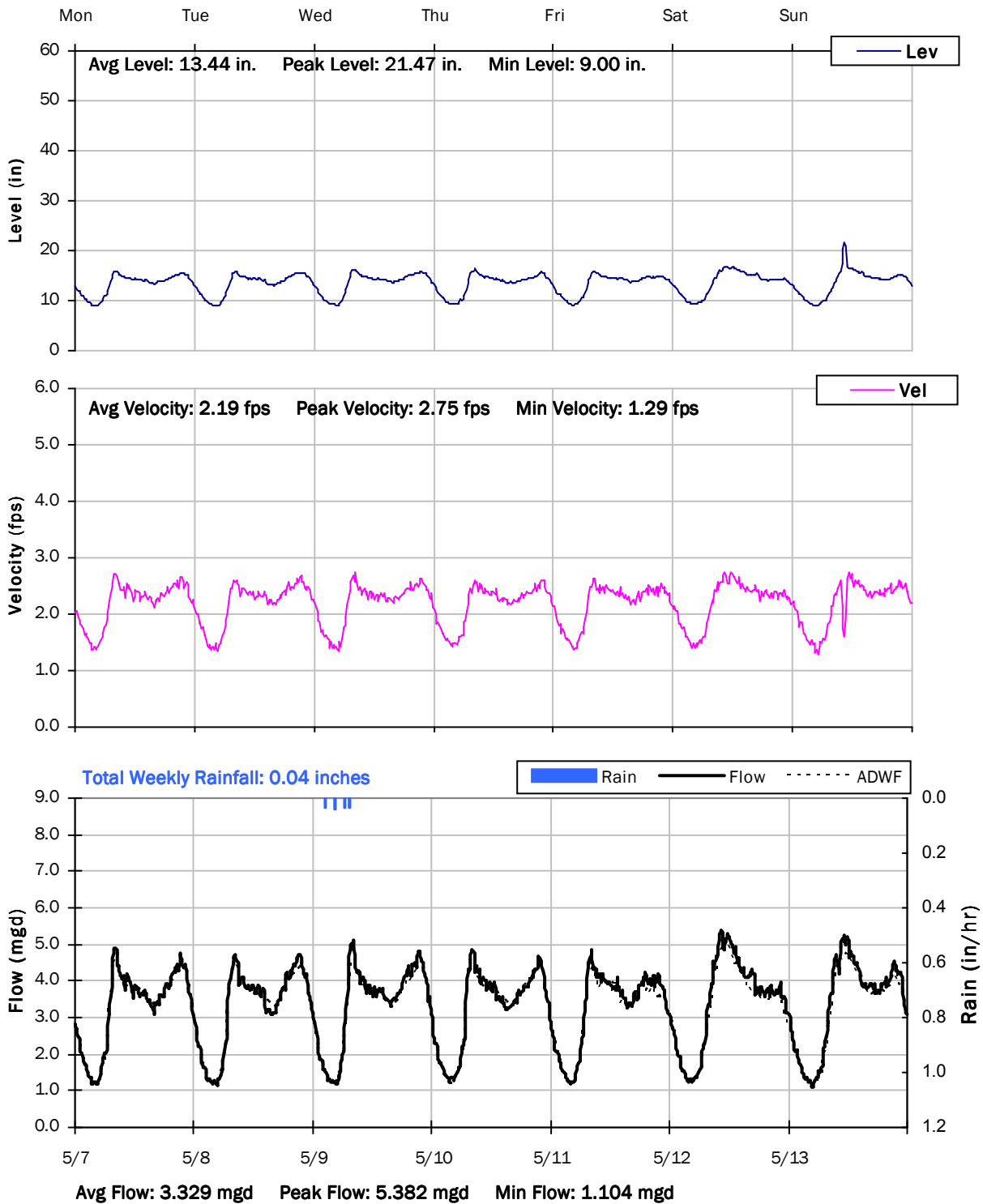
SITE 2

Weekly Level, Velocity and Flow Hydrographs

4/30/2018 to 5/7/2018



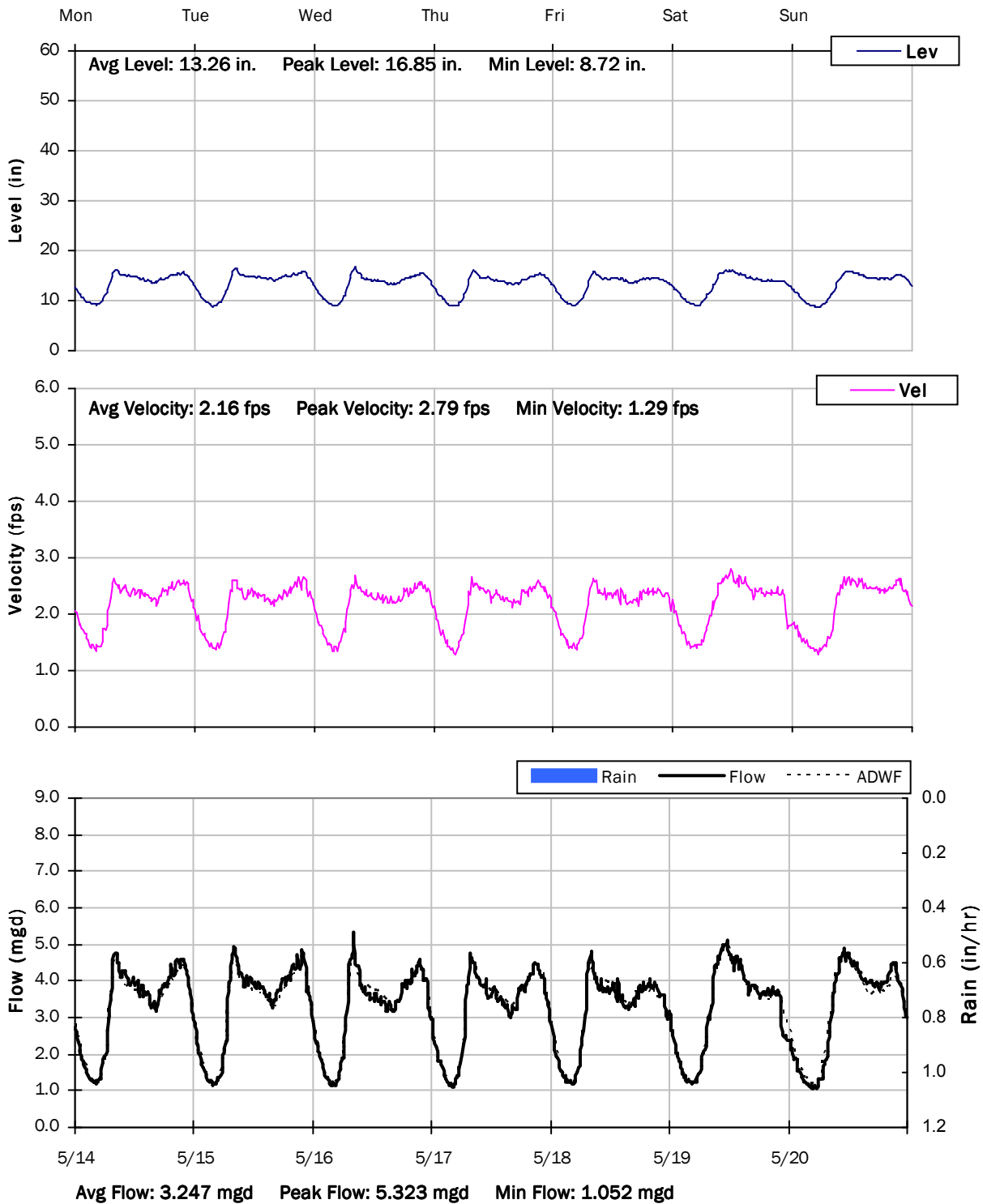
SITE 2
Weekly Level, Velocity and Flow Hydrographs
5/7/2018 to 5/14/2018



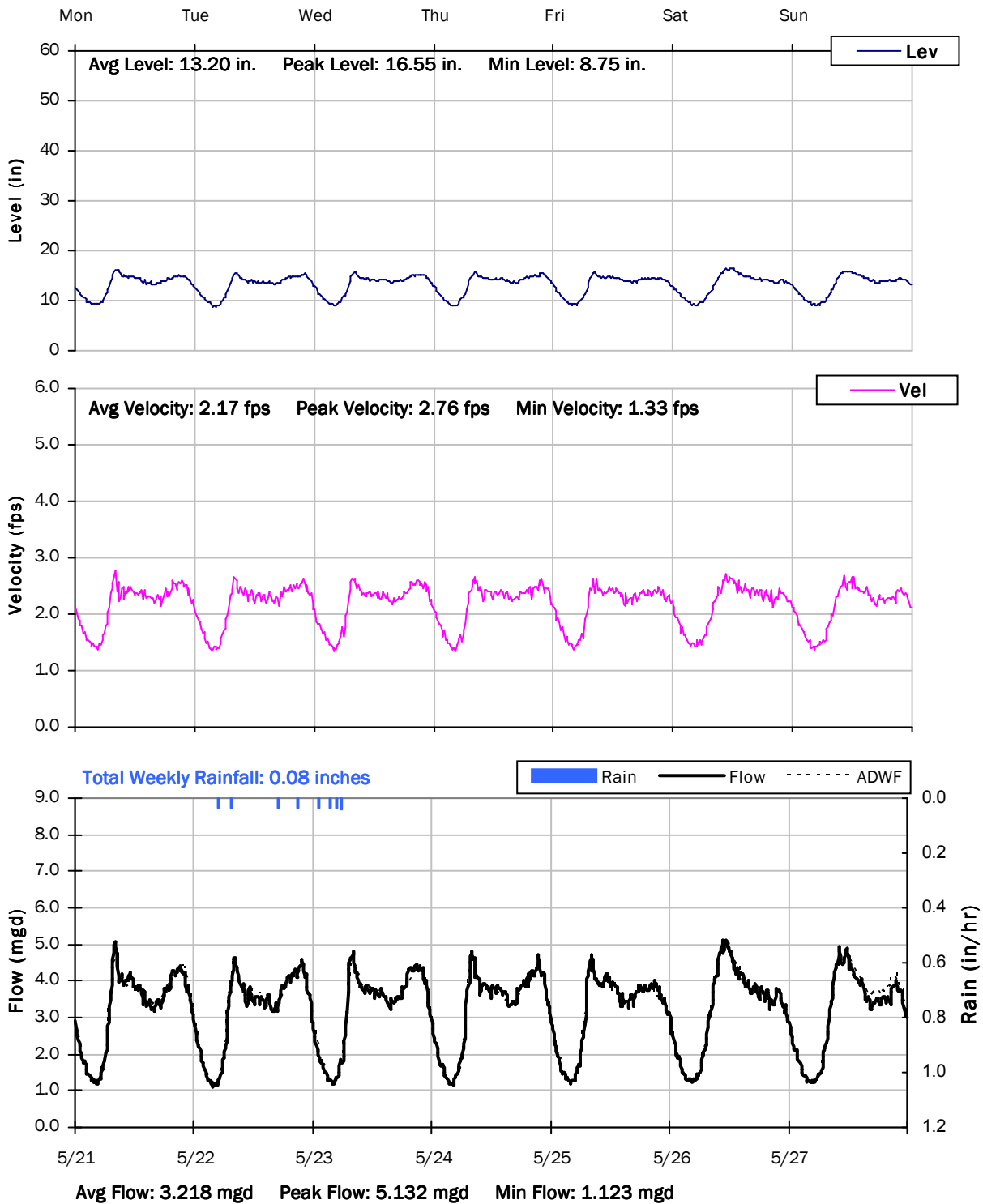
SITE 2

Weekly Level, Velocity and Flow Hydrographs

5/14/2018 to 5/21/2018



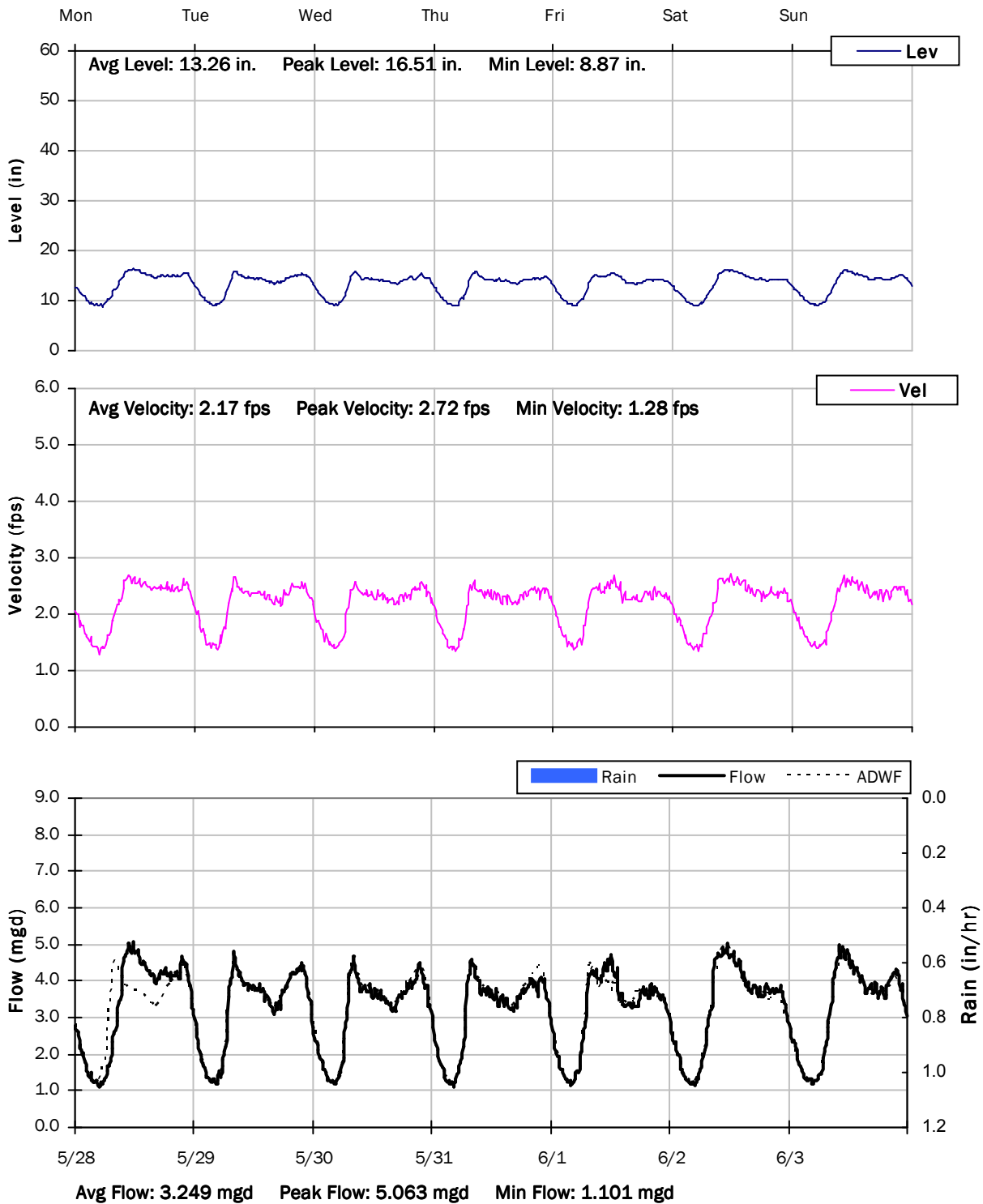
SITE 2
Weekly Level, Velocity and Flow Hydrographs
5/21/2018 to 5/28/2018



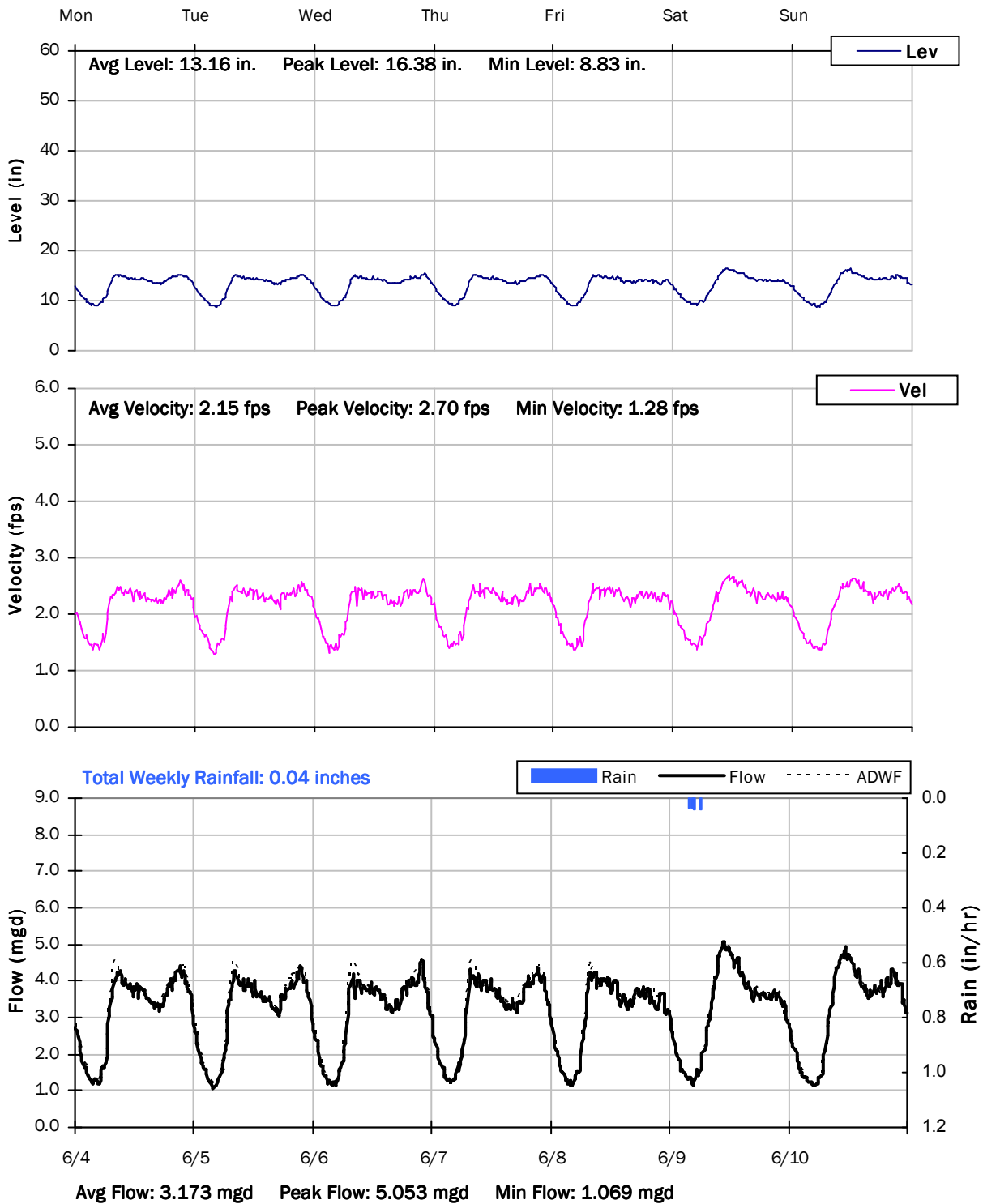
SITE 2

Weekly Level, Velocity and Flow Hydrographs

5/28/2018 to 6/4/2018



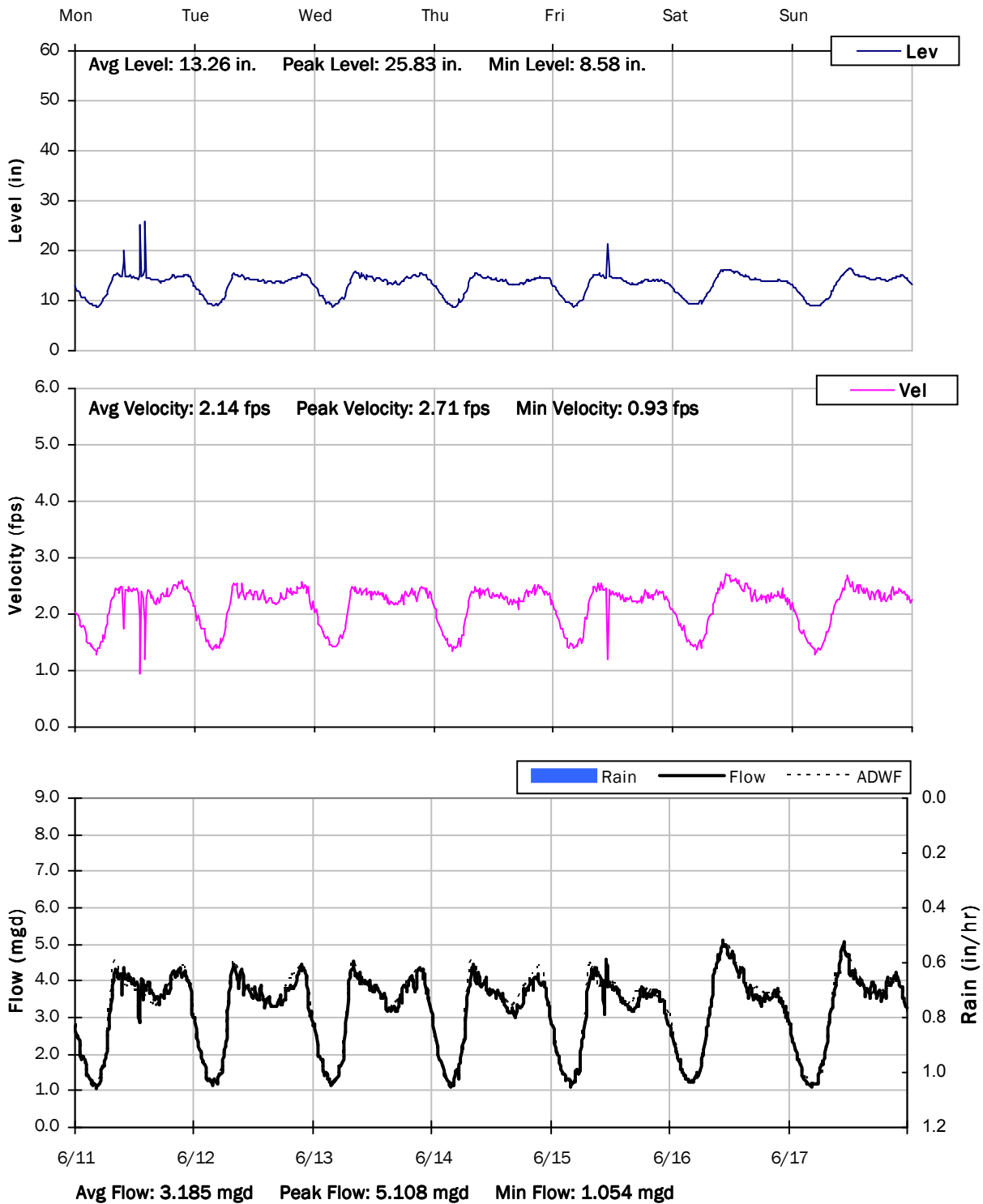
SITE 2
Weekly Level, Velocity and Flow Hydrographs
6/4/2018 to 6/11/2018



SITE 2

Weekly Level, Velocity and Flow Hydrographs

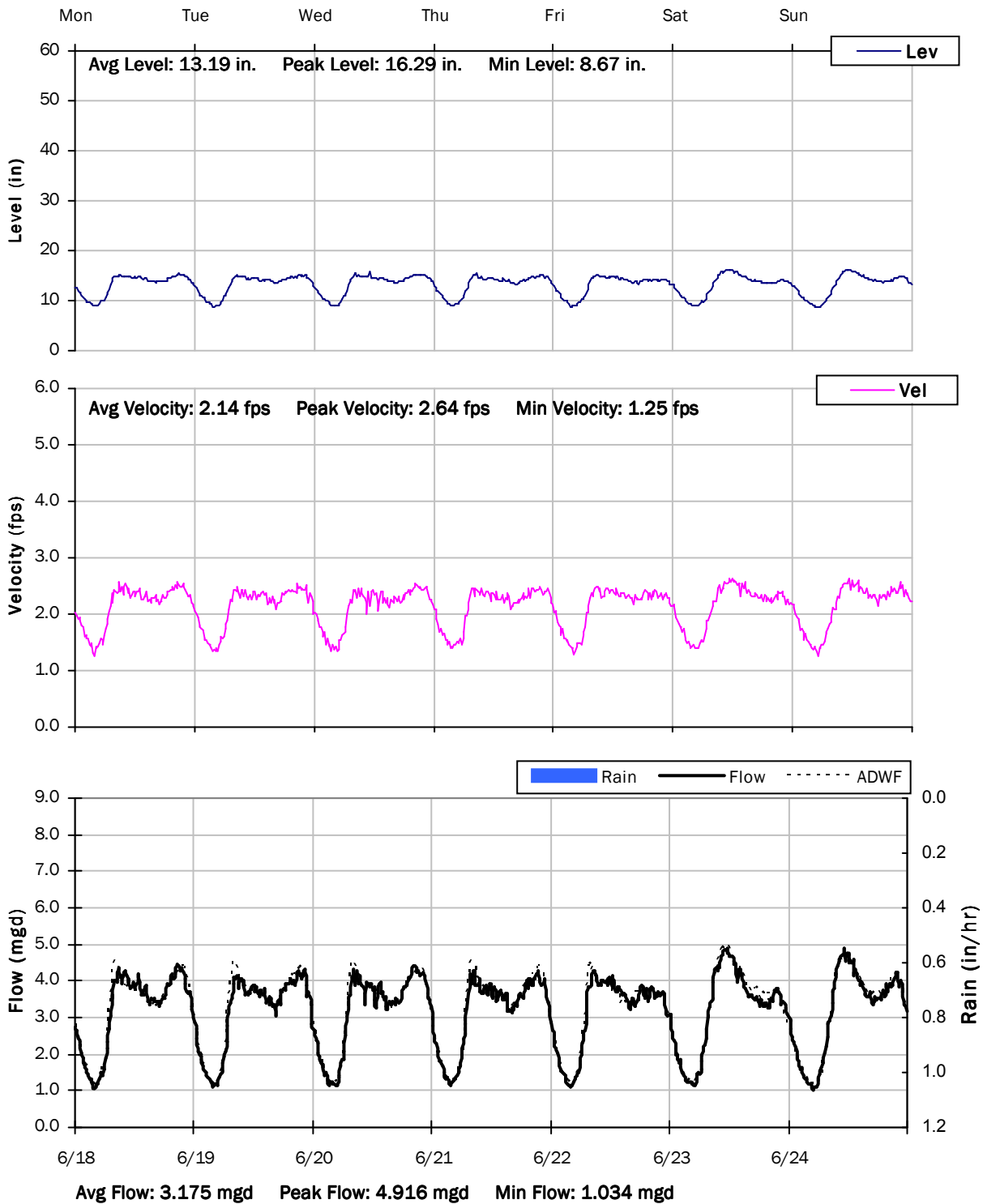
6/11/2018 to 6/18/2018



SITE 2

Weekly Level, Velocity and Flow Hydrographs

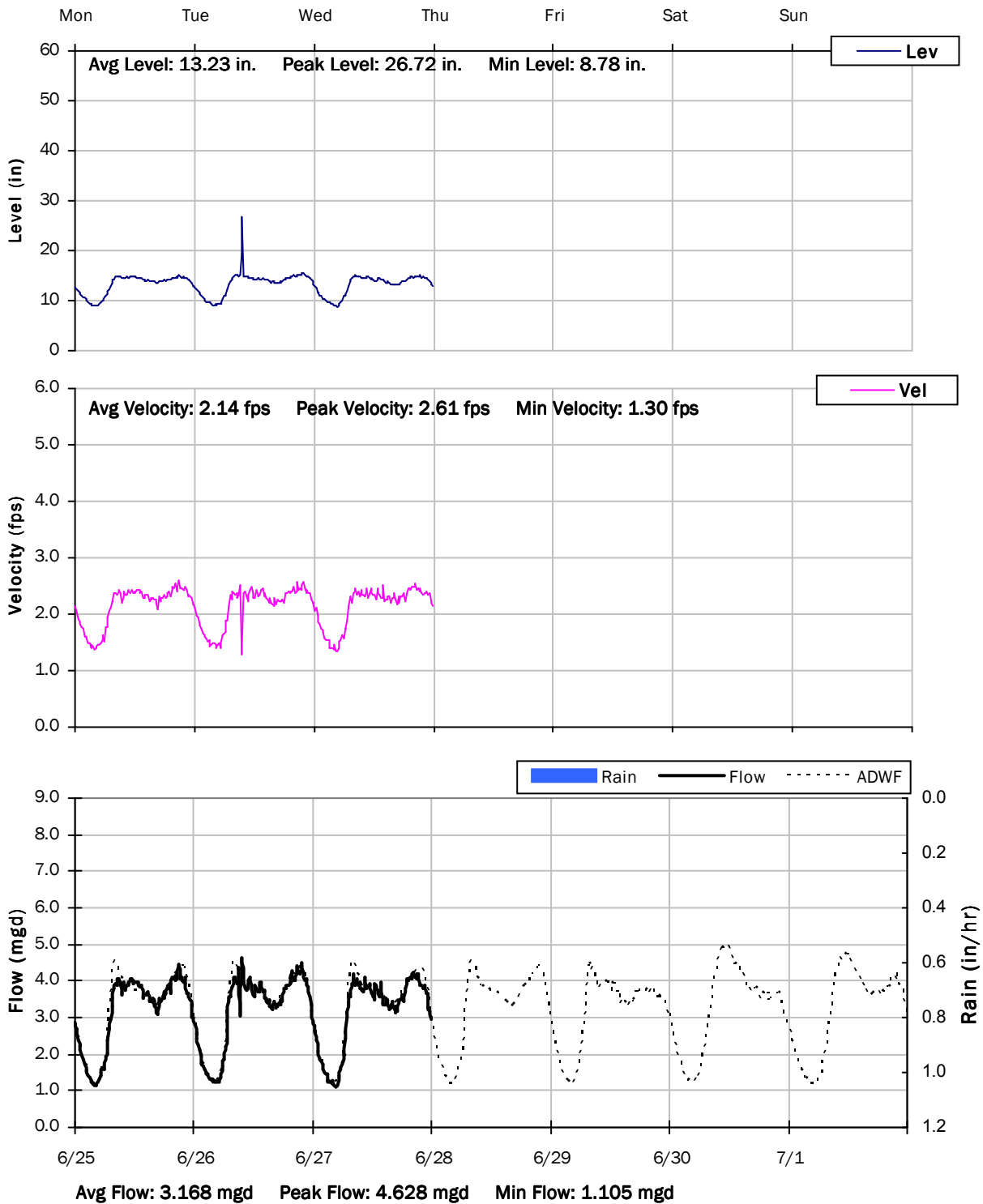
6/18/2018 to 6/25/2018



SITE 2

Weekly Level, Velocity and Flow Hydrographs

6/25/2018 to 7/2/2018



City of South San Francisco

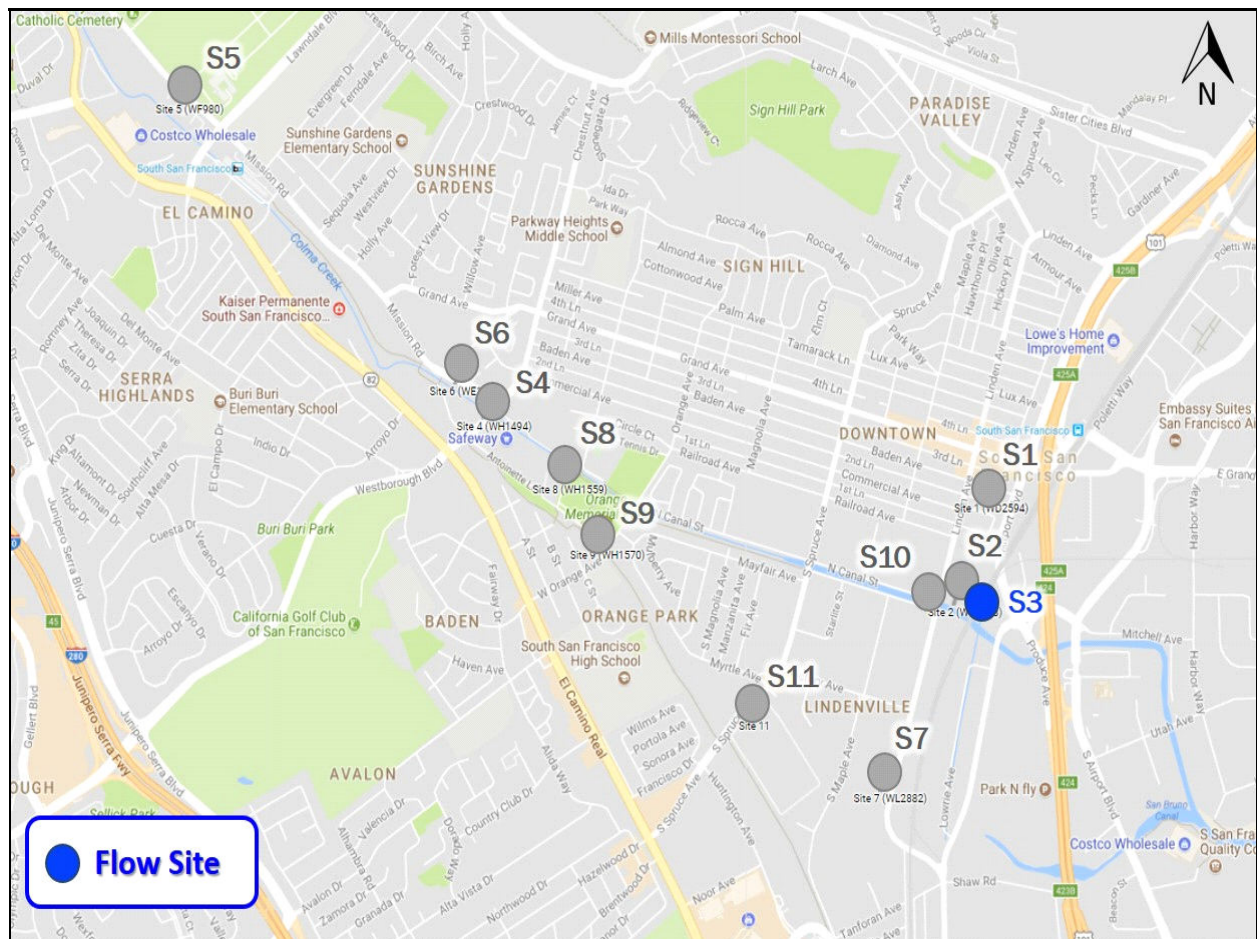
Sanitary Sewer Flow Monitoring

February 26- June 28, 2018

Monitoring Site: Site 3

Location: Pump Station #9 1460 San Mateo Ave. Enter via south gate, near railroad tracks

Data Summary Report

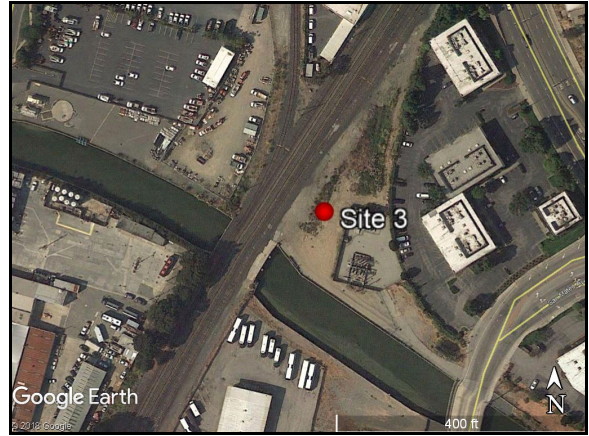


Vicinity Map: Site 3

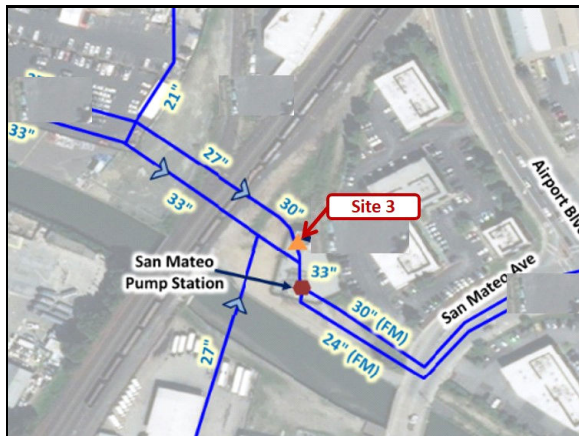
SITE 3

Site Information

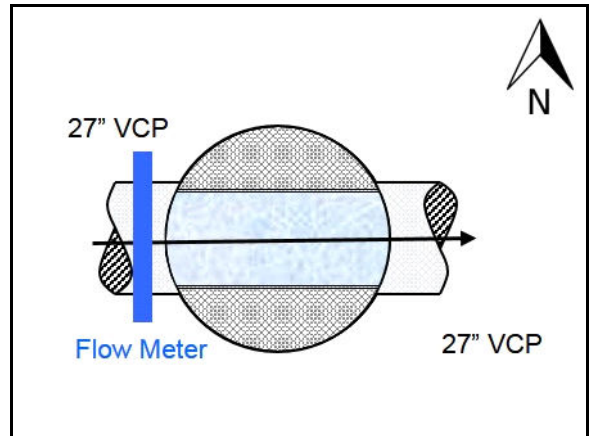
MH ID: WL2659
Location: Pump Station #9 1460 San Mateo Ave. Enter via south gate, near railroad tracks
Coordinates: 122.4099° W, 37.6499° N
Rim Elevation (Earth): 11 feet
Pipe Diameter: 27 inches
Sediment: 2.75 inches
ADWF: 0.078 mgd
Peak Measured Flow: 0.835 mgd



Satellite Map



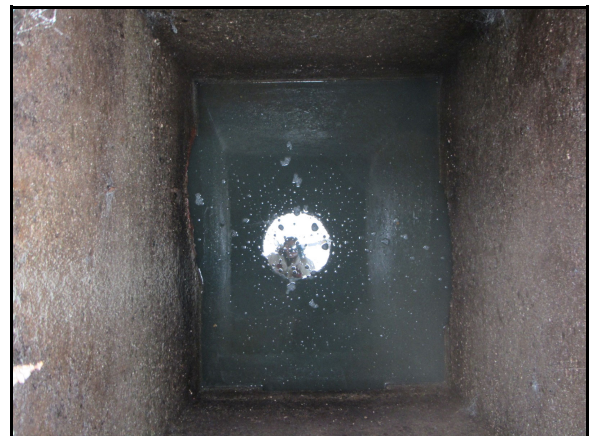
Sewer Map



Flow Sketch



Street View



Plan View

SITE 3

Additional Site Photos

Effluent Pipe



Influent Pipe

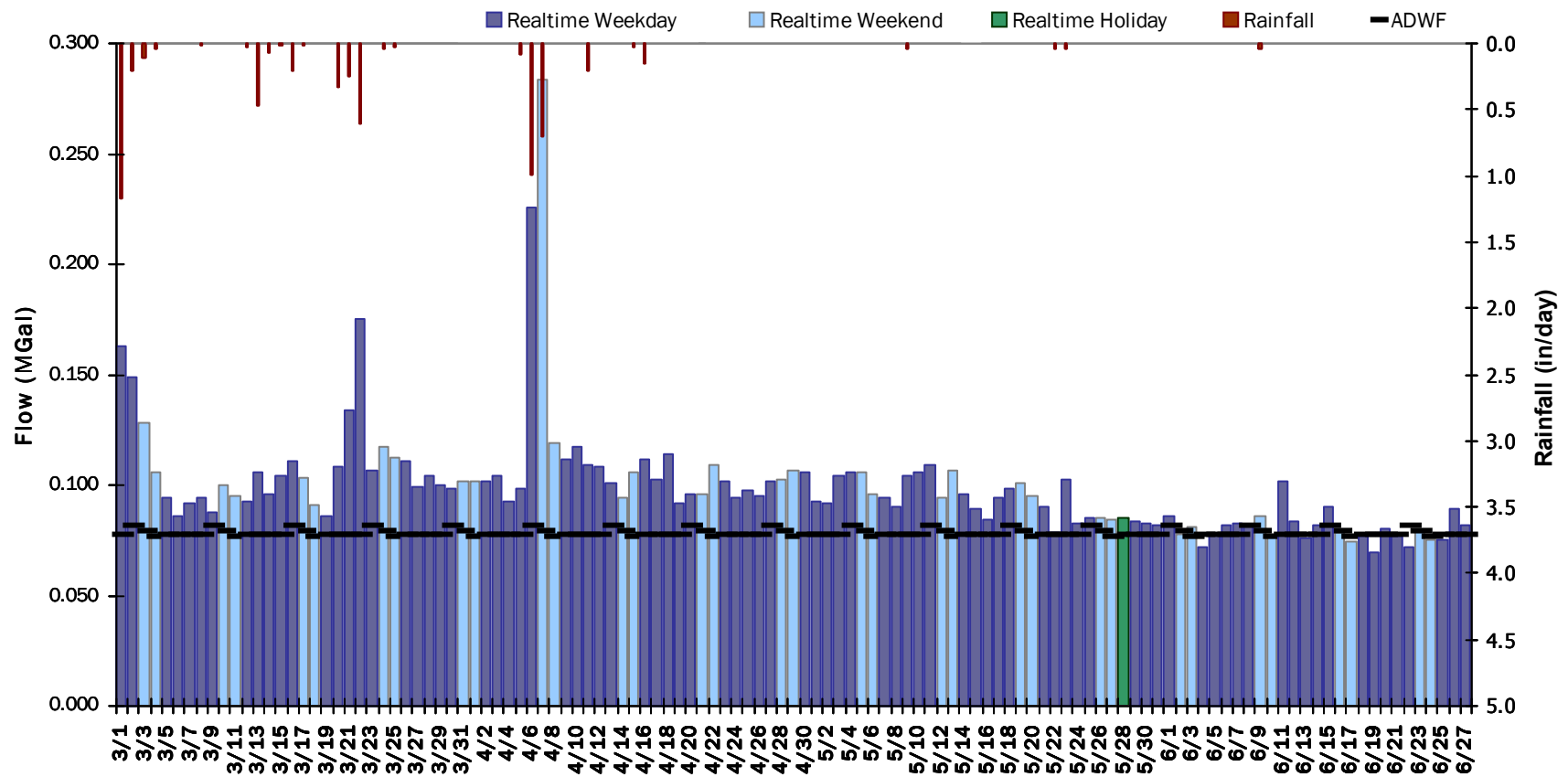


SITE 3

Period Flow Summary: Daily Flow Totals

Avg Period Flow: 0.099 MGal Peak Daily Flow: 0.283 MGal Min Daily Flow: 0.069 MGal

Total Period Rainfall: 5.92 inches



SITE 3

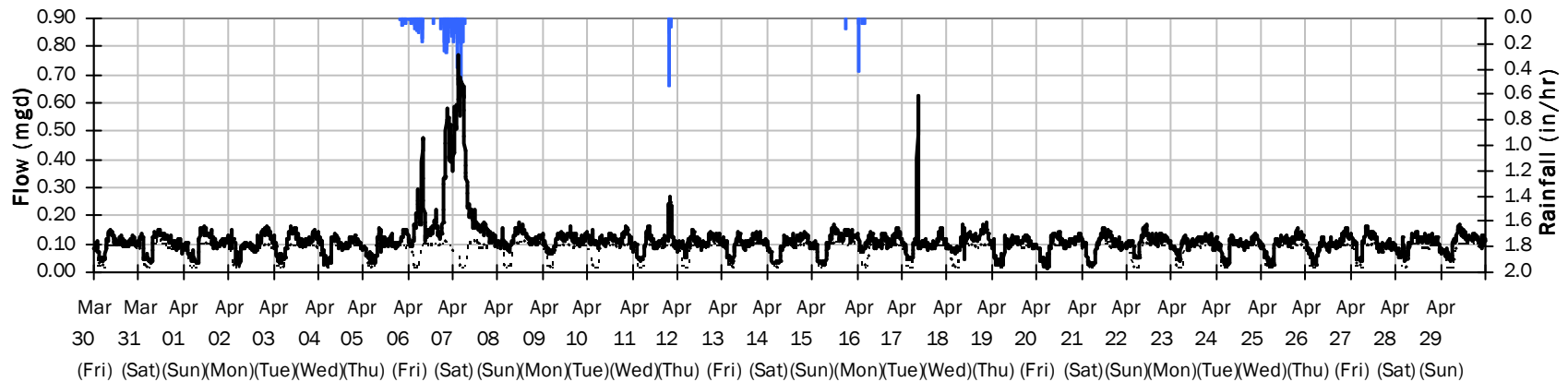
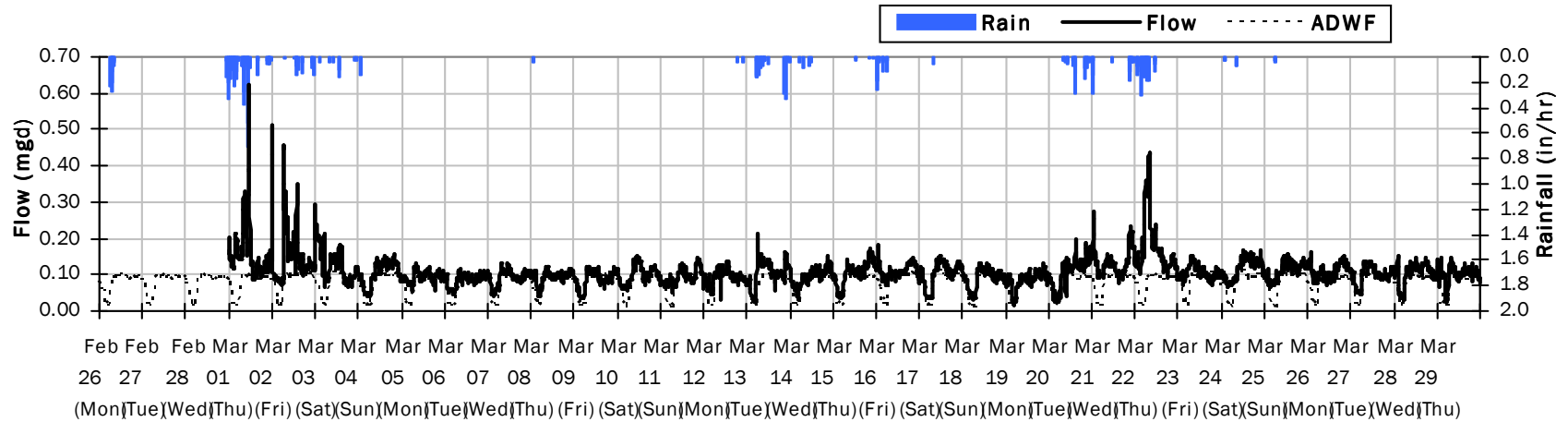
Flow Summary: 2/26/2018 to 4/29/2018

Total Period Rainfall: 6.26 inches

Avg Flow: 0.111 mgd

Peak Flow: 0.767 mgd

Min Flow: 0.014 mgd



SITE 3

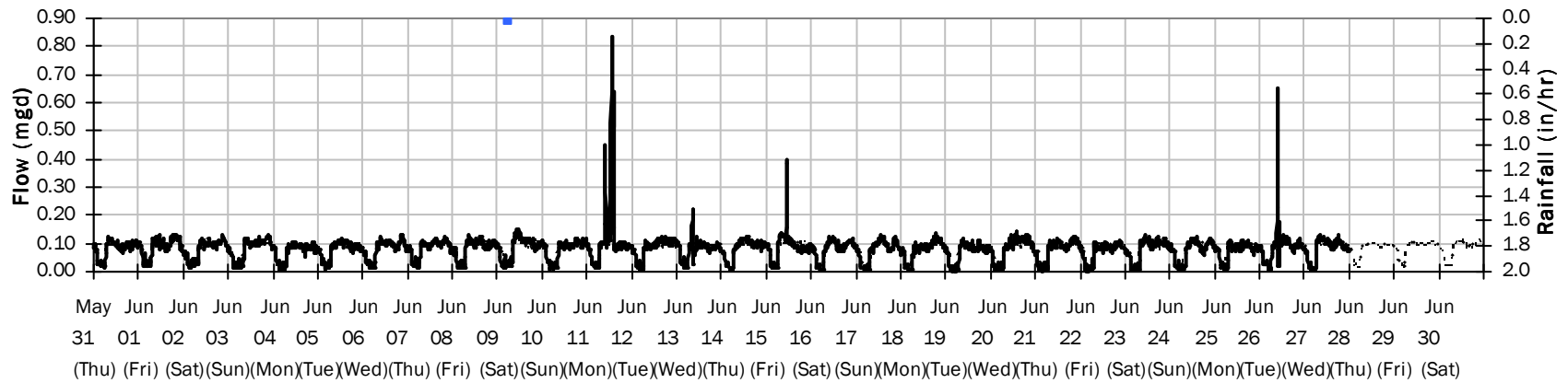
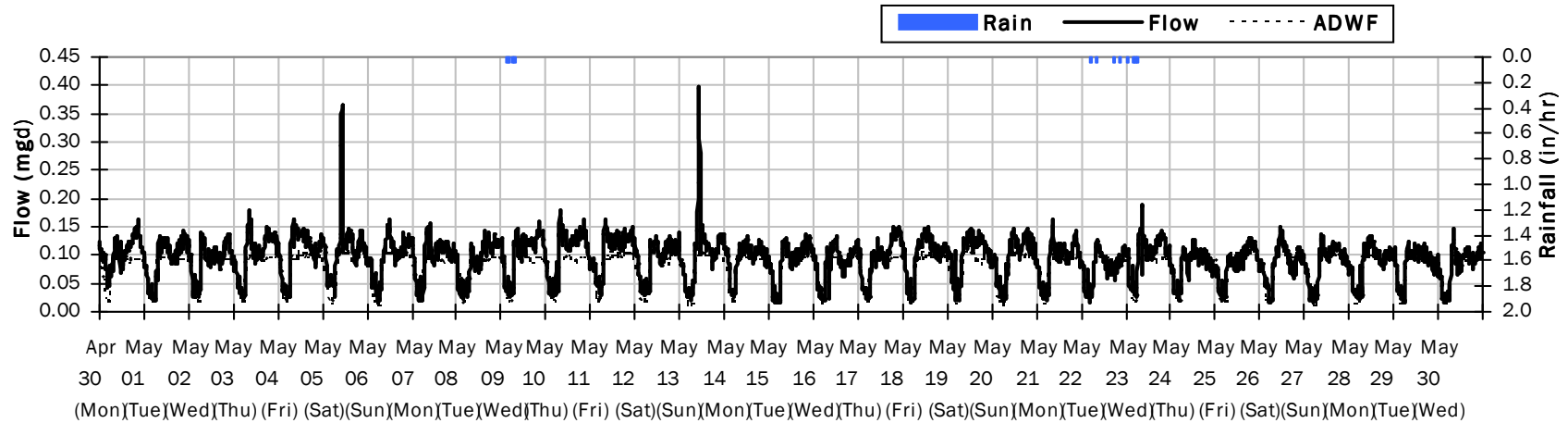
Flow Summary: 4/30/2018 to 6/30/2018

Total Period Rainfall: 0.16 inches

Avg Flow: 0.088 mgd

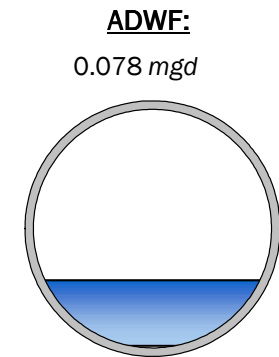
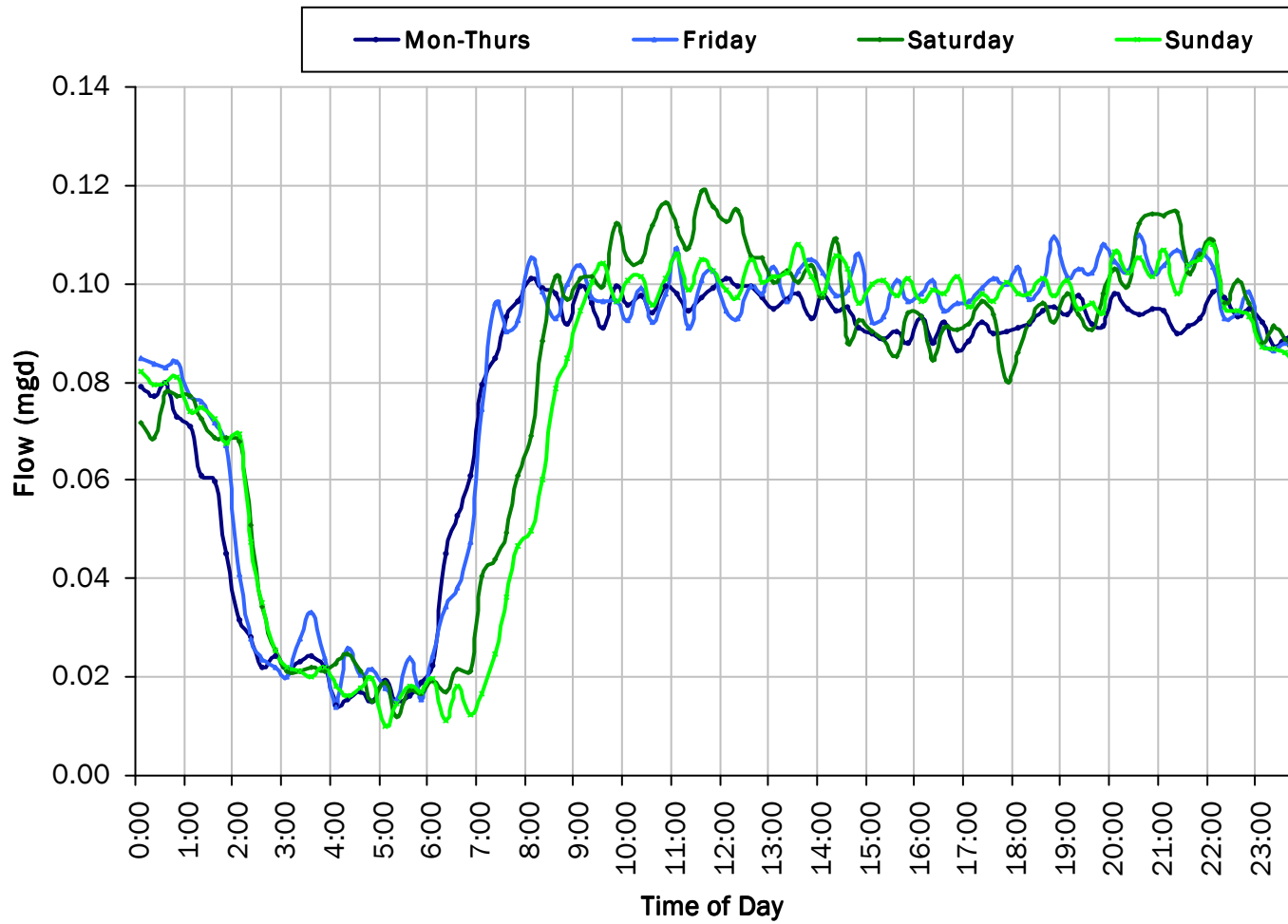
Peak Flow: 0.835 mgd

Min Flow: 0.003 mgd



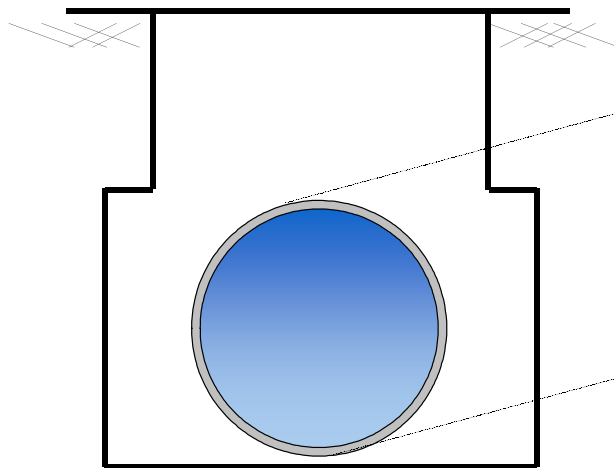
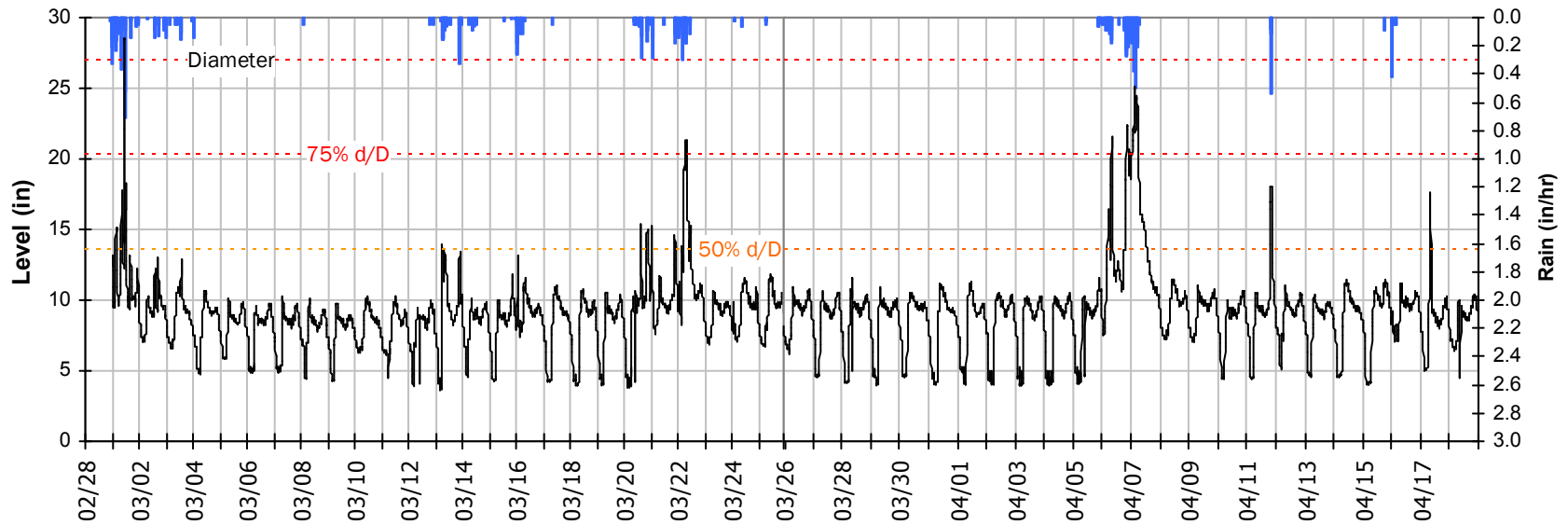
SITE 3

Average Dry Weather Flow Hydrographs



SITE 3 Site Capacity and Surge Summary

Realtime Flow Levels with Rainfall Data over Monitoring (High Capacity) Period



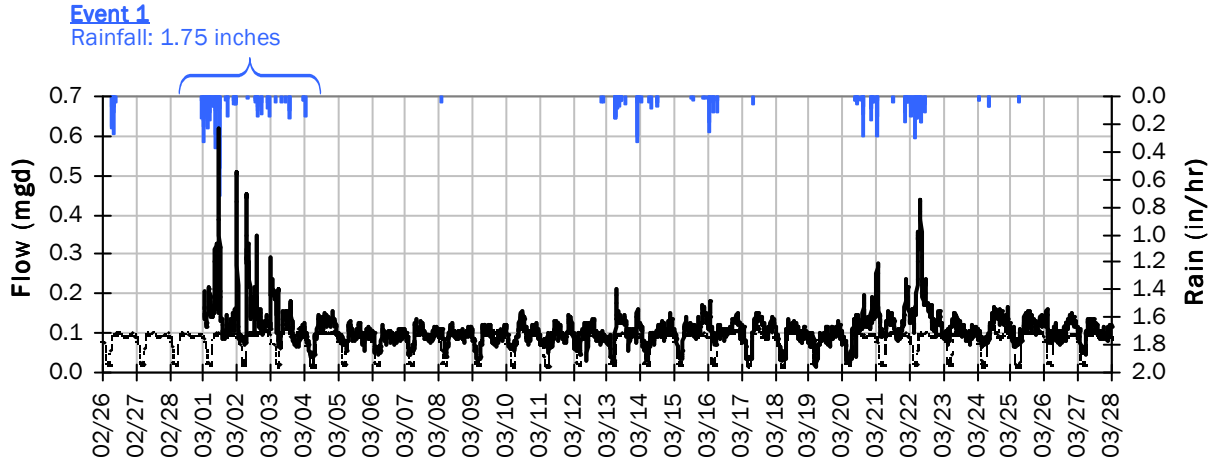
Pipe Diameter: 27 inches
Peak Measured Level: 28.4 inches
Peak d/D Ratio: 1.05

Surcharged 1.4 inches over crown

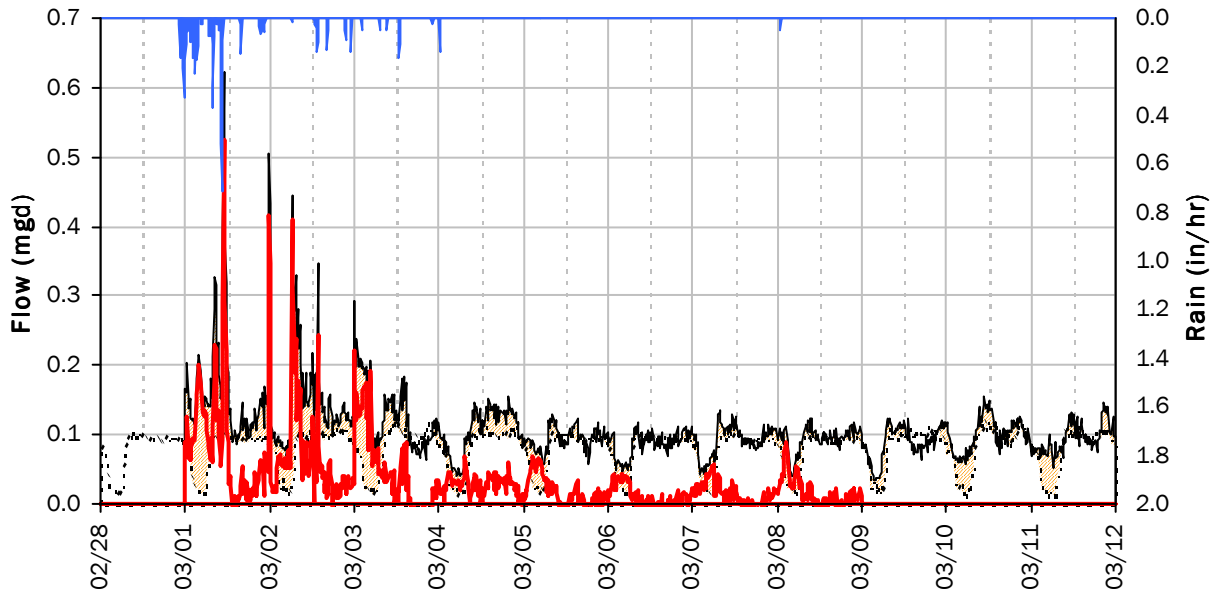
SITE 3

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



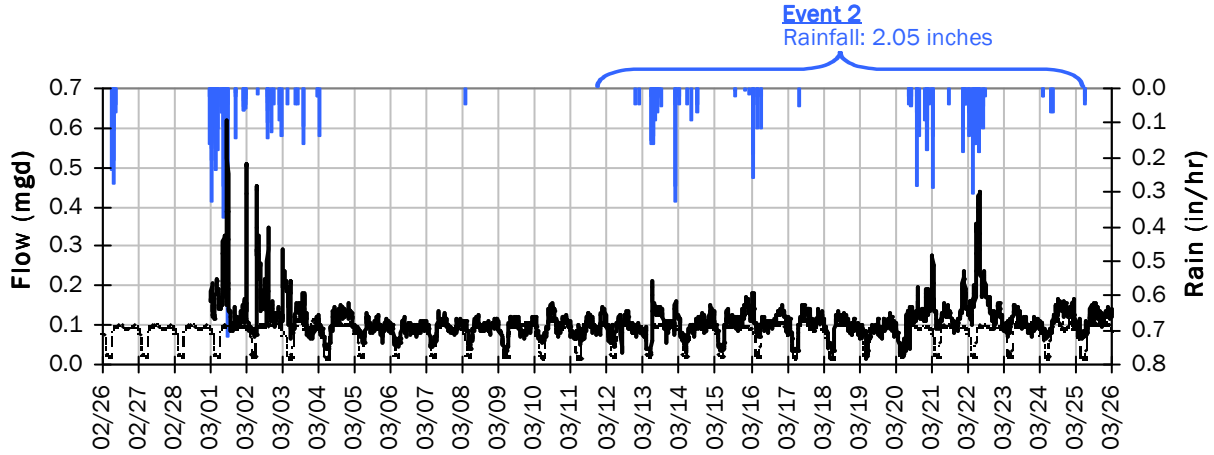
Storm Event I/I Analysis (Rain = 1.75 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	0.62 mgd	Peak I/I Rate:	0.52 mgd
PF:	7.94	Total I/I:	285,000 gallons
Peak Level:	28.42 in		
d/D Ratio:	1.05		

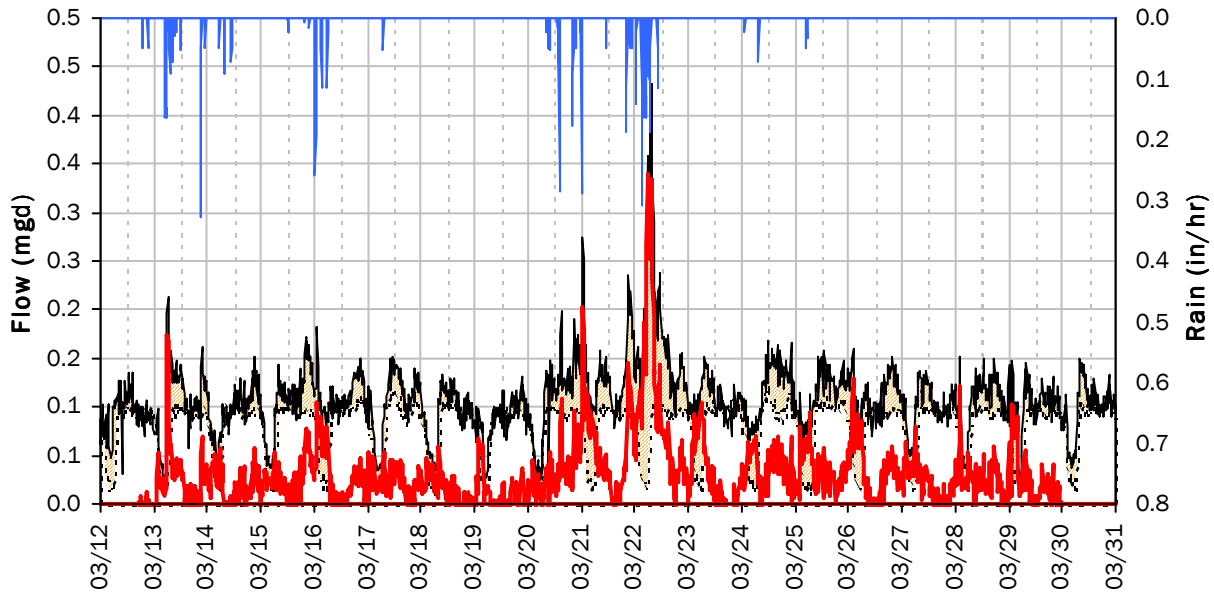
SITE 3

I/I Summary: Event 2

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 2 Detail Graph



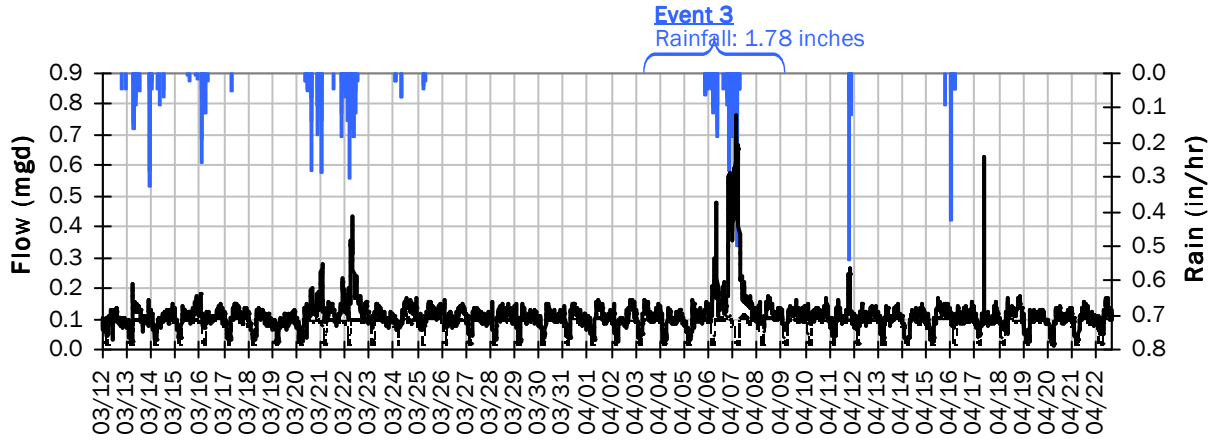
Storm Event I/I Analysis (Rain = 2.05 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	0.43 mgd	Peak I/I Rate:	0.34 mgd
PF:	5.51	Total I/I:	536,000 gallons
Peak Level:	21.38 in		
d/D Ratio:	0.79		

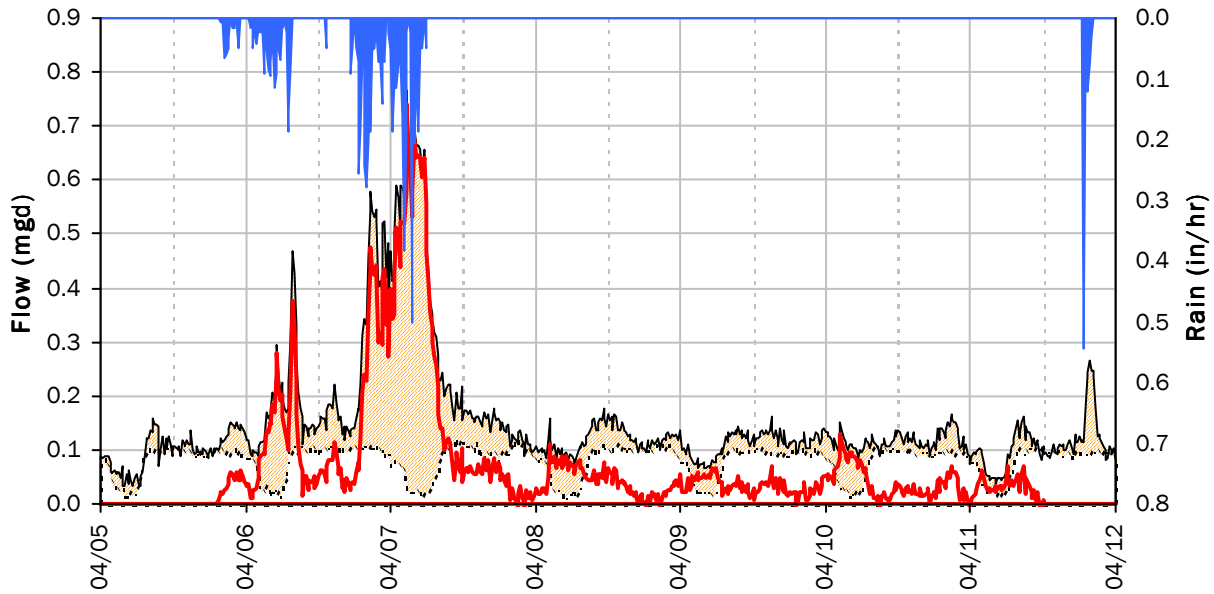
SITE 3

I/I Summary: Event 3

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



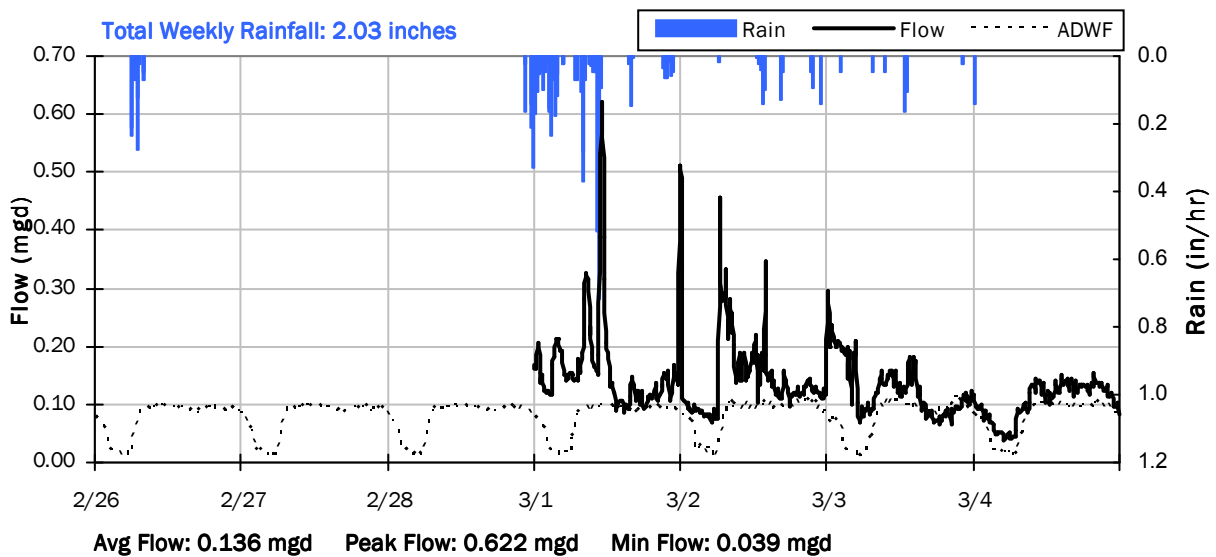
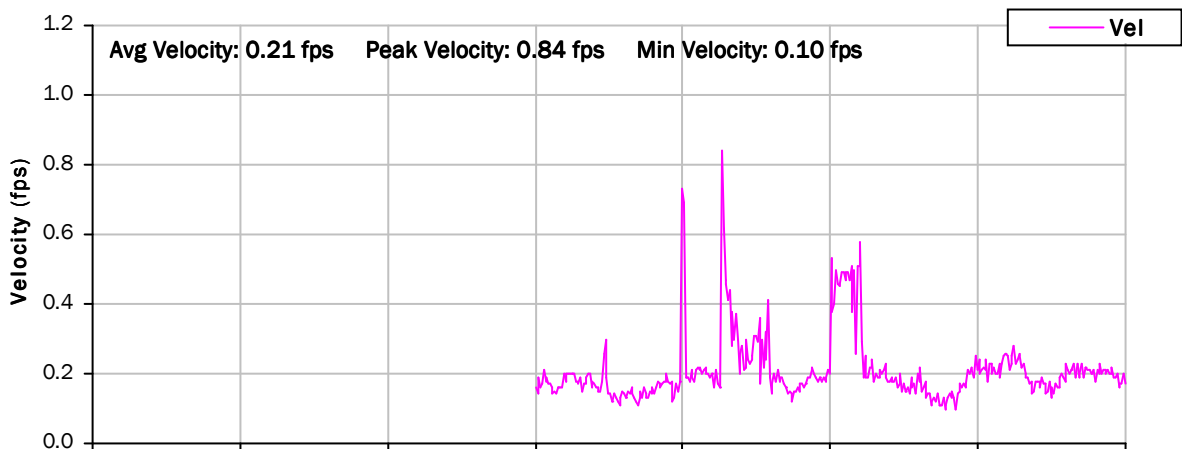
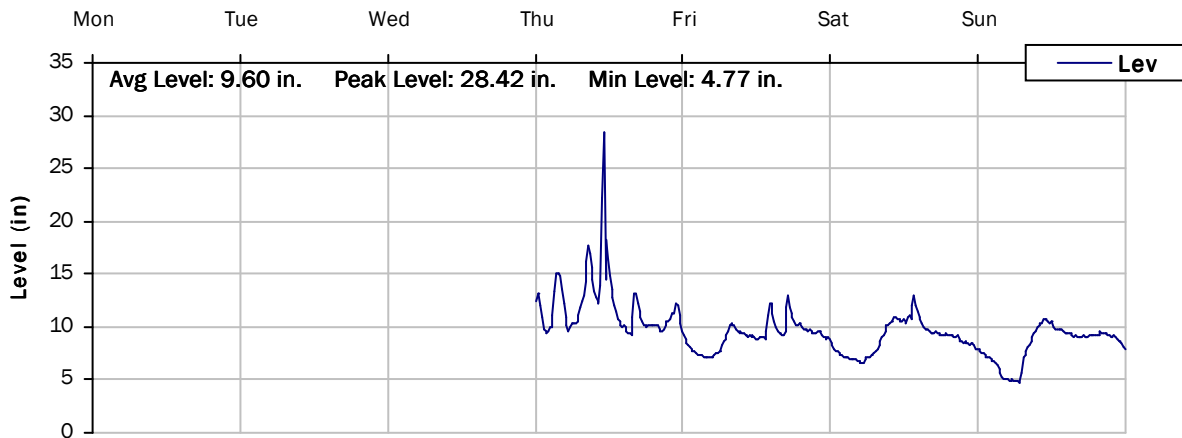
Event 3 Detail Graph



Storm Event I/I Analysis (Rain = 1.78 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	0.77 mgd	Peak I/I Rate:	0.74 mgd
PF:	9.80	Total I/I:	486,000 gallons
Peak Level:	25.13 in		
d/D Ratio:	0.93		

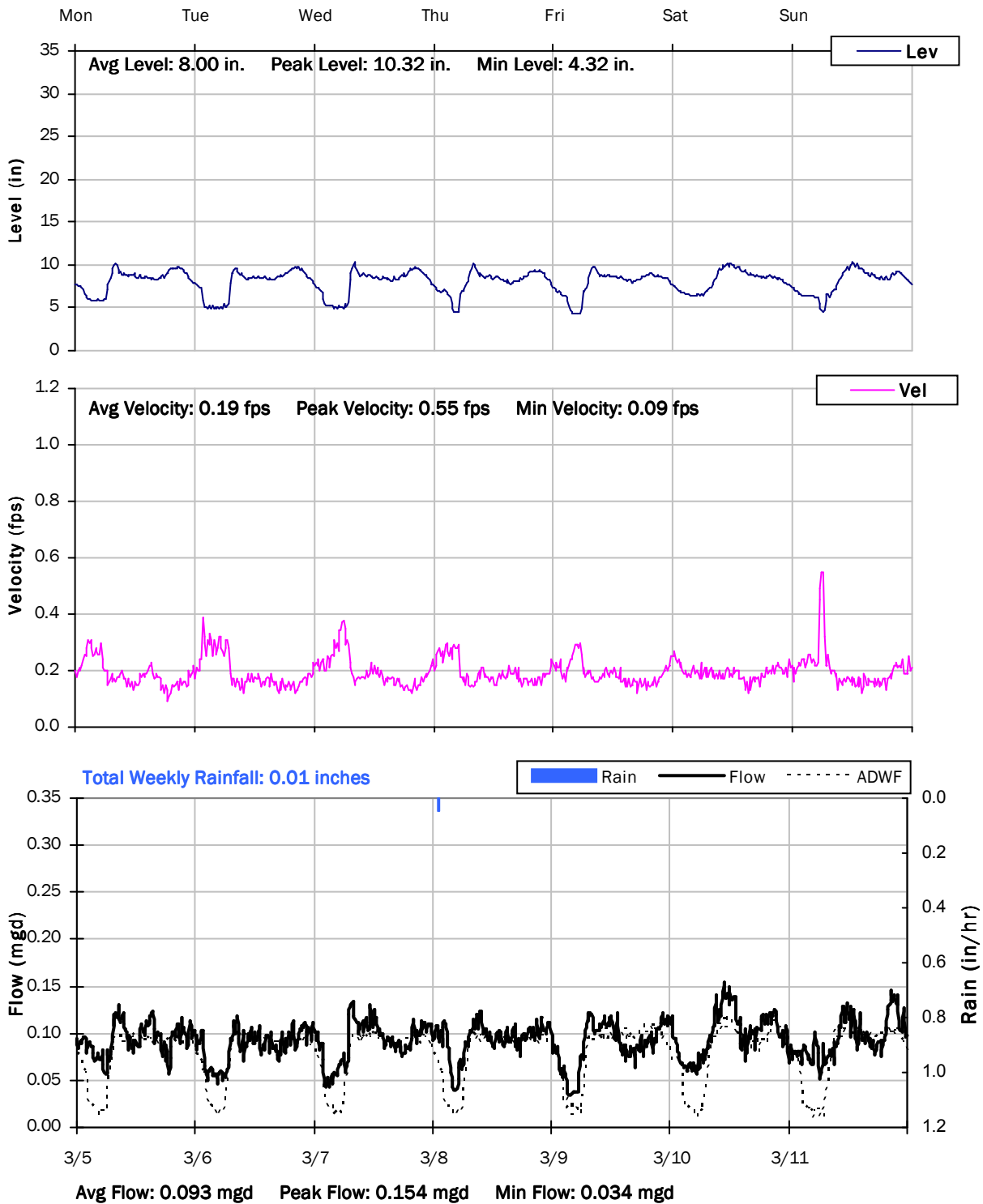
SITE 3
Weekly Level, Velocity and Flow Hydrographs
2/26/2018 to 3/5/2018



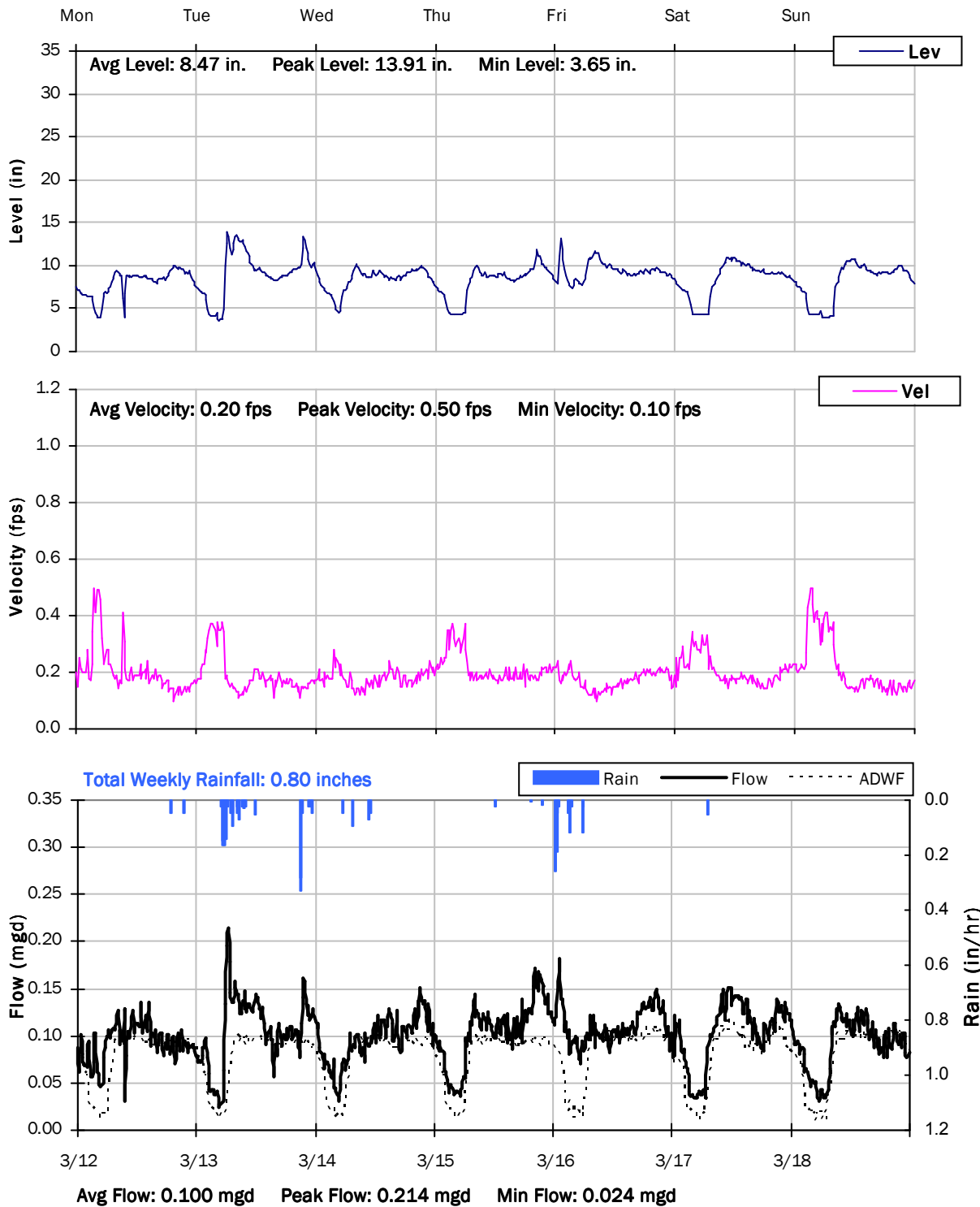
SITE 3

Weekly Level, Velocity and Flow Hydrographs

3/5/2018 to 3/12/2018



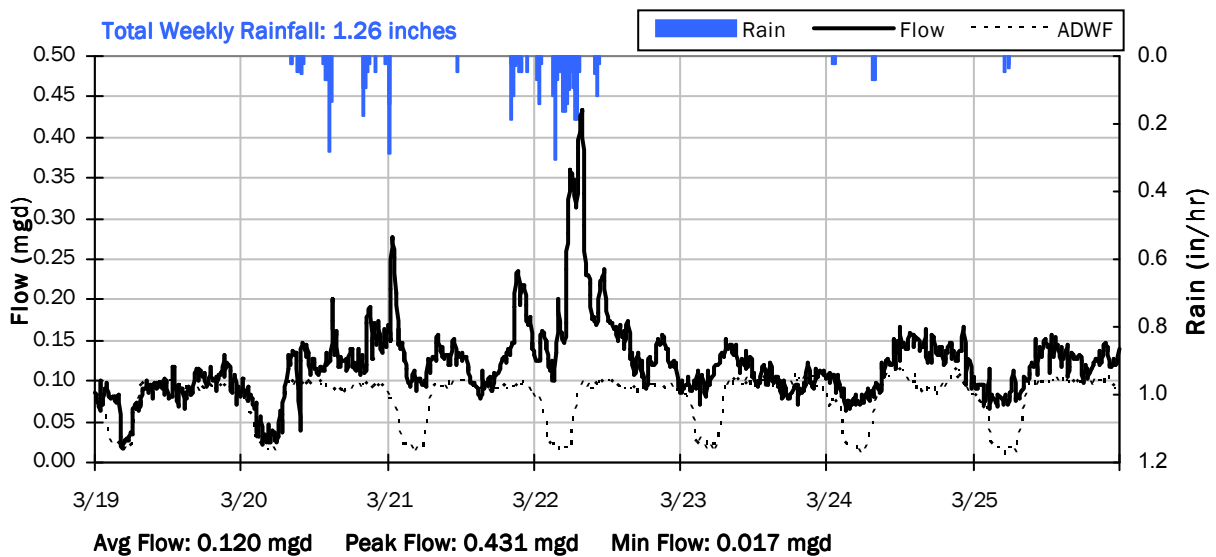
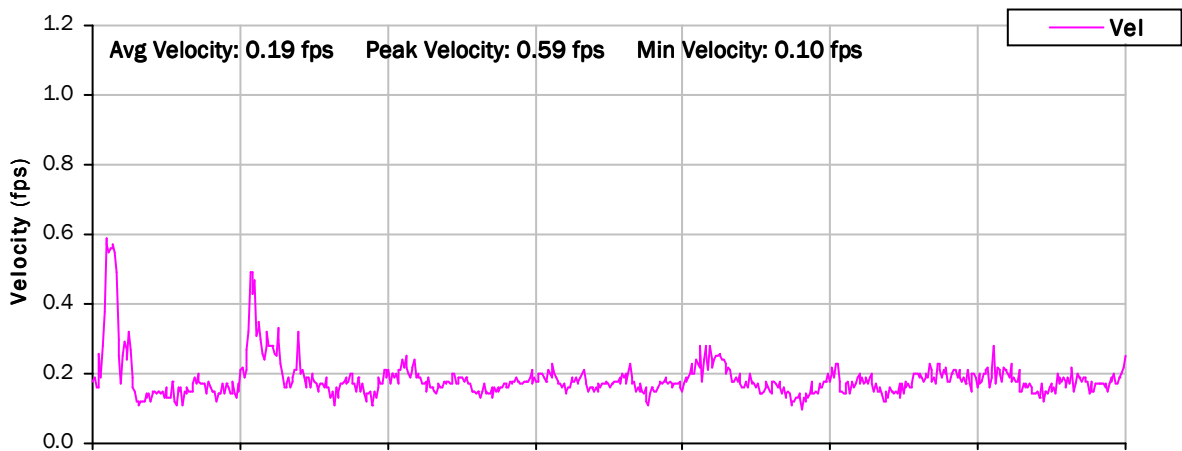
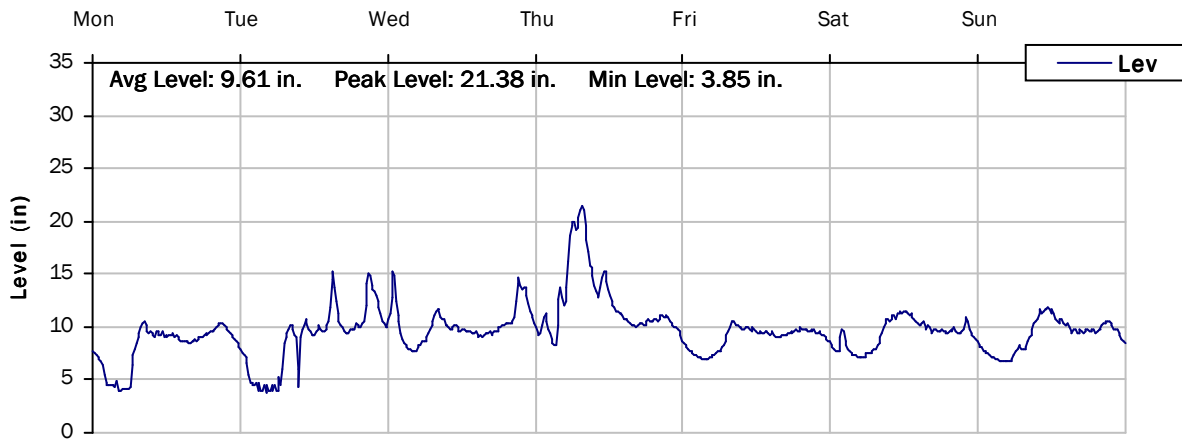
SITE 3
Weekly Level, Velocity and Flow Hydrographs
3/12/2018 to 3/19/2018



SITE 3

Weekly Level, Velocity and Flow Hydrographs

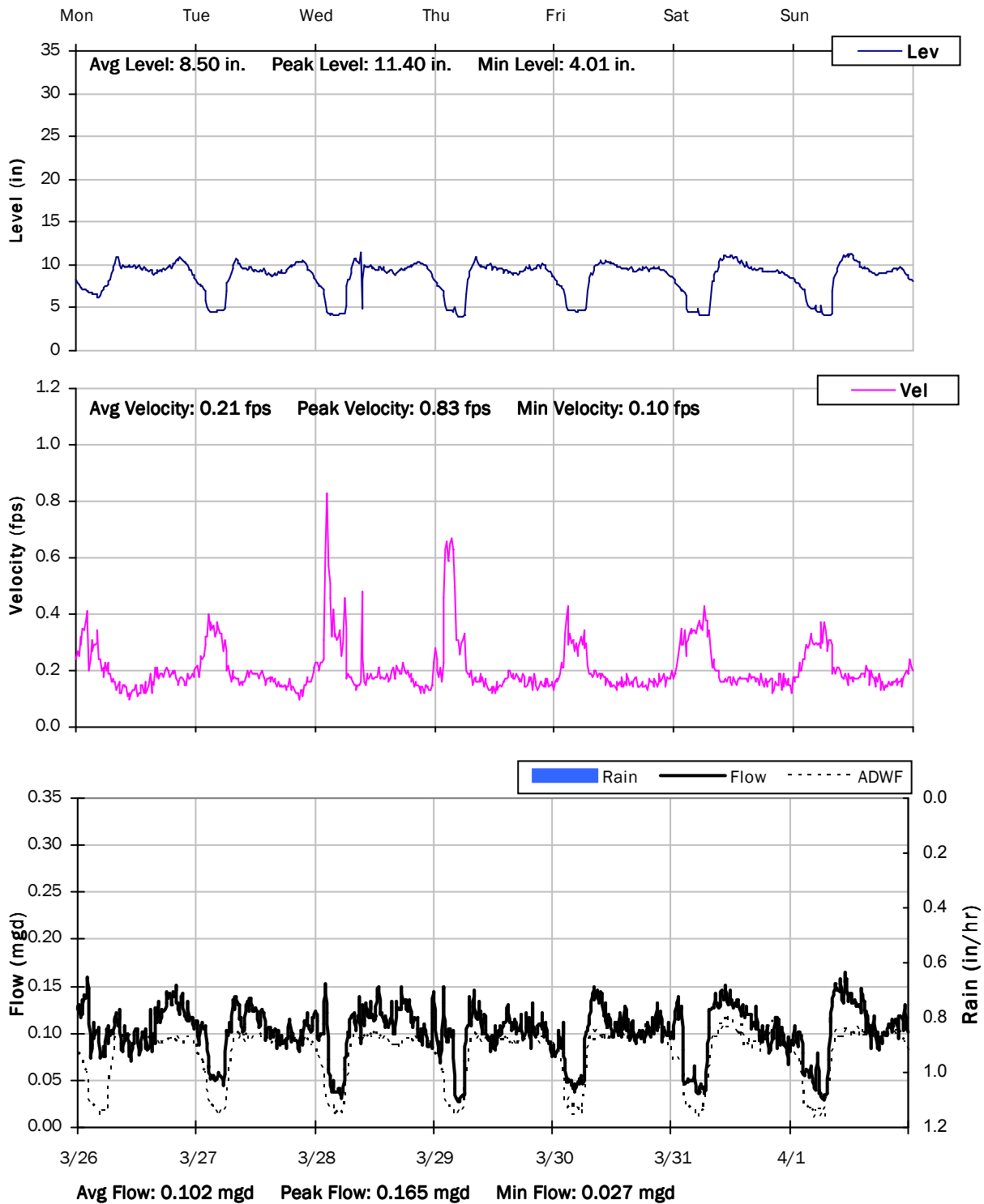
3/19/2018 to 3/26/2018



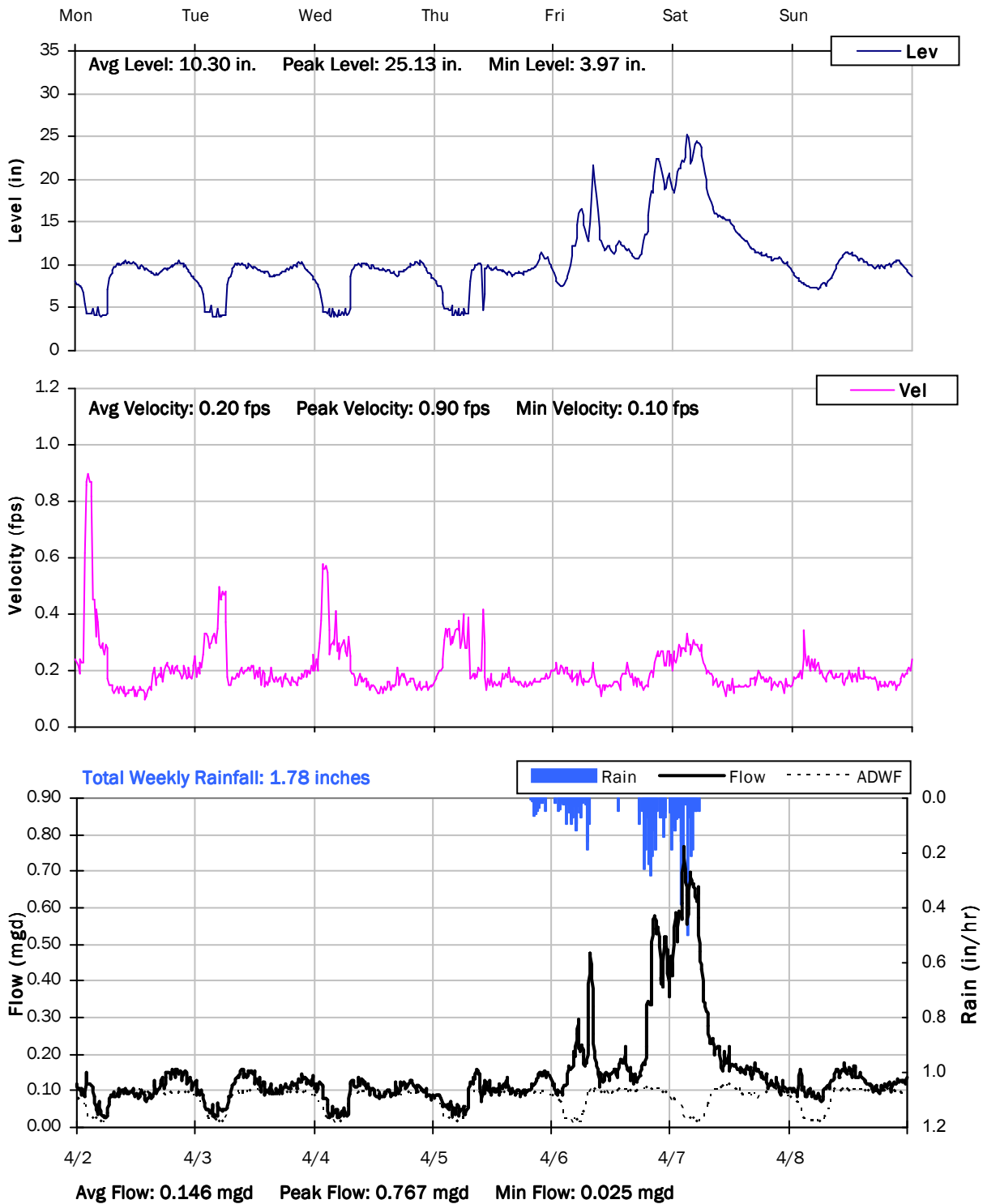
SITE 3

Weekly Level, Velocity and Flow Hydrographs

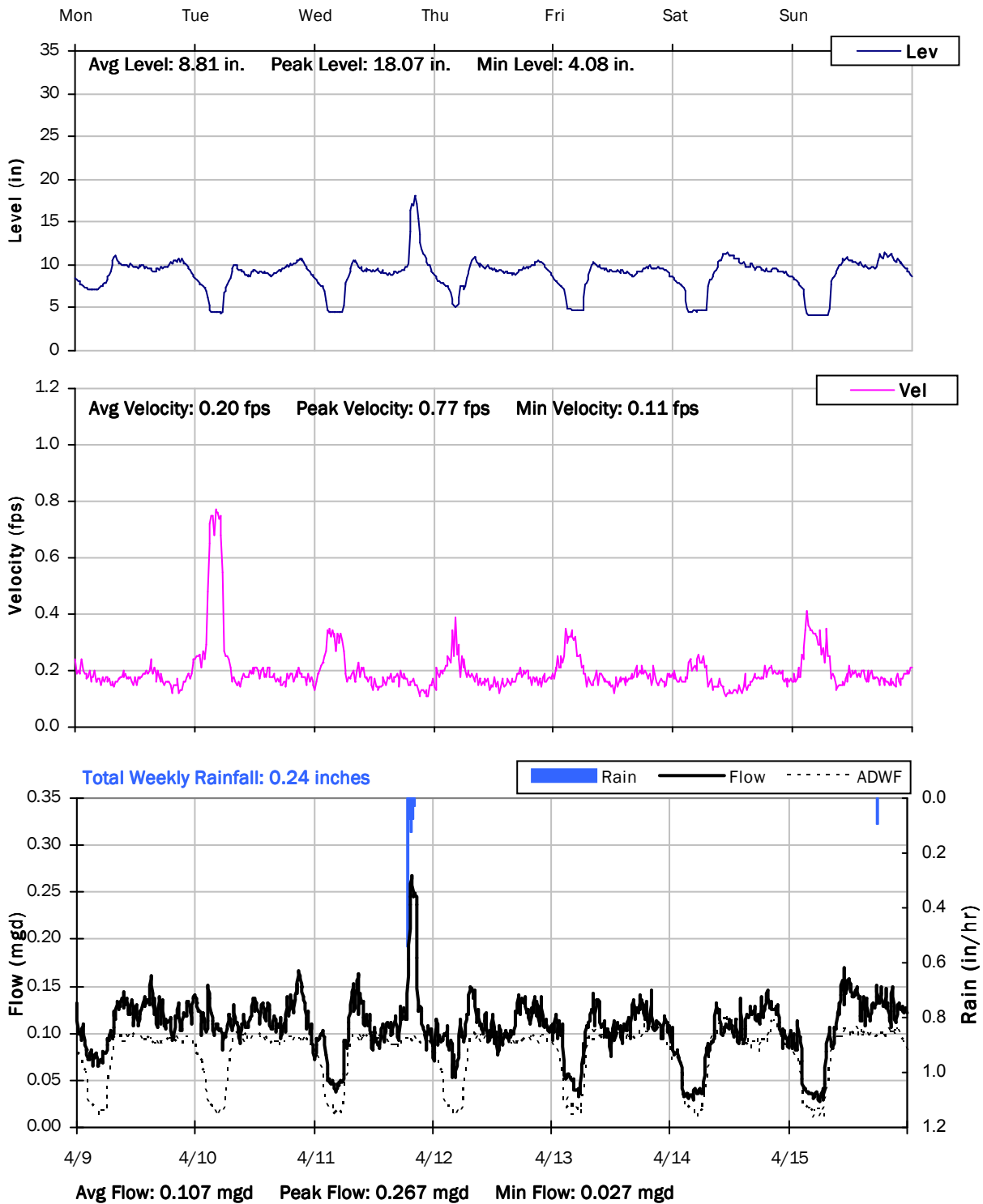
3/26/2018 to 4/2/2018



SITE 3
Weekly Level, Velocity and Flow Hydrographs
4/2/2018 to 4/9/2018



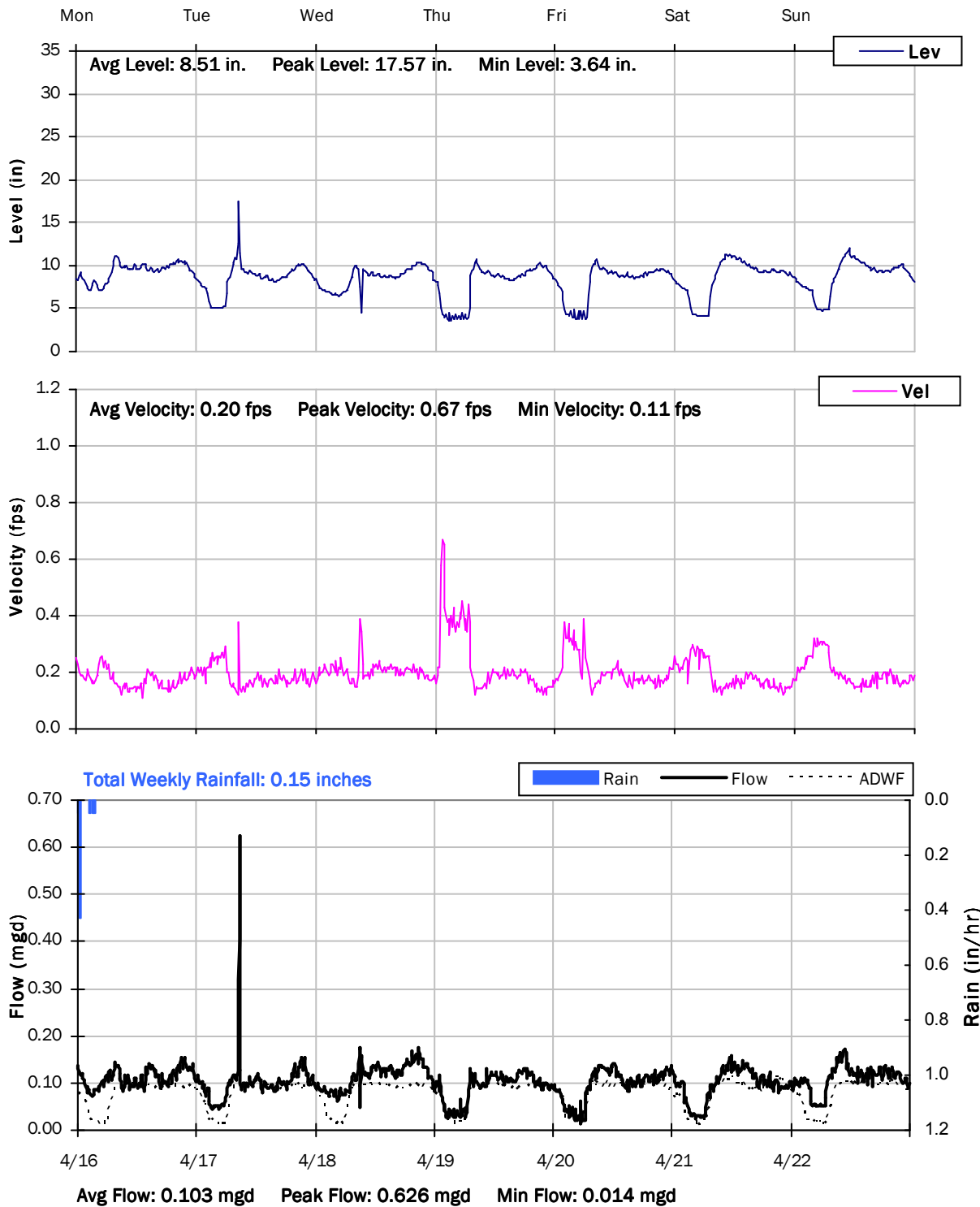
SITE 3
Weekly Level, Velocity and Flow Hydrographs
4/9/2018 to 4/16/2018



SITE 3

Weekly Level, Velocity and Flow Hydrographs

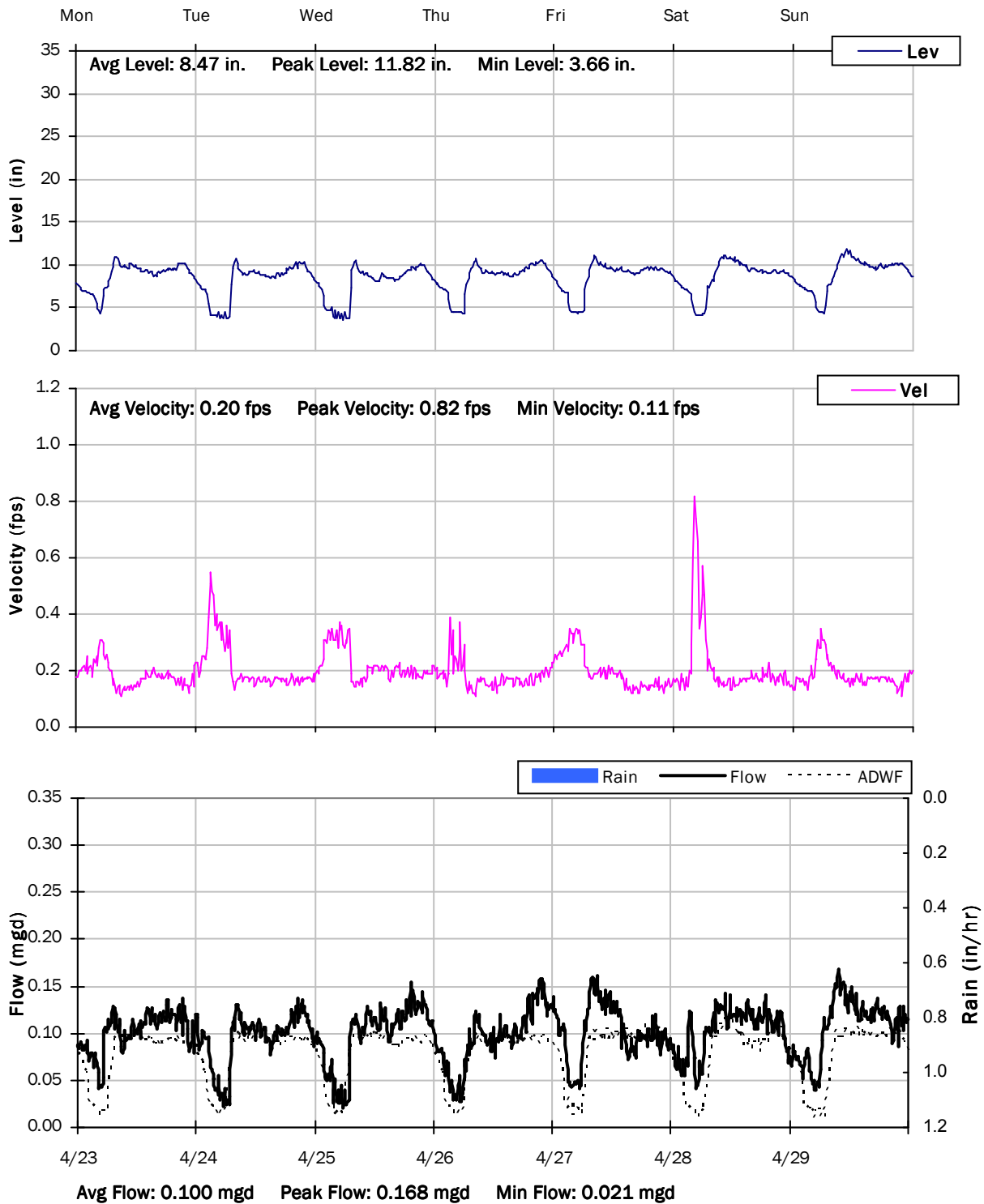
4/16/2018 to 4/23/2018



SITE 3

Weekly Level, Velocity and Flow Hydrographs

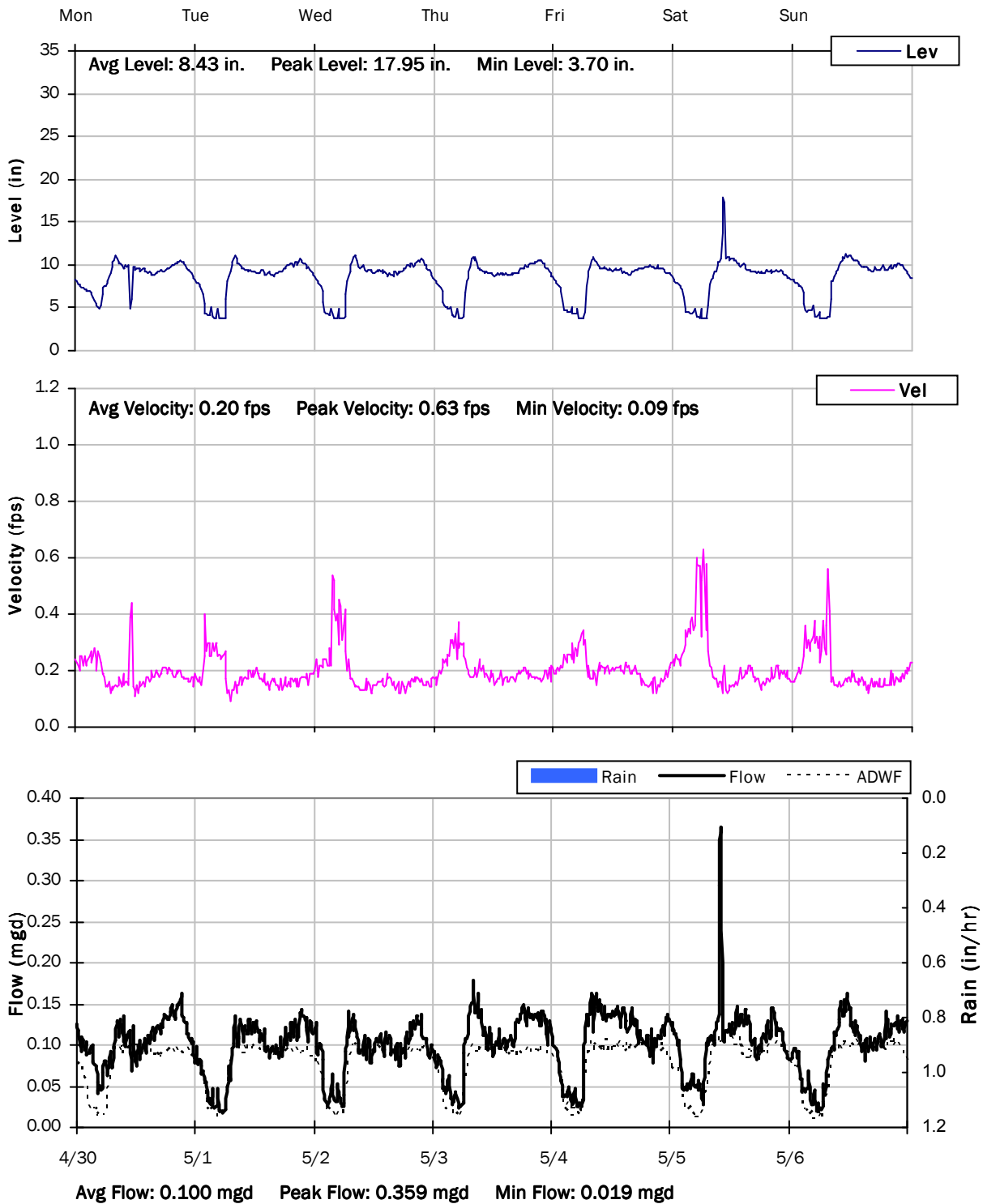
4/23/2018 to 4/30/2018



SITE 3

Weekly Level, Velocity and Flow Hydrographs

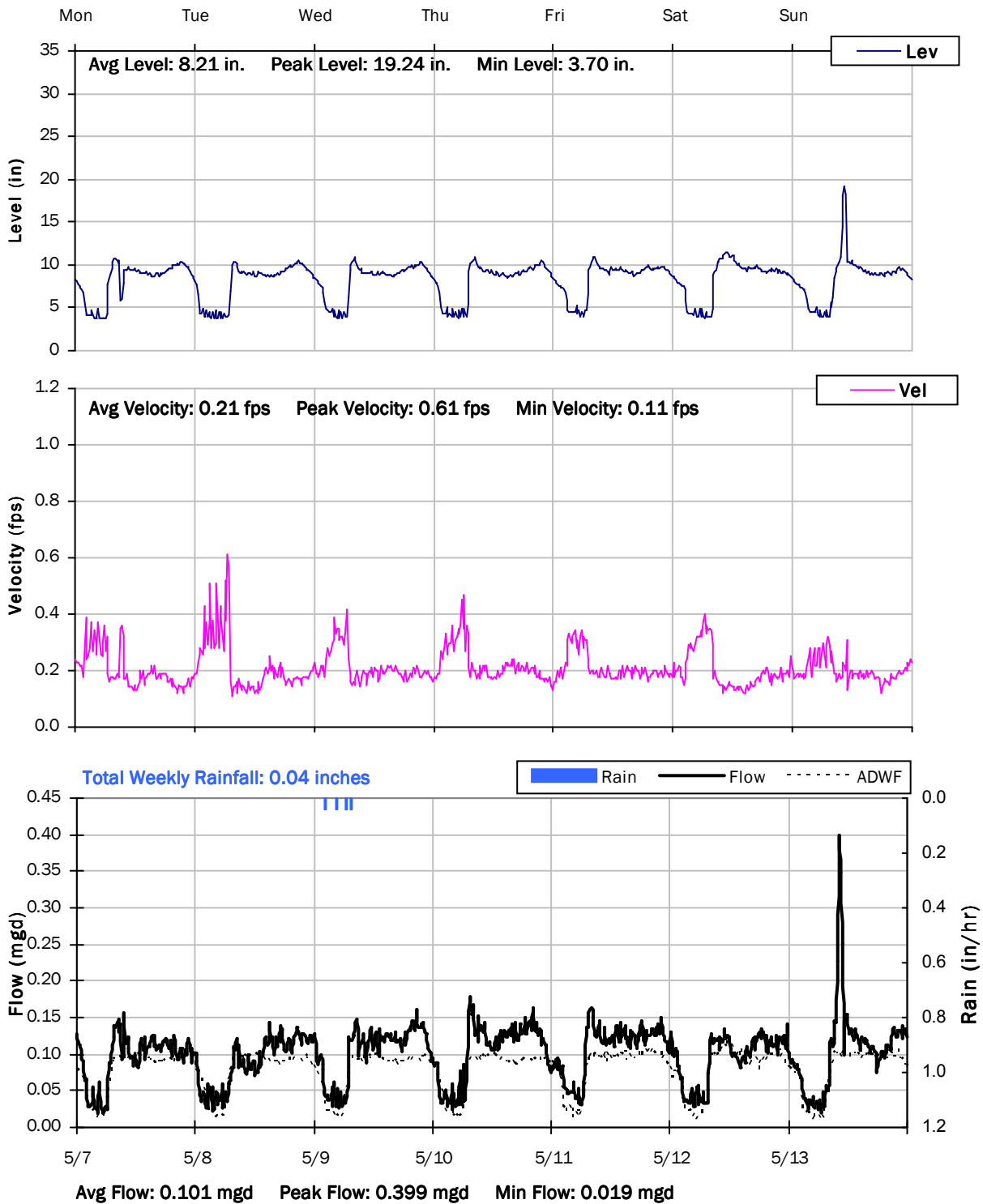
4/30/2018 to 5/7/2018



SITE 3

Weekly Level, Velocity and Flow Hydrographs

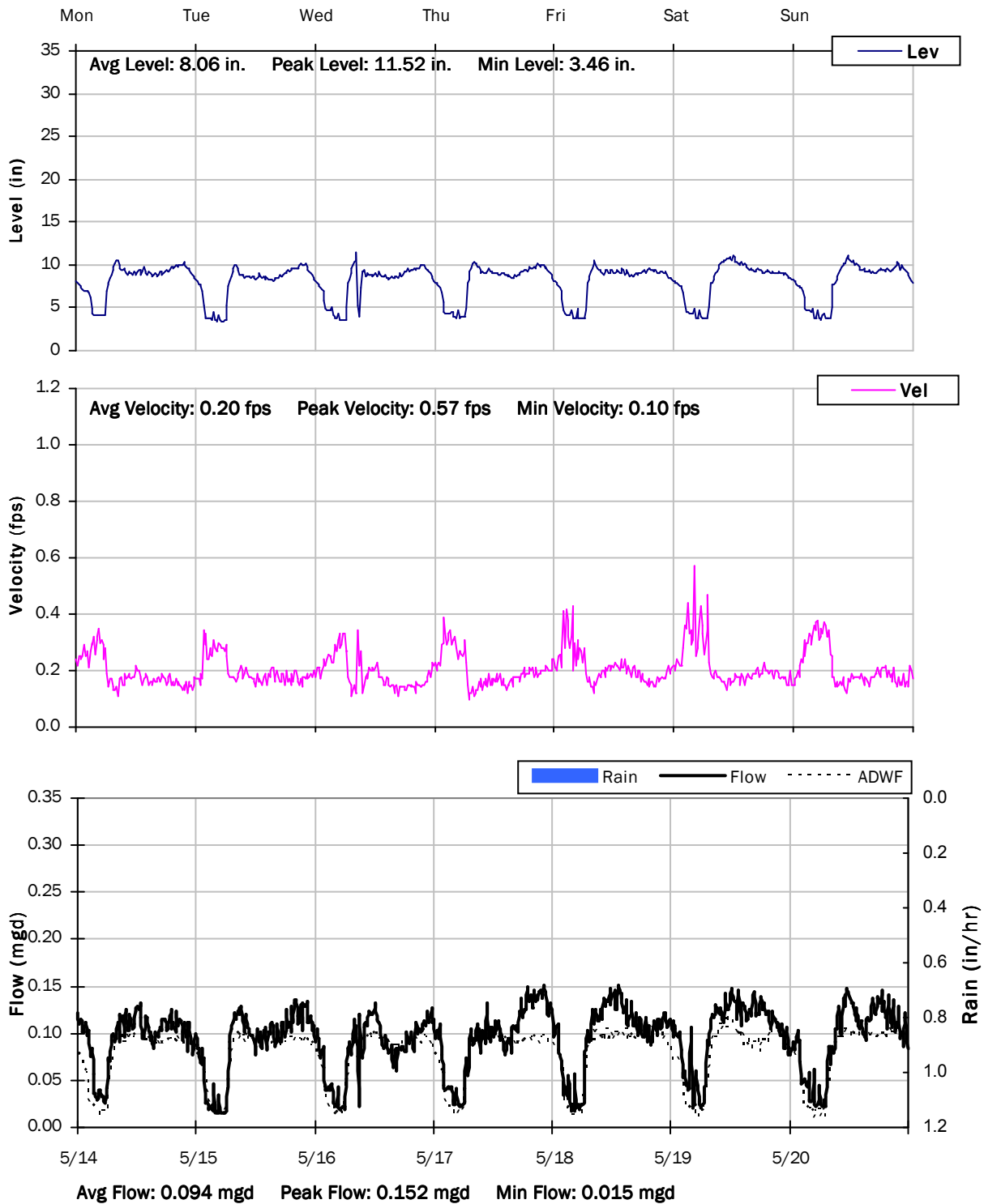
5/7/2018 to 5/14/2018



SITE 3

Weekly Level, Velocity and Flow Hydrographs

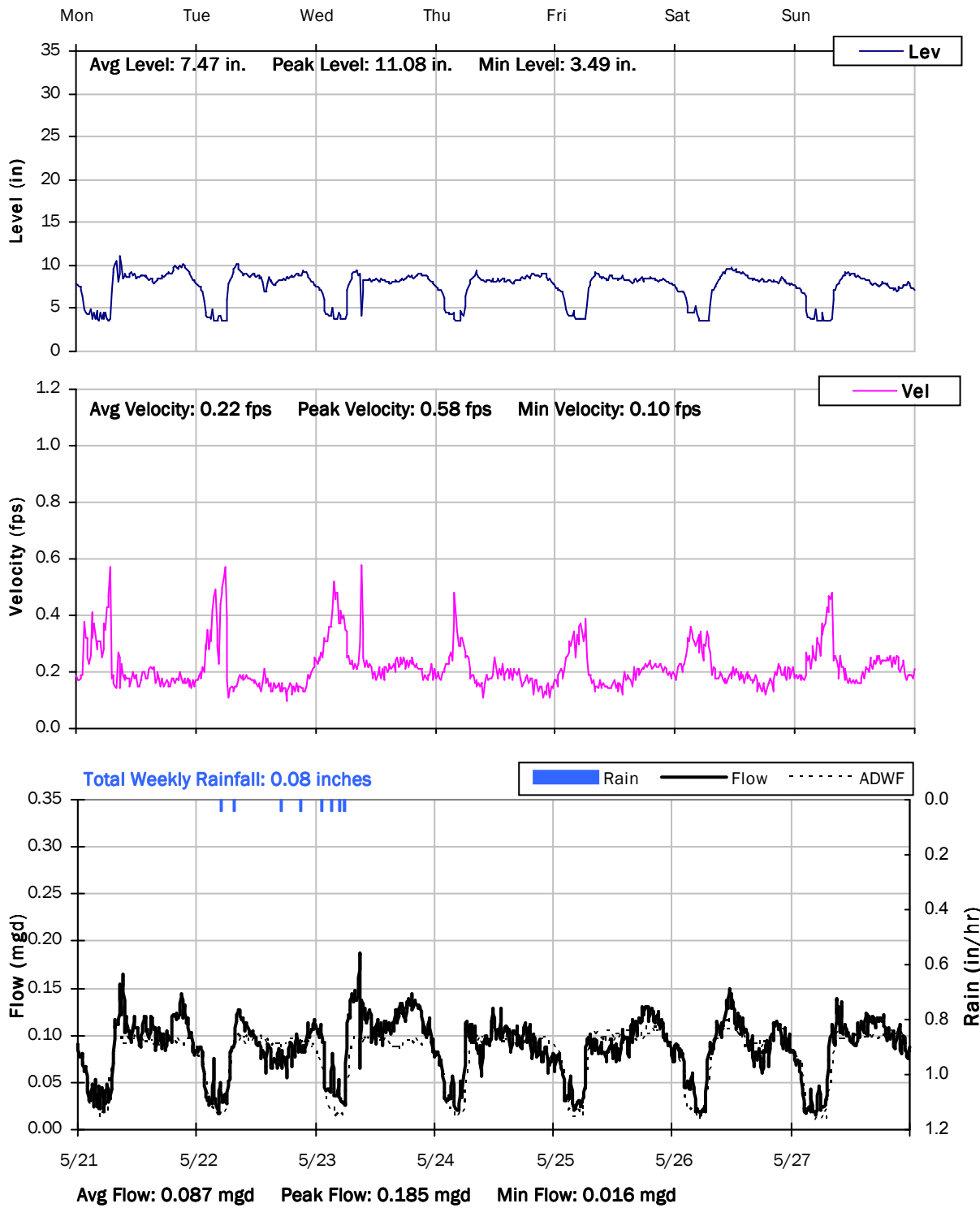
5/14/2018 to 5/21/2018



SITE 3

Weekly Level, Velocity and Flow Hydrographs

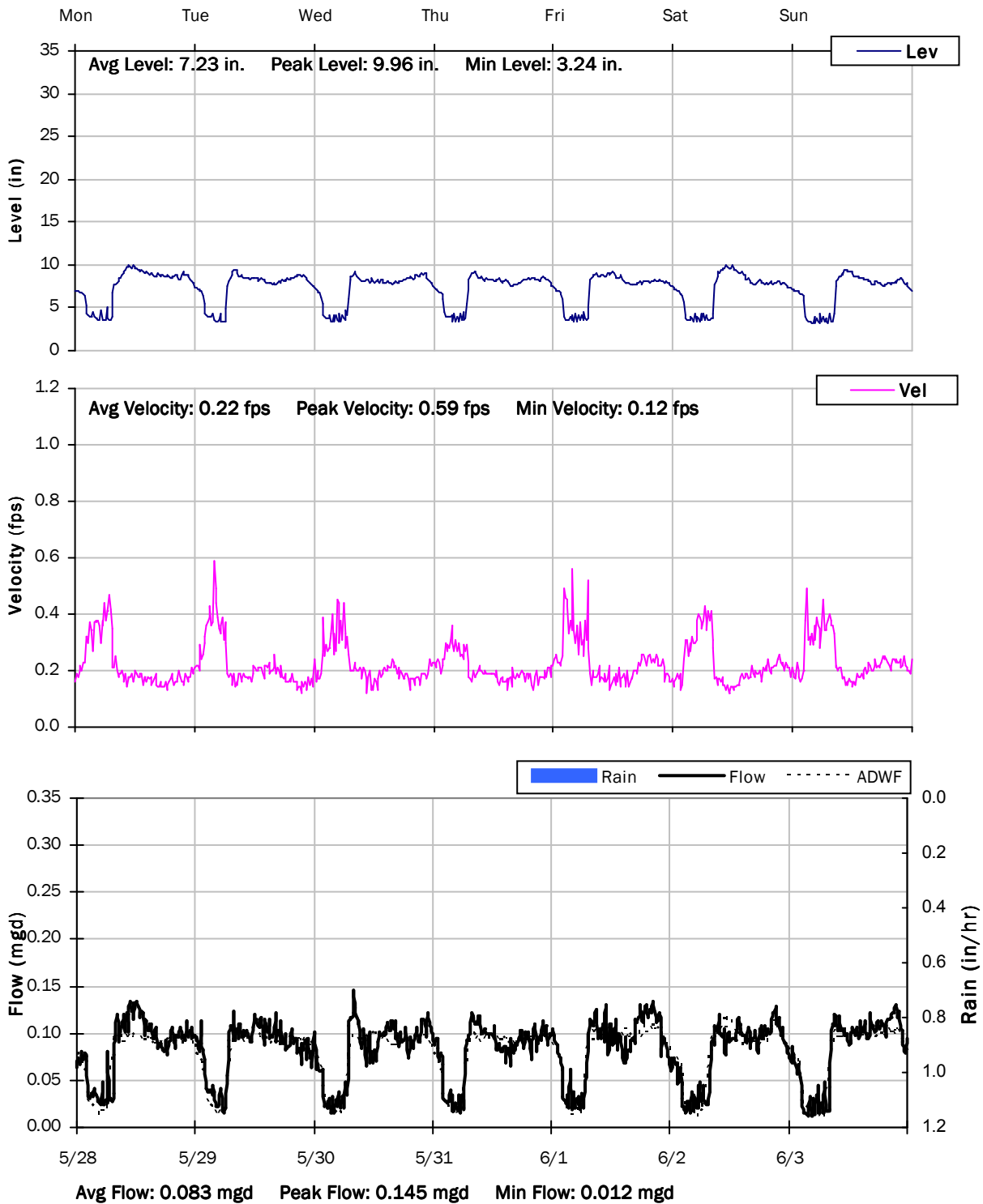
5/21/2018 to 5/28/2018



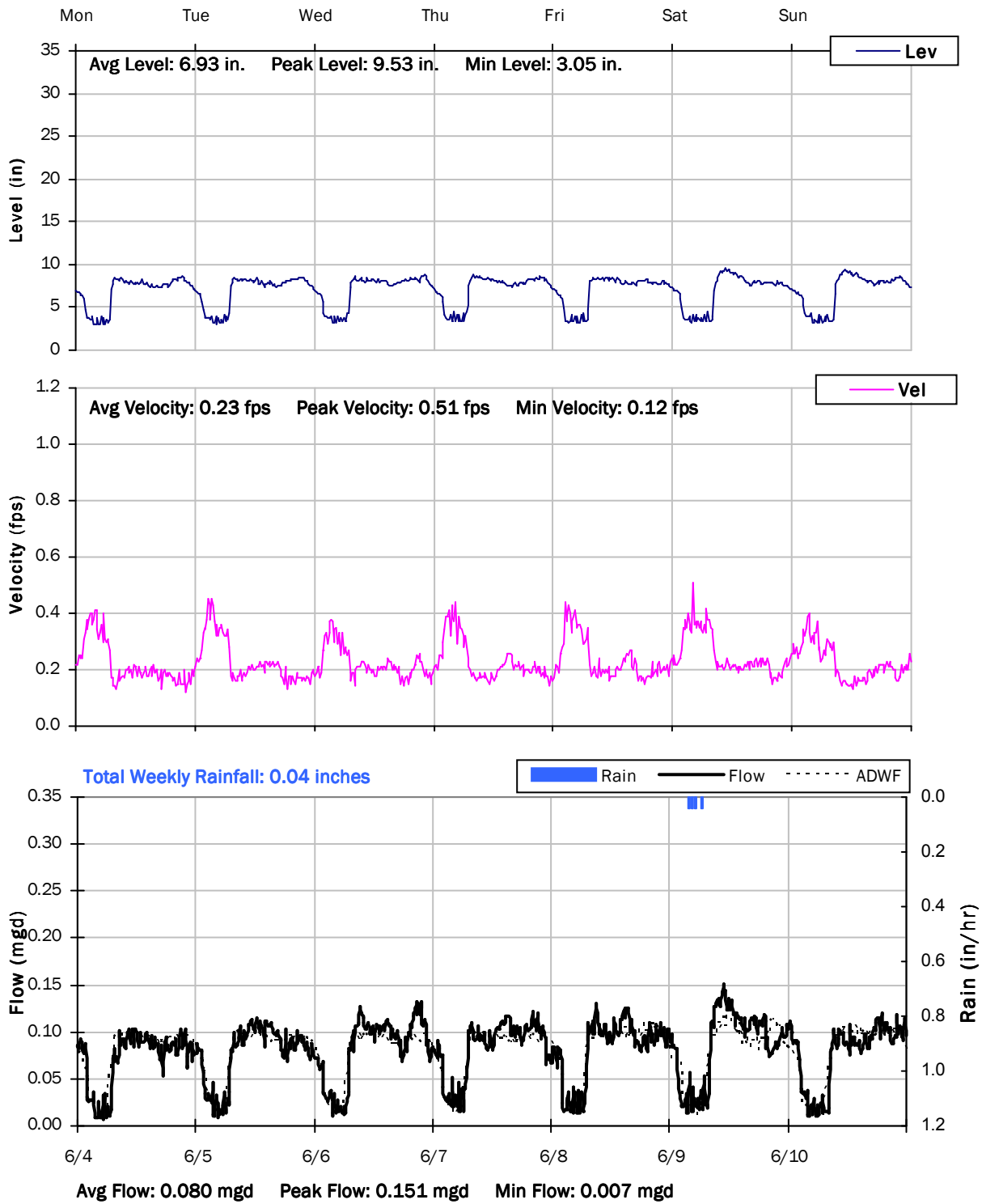
SITE 3

Weekly Level, Velocity and Flow Hydrographs

5/28/2018 to 6/4/2018



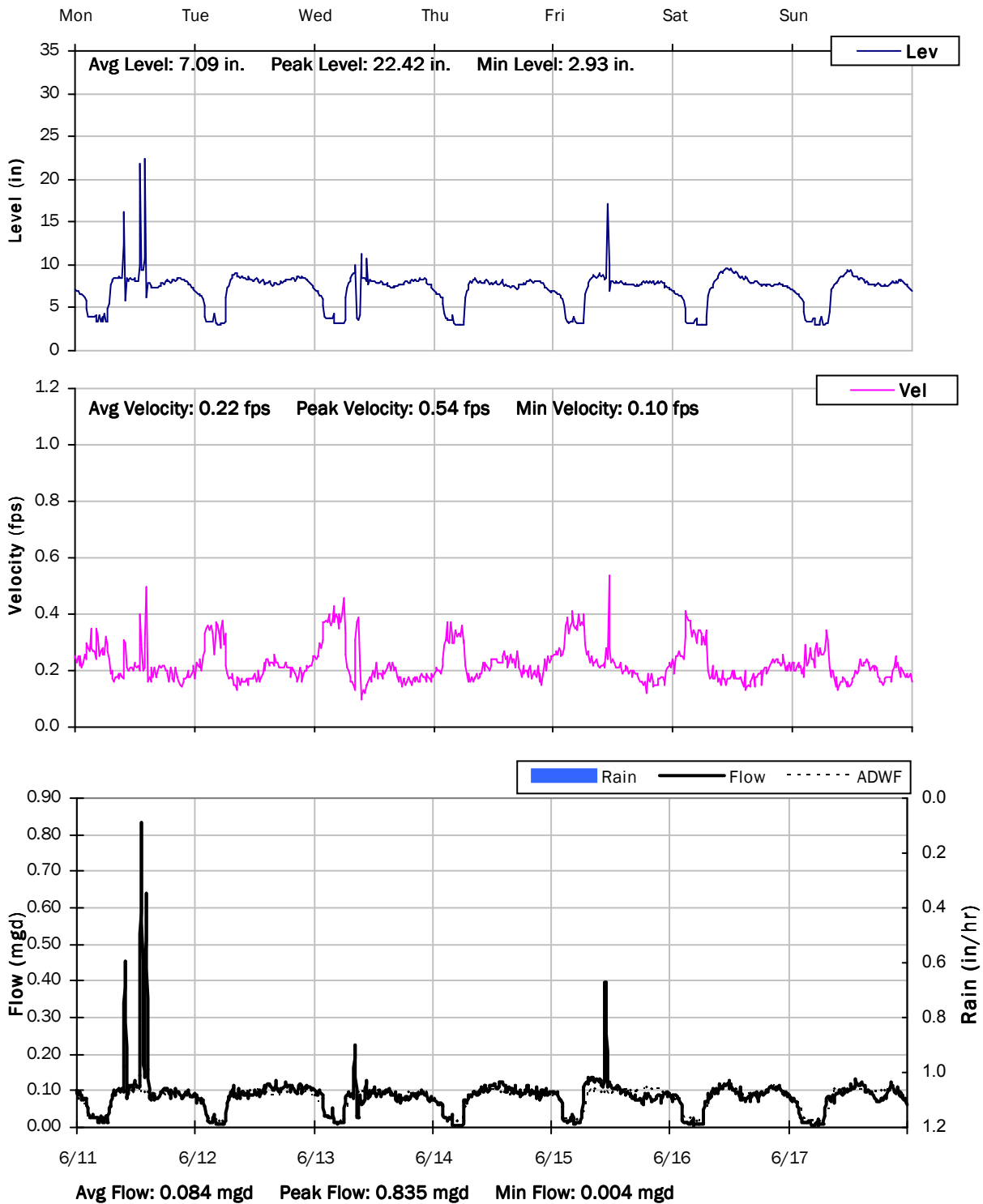
SITE 3
Weekly Level, Velocity and Flow Hydrographs
6/4/2018 to 6/11/2018



SITE 3

Weekly Level, Velocity and Flow Hydrographs

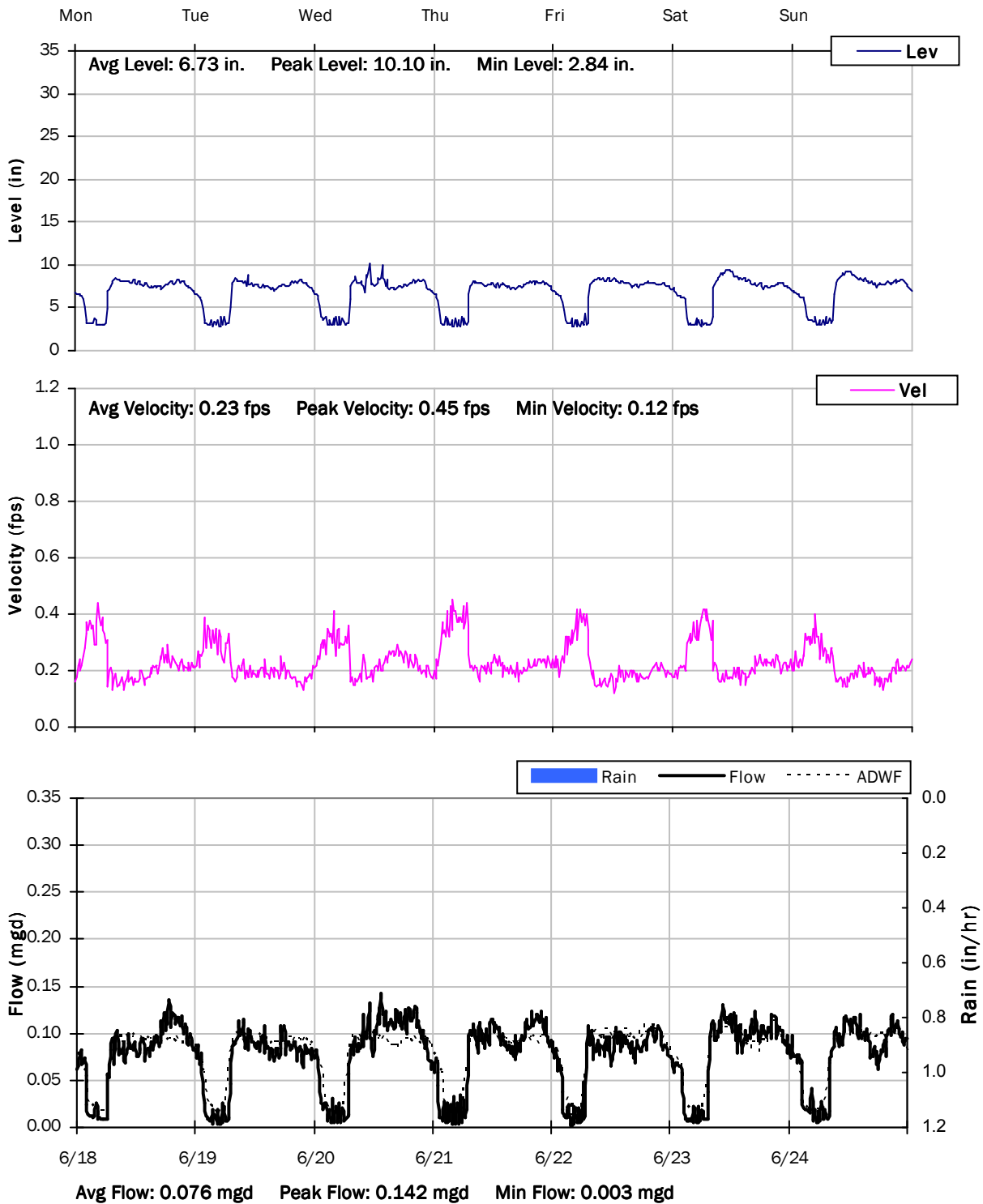
6/11/2018 to 6/18/2018



SITE 3

Weekly Level, Velocity and Flow Hydrographs

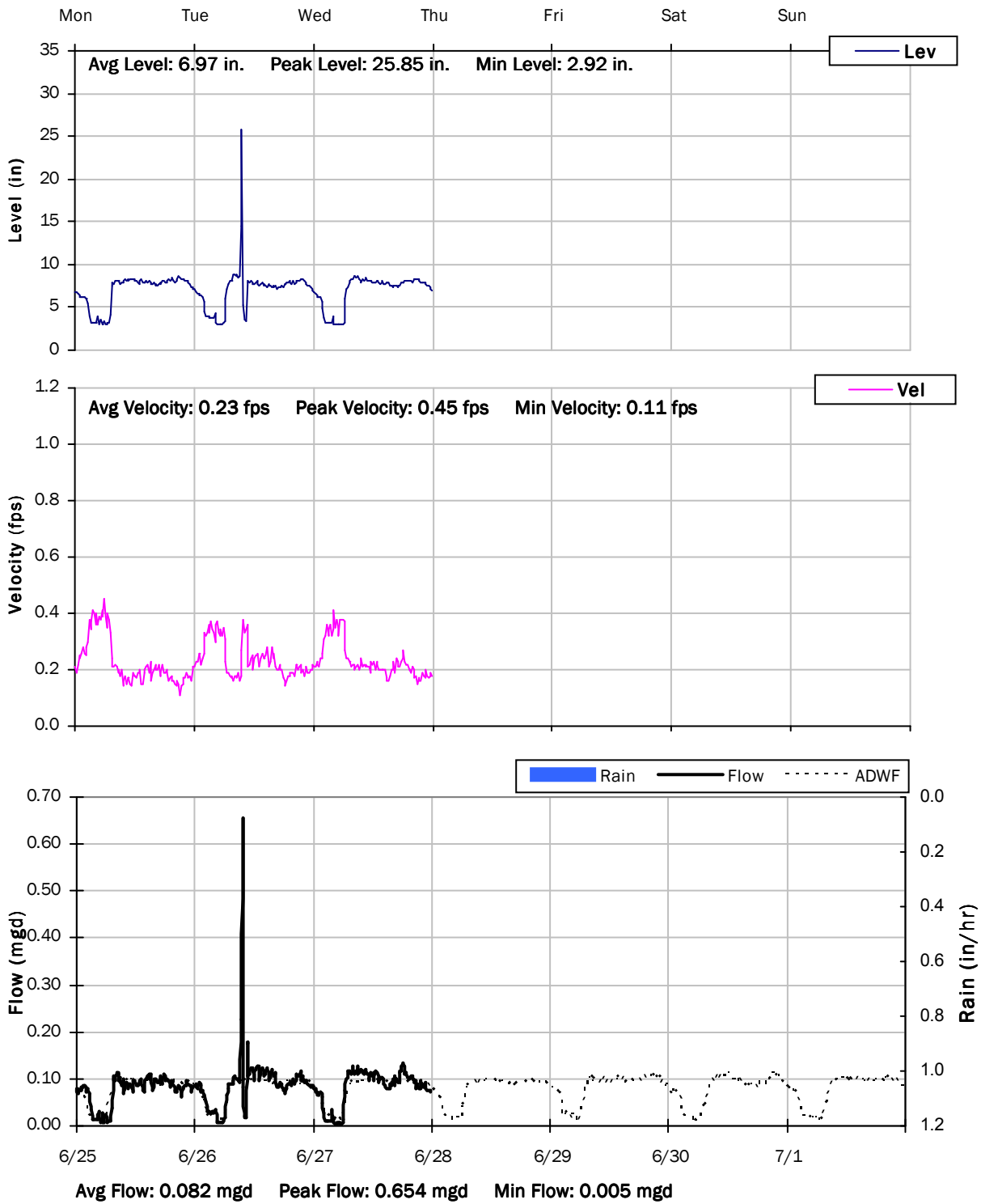
6/18/2018 to 6/25/2018



SITE 3

Weekly Level, Velocity and Flow Hydrographs

6/25/2018 to 7/2/2018

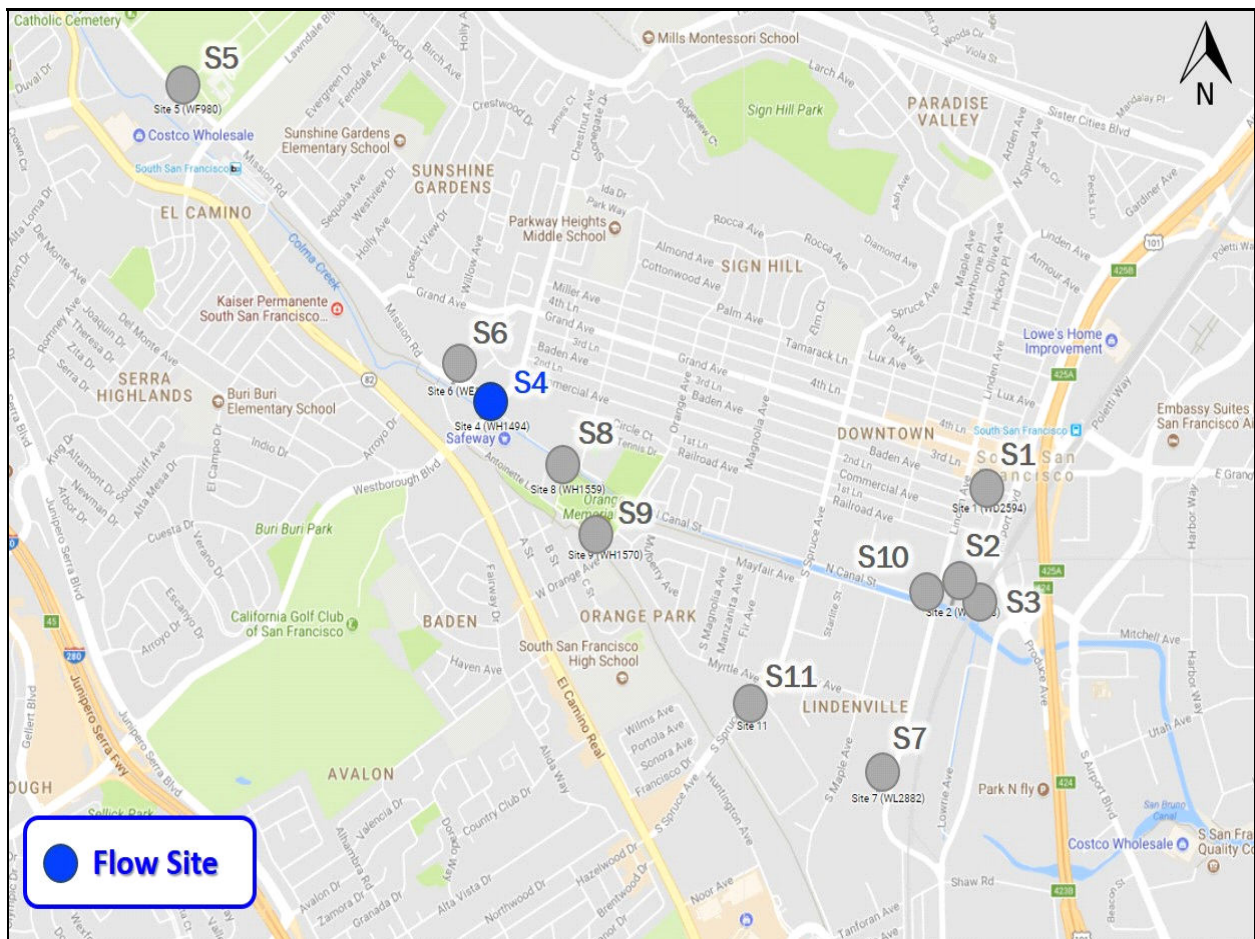


City of South San Francisco Sanitary Sewer Flow Monitoring February 26- June 28, 2018

Monitoring Site: Site 4

Location: 40 Chestnut Avenue, south of Mission Road

Data Summary Report

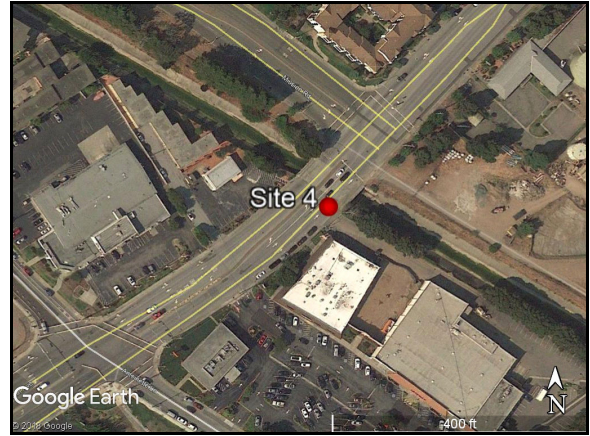


Vicinity Map: Site 4

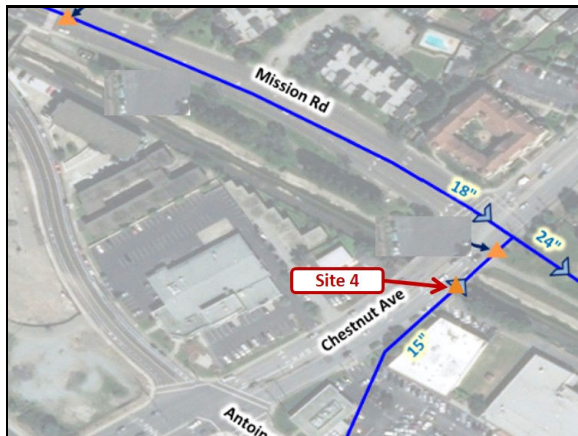
SITE 4

Site Information

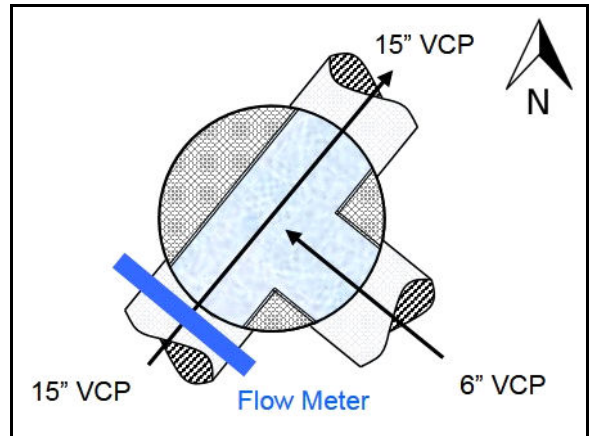
MH ID:	WH1494
Location:	40 Chestnut Avenue, south of Mission Road
Coordinates:	122.4323° W, 37.6562° N
Rim Elevation (Earth):	40 feet
Pipe Diameter:	15 inches
Sediment:	0.00 inches
ADWF:	0.137 mgd
Peak Measured Flow:	1.313 mgd



Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 4

Additional Site Photos

Effluent Pipe



Southwest Influent Pipe



SITE 4

Additional Site Photos

Southeast Influent Pipe

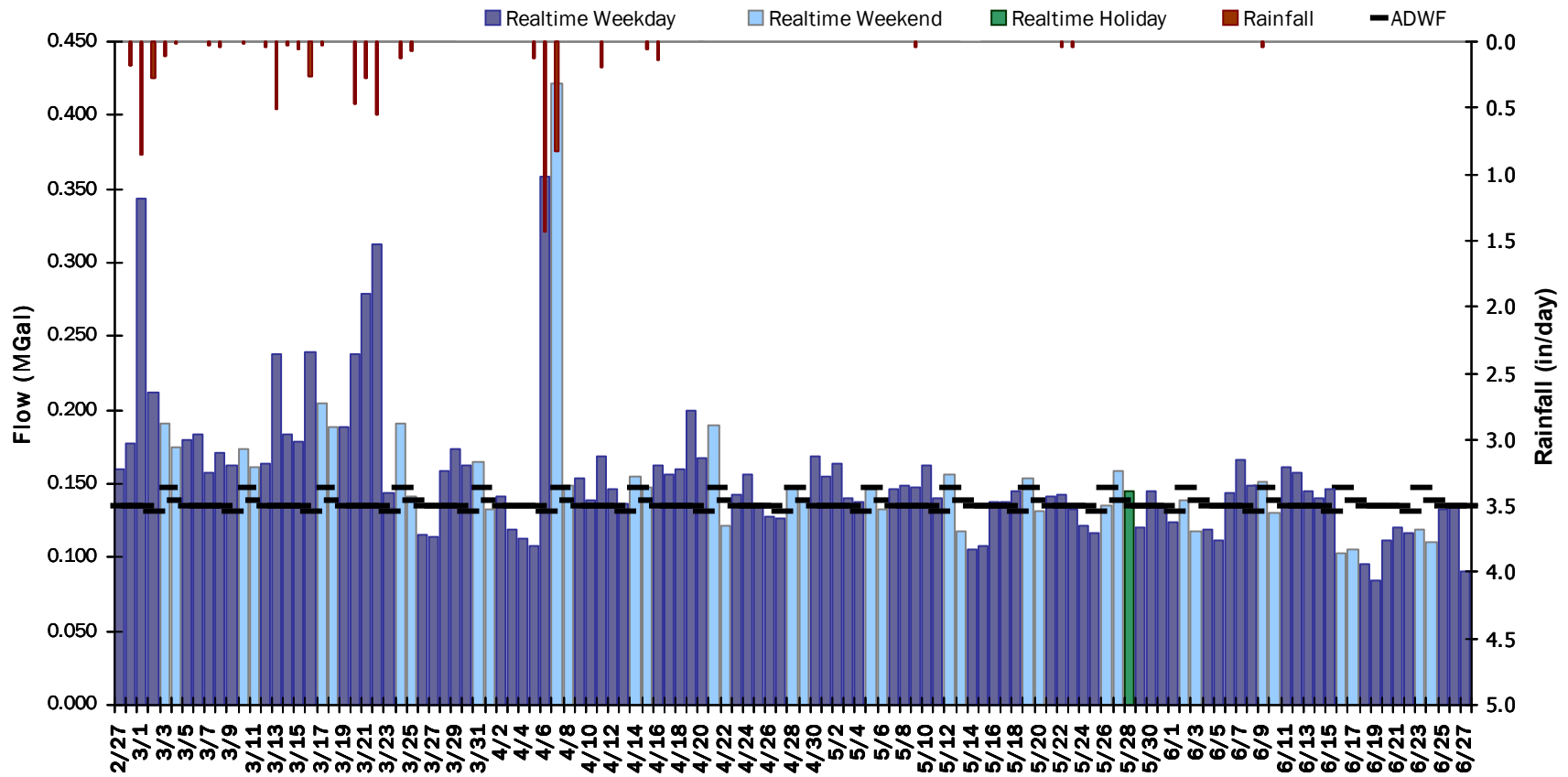


SITE 4

Period Flow Summary: Daily Flow Totals

Avg Period Flow: 0.156 MGal Peak Daily Flow: 0.421 MGal Min Daily Flow: 0.084 MGal

Total Period Rainfall: 6.83 inches



SITE 4

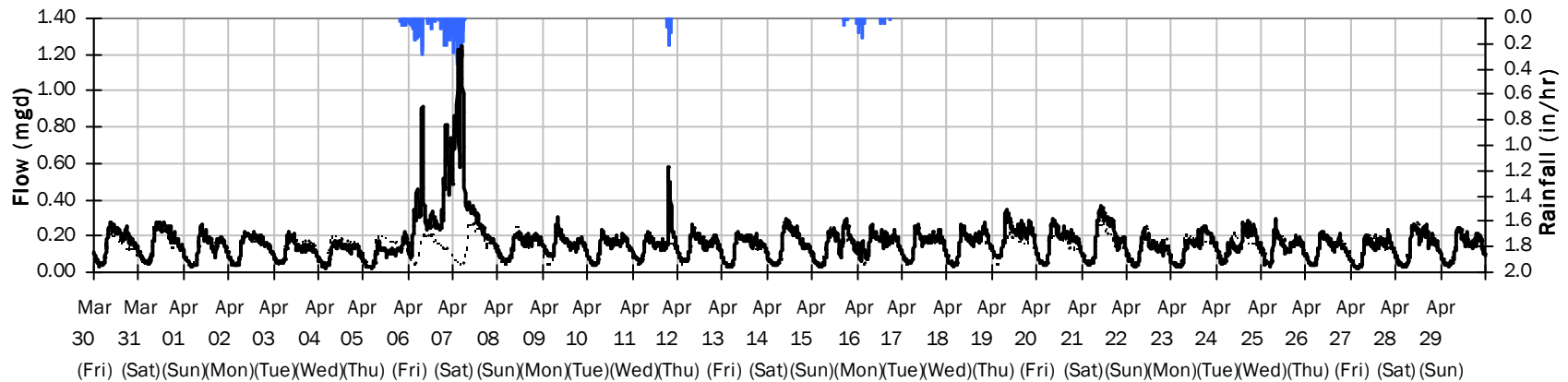
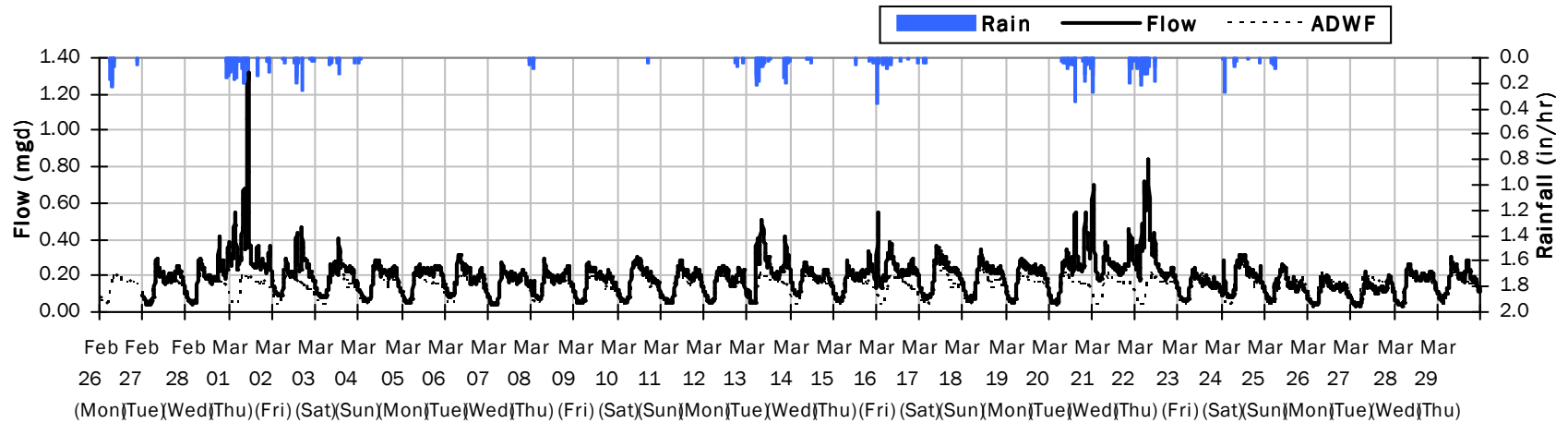
Flow Summary: 2/26/2018 to 4/29/2018

Total Period Rainfall: 6.98 inches

Avg Flow: 0.177 mgd

Peak Flow: 1.313 mgd

Min Flow: 0.024 mgd



SITE 4

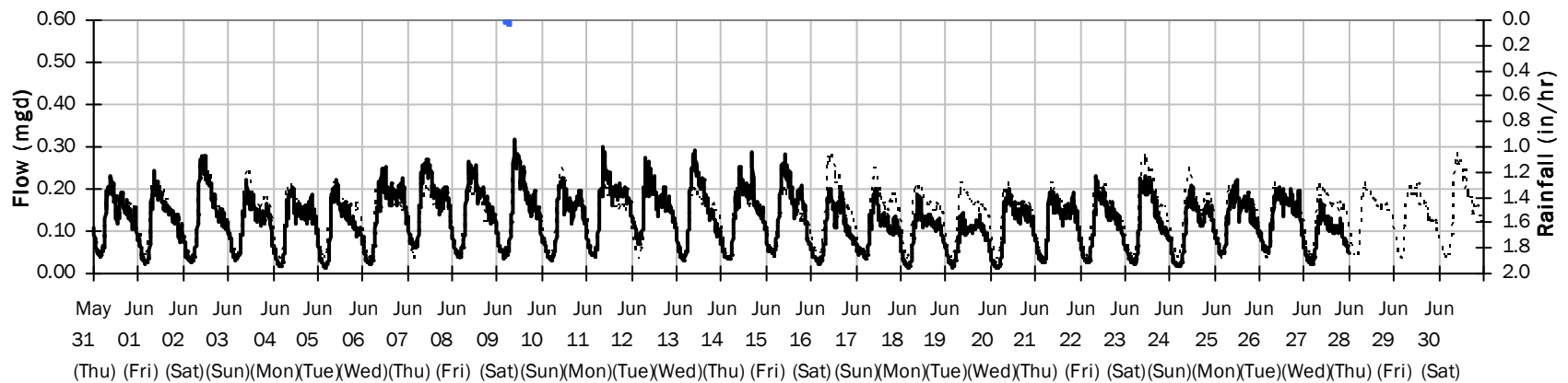
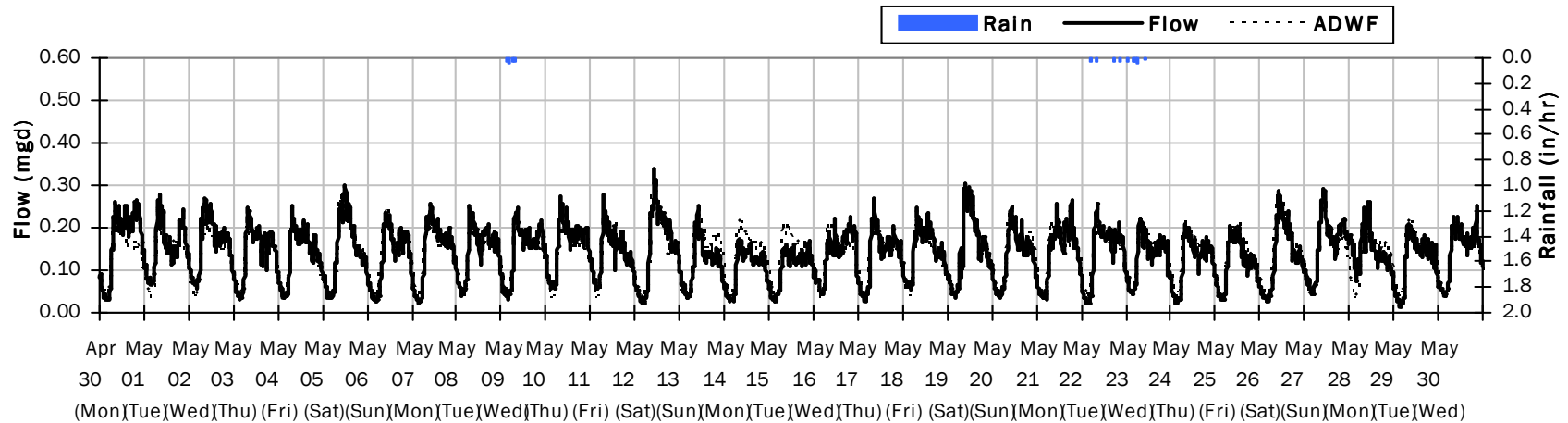
Flow Summary: 4/30/2018 to 6/30/2018

Total Period Rainfall: 0.17 inches

Avg Flow: 0.134 mgd

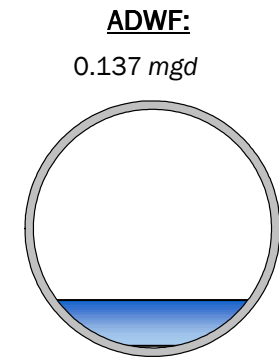
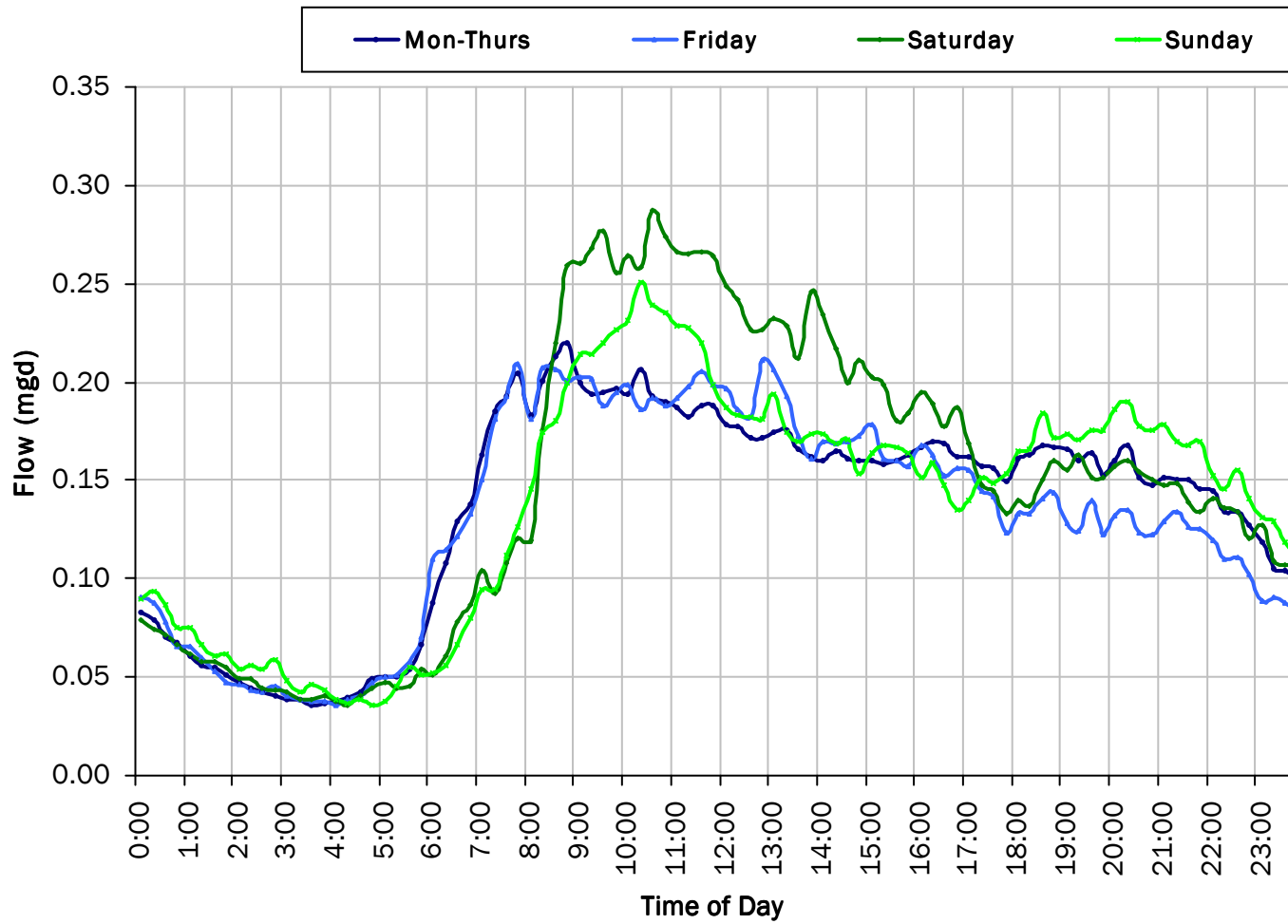
Peak Flow: 0.339 mgd

Min Flow: 0.013 mgd



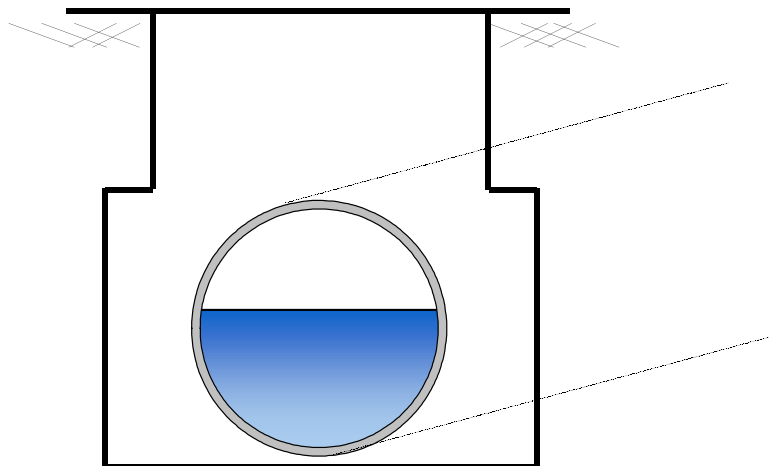
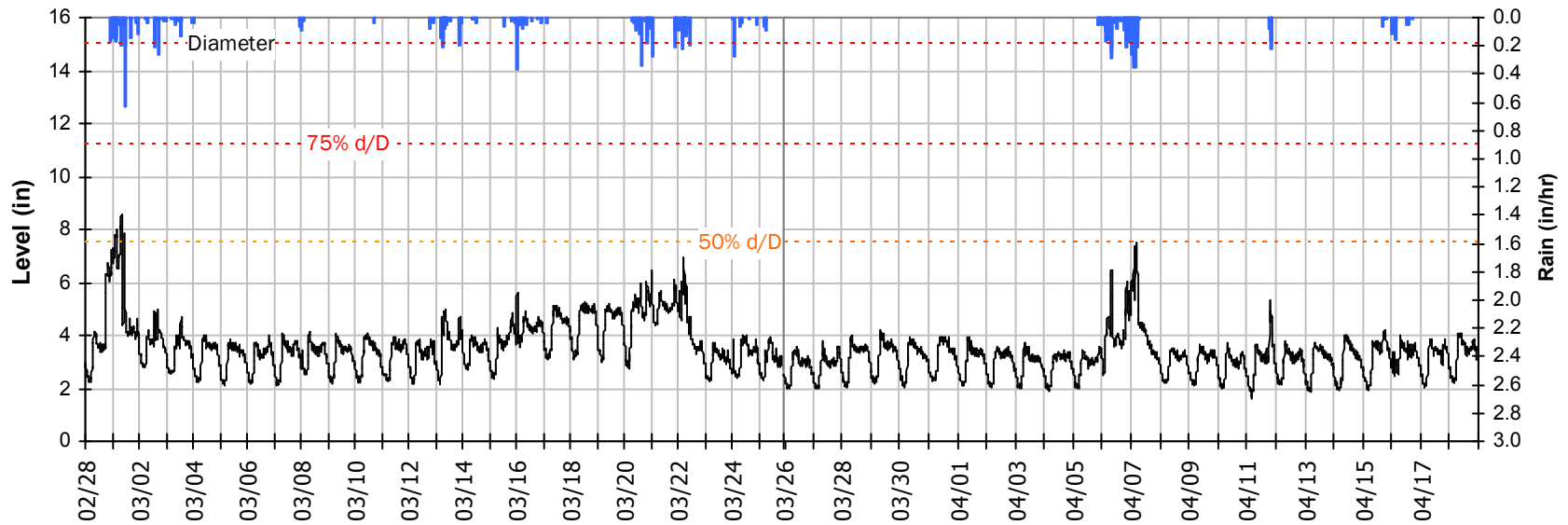
SITE 4

Average Dry Weather Flow Hydrographs



SITE 4 Site Capacity and Surge Summary

Realtime Flow Levels with Rainfall Data over Monitoring (High Capacity) Period

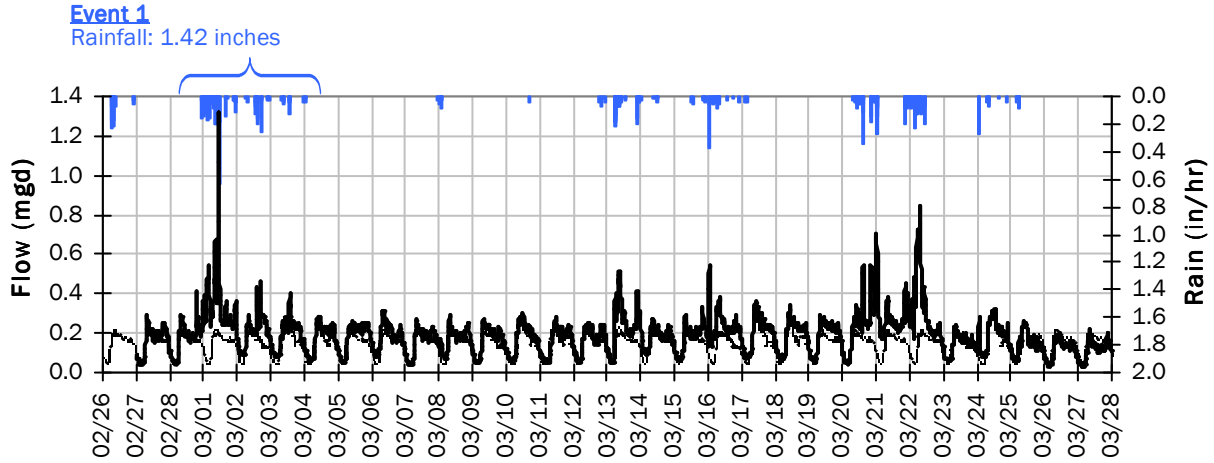


Pipe Diameter:	15	inches
Peak Measured Level:	8.58	inches
Peak d/D Ratio:	0.57	

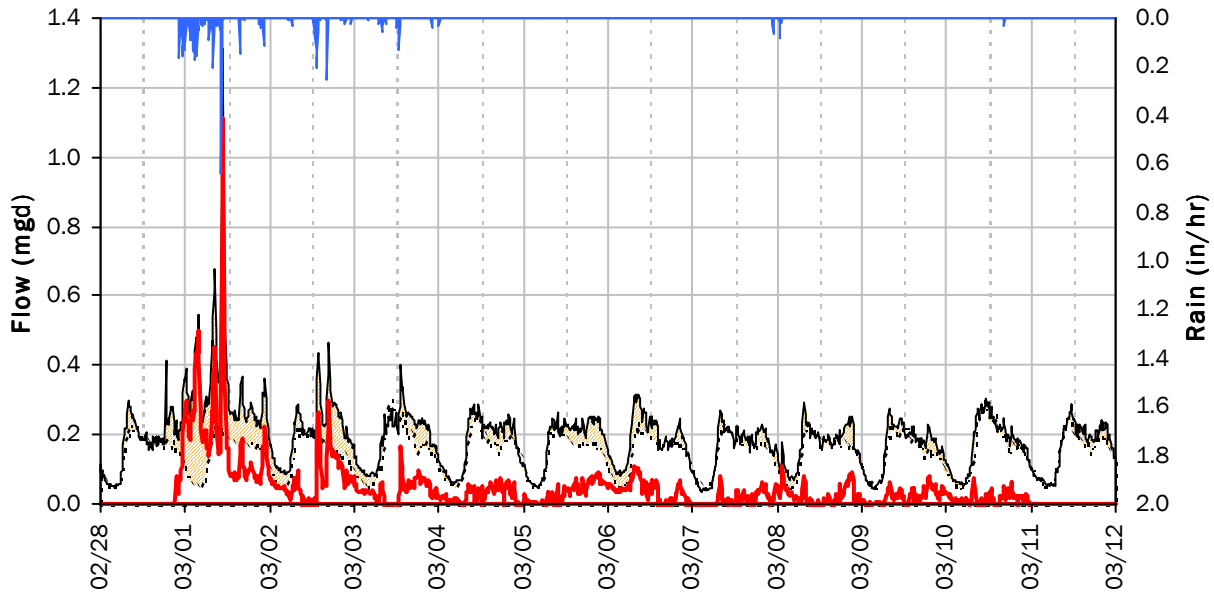
SITE 4

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



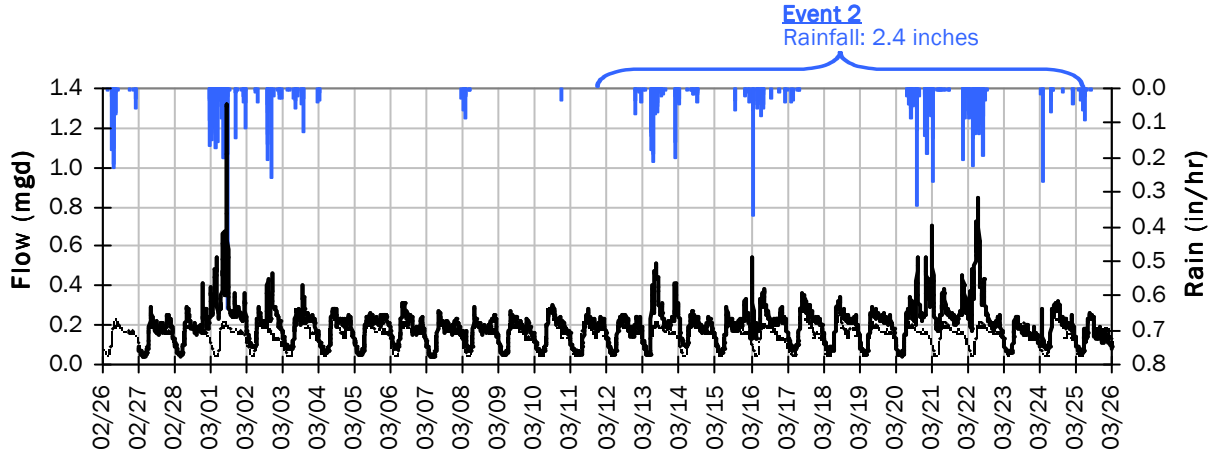
Storm Event I/I Analysis (Rain = 1.42 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	1.31 <i>mgd</i>	Peak I/I Rate:	1.11 <i>mgd</i>
PF:	9.59	Total I/I:	486,000 <i>gallons</i>
Peak Level:	8.58 <i>in</i>		
d/D Ratio:	0.57		

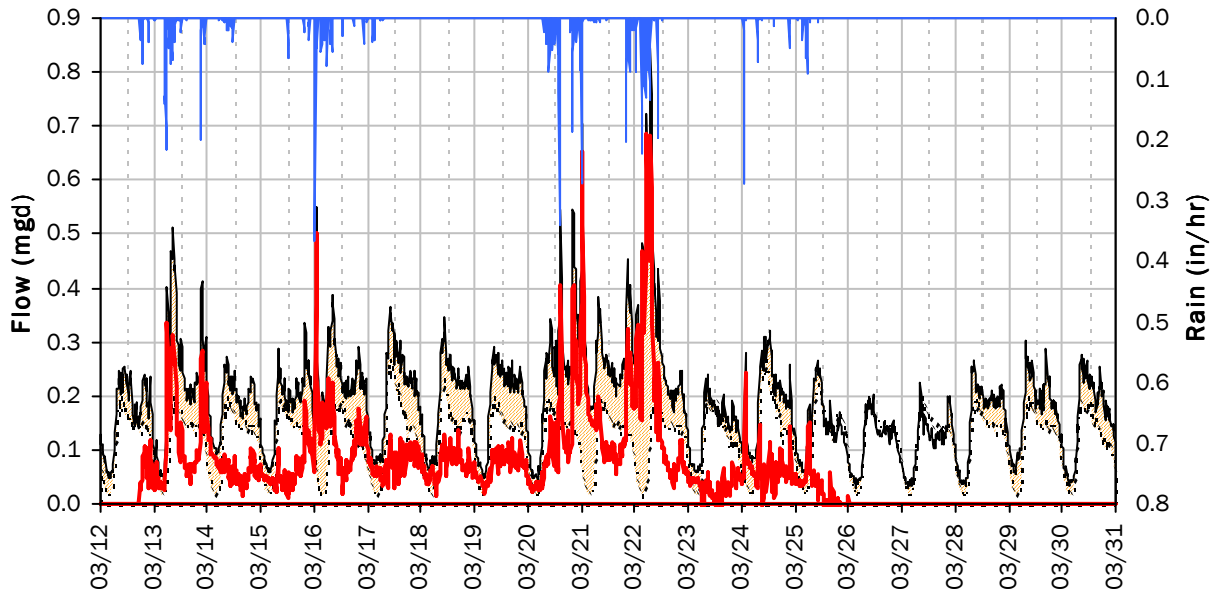
SITE 4

I/I Summary: Event 2

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 2 Detail Graph



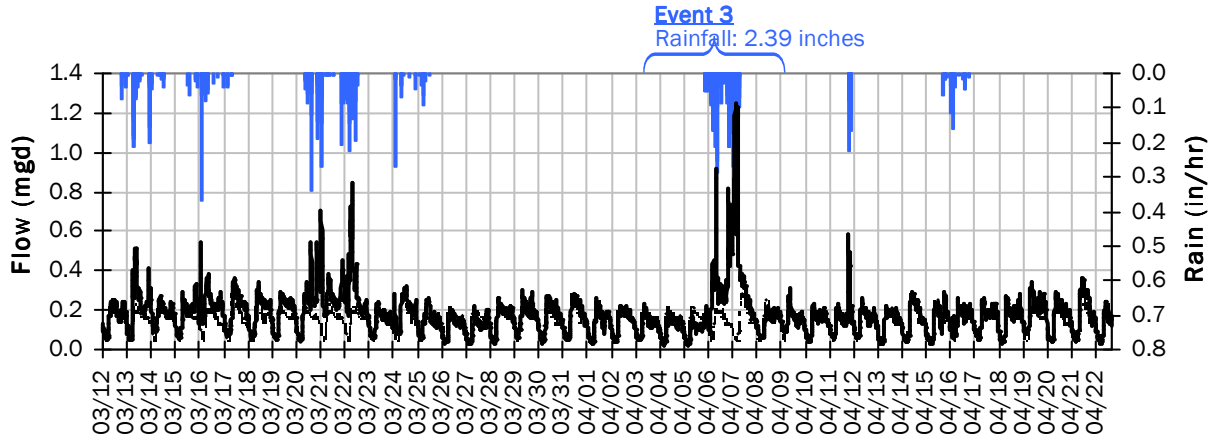
Storm Event I/I Analysis (Rain = 2.40 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	0.85 mgd	Peak I/I Rate:	0.69 mgd
PF:	6.17	Total I/I:	1,221,000 gallons
Peak Level:	6.97 in		
d/D Ratio:	0.46		

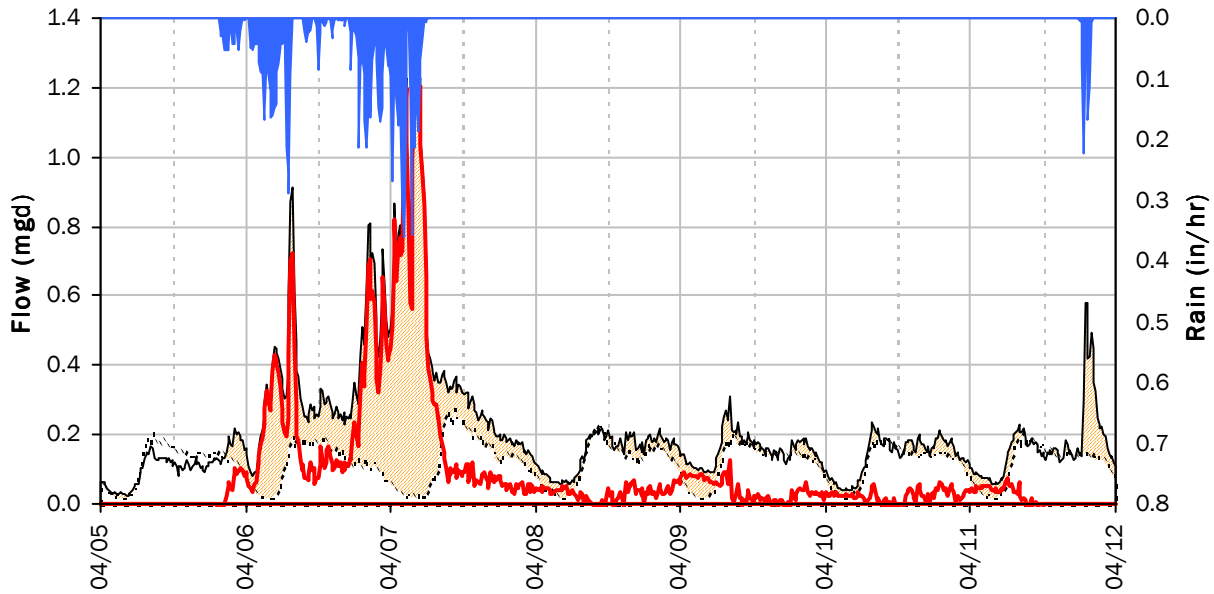
SITE 4

I/I Summary: Event 3

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



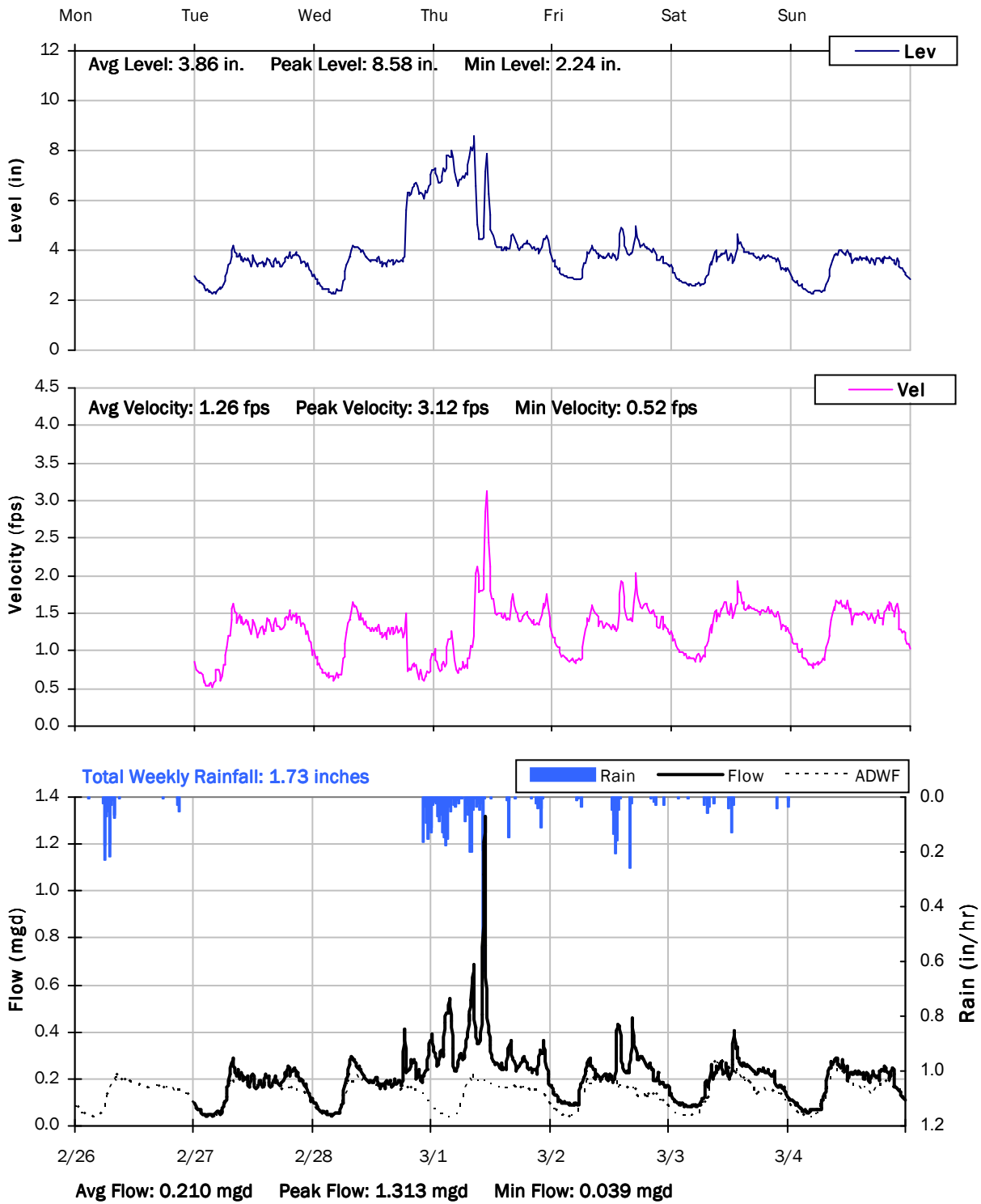
Event 3 Detail Graph



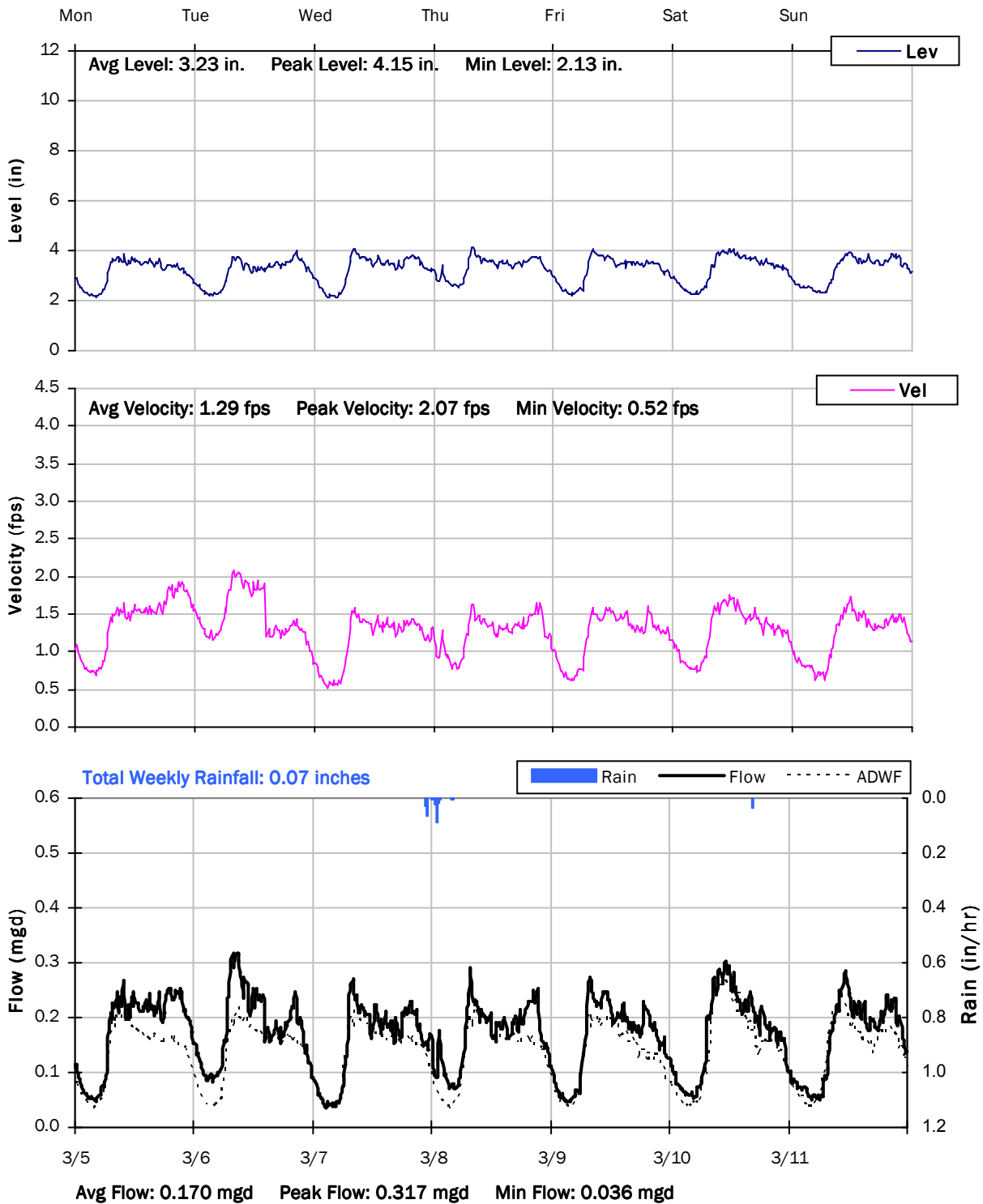
Storm Event I/I Analysis (Rain = 2.39 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	1.25 mgd	Peak I/I Rate:	1.23 mgd
PF:	9.11	Total I/I:	660,000 gallons
Peak Level:	7.51 in		
d/D Ratio:	0.50		

SITE 4
Weekly Level, Velocity and Flow Hydrographs
2/26/2018 to 3/5/2018



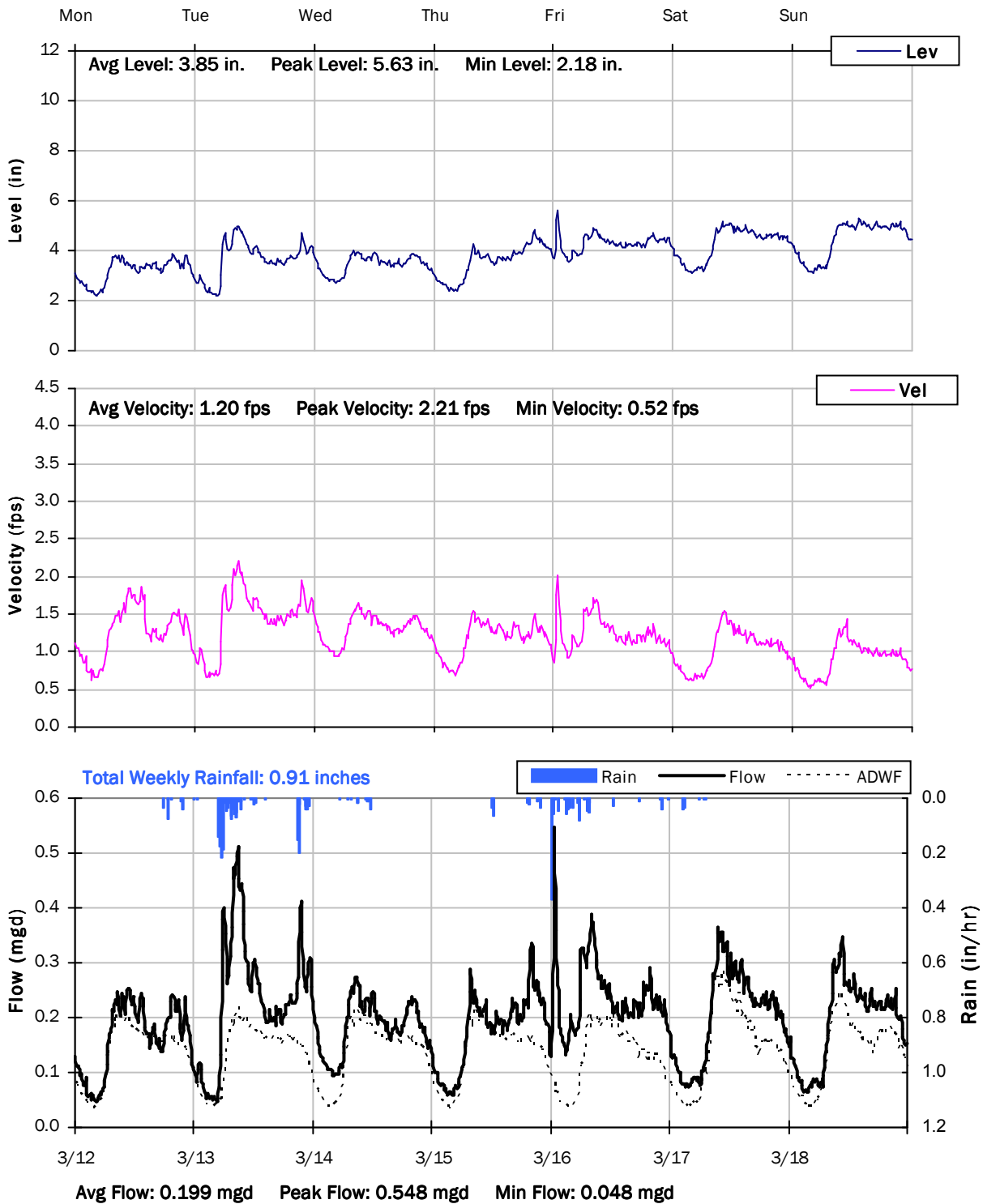
SITE 4
Weekly Level, Velocity and Flow Hydrographs
3/5/2018 to 3/12/2018



SITE 4

Weekly Level, Velocity and Flow Hydrographs

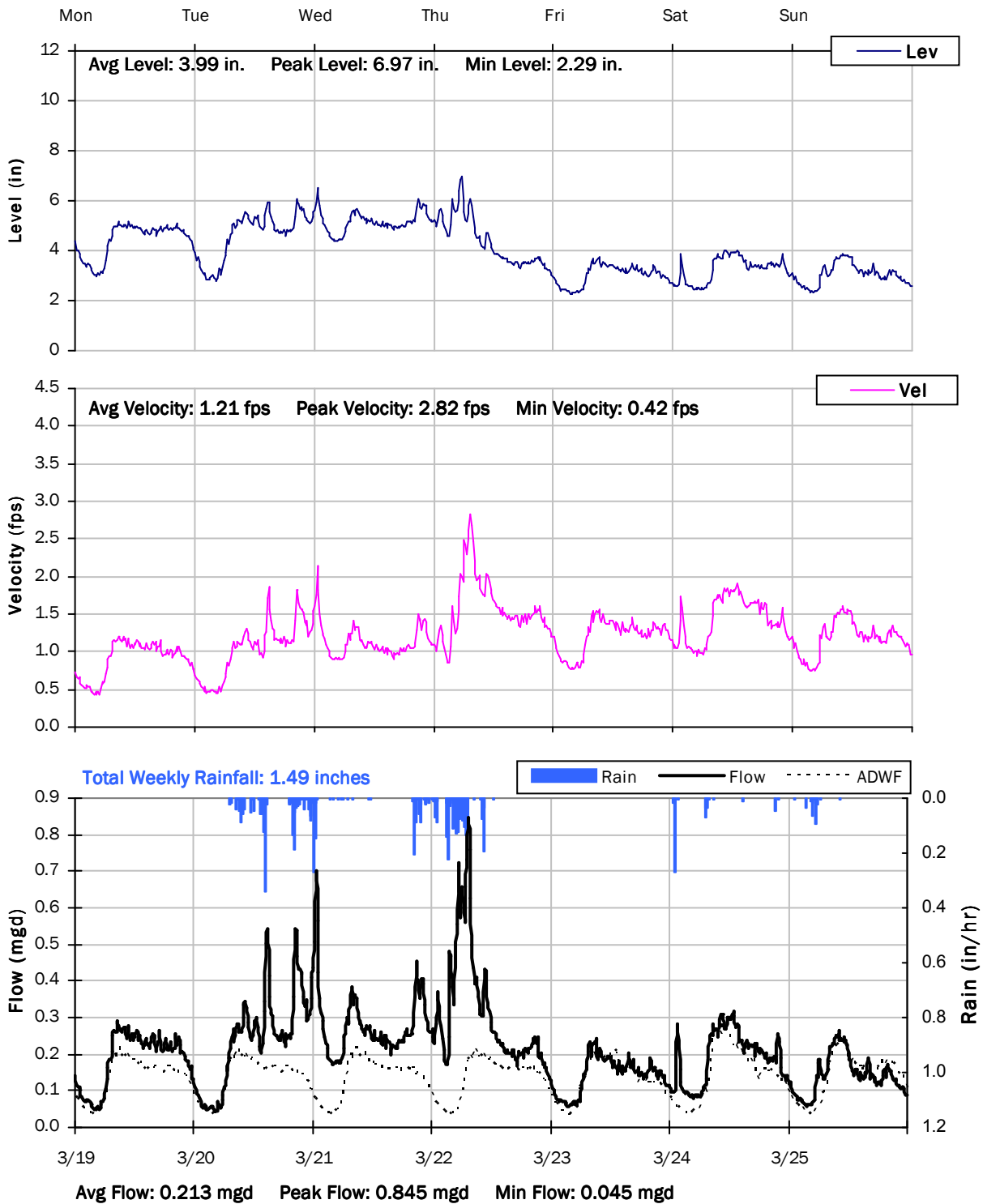
3/12/2018 to 3/19/2018



SITE 4

Weekly Level, Velocity and Flow Hydrographs

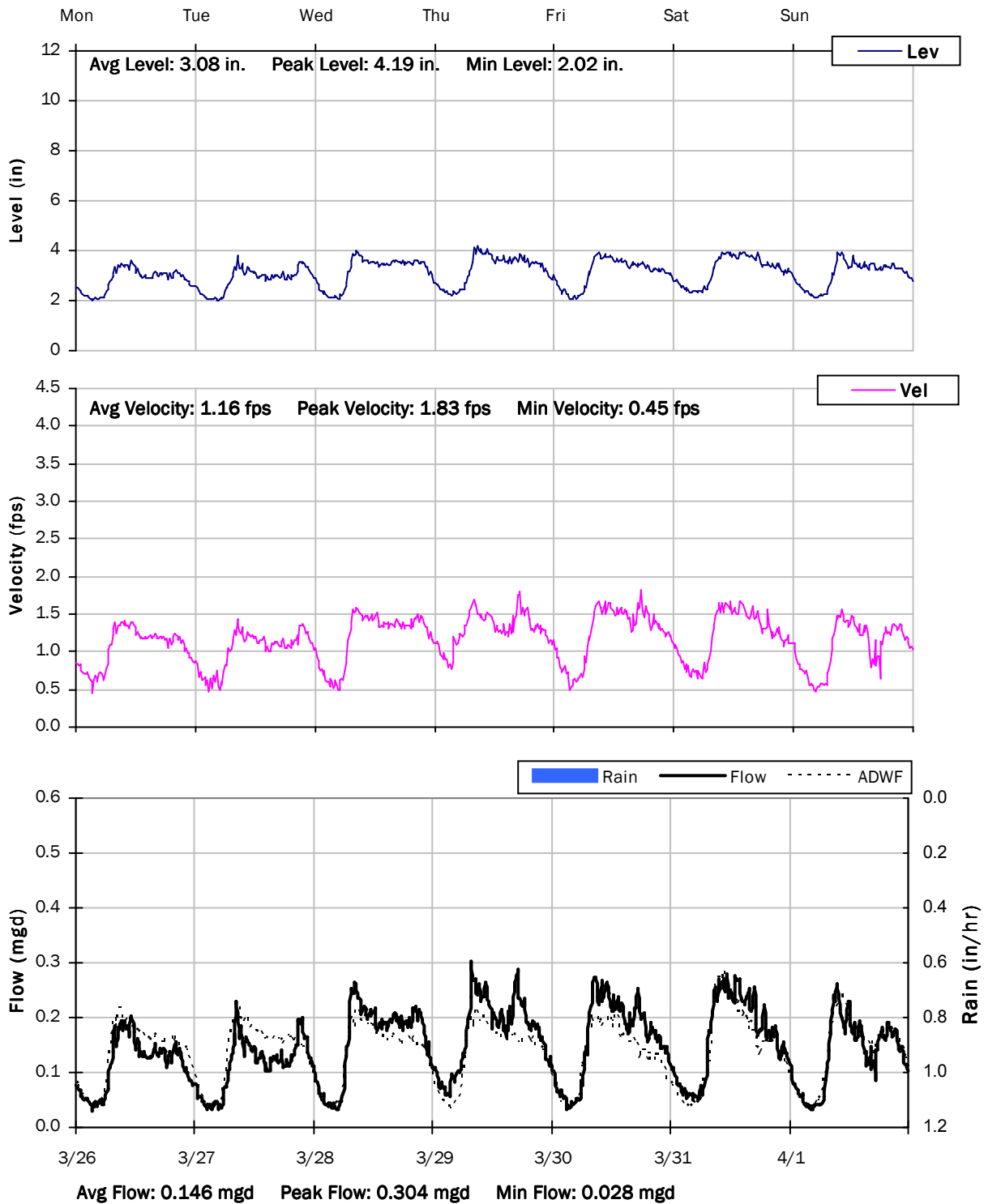
3/19/2018 to 3/26/2018



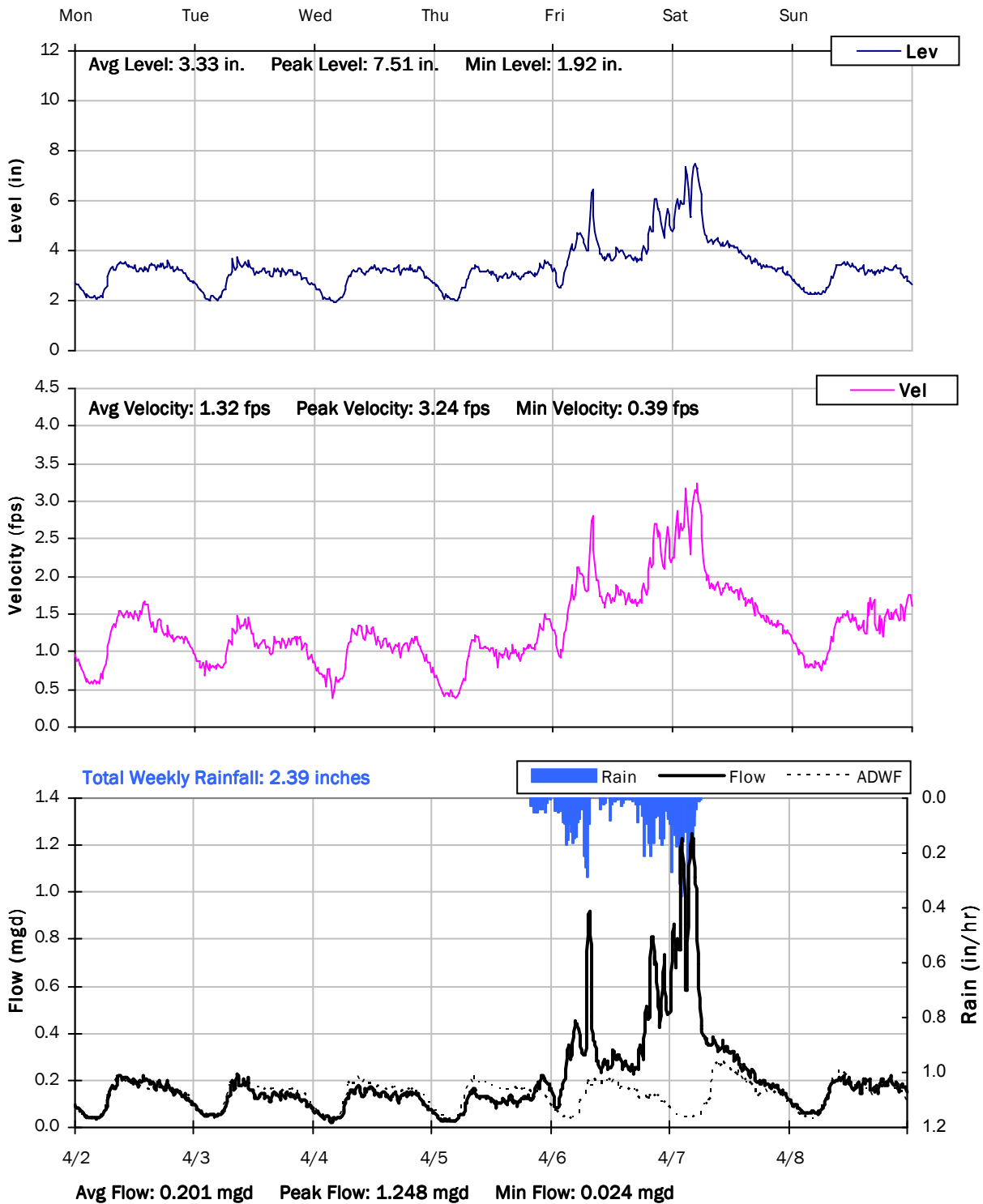
SITE 4

Weekly Level, Velocity and Flow Hydrographs

3/26/2018 to 4/2/2018



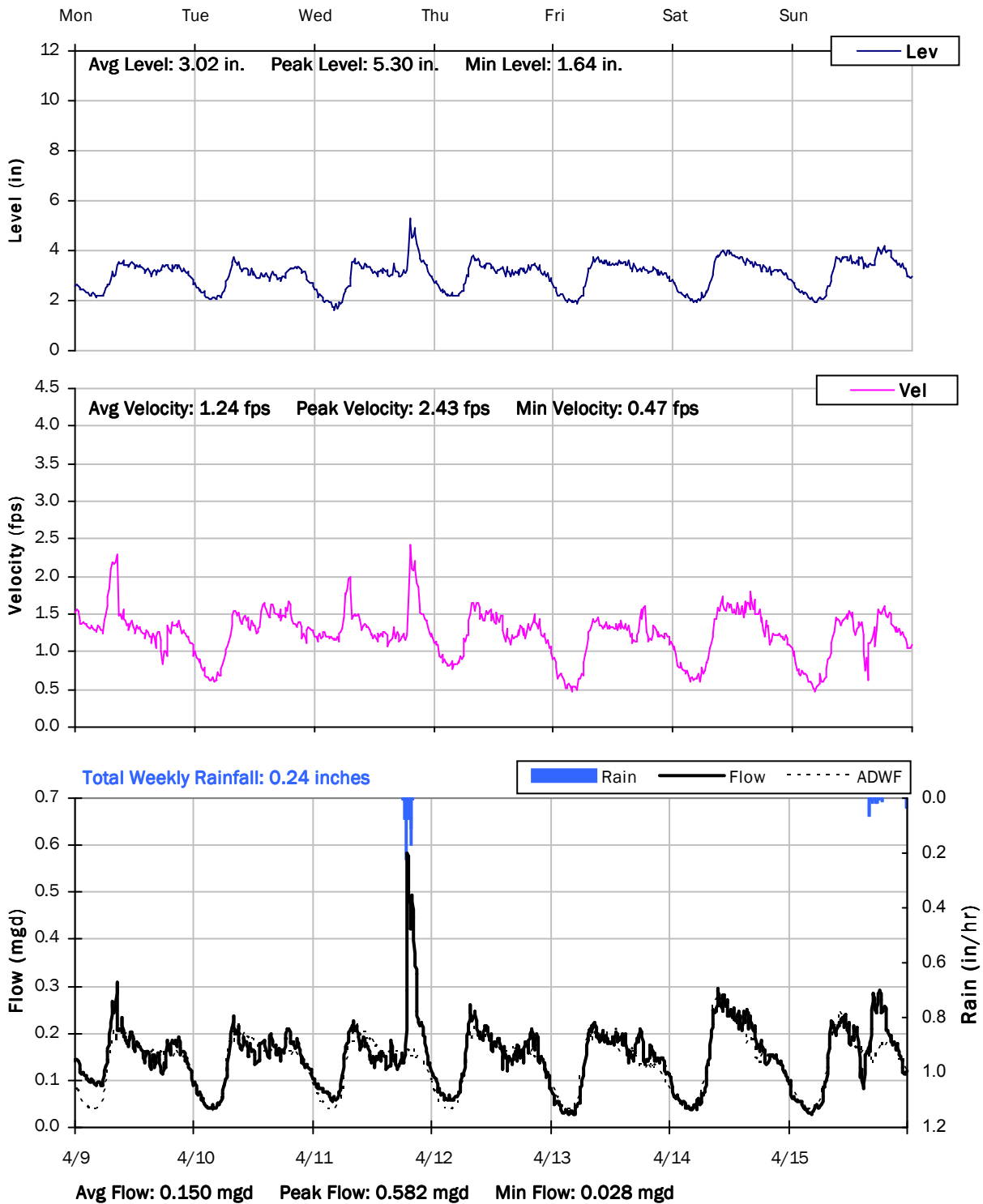
SITE 4
Weekly Level, Velocity and Flow Hydrographs
4/2/2018 to 4/9/2018



SITE 4

Weekly Level, Velocity and Flow Hydrographs

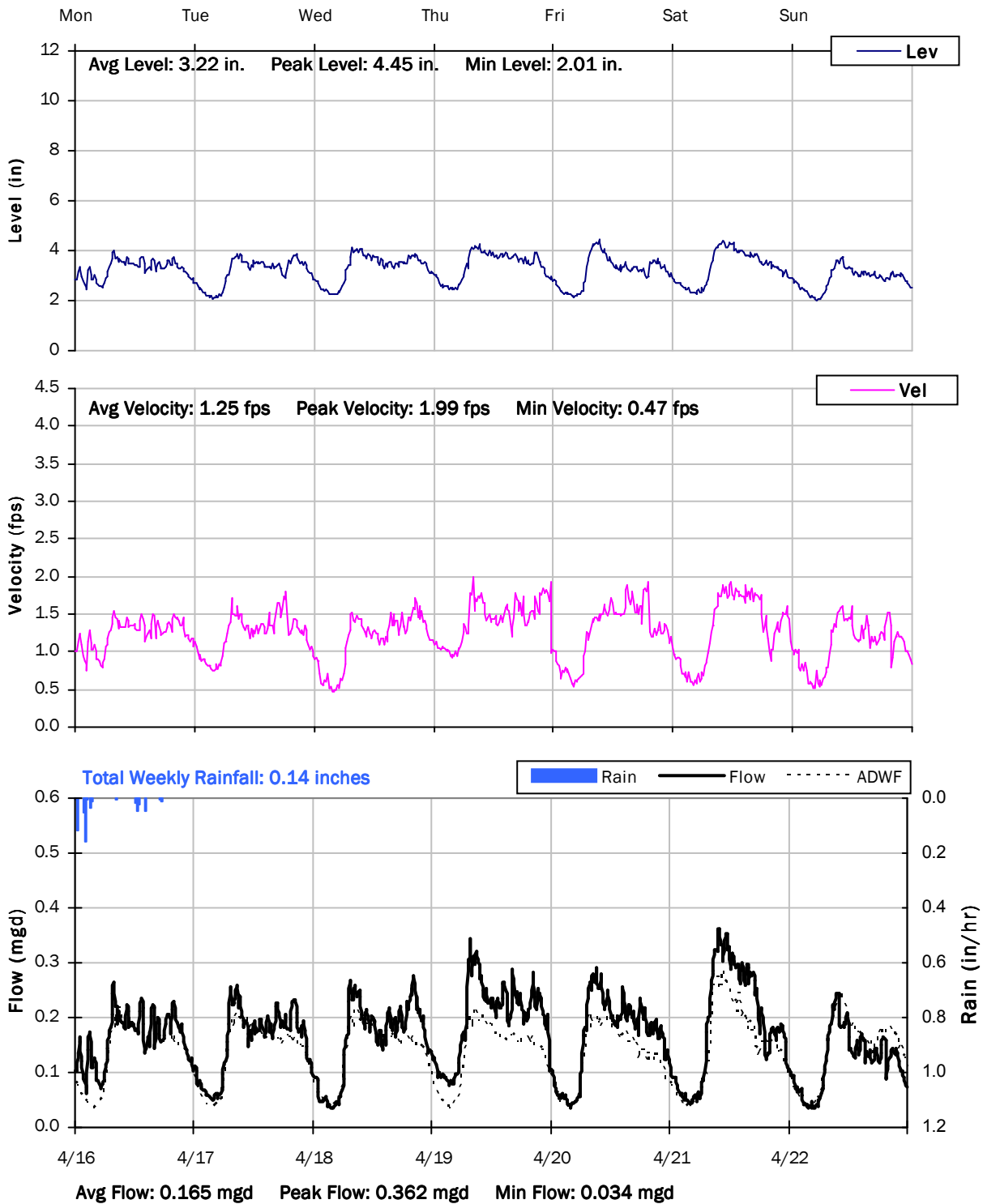
4/9/2018 to 4/16/2018



SITE 4

Weekly Level, Velocity and Flow Hydrographs

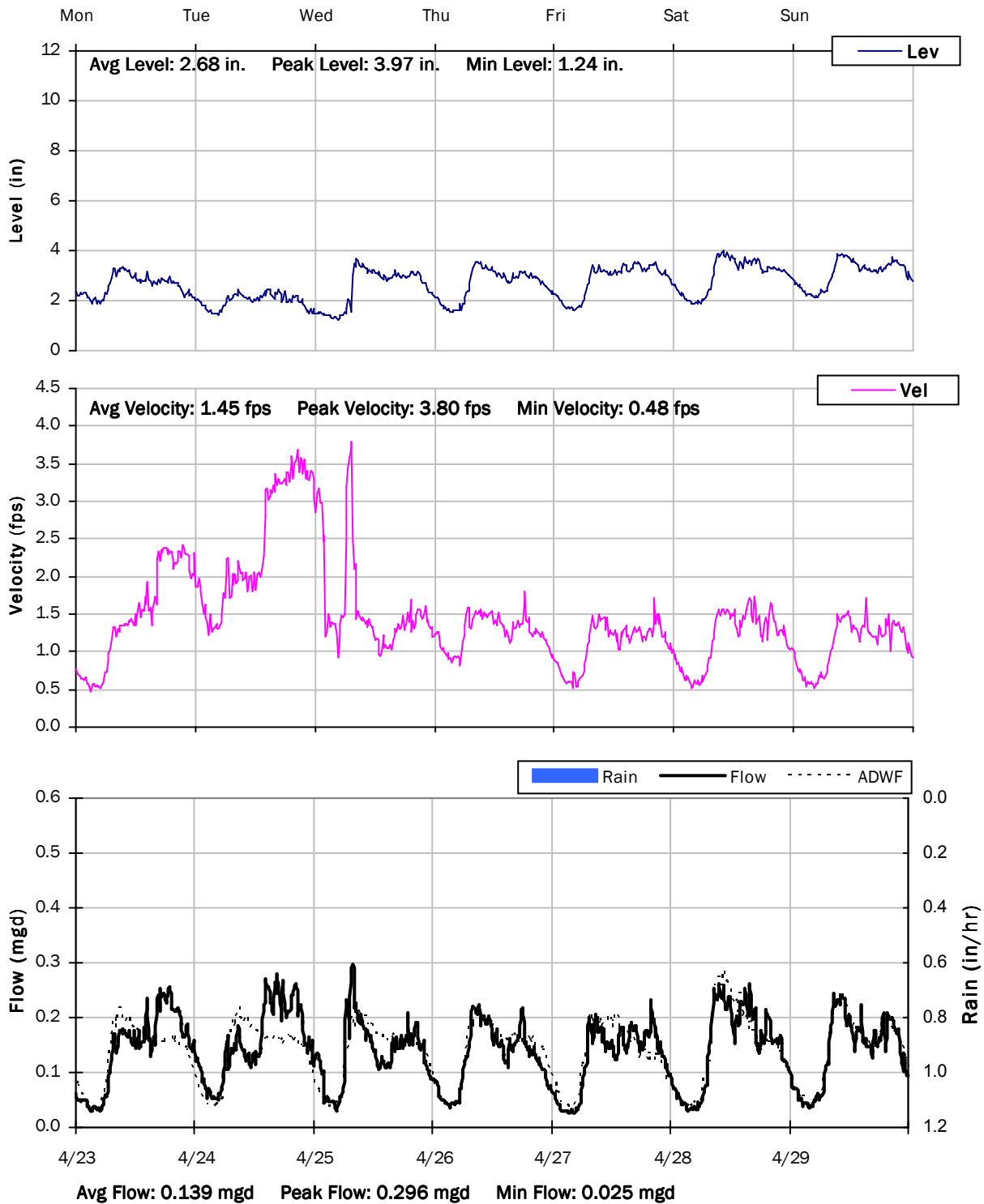
4/16/2018 to 4/23/2018



SITE 4

Weekly Level, Velocity and Flow Hydrographs

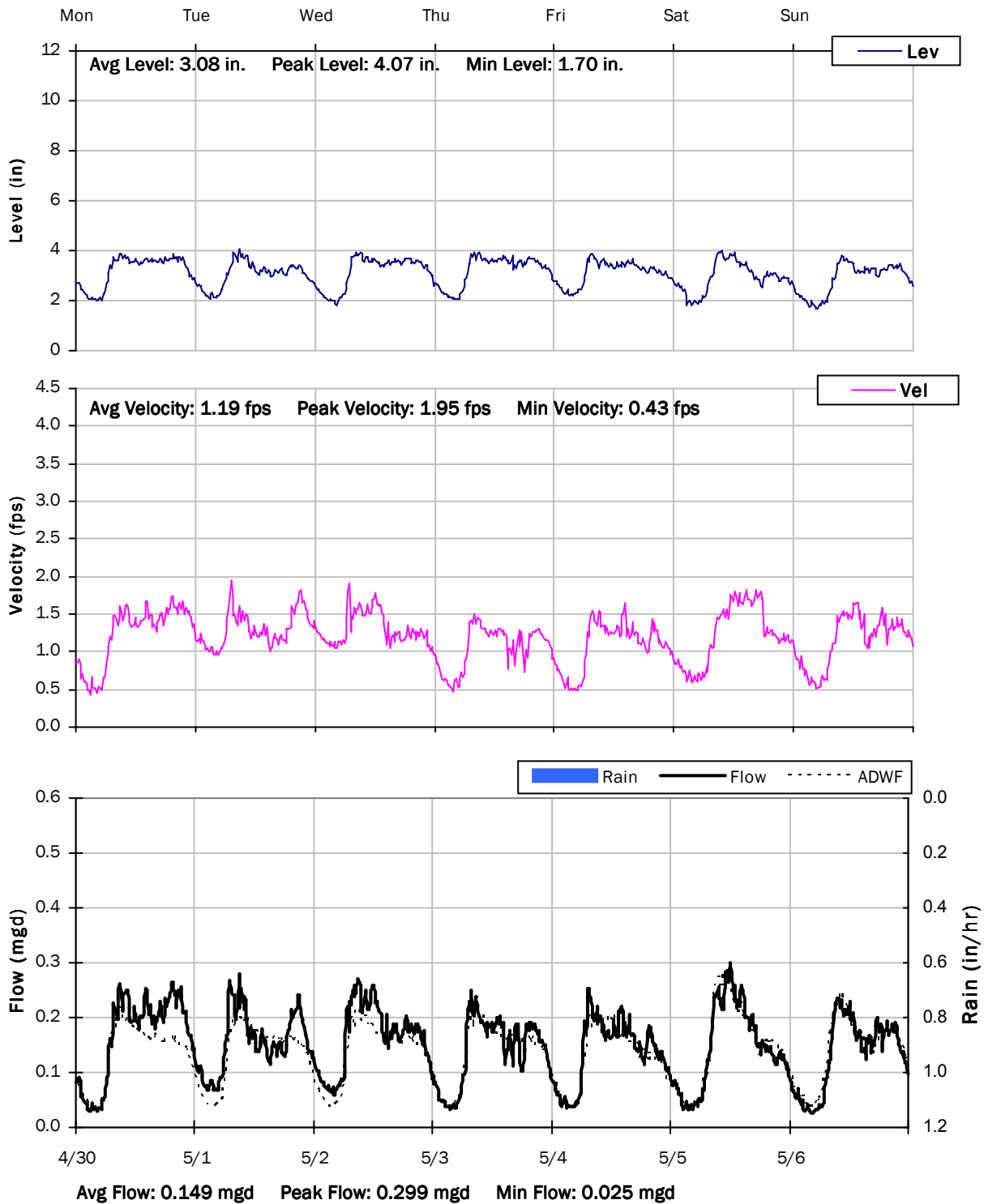
4/23/2018 to 4/30/2018



SITE 4

Weekly Level, Velocity and Flow Hydrographs

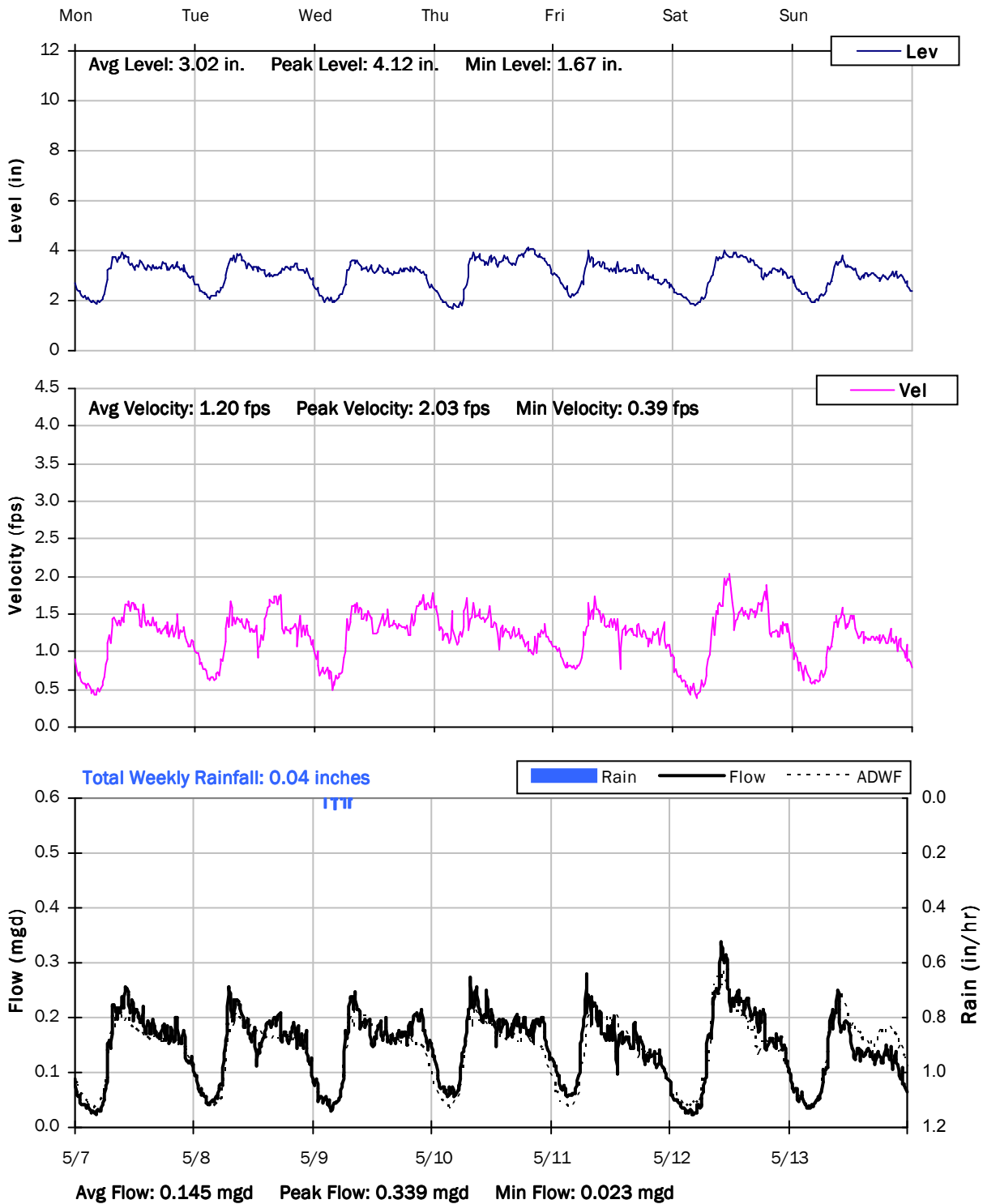
4/30/2018 to 5/7/2018



SITE 4

Weekly Level, Velocity and Flow Hydrographs

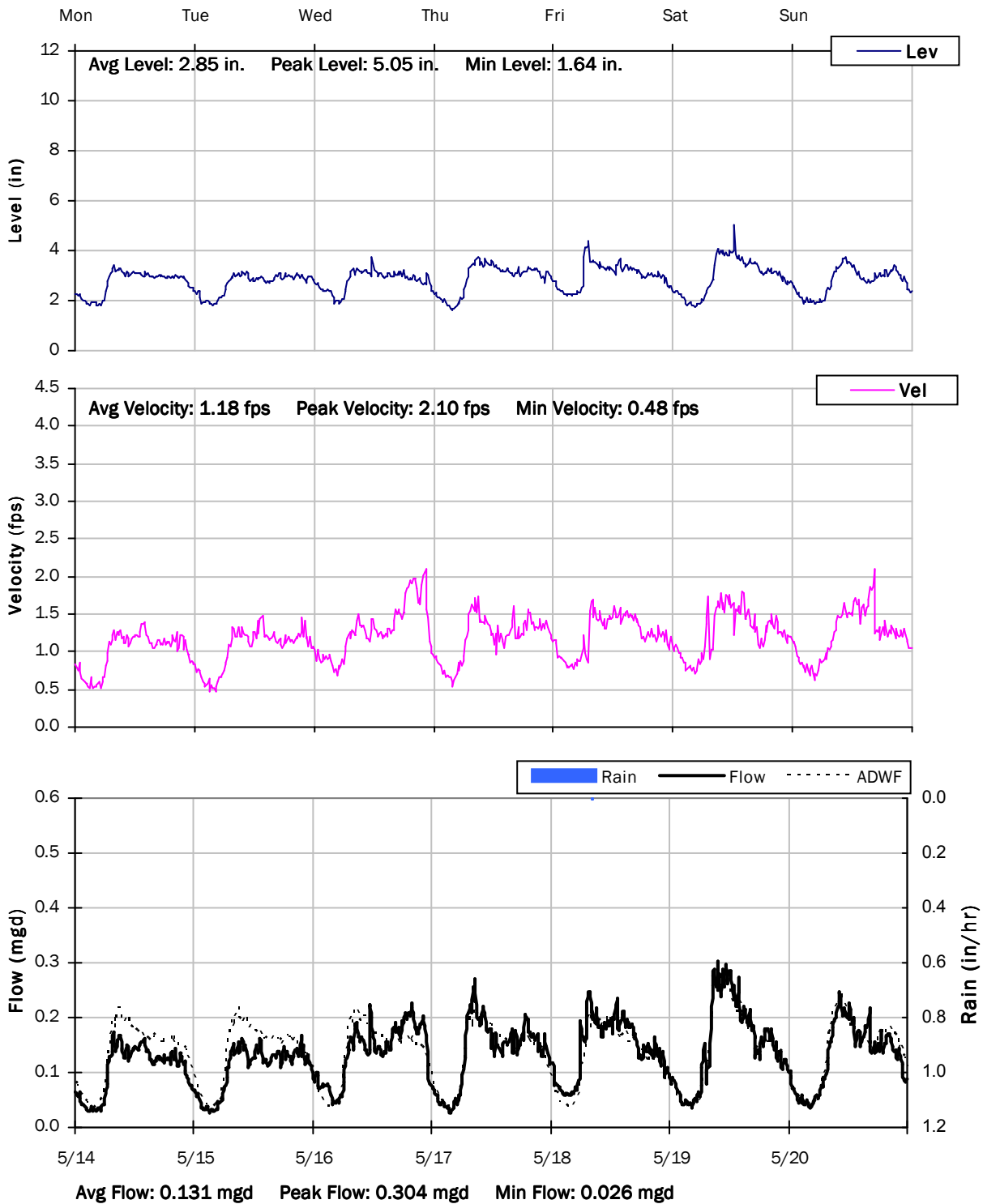
5/7/2018 to 5/14/2018



SITE 4

Weekly Level, Velocity and Flow Hydrographs

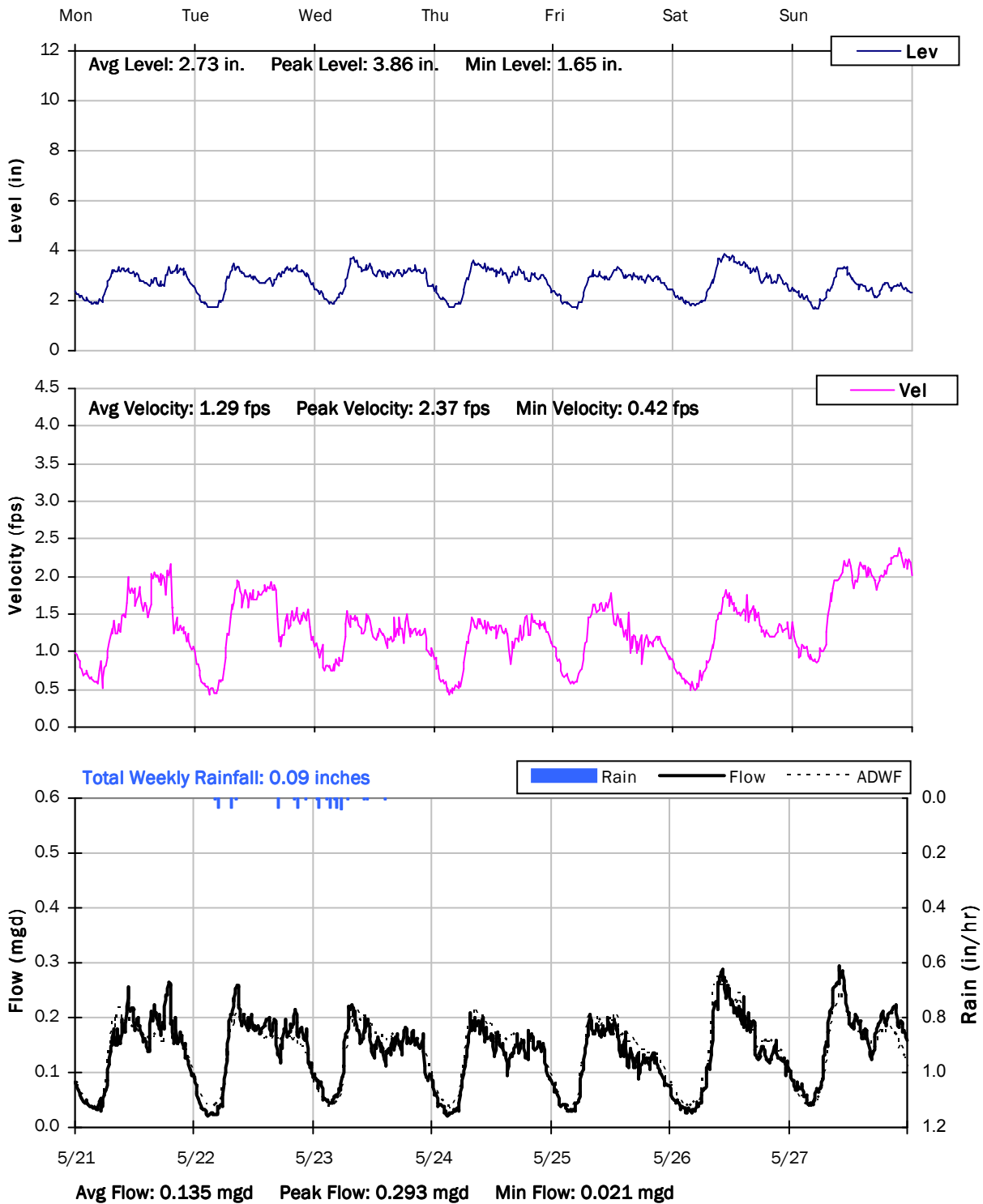
5/14/2018 to 5/21/2018



SITE 4

Weekly Level, Velocity and Flow Hydrographs

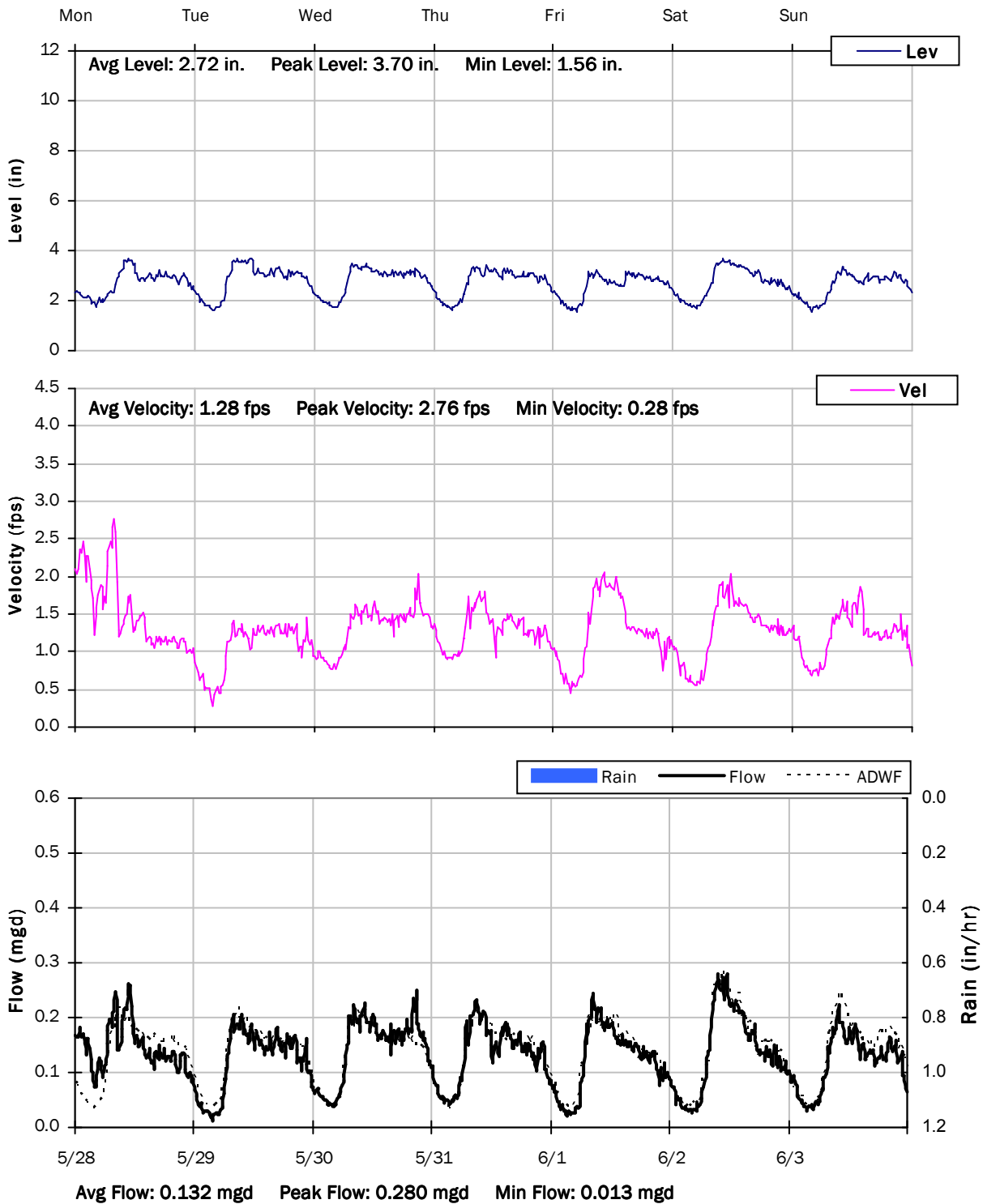
5/21/2018 to 5/28/2018



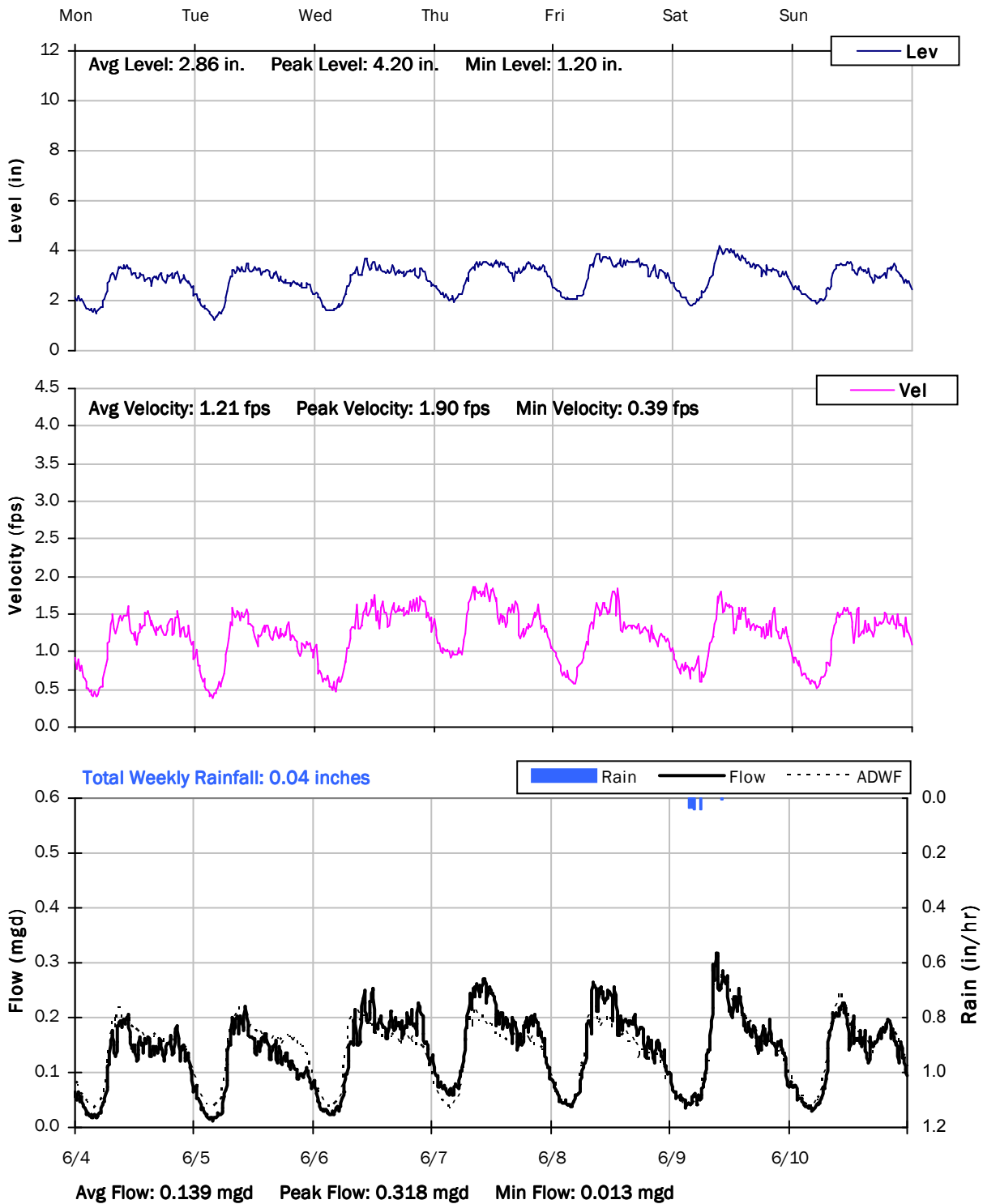
SITE 4

Weekly Level, Velocity and Flow Hydrographs

5/28/2018 to 6/4/2018



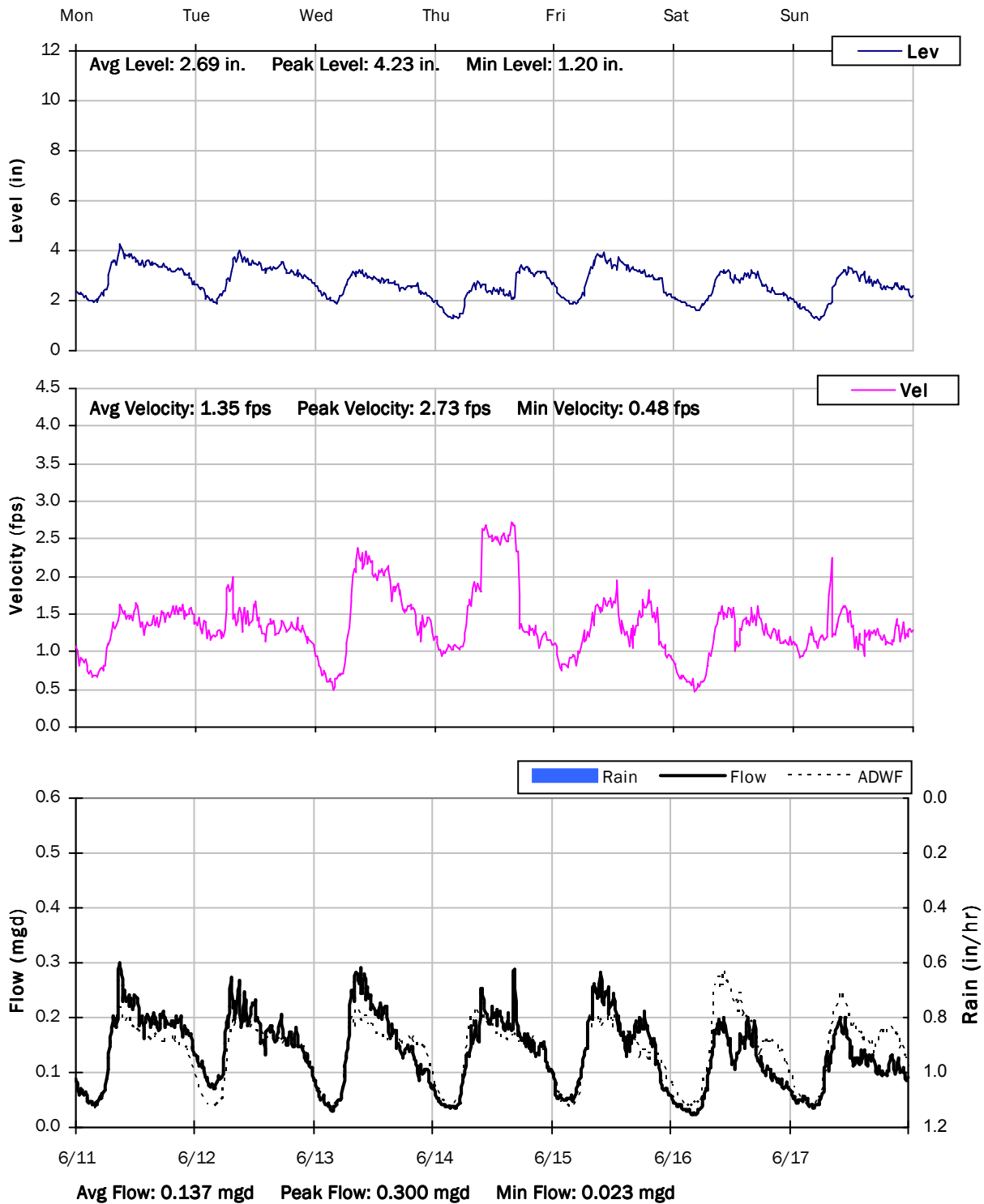
SITE 4
Weekly Level, Velocity and Flow Hydrographs
6/4/2018 to 6/11/2018



SITE 4

Weekly Level, Velocity and Flow Hydrographs

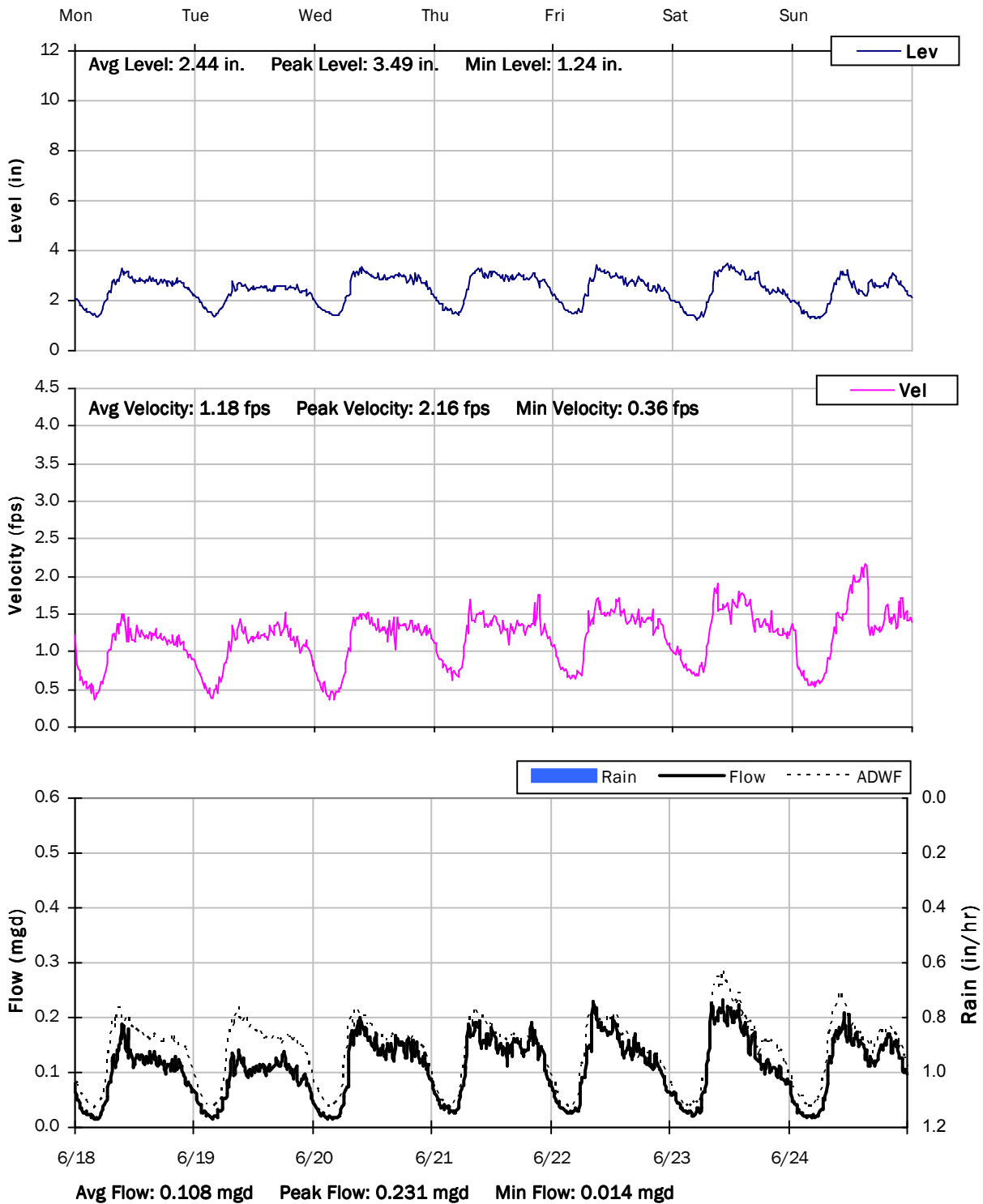
6/11/2018 to 6/18/2018



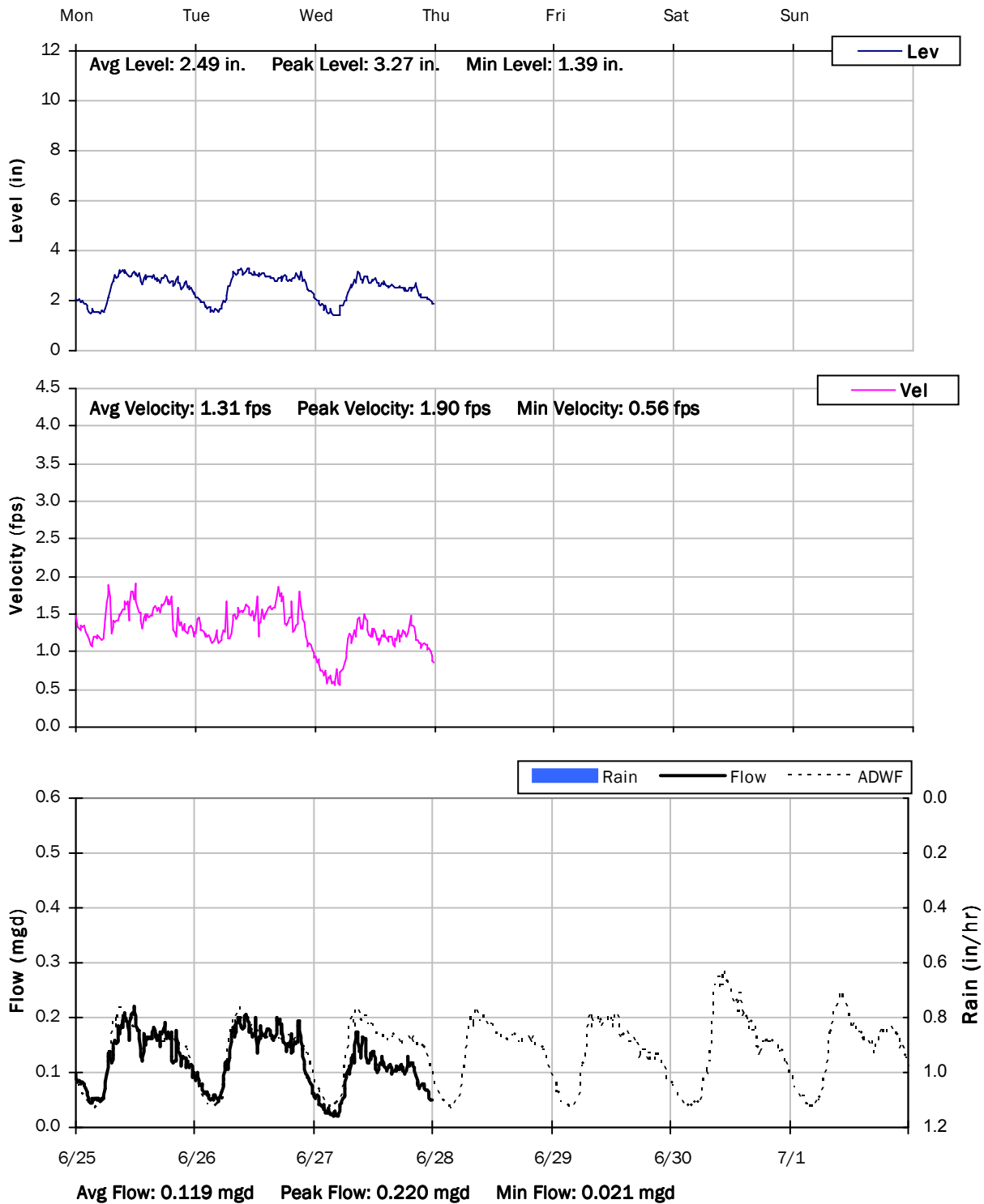
SITE 4

Weekly Level, Velocity and Flow Hydrographs

6/18/2018 to 6/25/2018



SITE 4
Weekly Level, Velocity and Flow Hydrographs
6/25/2018 to 7/2/2018

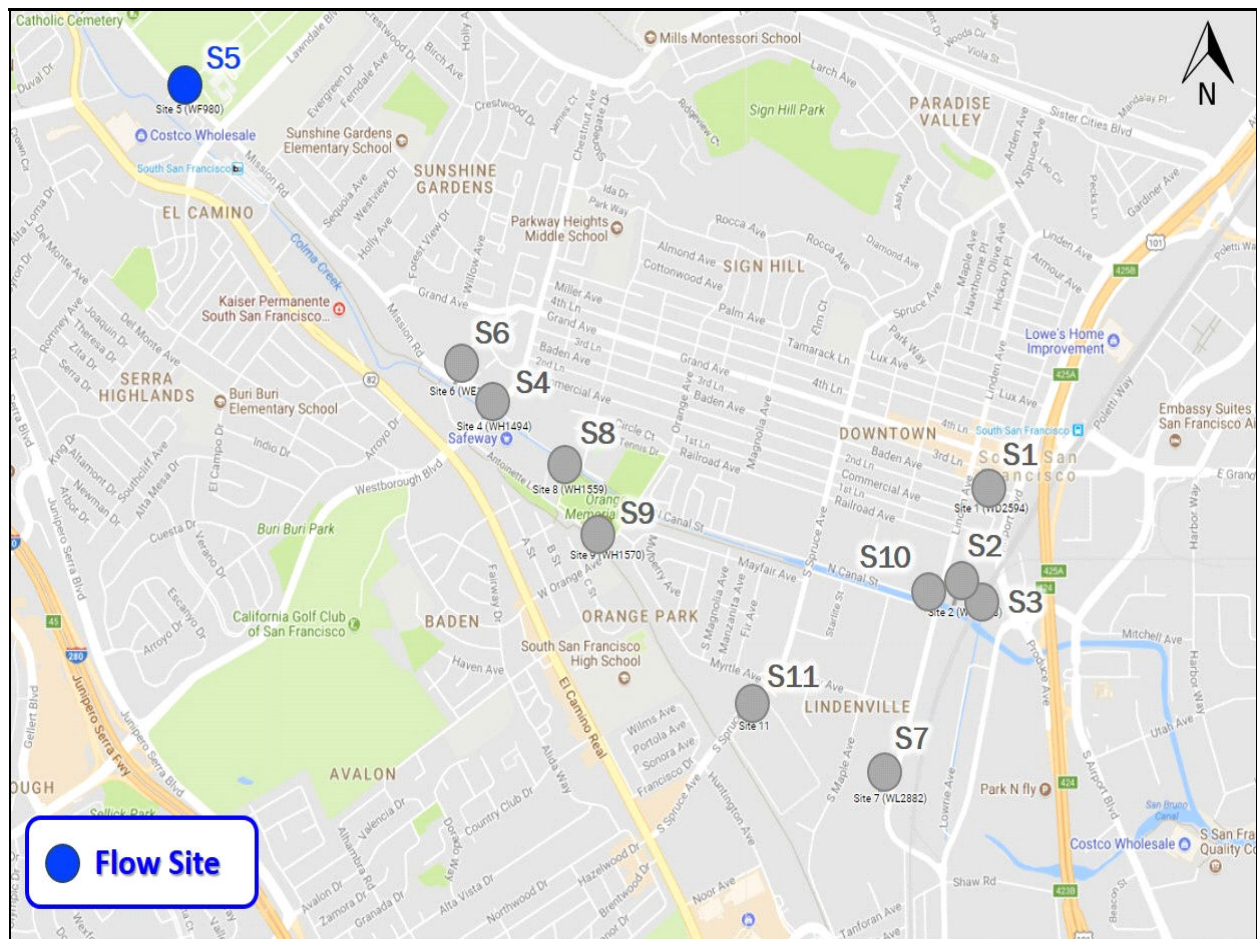


City of South San Francisco Sanitary Sewer Flow Monitoring February 26- June 28, 2018

Monitoring Site: Site 5

Location: 1303 Mission Avenue, north of Isabelle Way

Data Summary Report

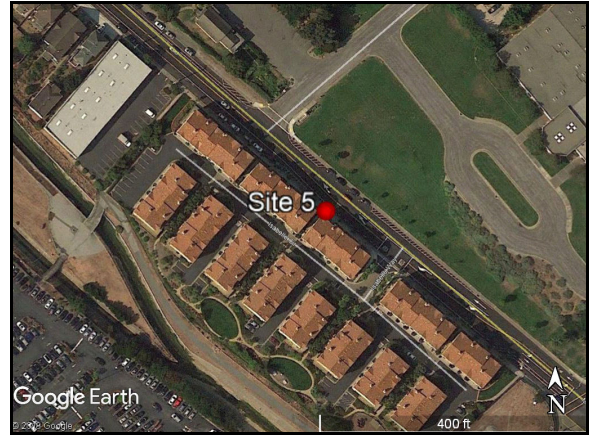


Vicinity Map: Site 5

SITE 5

Site Information

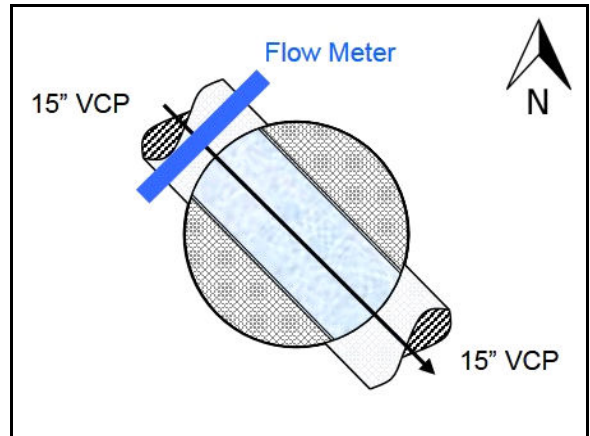
MH ID:	WF980
Location:	1303 Mission Avenue, north of Isabelle Way
Coordinates:	122.4462° W, 37.6665° N
Rim Elevation (Earth):	83 feet
Pipe Diameter:	15 inches
Sediment:	0.00 inches
ADWF:	0.266 mgd
Peak Measured Flow:	1.836 mgd



Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 5

Additional Site Photos

Effluent Pipe



Influent Pipe

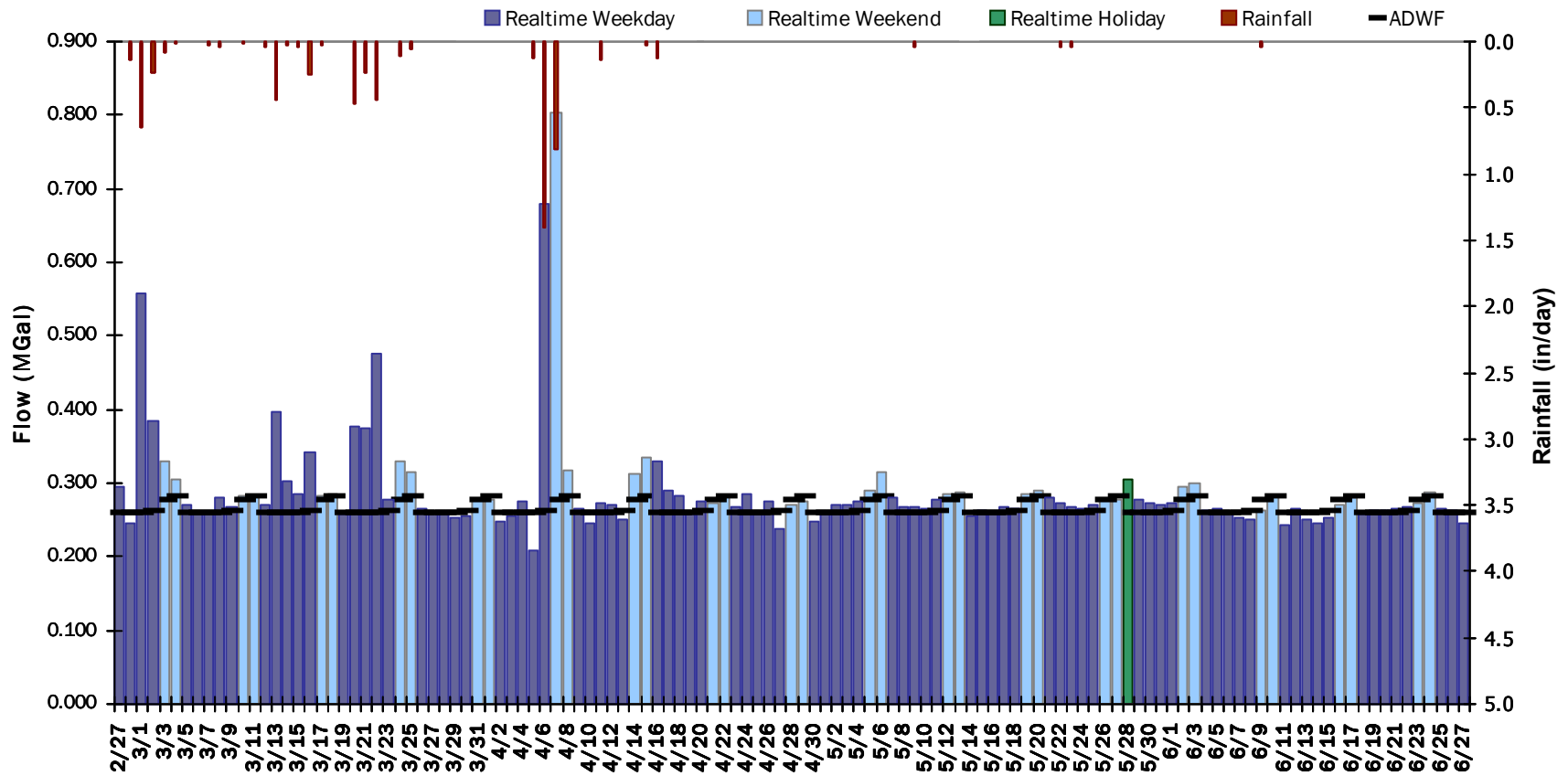


SITE 5

Period Flow Summary: Daily Flow Totals

Avg Period Flow: 0.289 MGal Peak Daily Flow: 0.804 MGal Min Daily Flow: 0.209 MGal

Total Period Rainfall: 6.11 inches



SITE 5

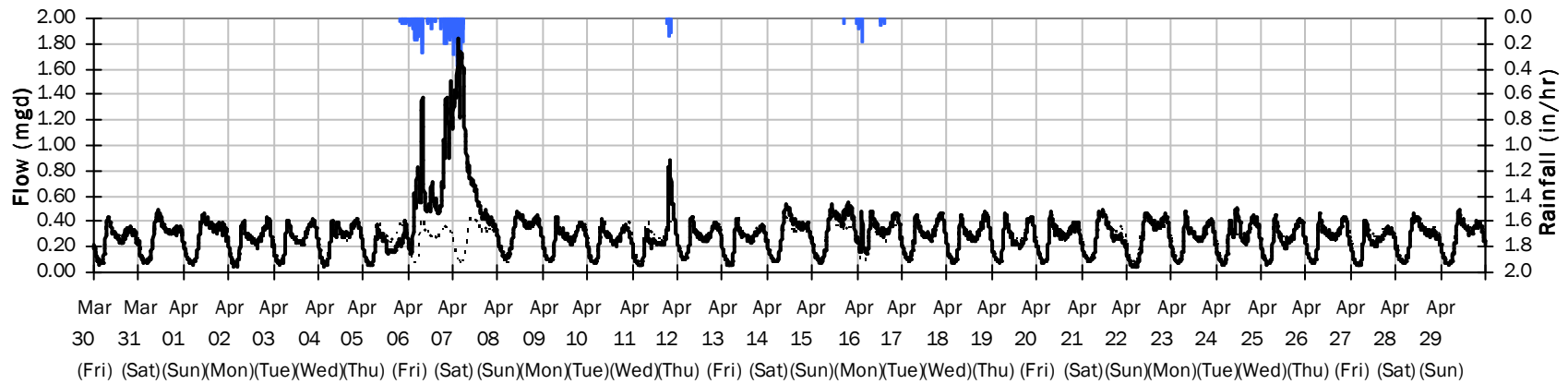
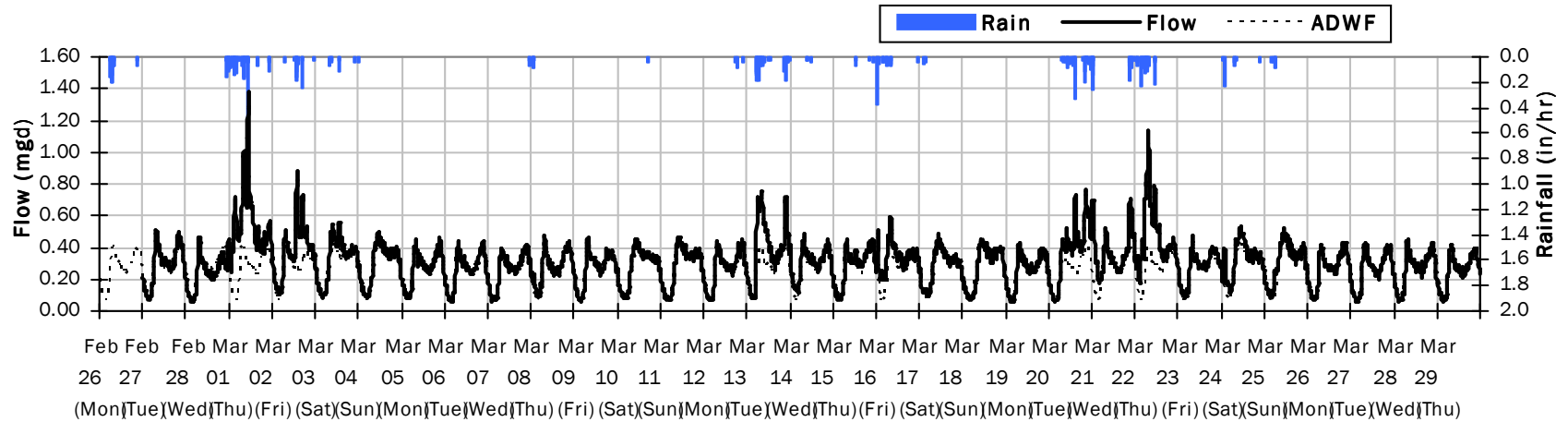
Flow Summary: 2/26/2018 to 4/29/2018

Total Period Rainfall: 6.22 inches

Avg Flow: 0.307 mgd

Peak Flow: 1.836 mgd

Min Flow: 0.041 mgd



SITE 5

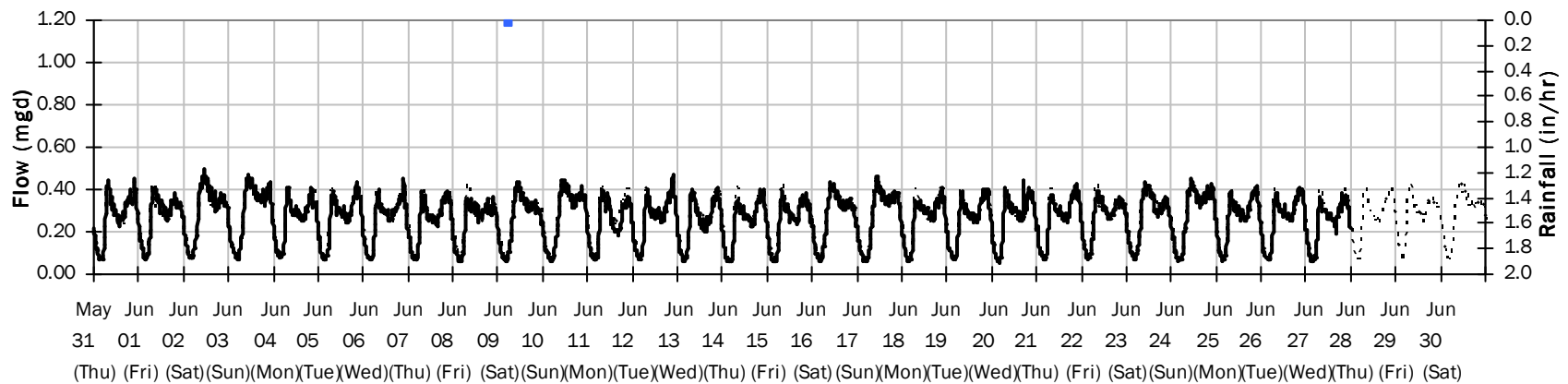
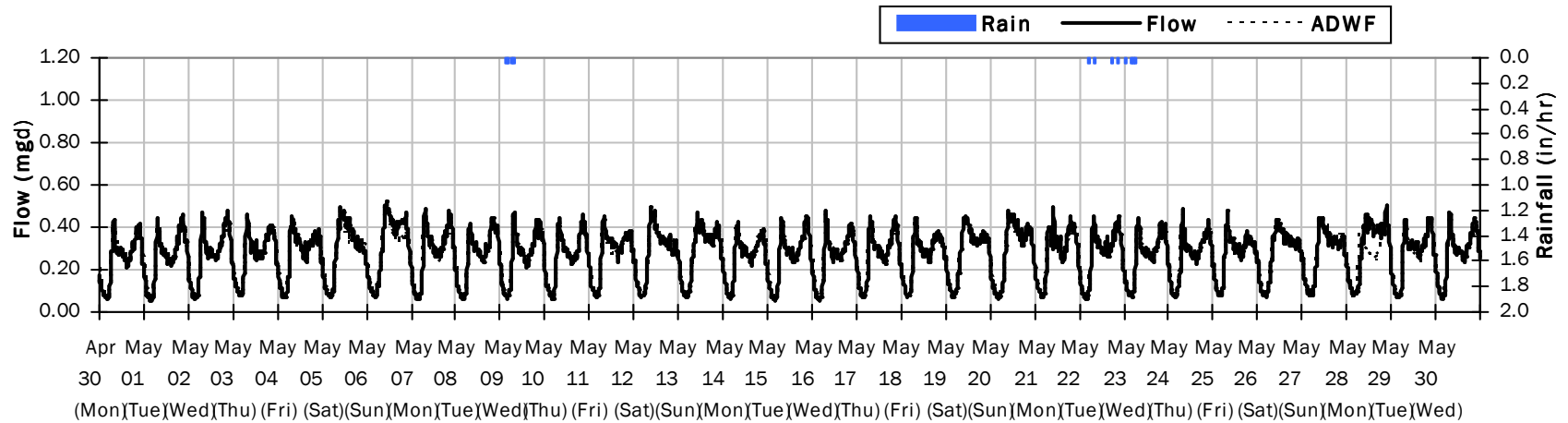
Flow Summary: 4/30/2018 to 6/30/2018

Total Period Rainfall: 0.16 inches

Avg Flow: 0.270 mgd

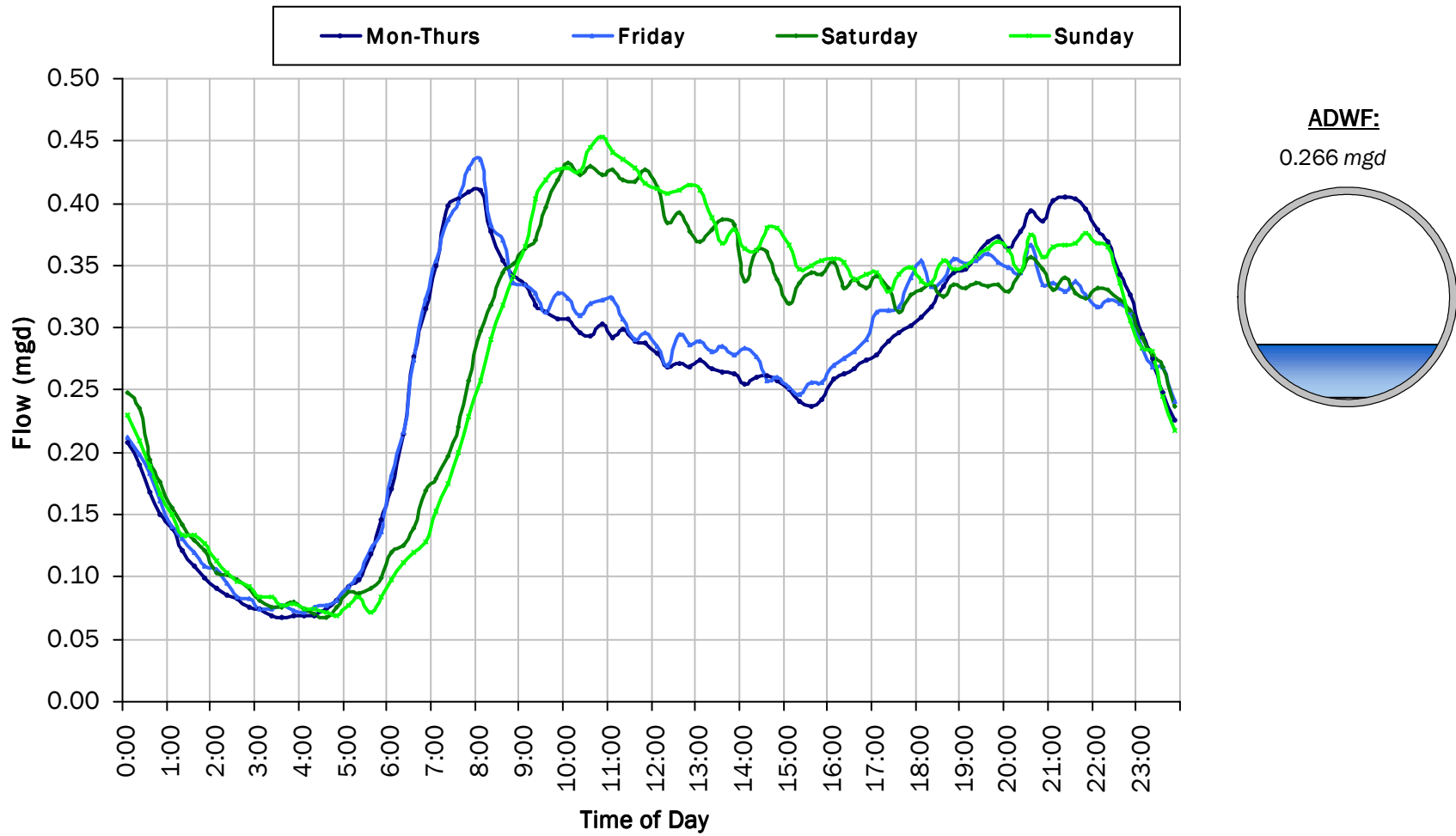
Peak Flow: 0.520 mgd

Min Flow: 0.049 mgd



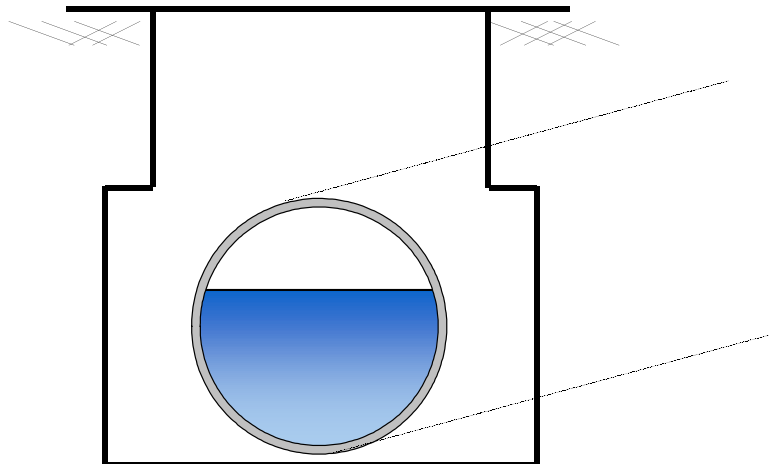
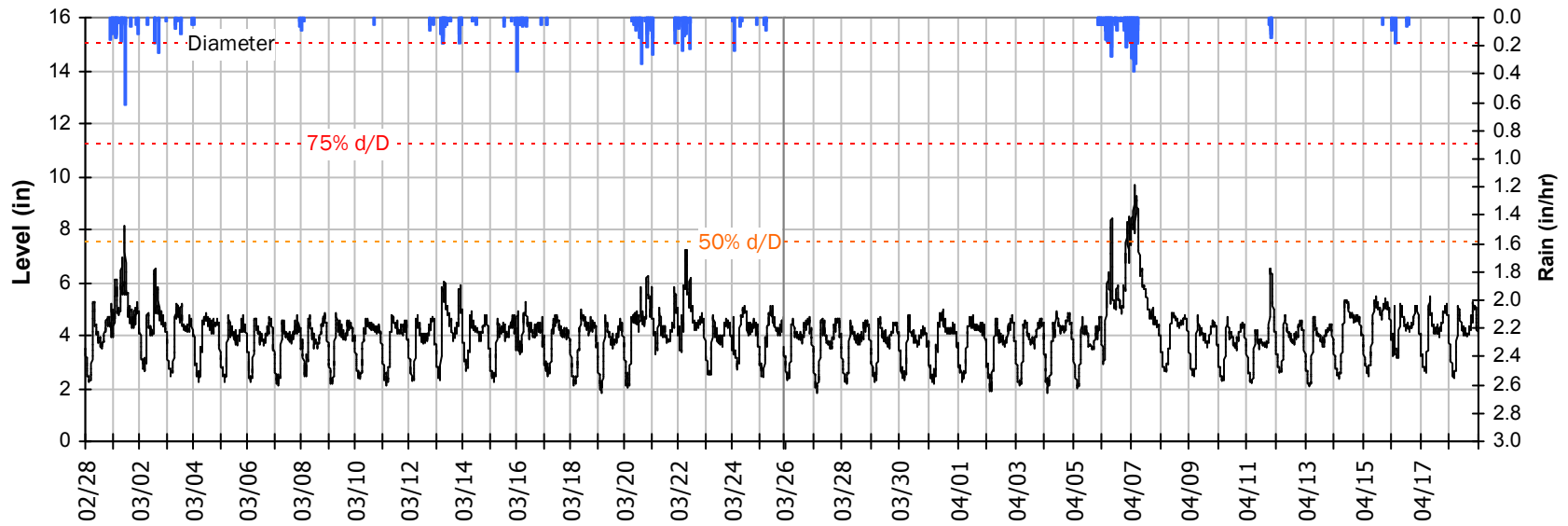
SITE 5

Average Dry Weather Flow Hydrographs



SITE 5 Site Capacity and Surge Summary

Realtime Flow Levels with Rainfall Data over Monitoring (High Capacity) Period

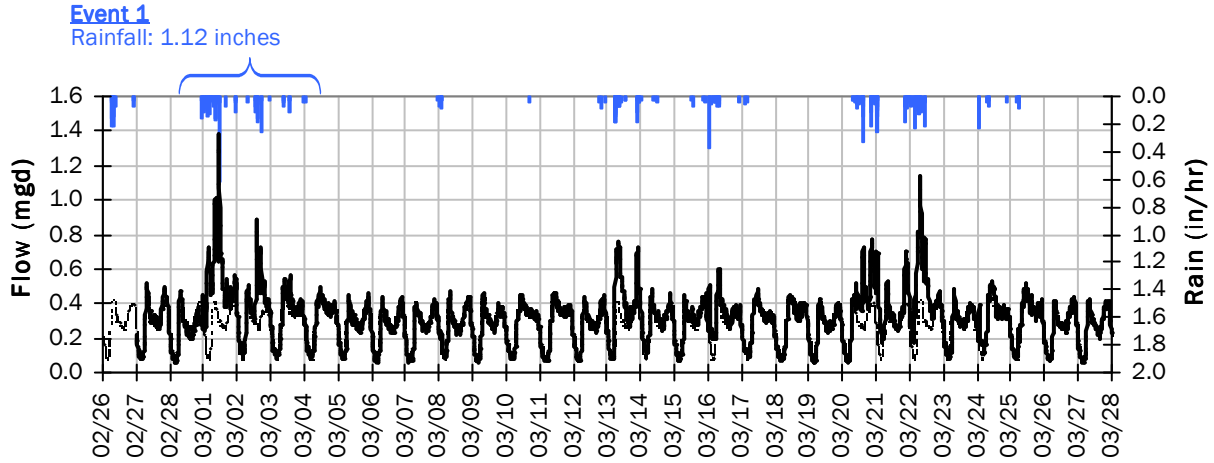


Pipe Diameter: 15 inches
Peak Measured Level: 9.7 inches
Peak d/D Ratio: 0.65

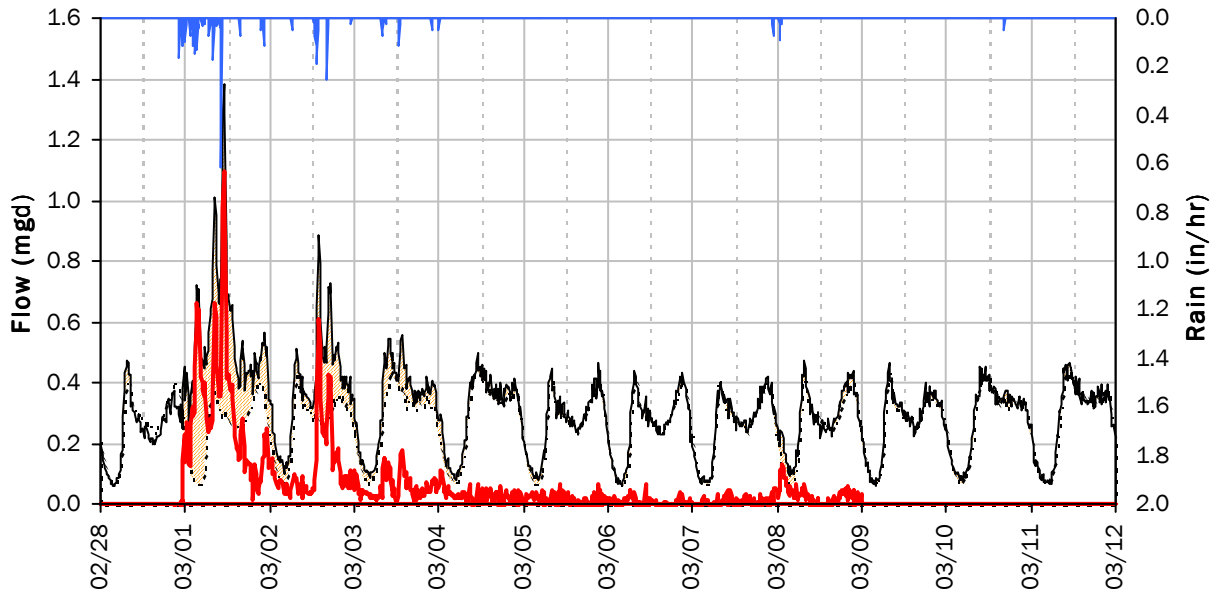
SITE 5

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



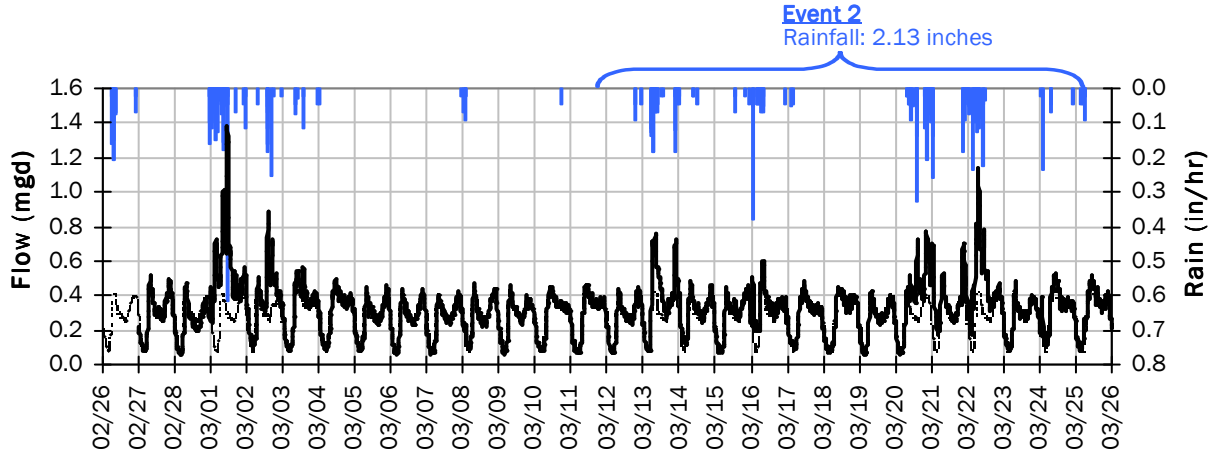
Storm Event I/I Analysis (Rain = 1.12 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	1.38 mgd	Peak I/I Rate:	1.10 mgd
PF:	5.20	Total I/I:	567,000 gallons
Peak Level:	8.13 in		
d/D Ratio:	0.54		

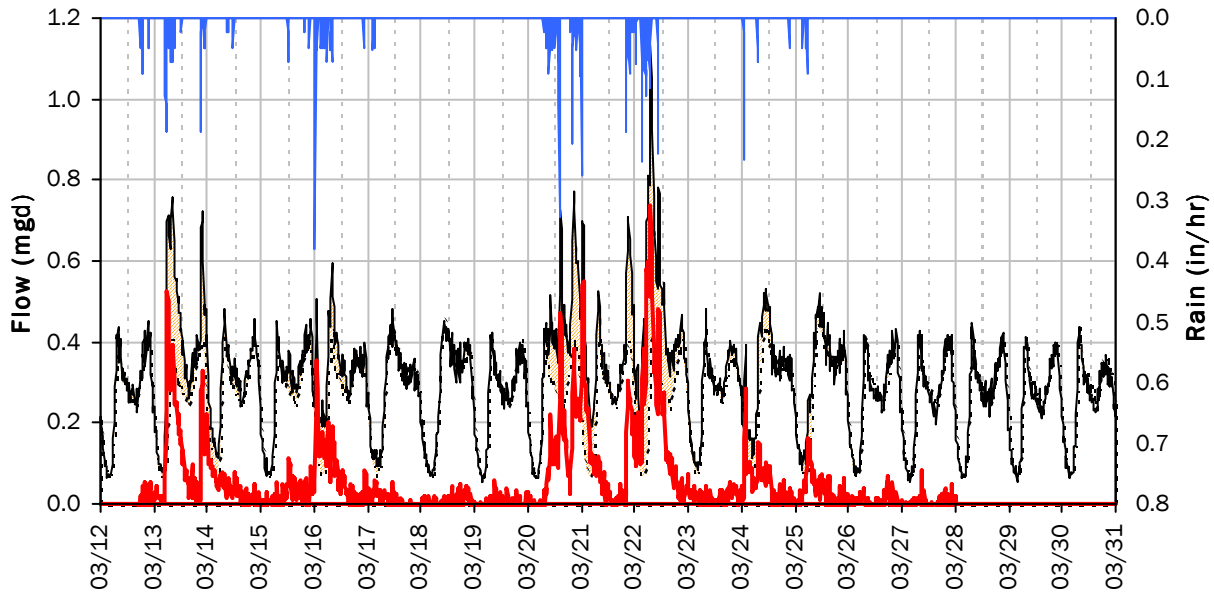
SITE 5

I/I Summary: Event 2

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 2 Detail Graph



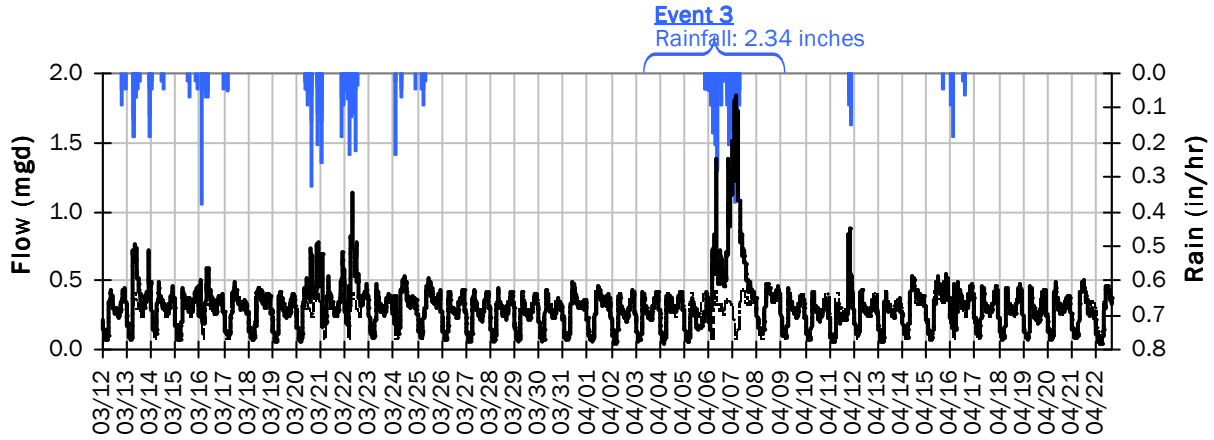
Storm Event I/I Analysis (Rain = 2.13 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	1.14 mgd	Peak I/I Rate:	0.74 mgd
PF:	4.27	Total I/I:	845,000 gallons
Peak Level:	7.25 in		
d/D Ratio:	0.48		

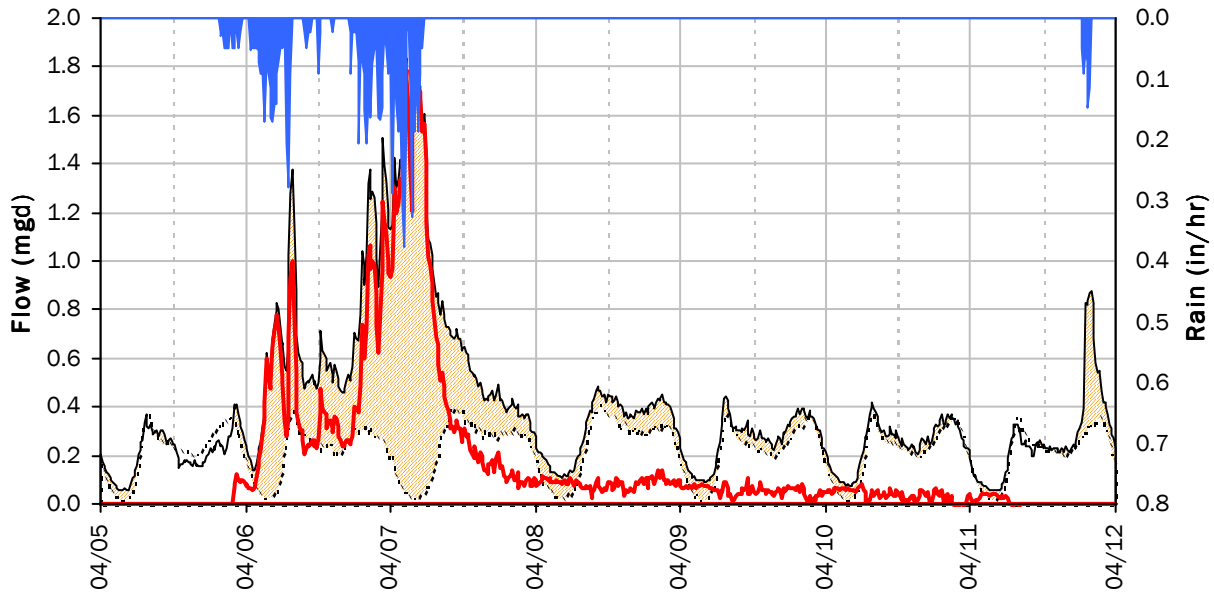
SITE 5

I/I Summary: Event 3

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



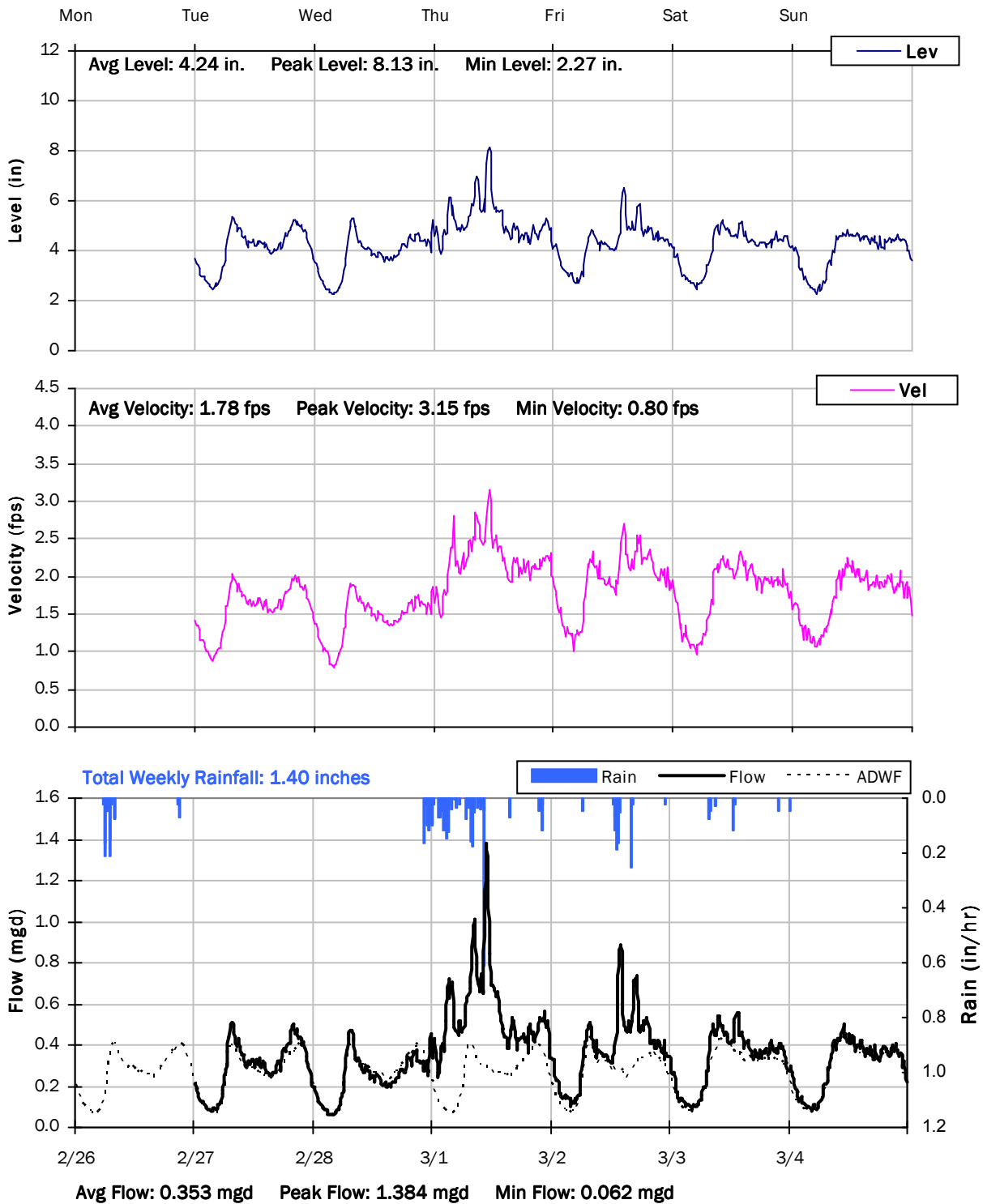
Event 3 Detail Graph



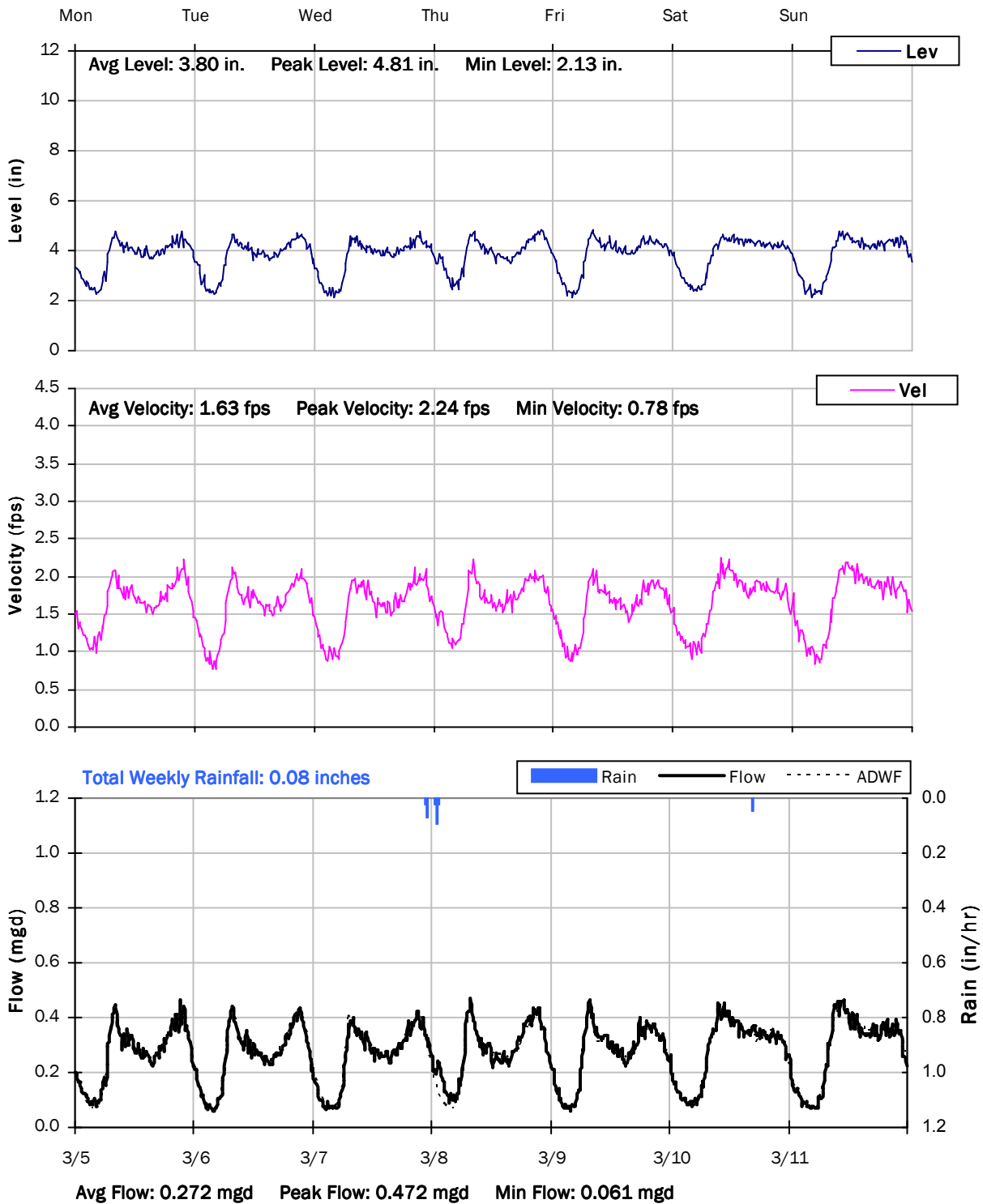
Storm Event I/I Analysis (Rain = 2.34 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	1.84 mgd	Peak I/I Rate:	1.79 mgd
PF:	6.90	Total I/I:	1,235,000 gallons
Peak Level:	9.70 in		
d/D Ratio:	0.65		

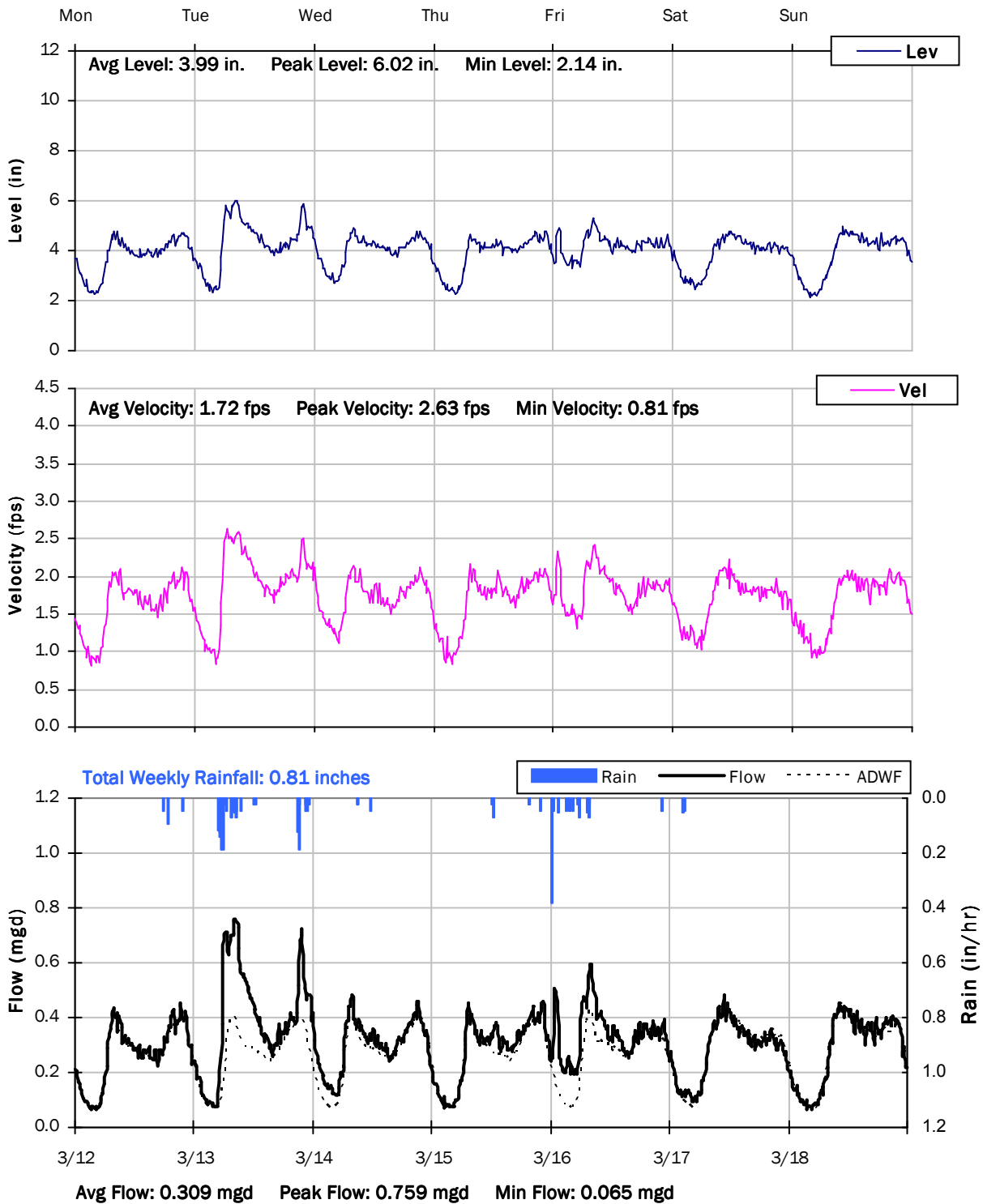
SITE 5
Weekly Level, Velocity and Flow Hydrographs
2/26/2018 to 3/5/2018



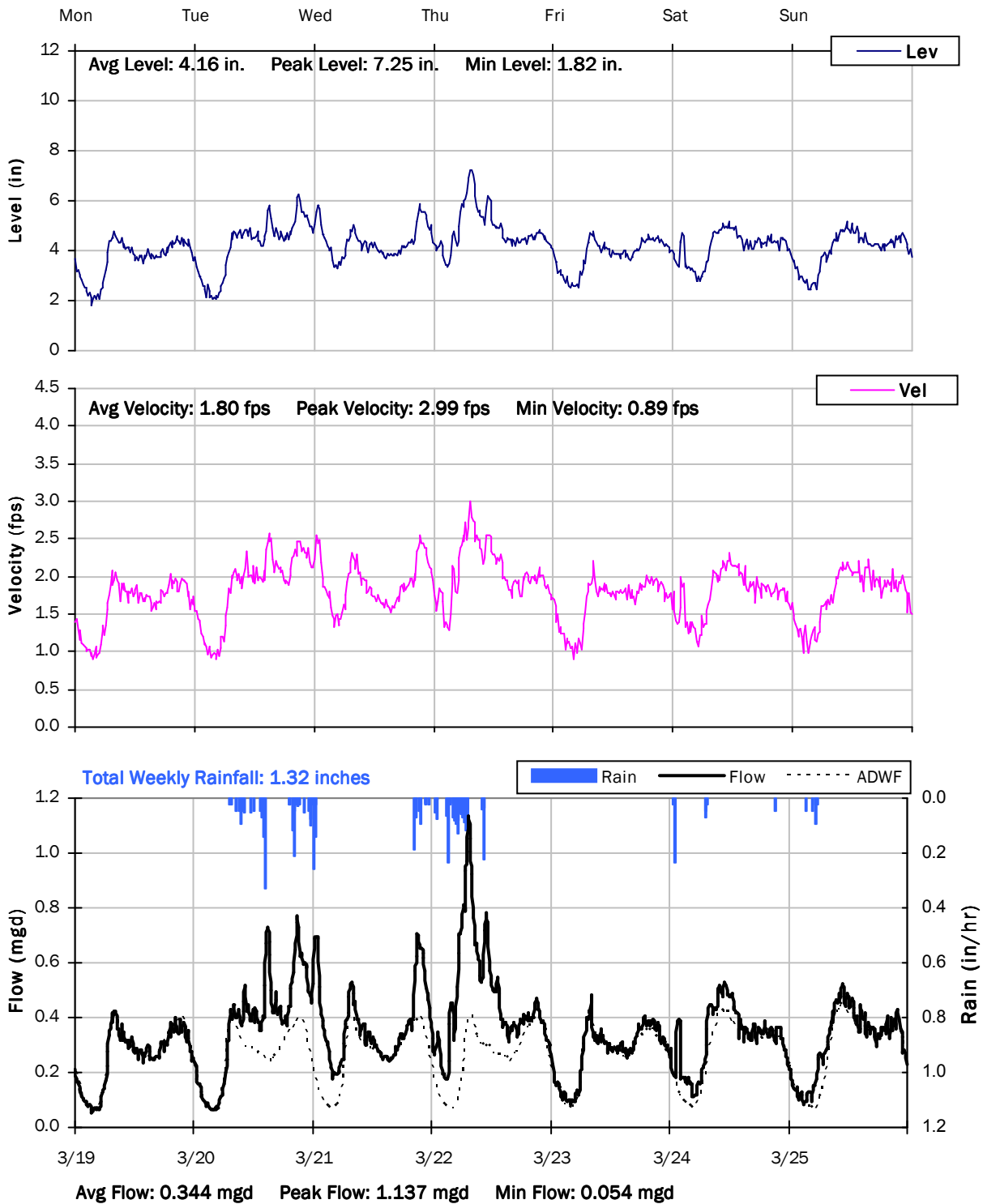
SITE 5
Weekly Level, Velocity and Flow Hydrographs
3/5/2018 to 3/12/2018



SITE 5
Weekly Level, Velocity and Flow Hydrographs
3/12/2018 to 3/19/2018



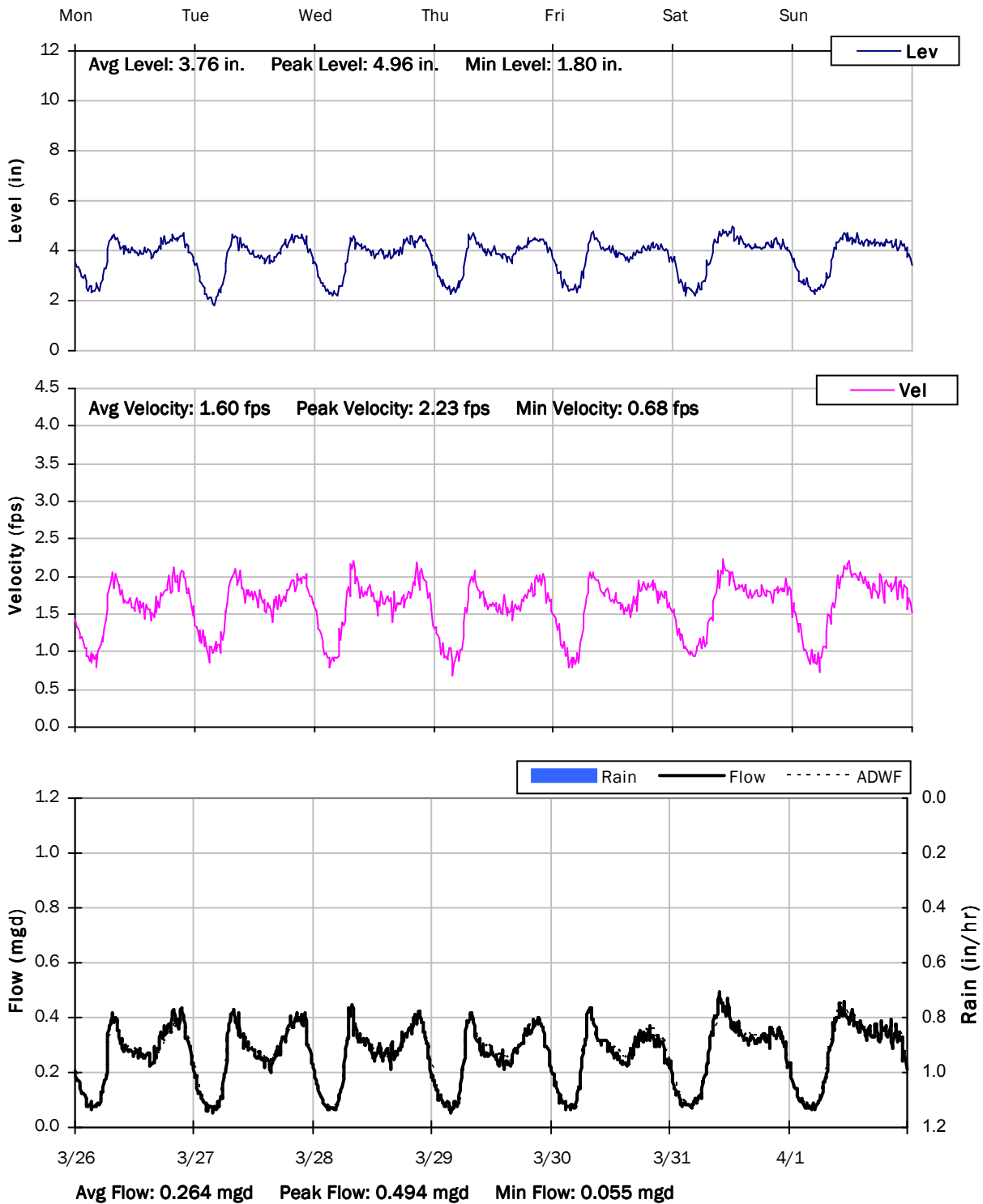
SITE 5
Weekly Level, Velocity and Flow Hydrographs
3/19/2018 to 3/26/2018



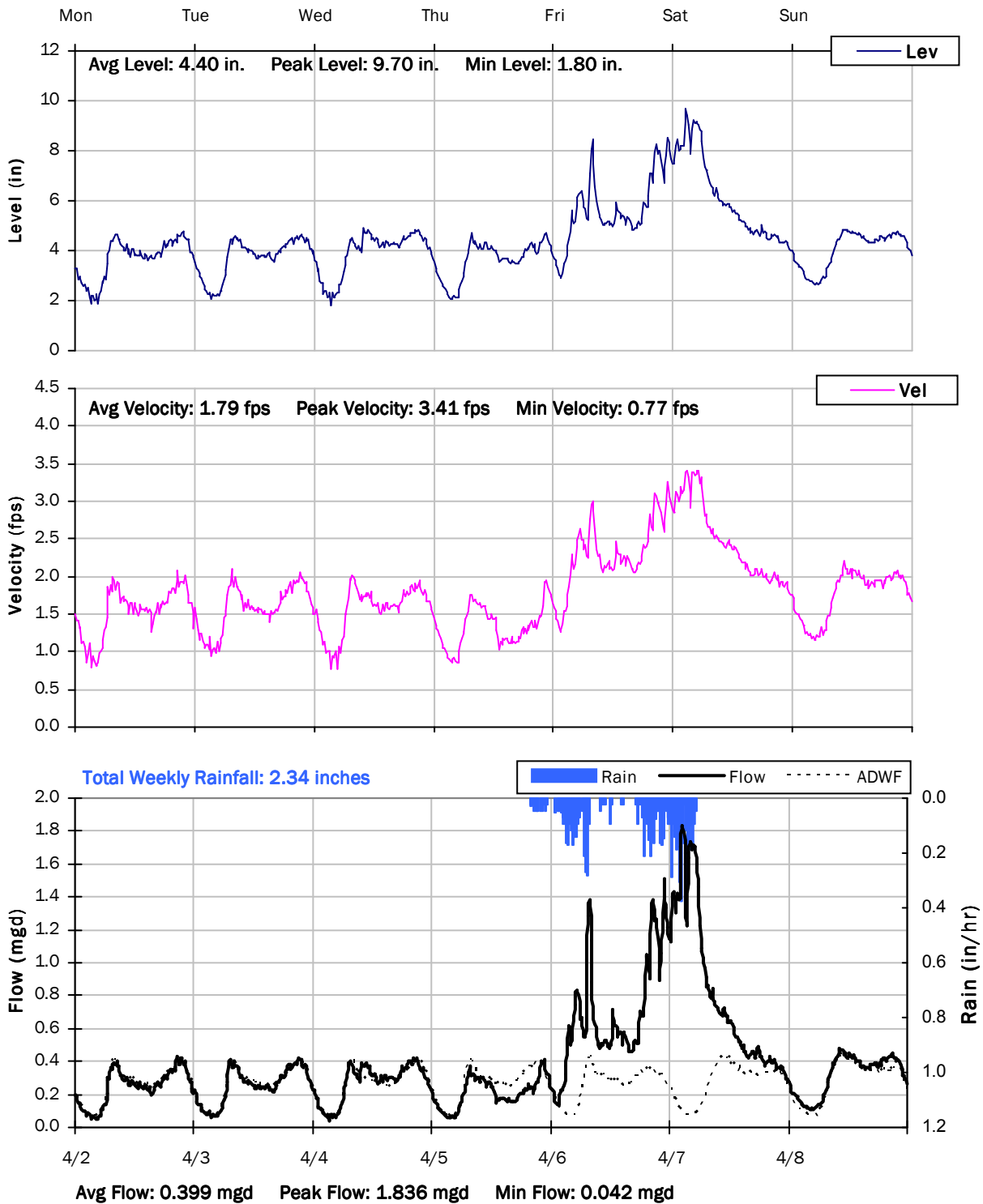
SITE 5

Weekly Level, Velocity and Flow Hydrographs

3/26/2018 to 4/2/2018



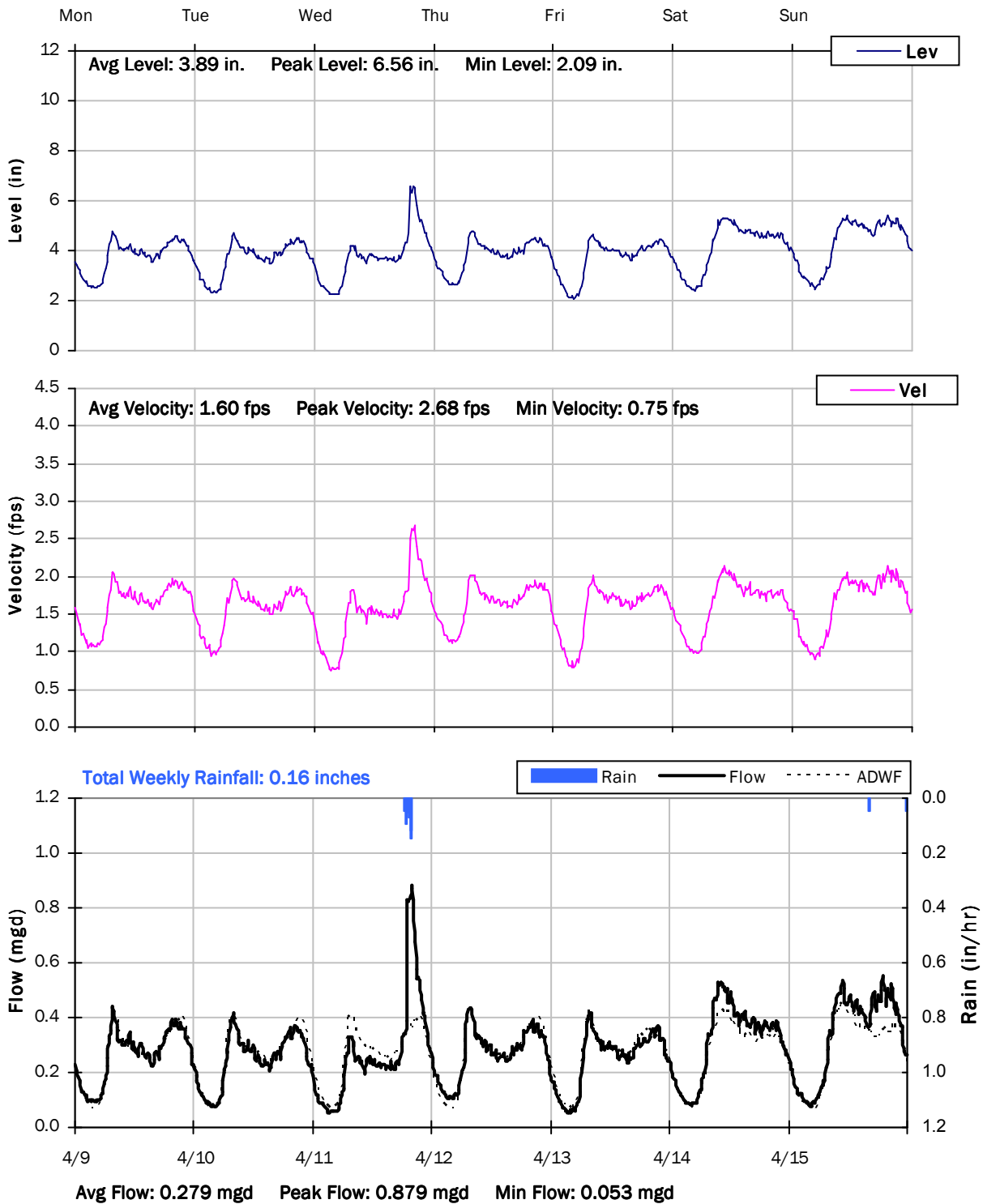
SITE 5
Weekly Level, Velocity and Flow Hydrographs
4/2/2018 to 4/9/2018



SITE 5

Weekly Level, Velocity and Flow Hydrographs

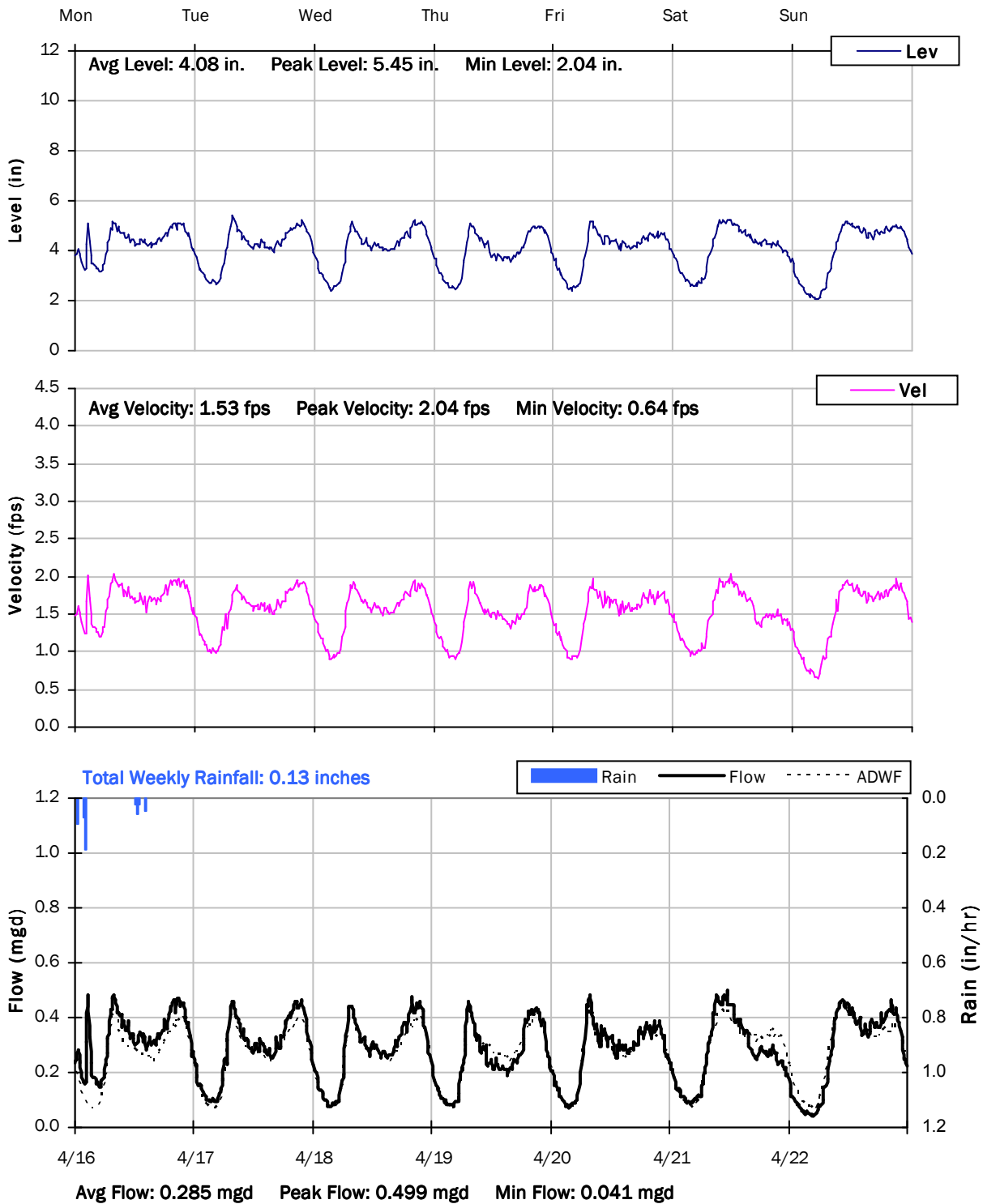
4/9/2018 to 4/16/2018



SITE 5

Weekly Level, Velocity and Flow Hydrographs

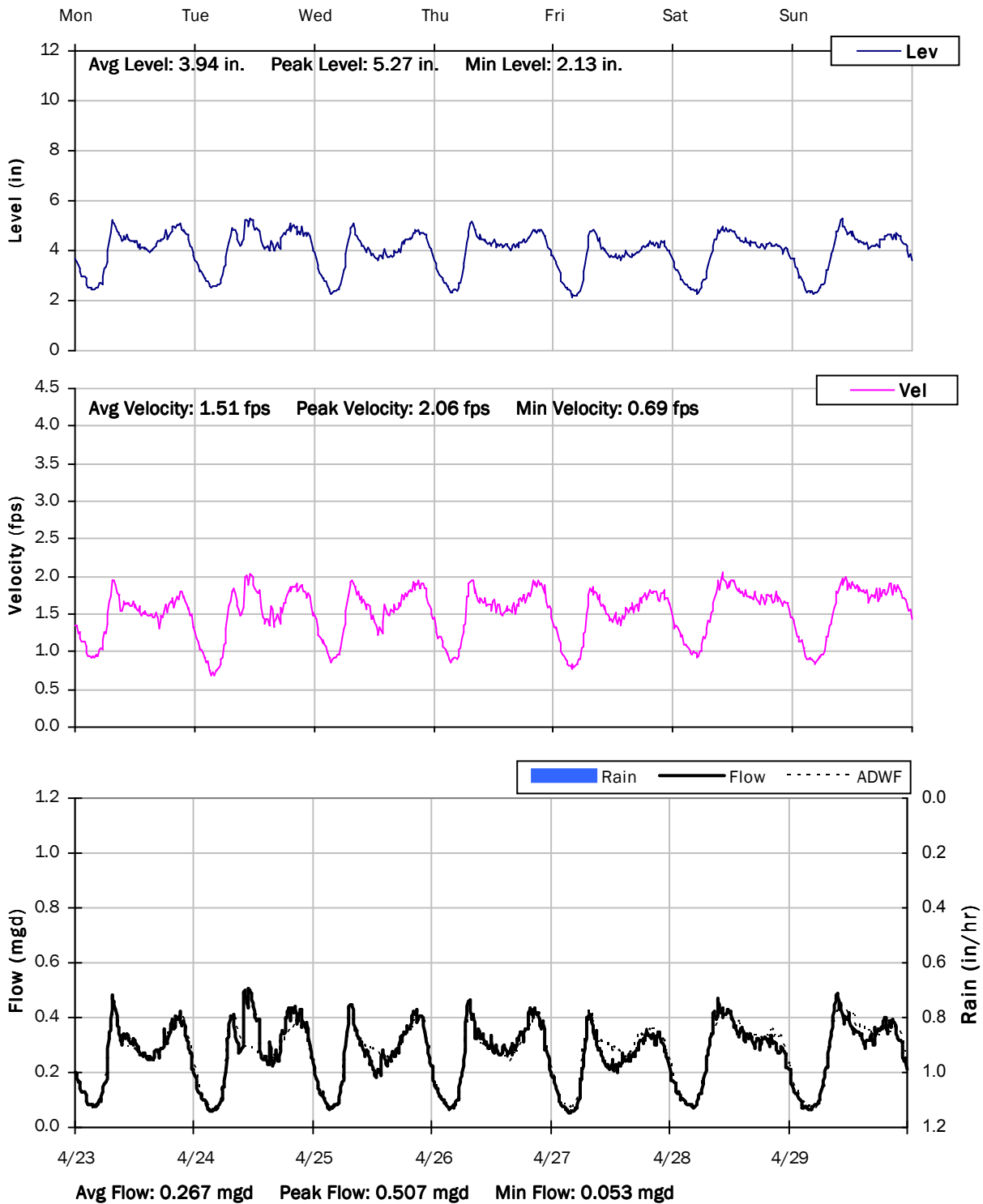
4/16/2018 to 4/23/2018



SITE 5

Weekly Level, Velocity and Flow Hydrographs

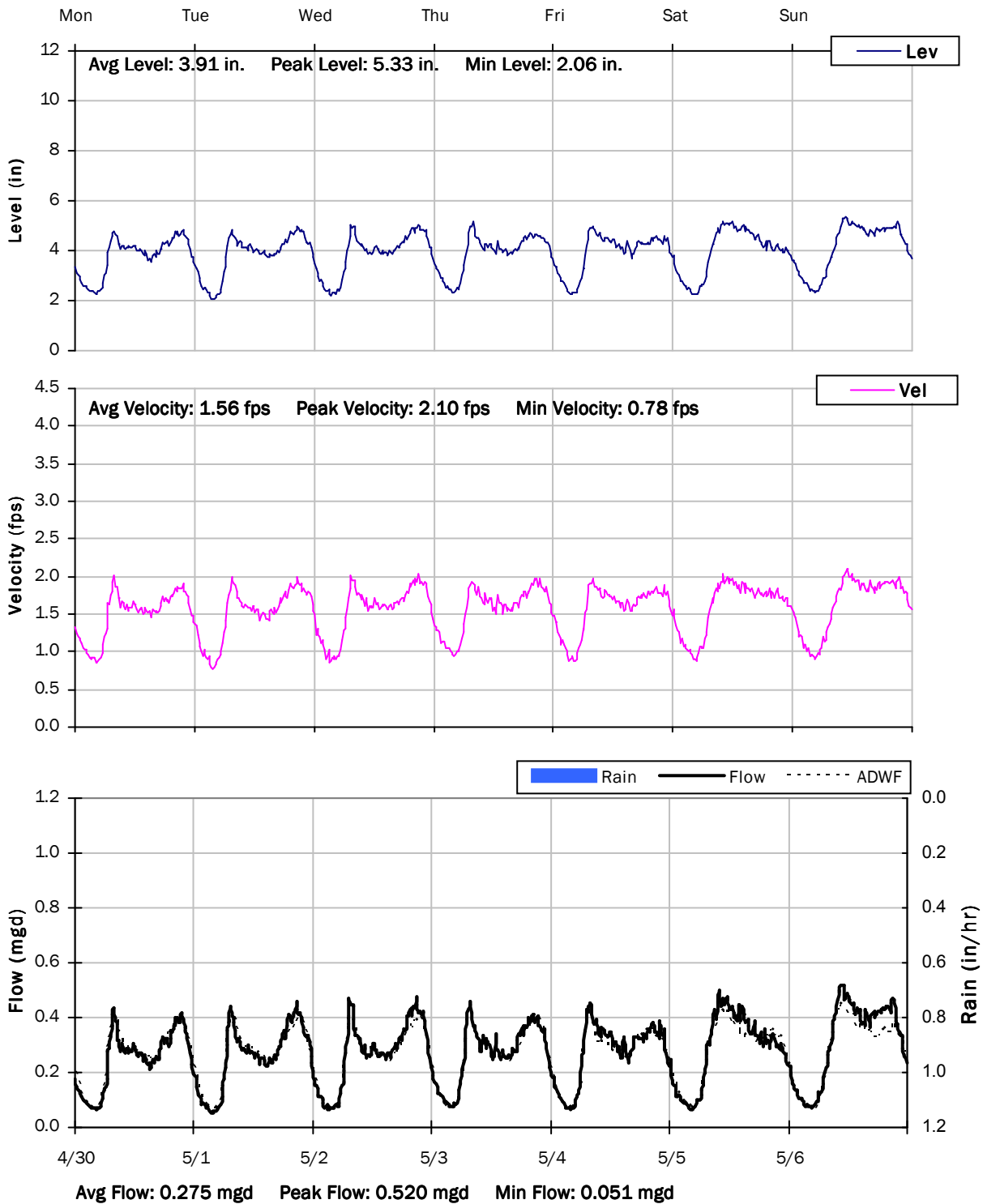
4/23/2018 to 4/30/2018



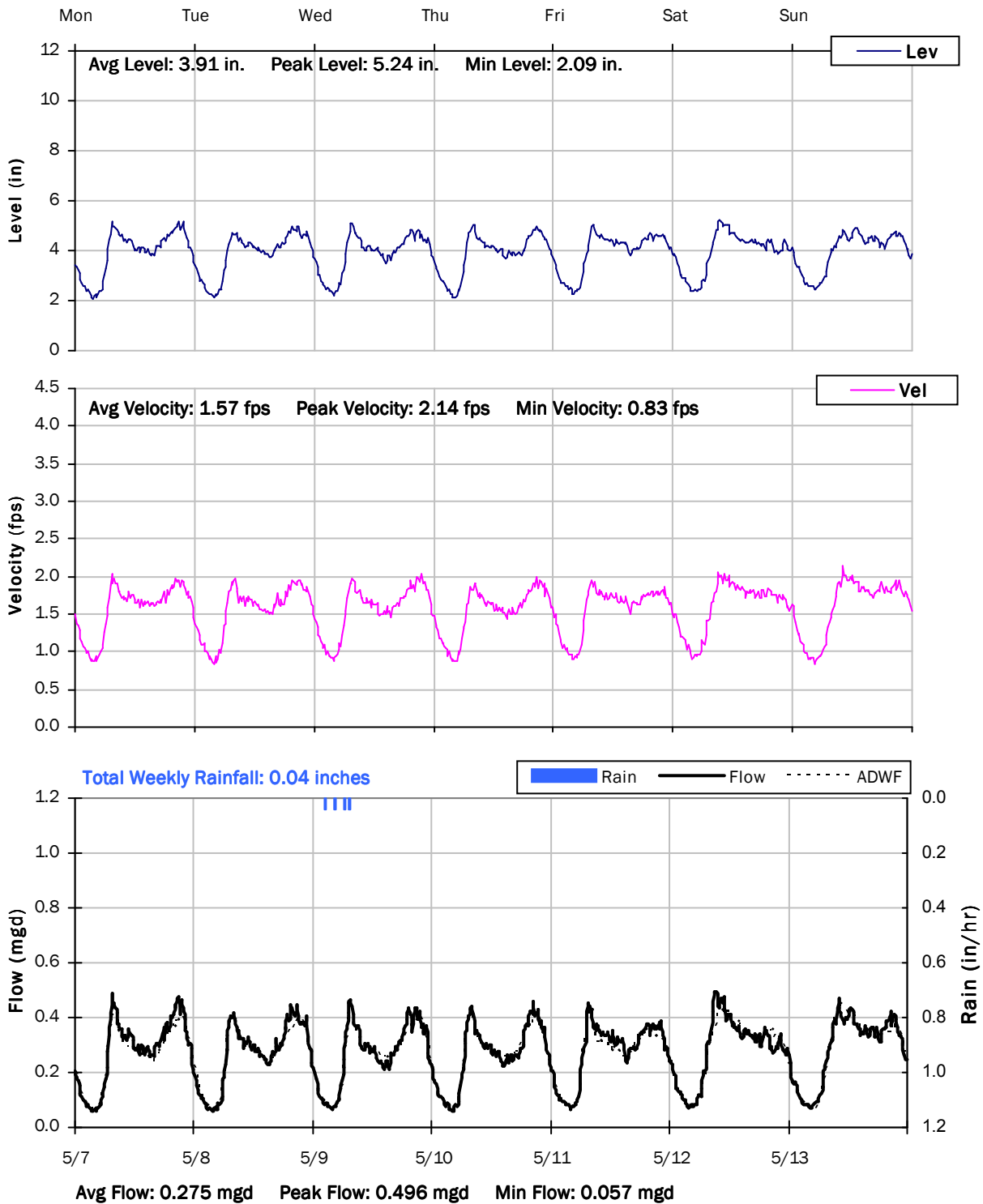
SITE 5

Weekly Level, Velocity and Flow Hydrographs

4/30/2018 to 5/7/2018



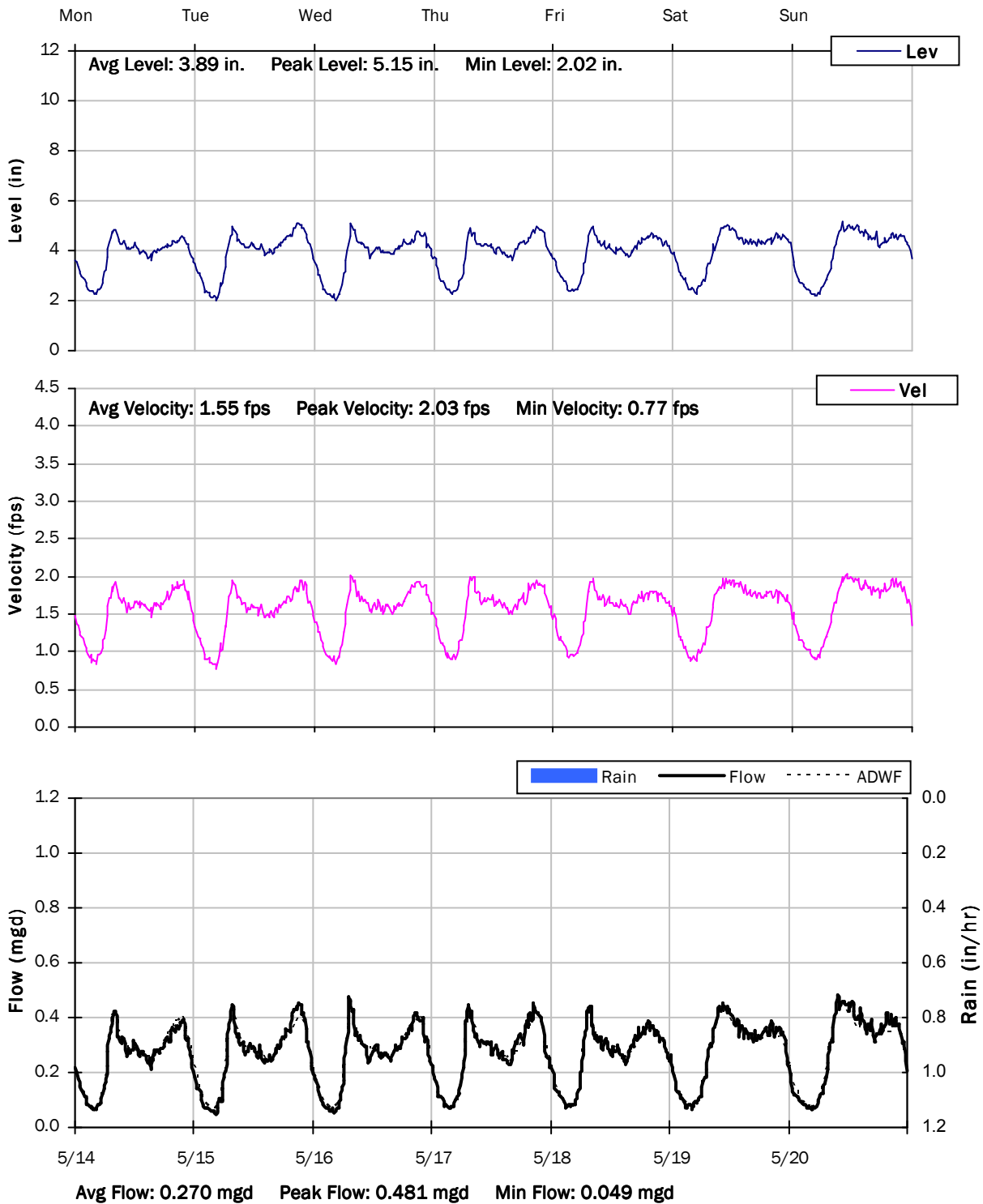
SITE 5
Weekly Level, Velocity and Flow Hydrographs
5/7/2018 to 5/14/2018



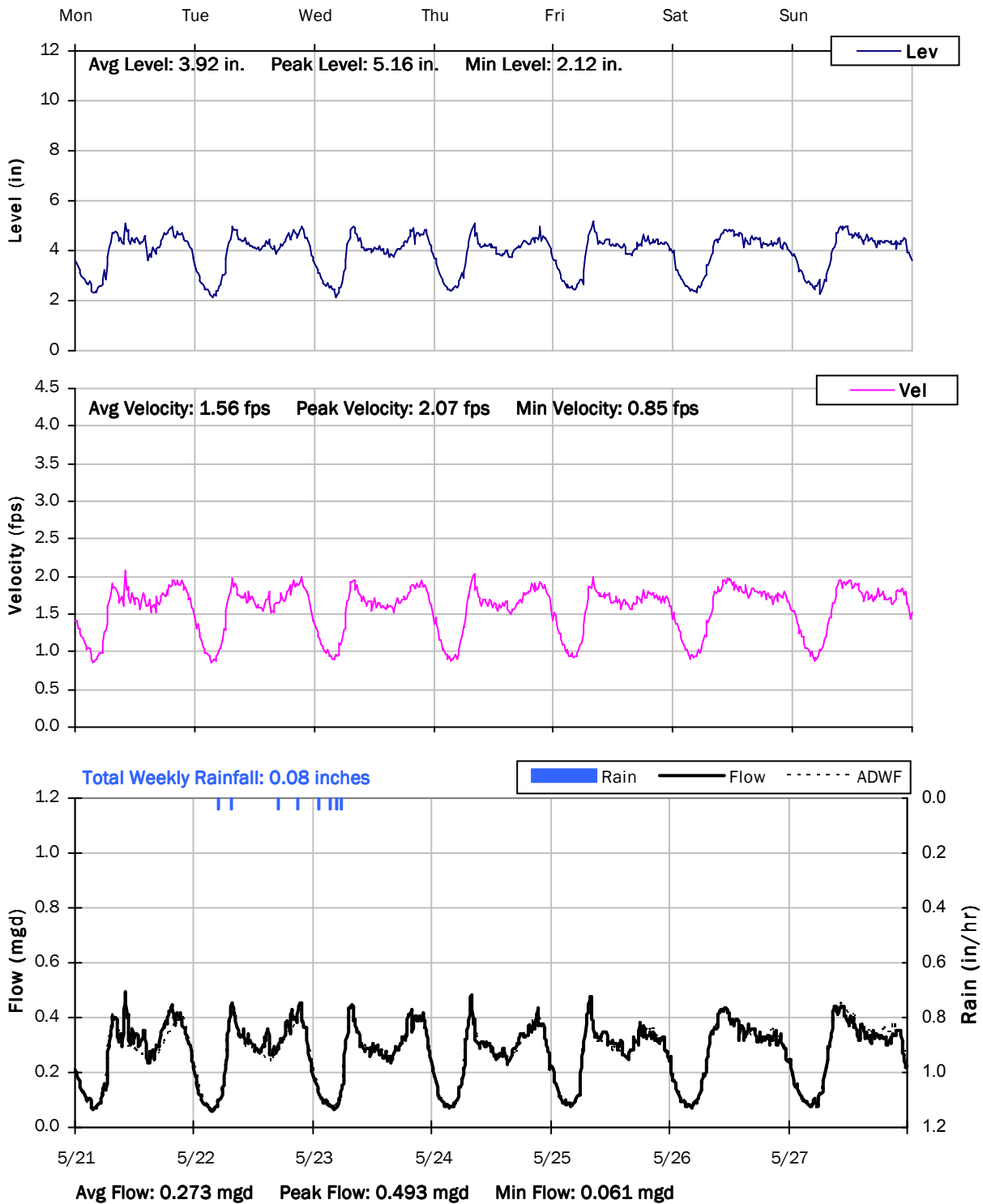
SITE 5

Weekly Level, Velocity and Flow Hydrographs

5/14/2018 to 5/21/2018



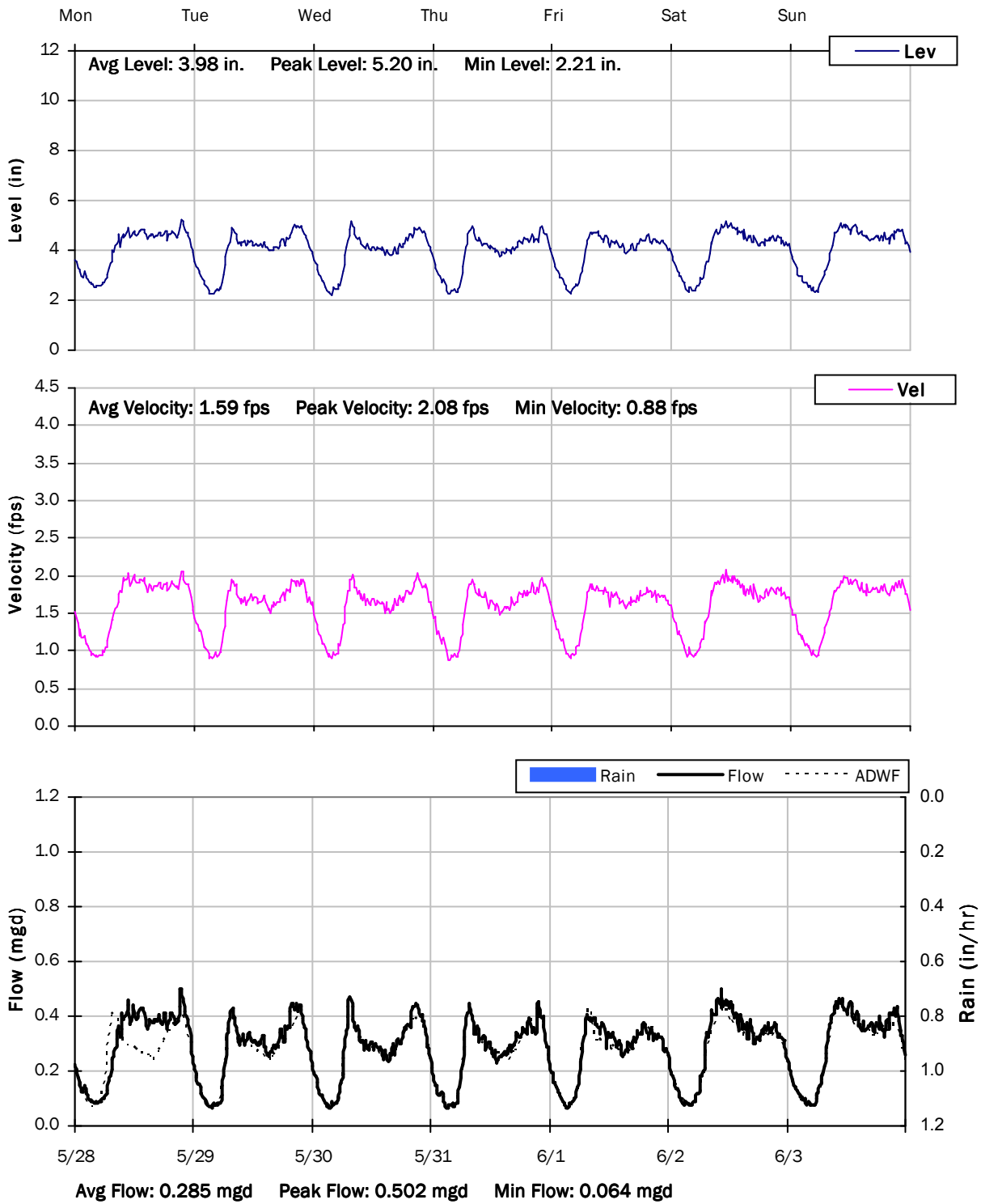
SITE 5
Weekly Level, Velocity and Flow Hydrographs
5/21/2018 to 5/28/2018



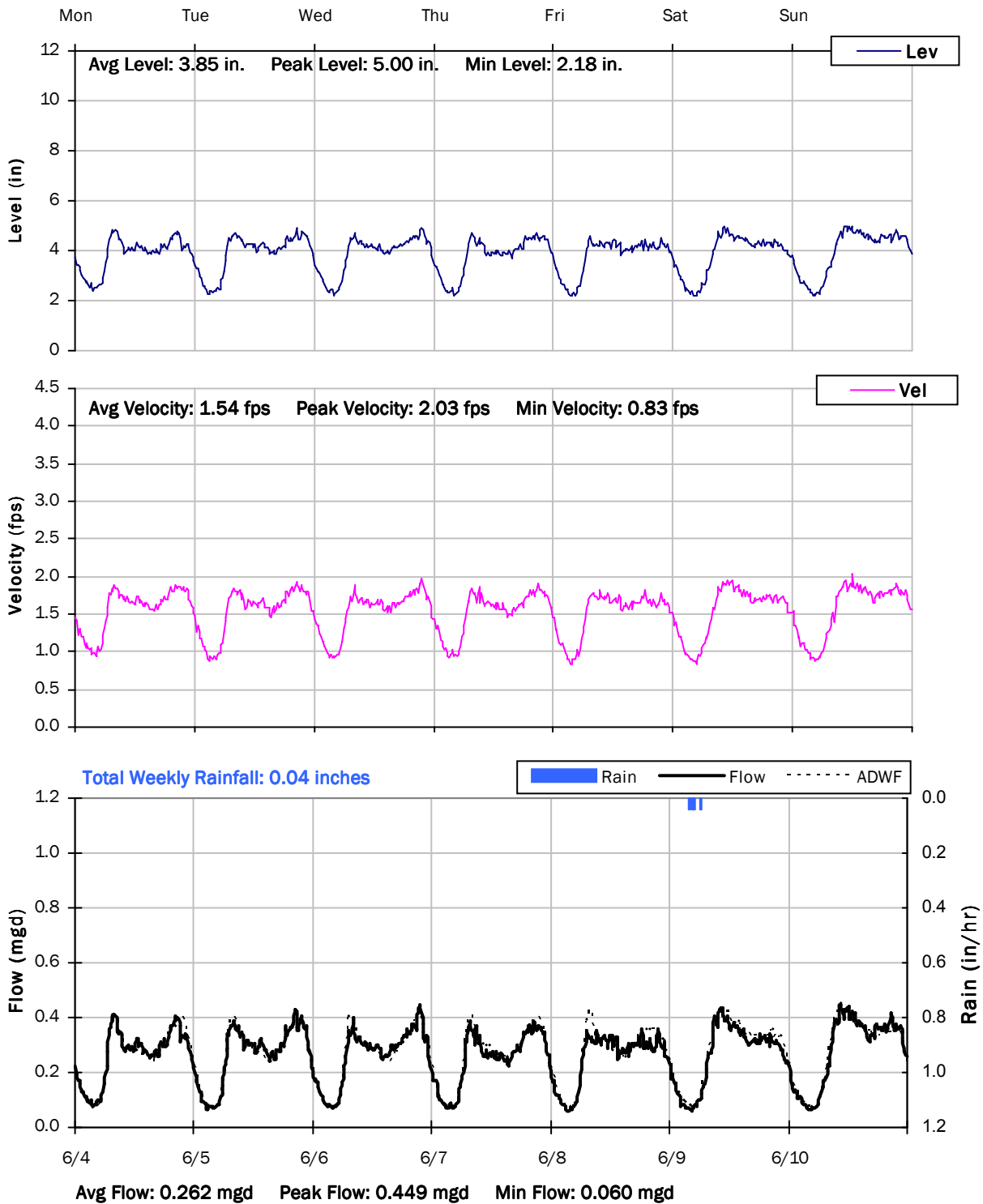
SITE 5

Weekly Level, Velocity and Flow Hydrographs

5/28/2018 to 6/4/2018



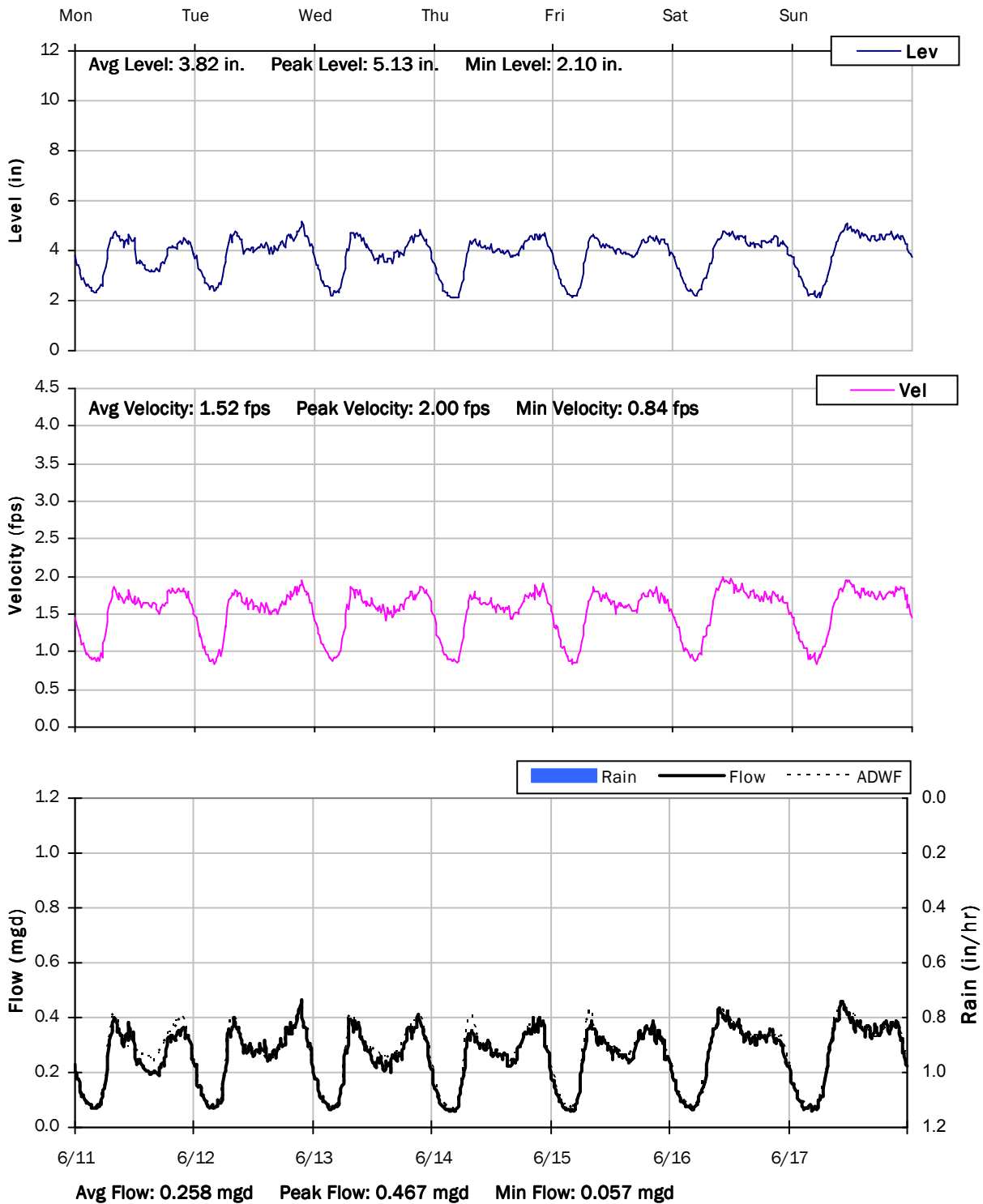
SITE 5
Weekly Level, Velocity and Flow Hydrographs
6/4/2018 to 6/11/2018



SITE 5

Weekly Level, Velocity and Flow Hydrographs

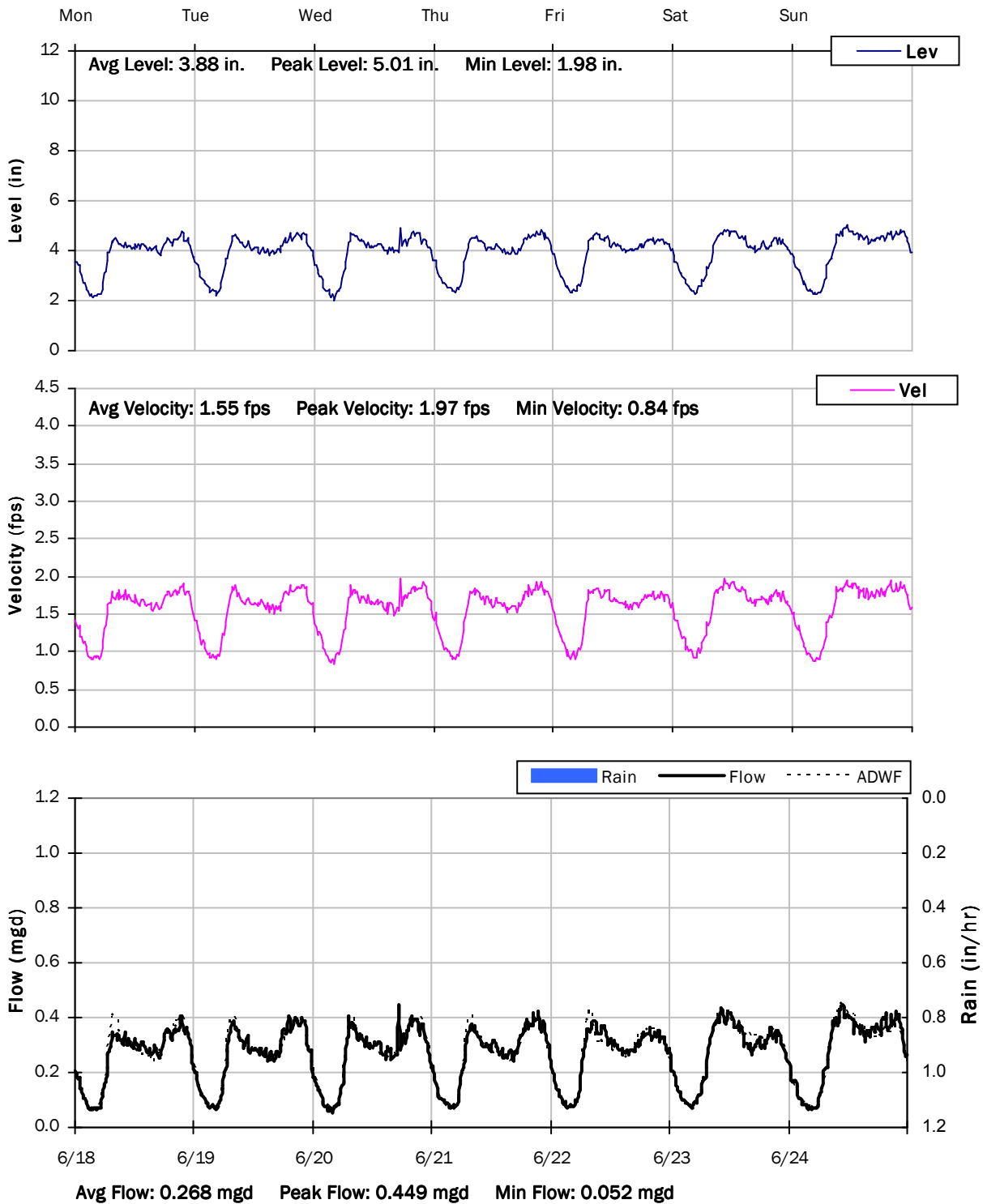
6/11/2018 to 6/18/2018



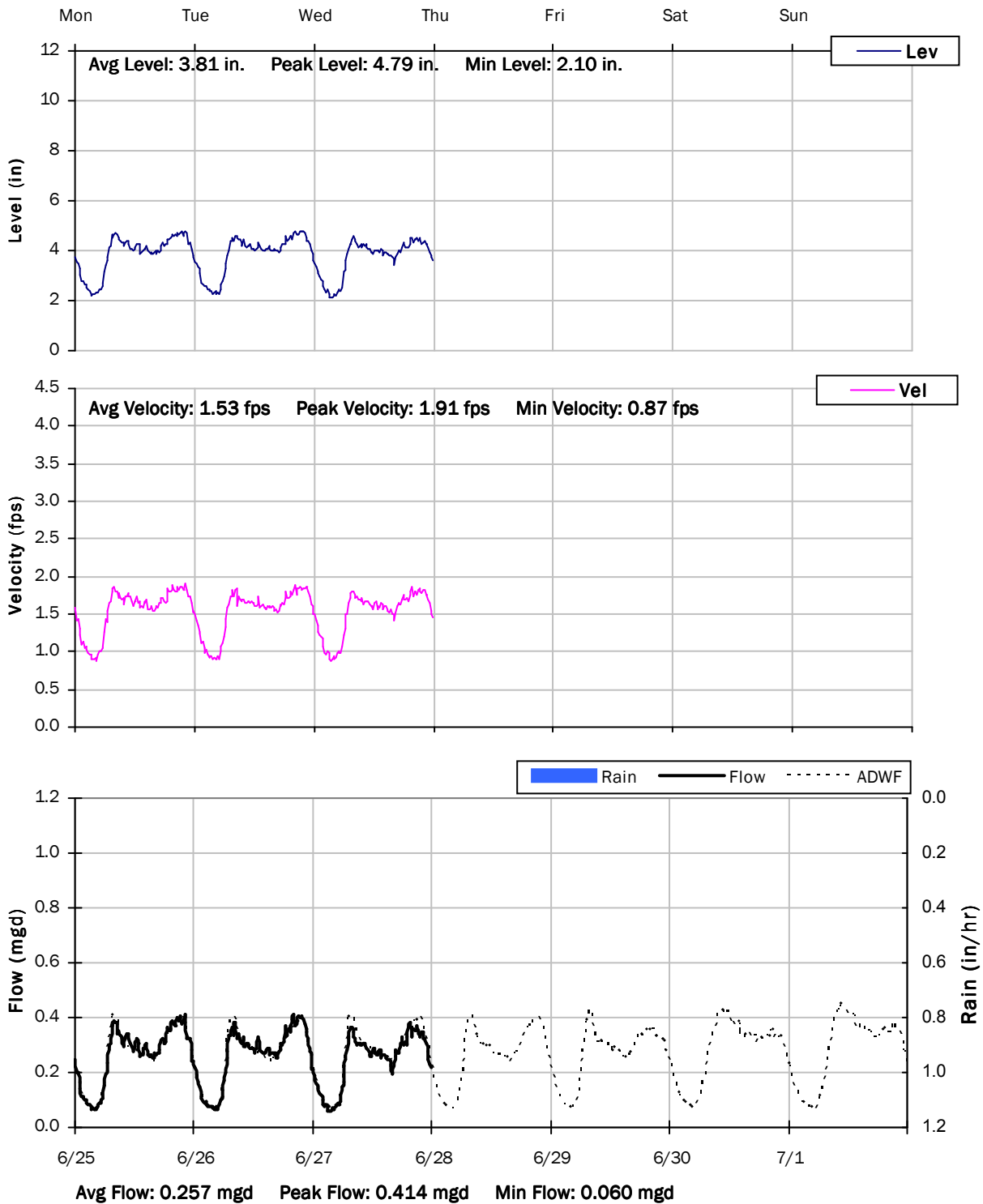
SITE 5

Weekly Level, Velocity and Flow Hydrographs

6/18/2018 to 6/25/2018



SITE 5
Weekly Level, Velocity and Flow Hydrographs
6/25/2018 to 7/2/2018

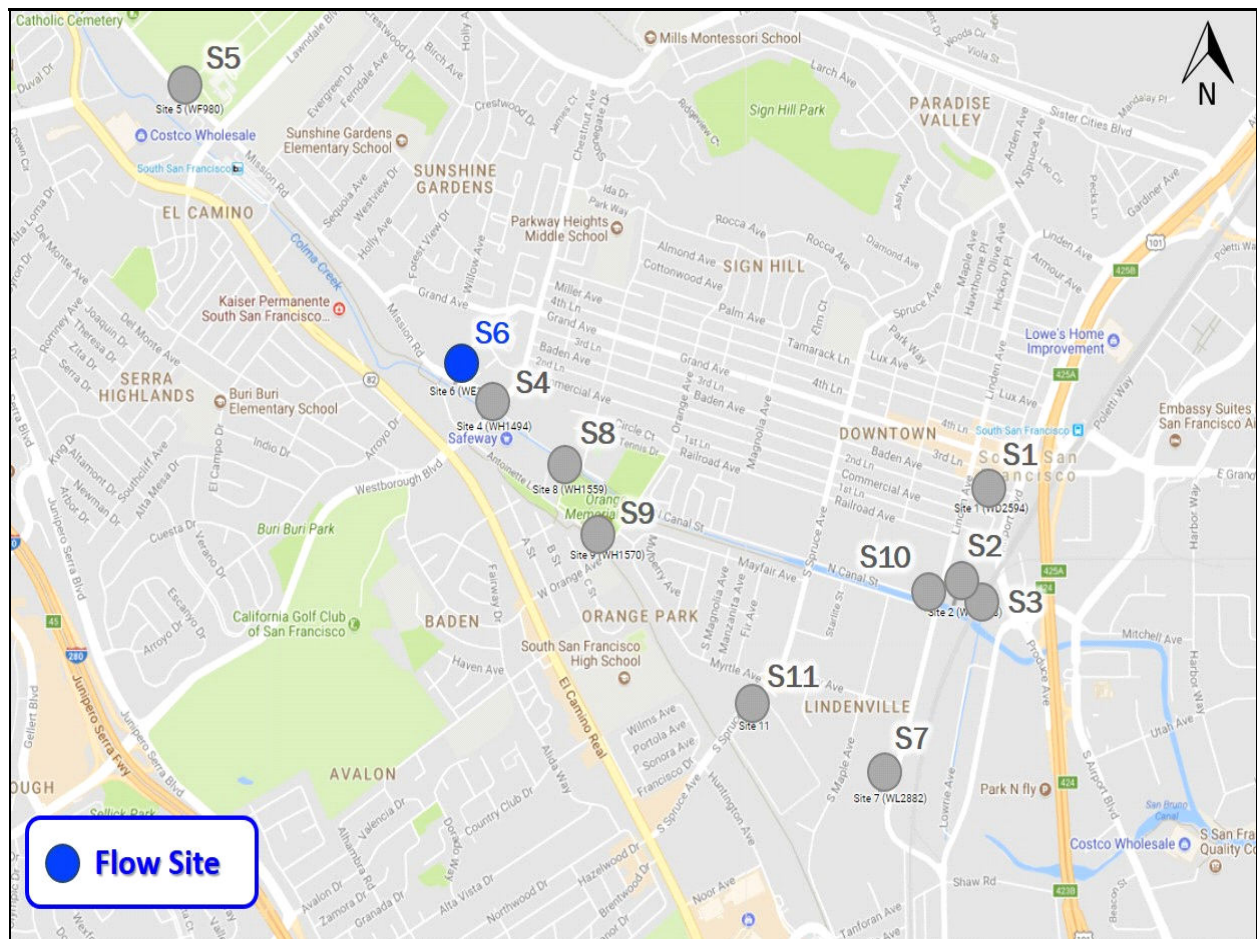


City of South San Francisco Sanitary Sewer Flow Monitoring February 26- June 28, 2018

Monitoring Site: Site 6

Location: 920 Mission Road, near Mission Glen Condos

Data Summary Report

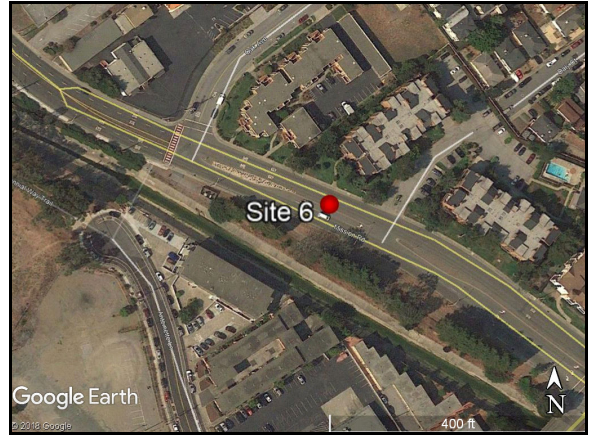


Vicinity Map: Site 6

SITE 6

Site Information

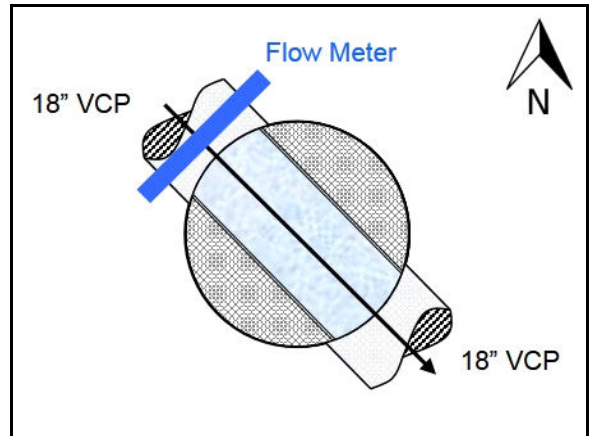
MH ID:	WE1489
Location:	920 Mission Road, near Mission Glen Condos
Coordinates:	122.4336° W, 37.6574° N
Rim Elevation (Earth):	39 feet
Pipe Diameter:	18 inches
Sediment:	0.00 inches
ADWF:	1.200 mgd
Peak Measured Flow:	5.146 mgd



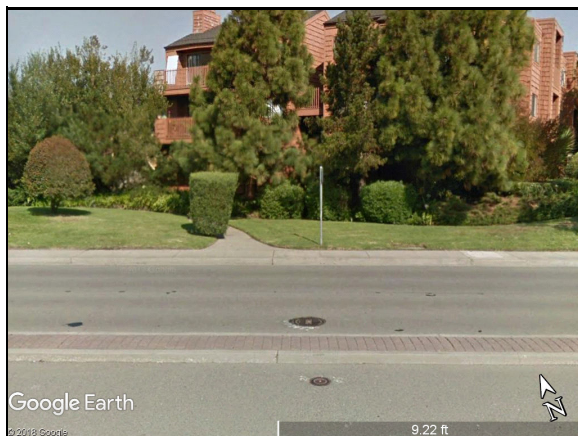
Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 6

Additional Site Photos

Effluent Pipe



Influent Pipe

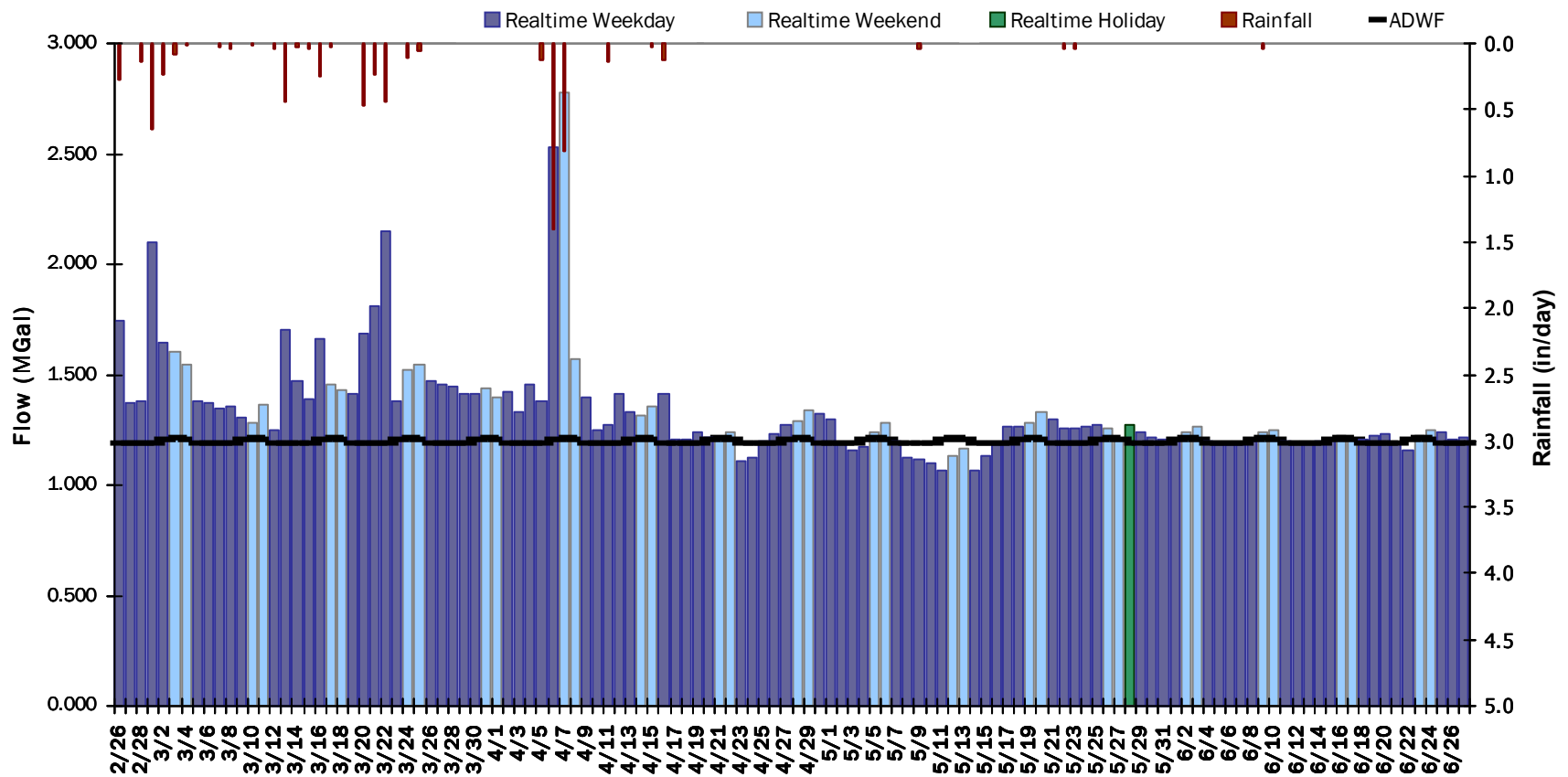


SITE 6

Period Flow Summary: Daily Flow Totals

Avg Period Flow: 1.338 MGal Peak Daily Flow: 2.775 MGal Min Daily Flow: 1.062 MGal

Total Period Rainfall: 6.13 inches



SITE 6

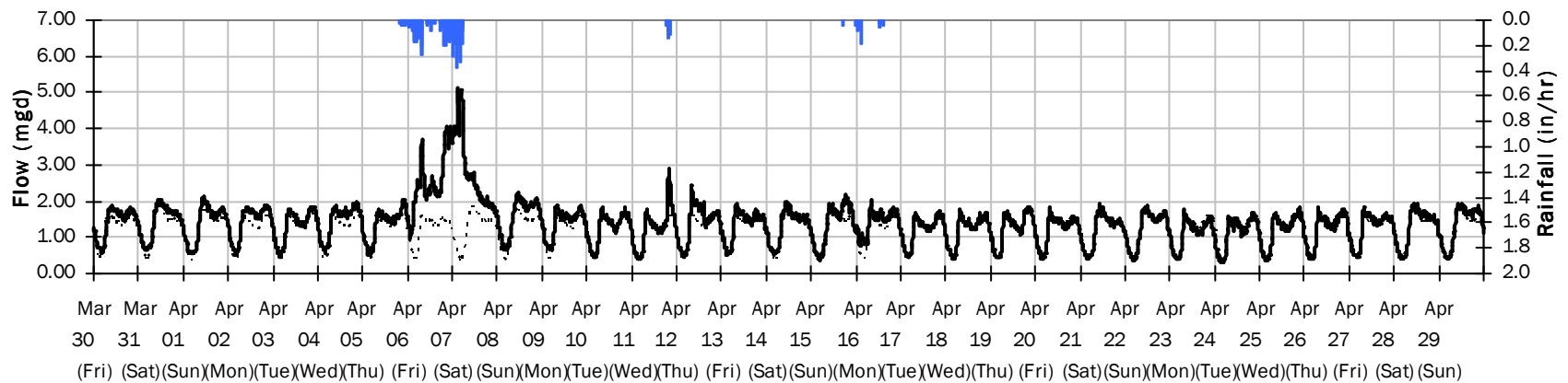
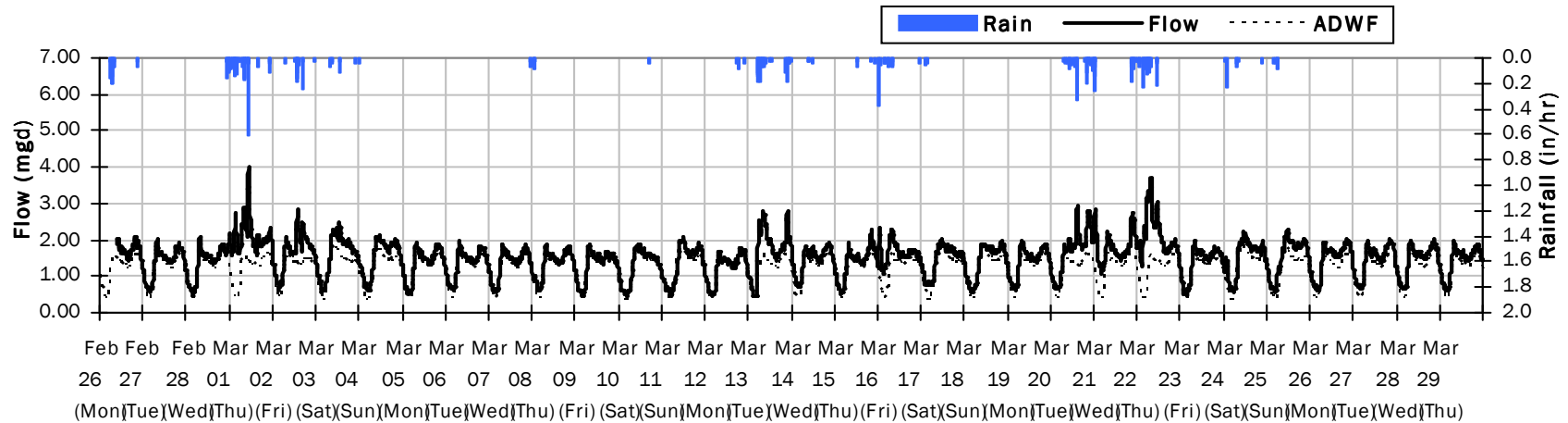
Flow Summary: 2/26/2018 to 4/29/2018

Total Period Rainfall: 6.22 inches

Avg Flow: 1.455 mgd

Peak Flow: 5.146 mgd

Min Flow: 0.313 mgd



SITE 6

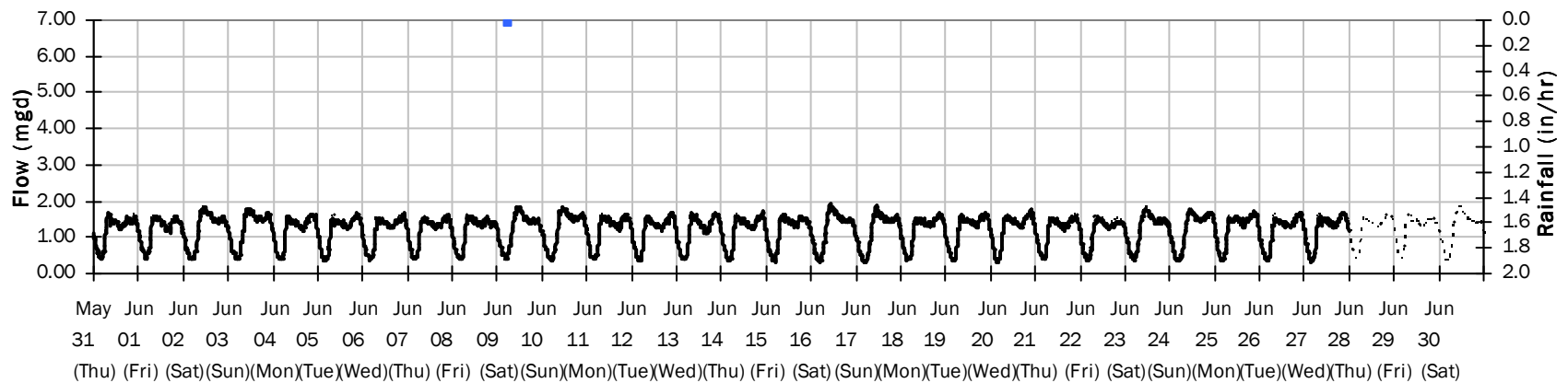
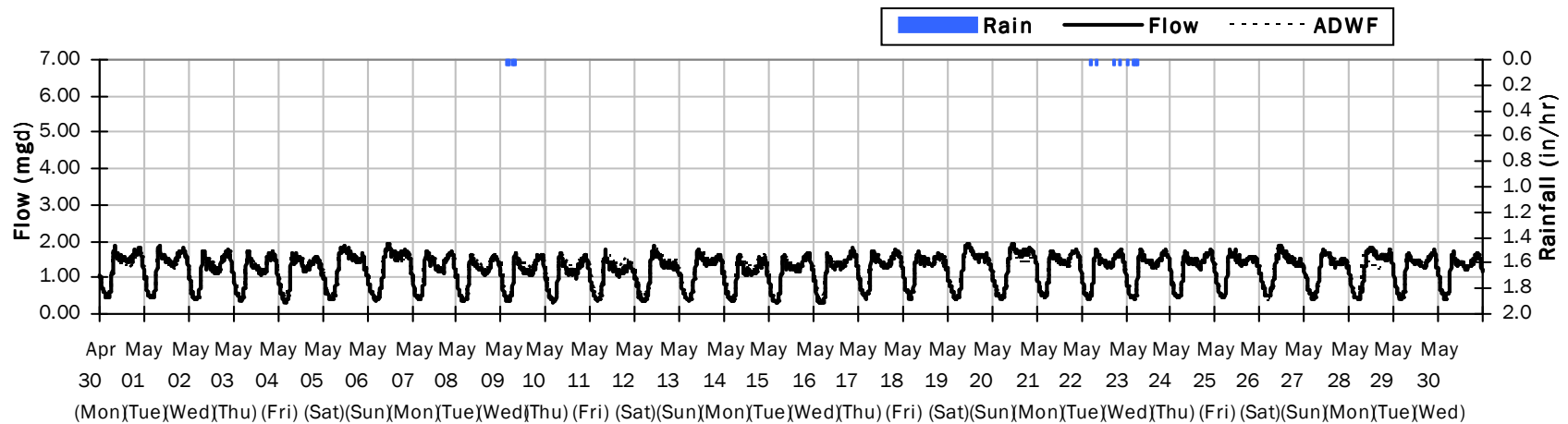
Flow Summary: 4/30/2018 to 6/30/2018

Total Period Rainfall: 0.16 inches

Avg Flow: 1.212 mgd

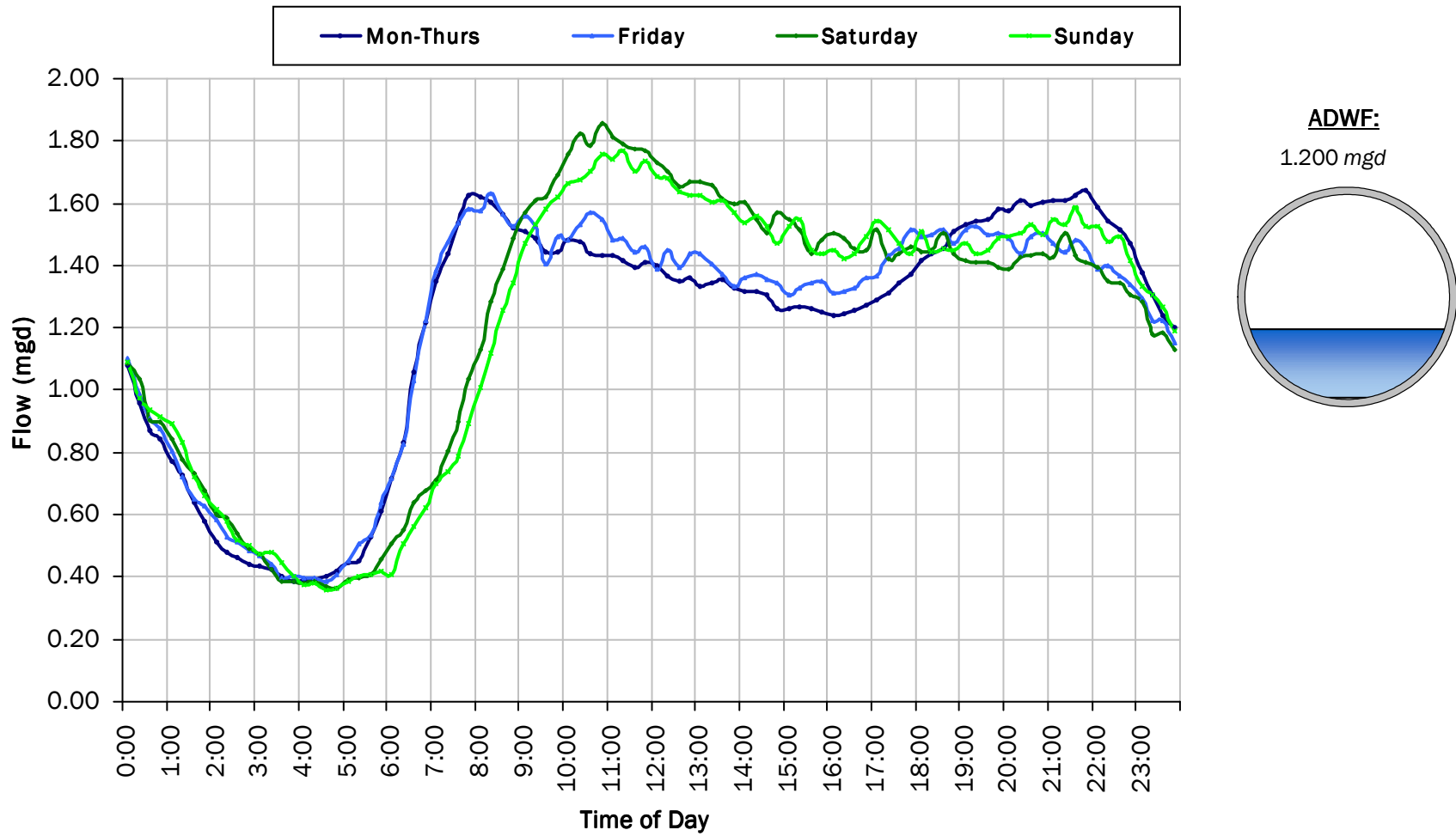
Peak Flow: 1.942 mgd

Min Flow: 0.296 mgd



SITE 6

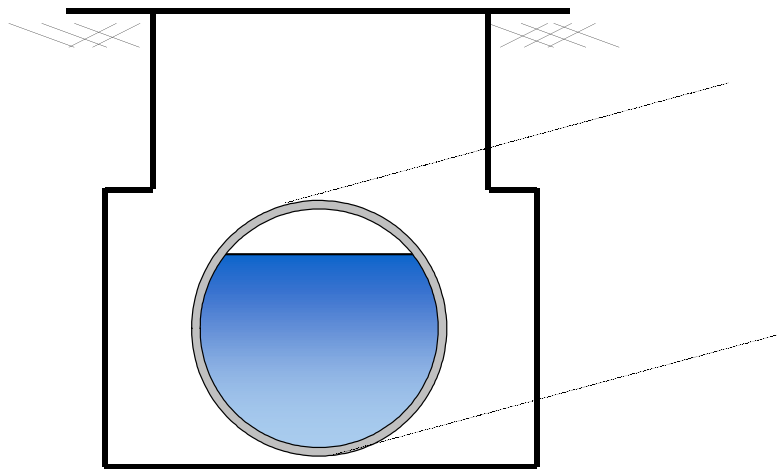
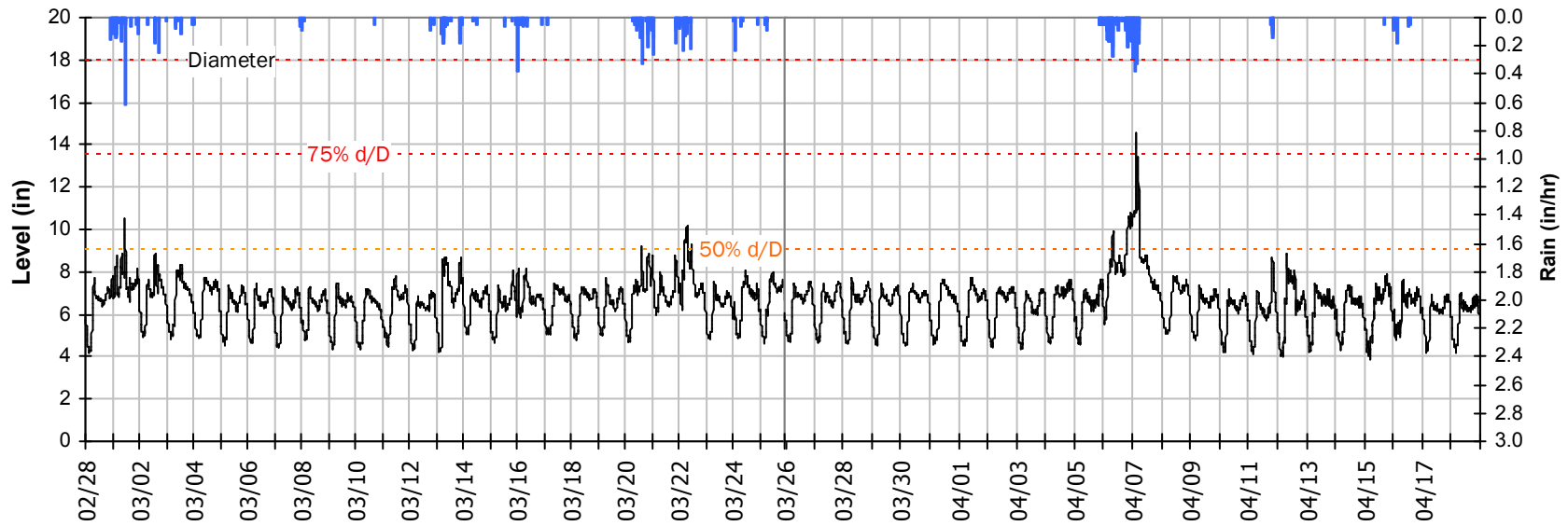
Average Dry Weather Flow Hydrographs



SITE 6

Site Capacity and Surge Summary

Realtime Flow Levels with Rainfall Data over Monitoring (High Capacity) Period

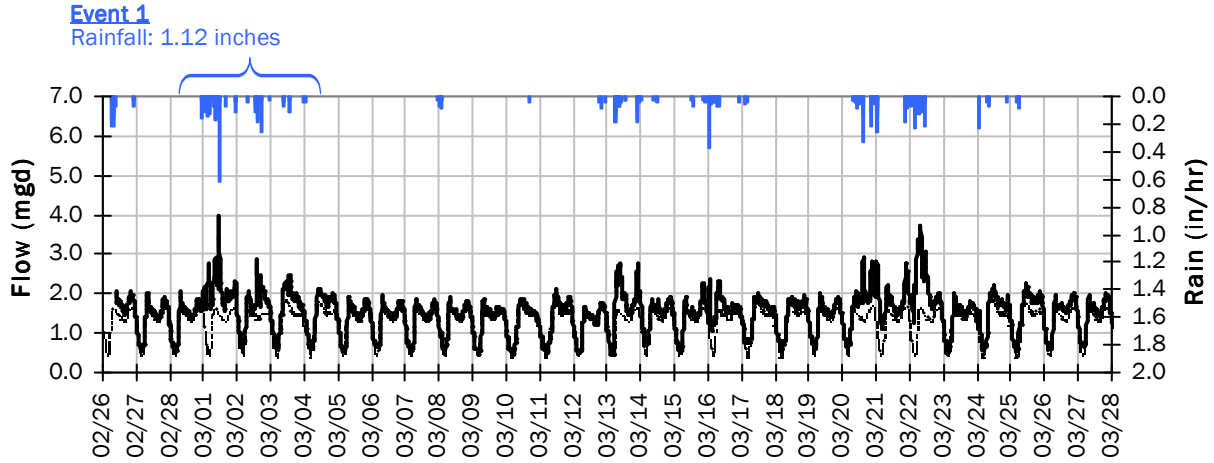


Pipe Diameter: 18 inches
Peak Measured Level: 14.5 inches
Peak d/D Ratio: 0.81

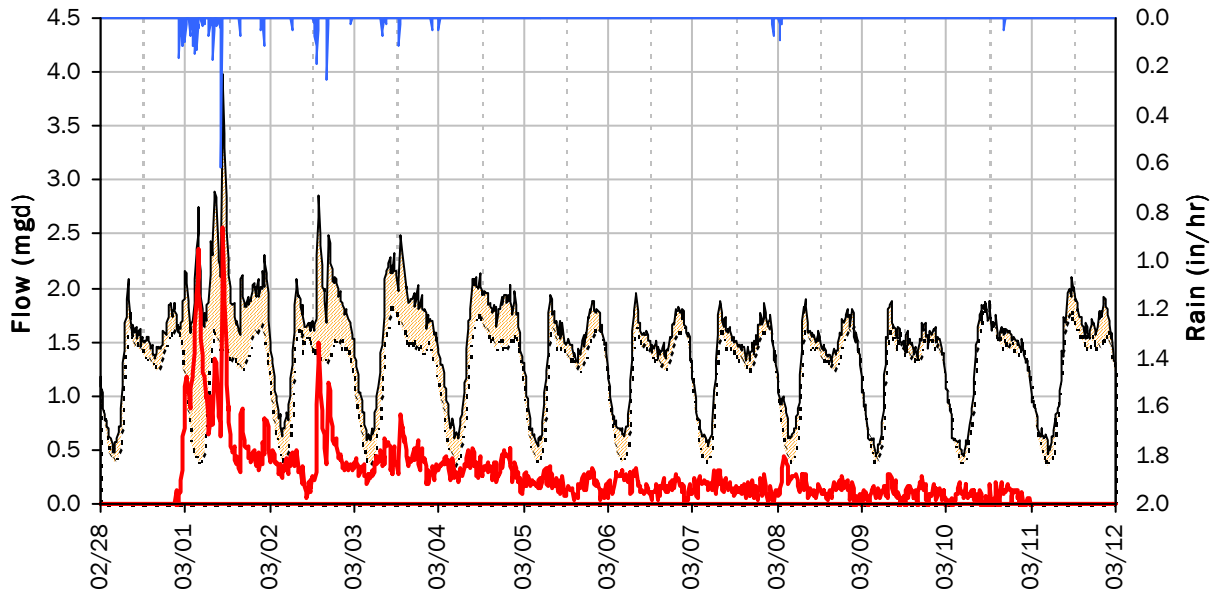
SITE 6

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



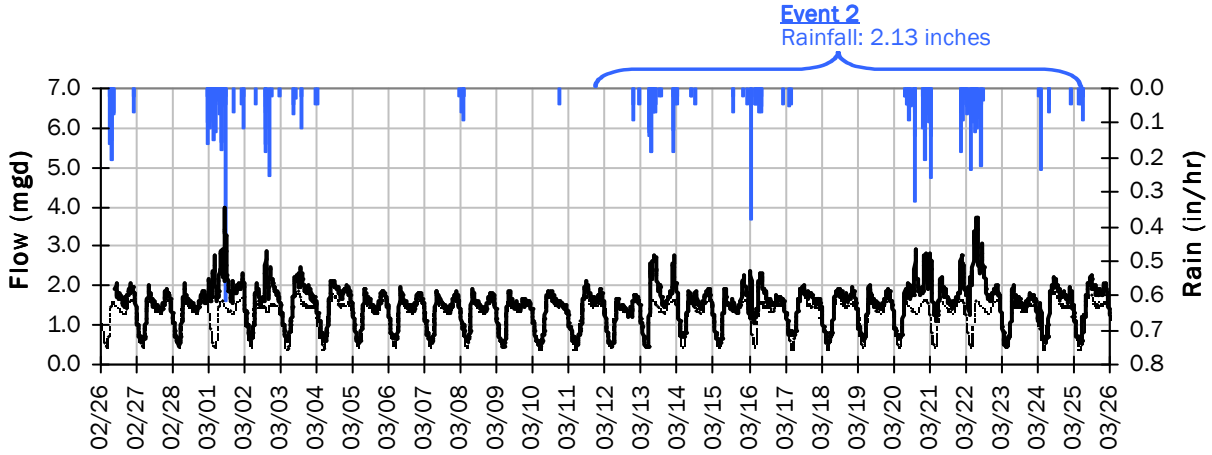
Storm Event I/I Analysis (Rain = 1.12 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	3.99 <i>mgd</i>	Peak I/I Rate:	2.56 <i>mgd</i>
PF:	3.32	Total I/I:	2,940,000 <i>gallons</i>
Peak Level:	10.55 <i>in</i>		
d/D Ratio:	0.59		

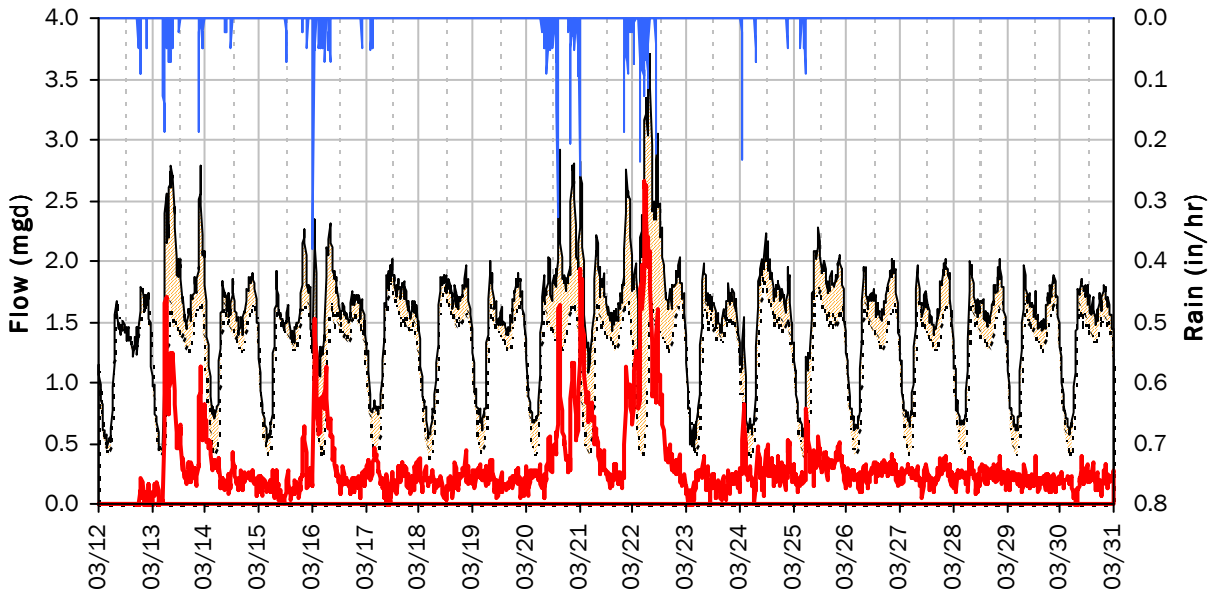
SITE 6

I/I Summary: Event 2

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 2 Detail Graph



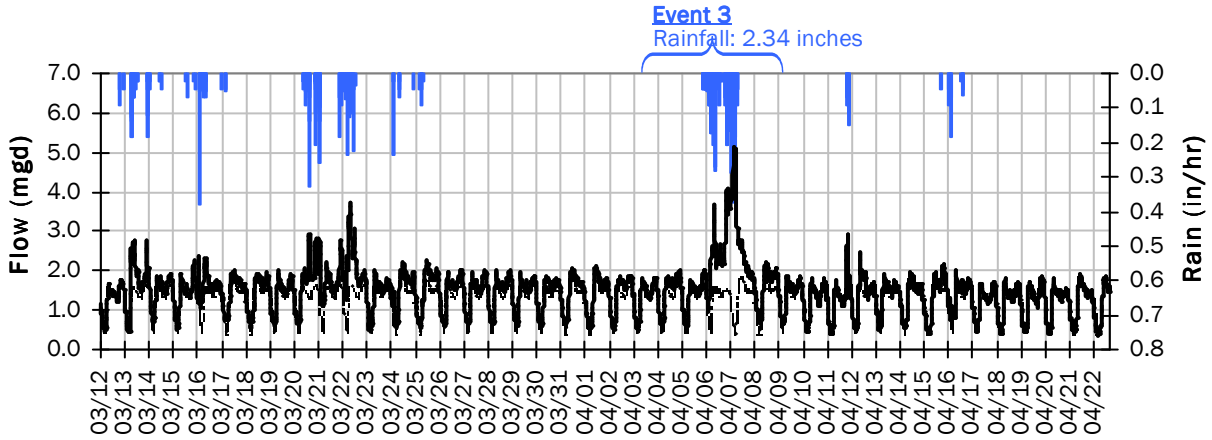
Storm Event I/I Analysis (Rain = 2.13 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	3.70 mgd	Peak I/I Rate:	2.65 mgd
PF:	3.09	Total I/I:	5,889,000 gallons
Peak Level:	10.21 in		
d/D Ratio:	0.57		

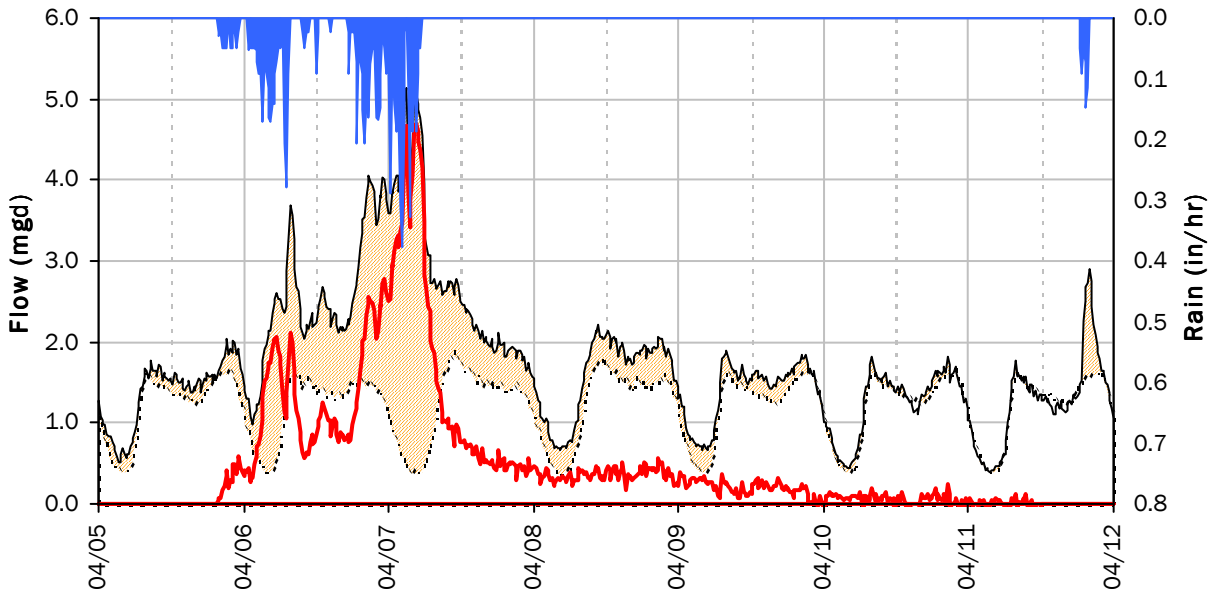
SITE 6

I/I Summary: Event 3

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 3 Detail Graph



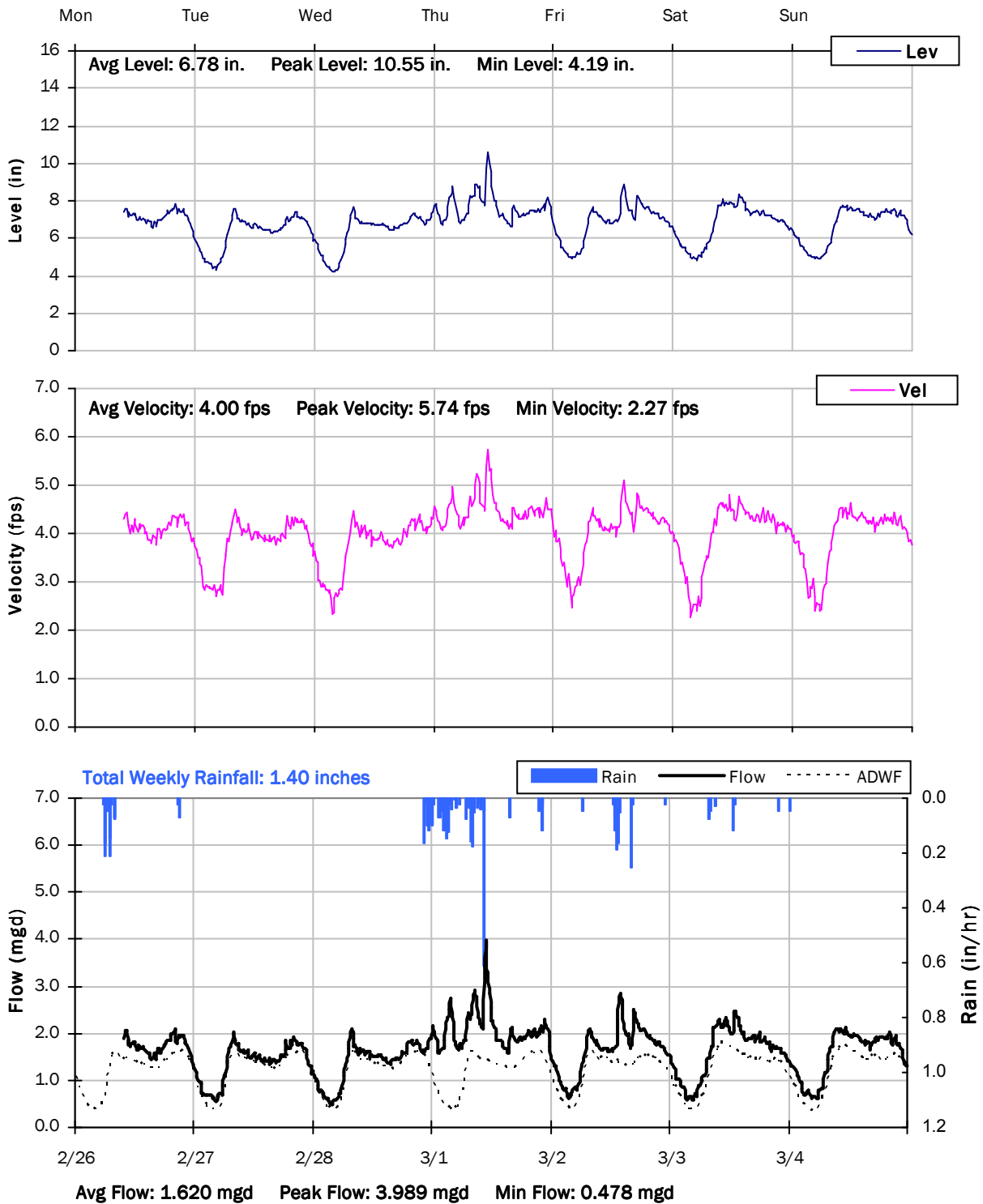
Storm Event I/I Analysis (Rain = 2.34 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	5.15 mgd	Peak I/I Rate:	4.70 mgd
PF:	4.29	Total I/I:	3,563,000 gallons
Peak Level:	14.52 in		
d/D Ratio:	0.81		

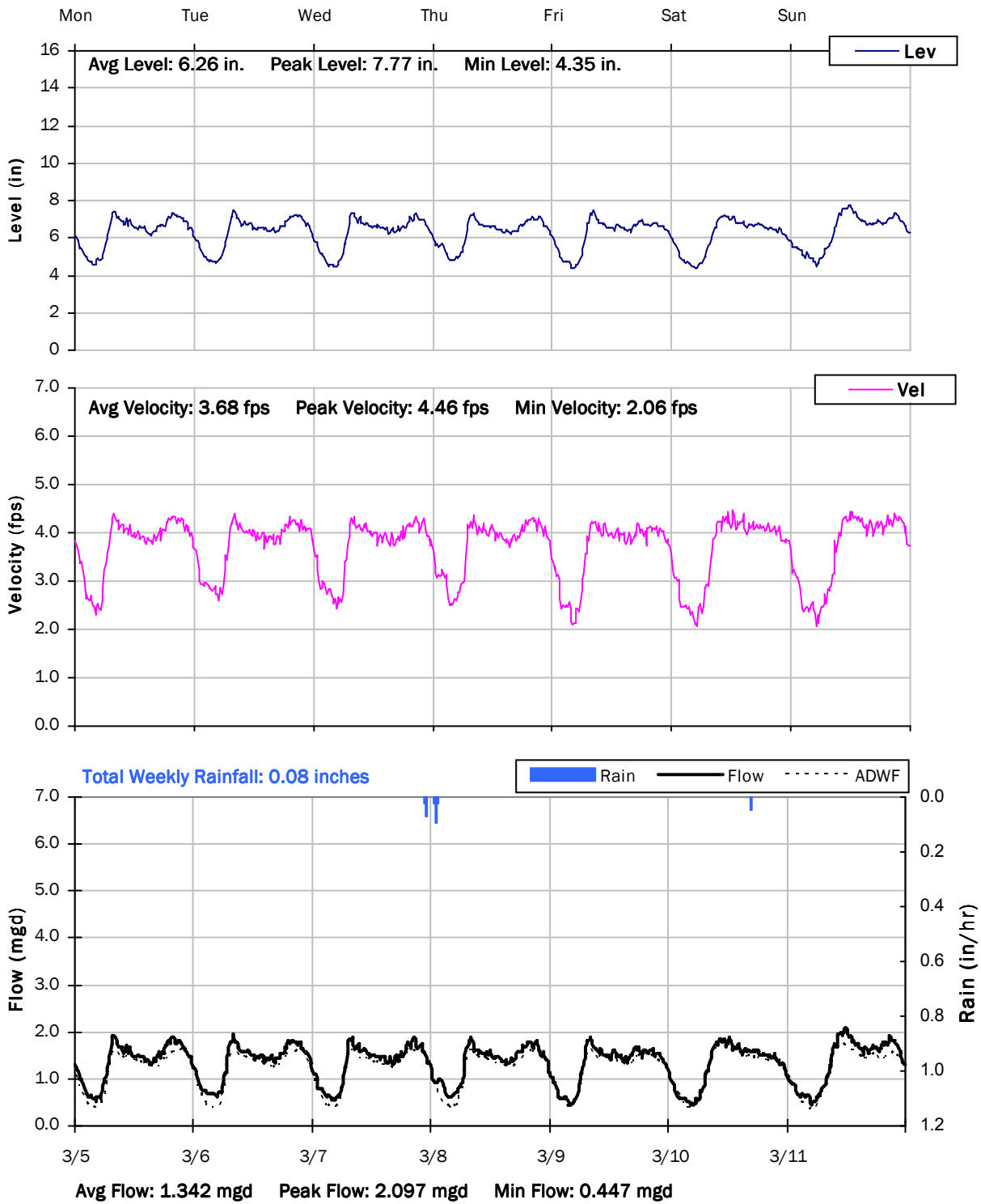
SITE 6

Weekly Level, Velocity and Flow Hydrographs

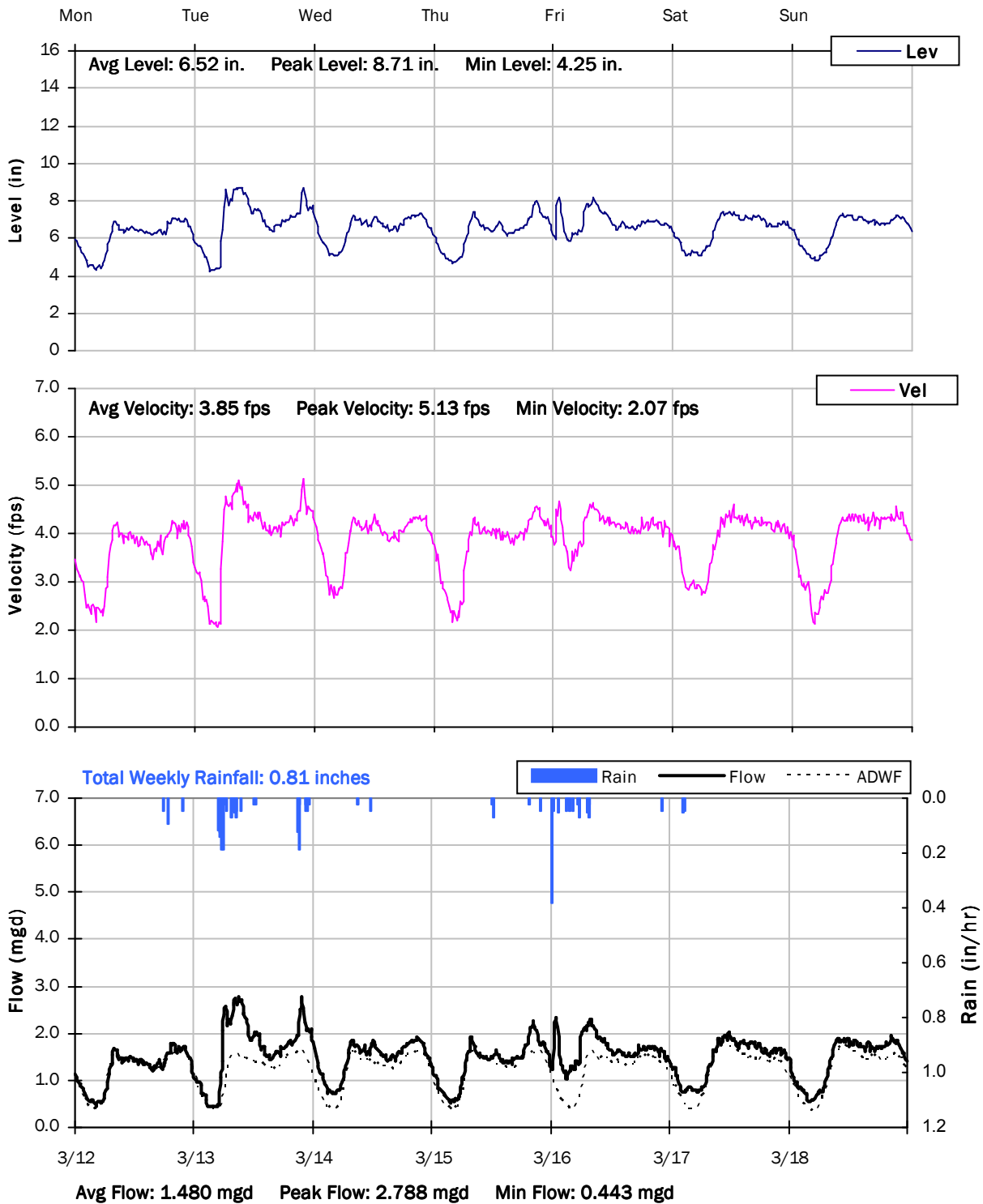
2/26/2018 to 3/5/2018



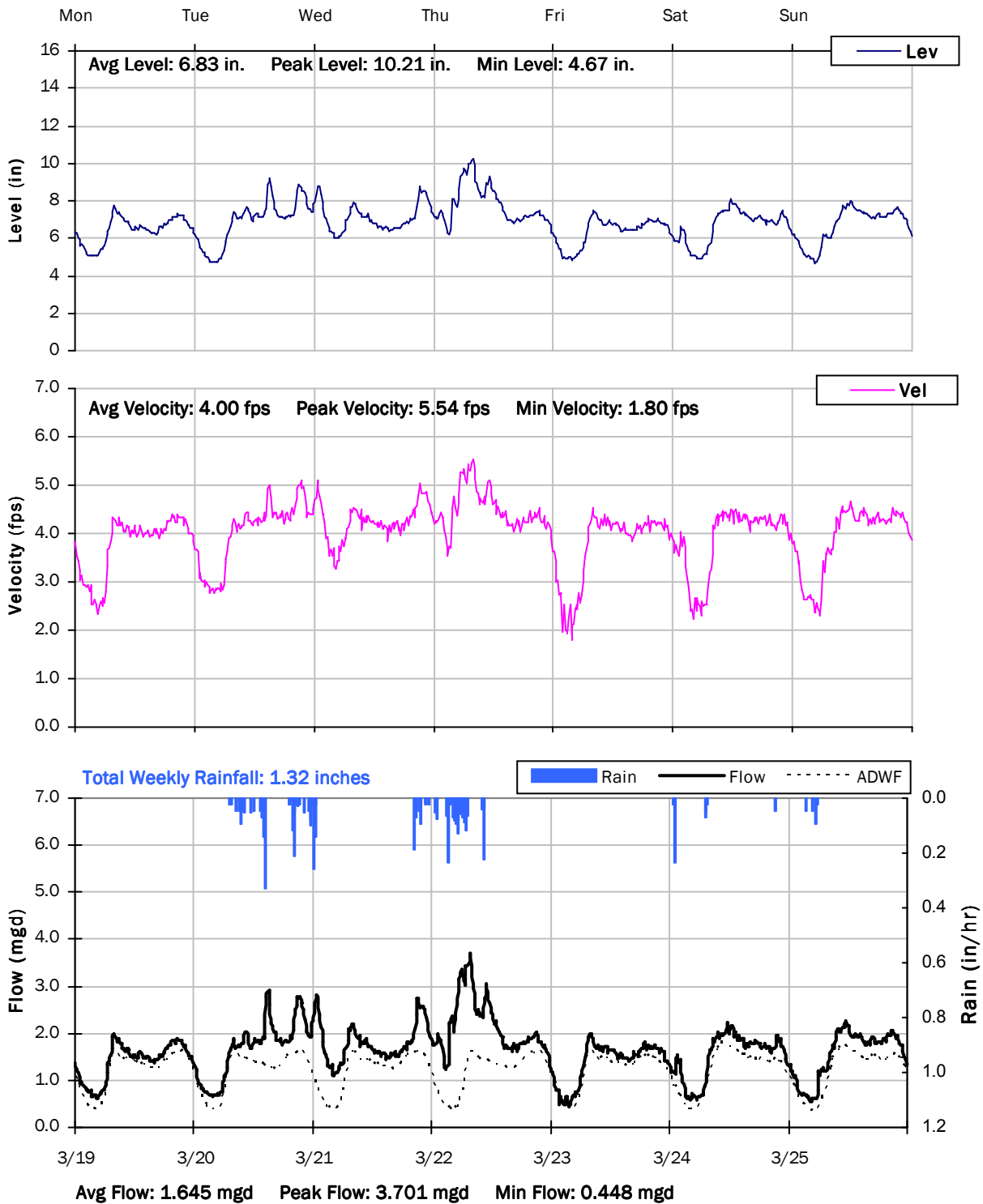
SITE 6
Weekly Level, Velocity and Flow Hydrographs
3/5/2018 to 3/12/2018



SITE 6
Weekly Level, Velocity and Flow Hydrographs
3/12/2018 to 3/19/2018



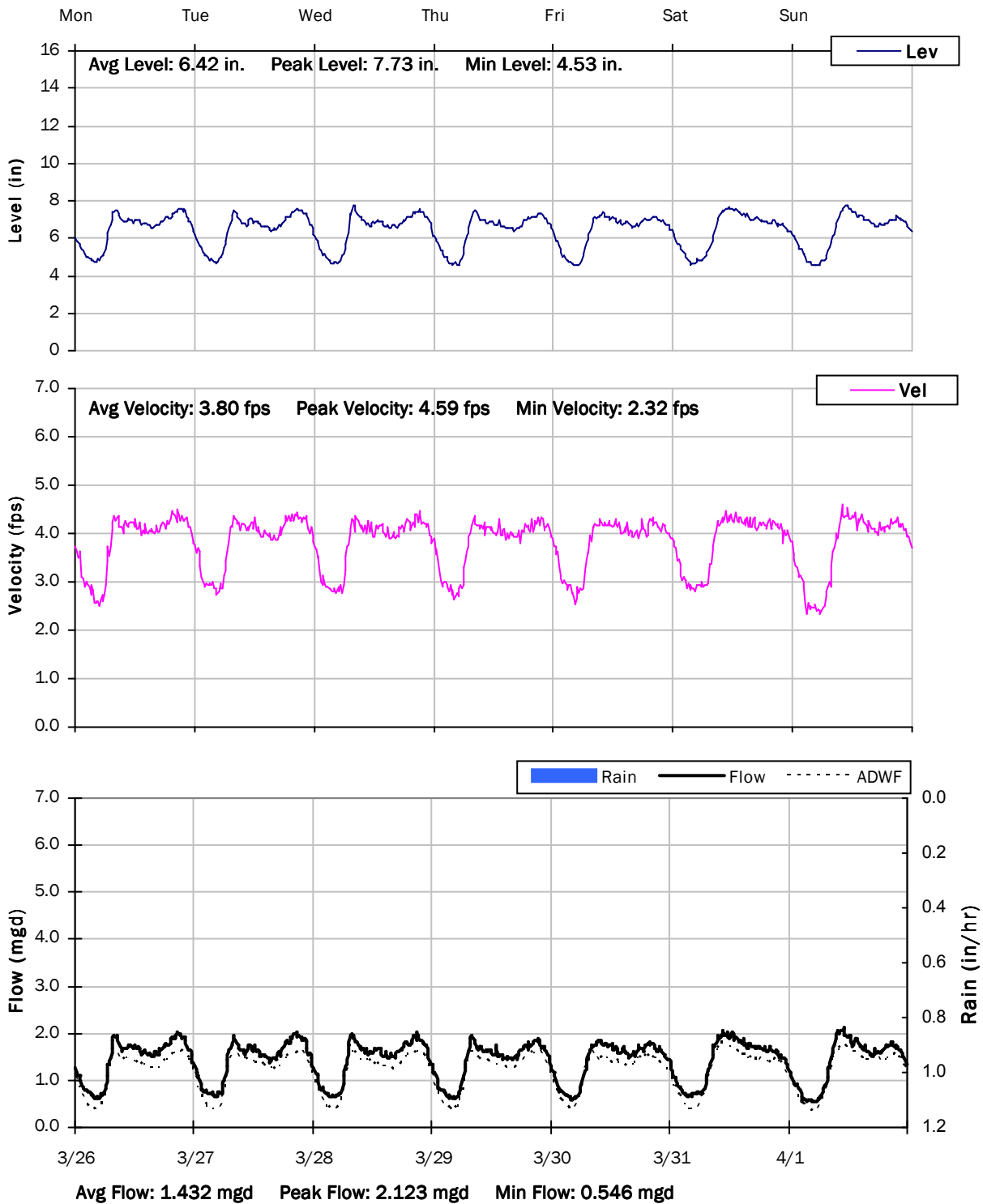
SITE 6
Weekly Level, Velocity and Flow Hydrographs
3/19/2018 to 3/26/2018



SITE 6

Weekly Level, Velocity and Flow Hydrographs

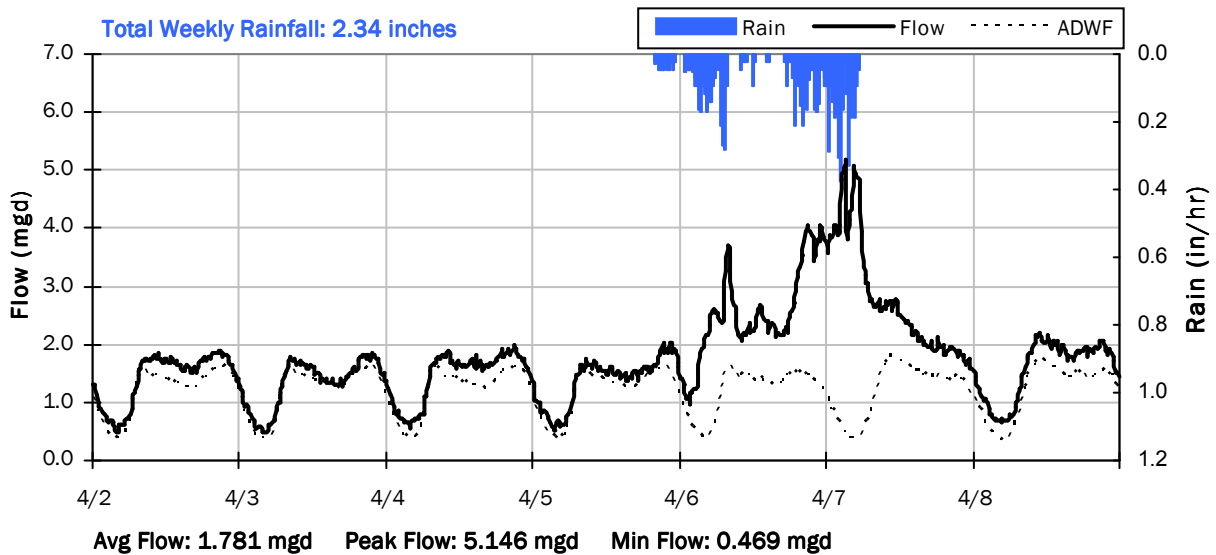
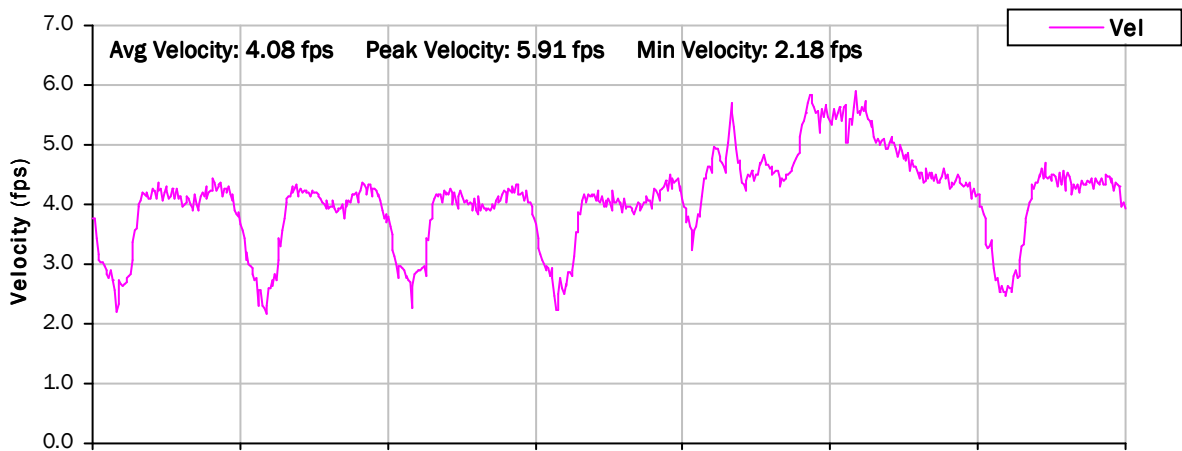
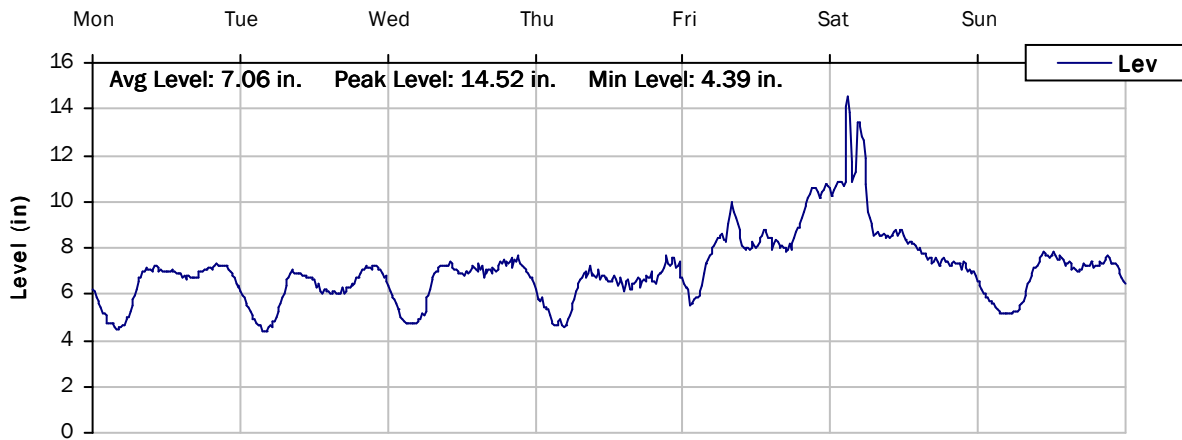
3/26/2018 to 4/2/2018



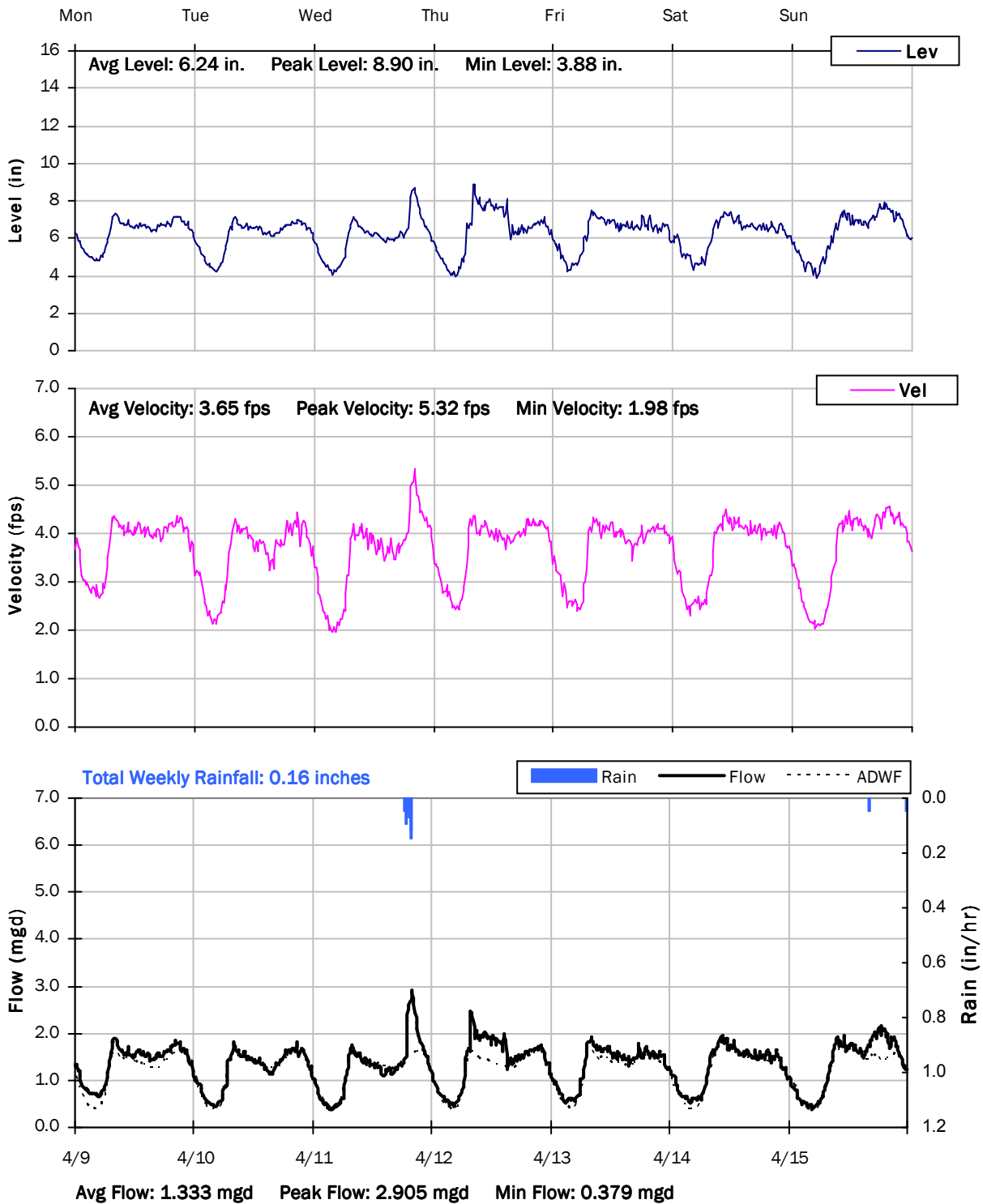
SITE 6

Weekly Level, Velocity and Flow Hydrographs

4/2/2018 to 4/9/2018



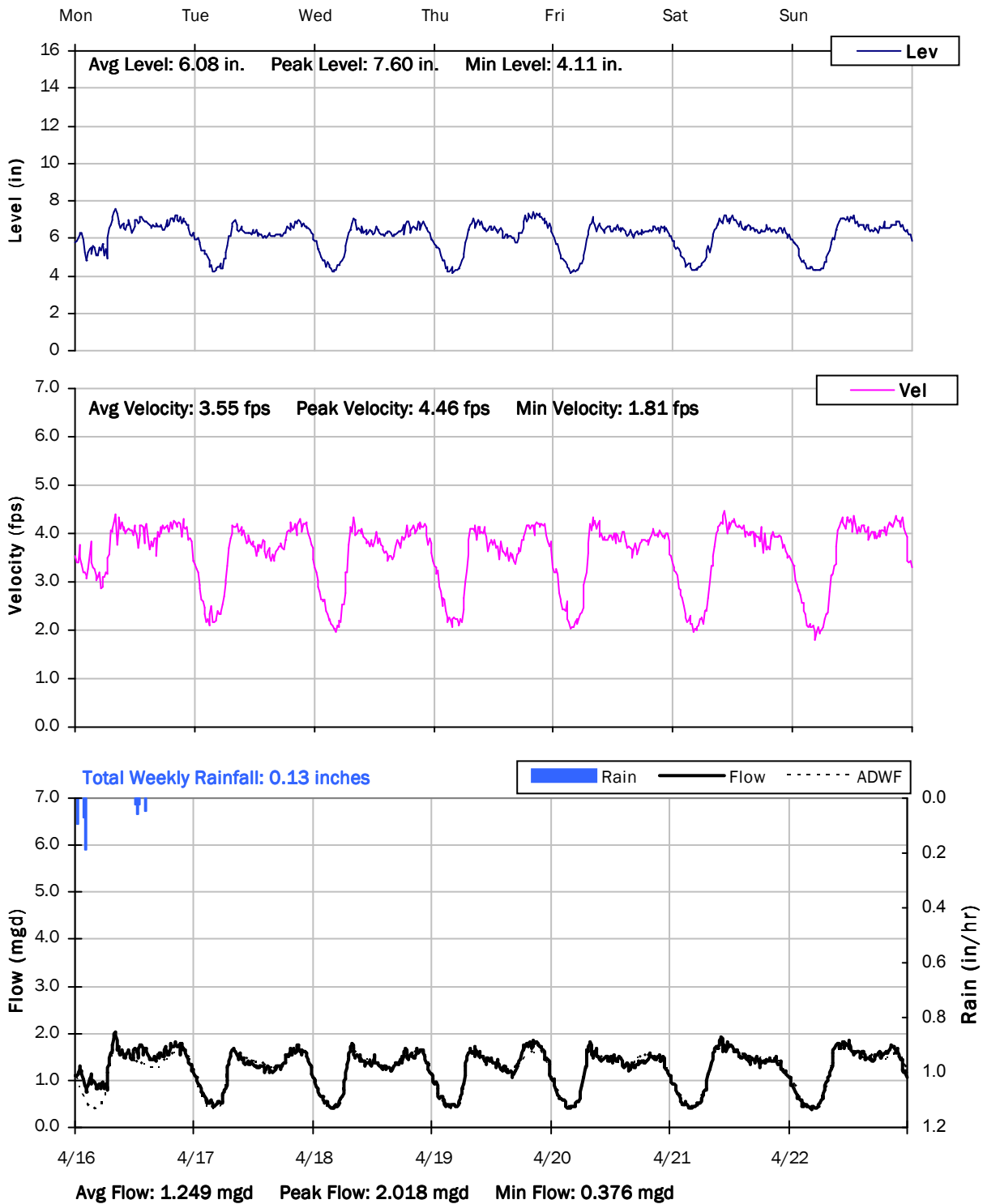
SITE 6
Weekly Level, Velocity and Flow Hydrographs
4/9/2018 to 4/16/2018



SITE 6

Weekly Level, Velocity and Flow Hydrographs

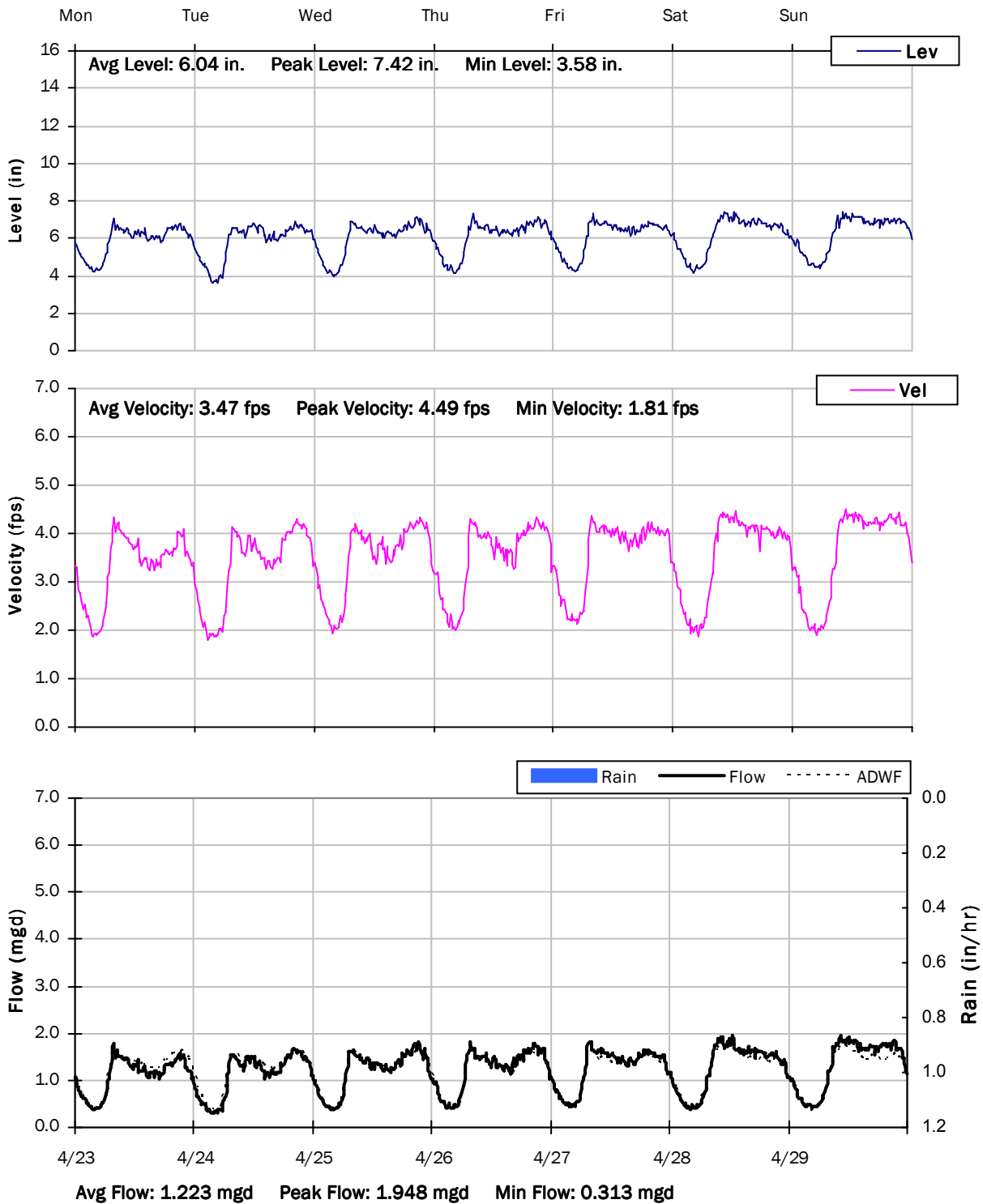
4/16/2018 to 4/23/2018



SITE 6

Weekly Level, Velocity and Flow Hydrographs

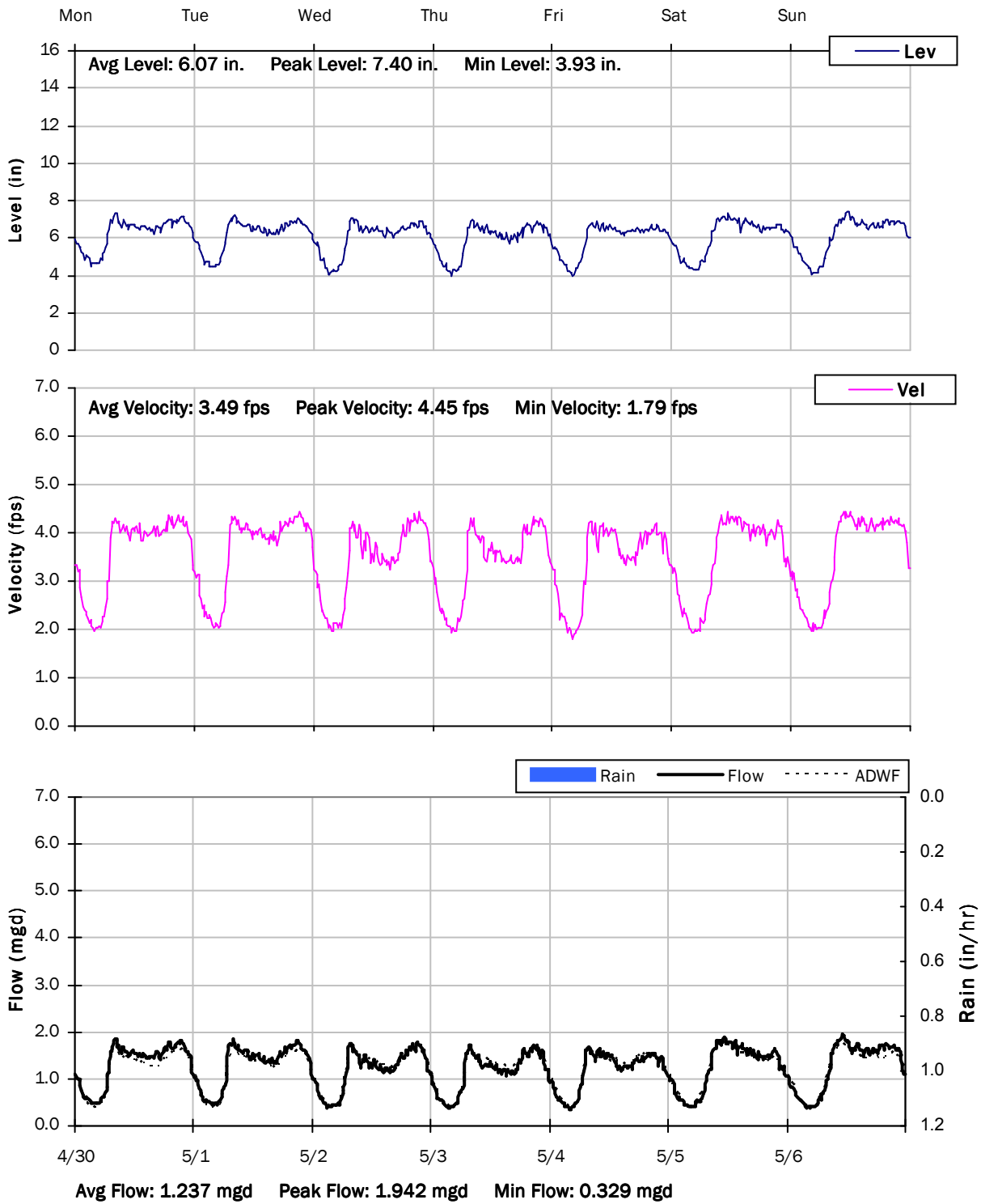
4/23/2018 to 4/30/2018



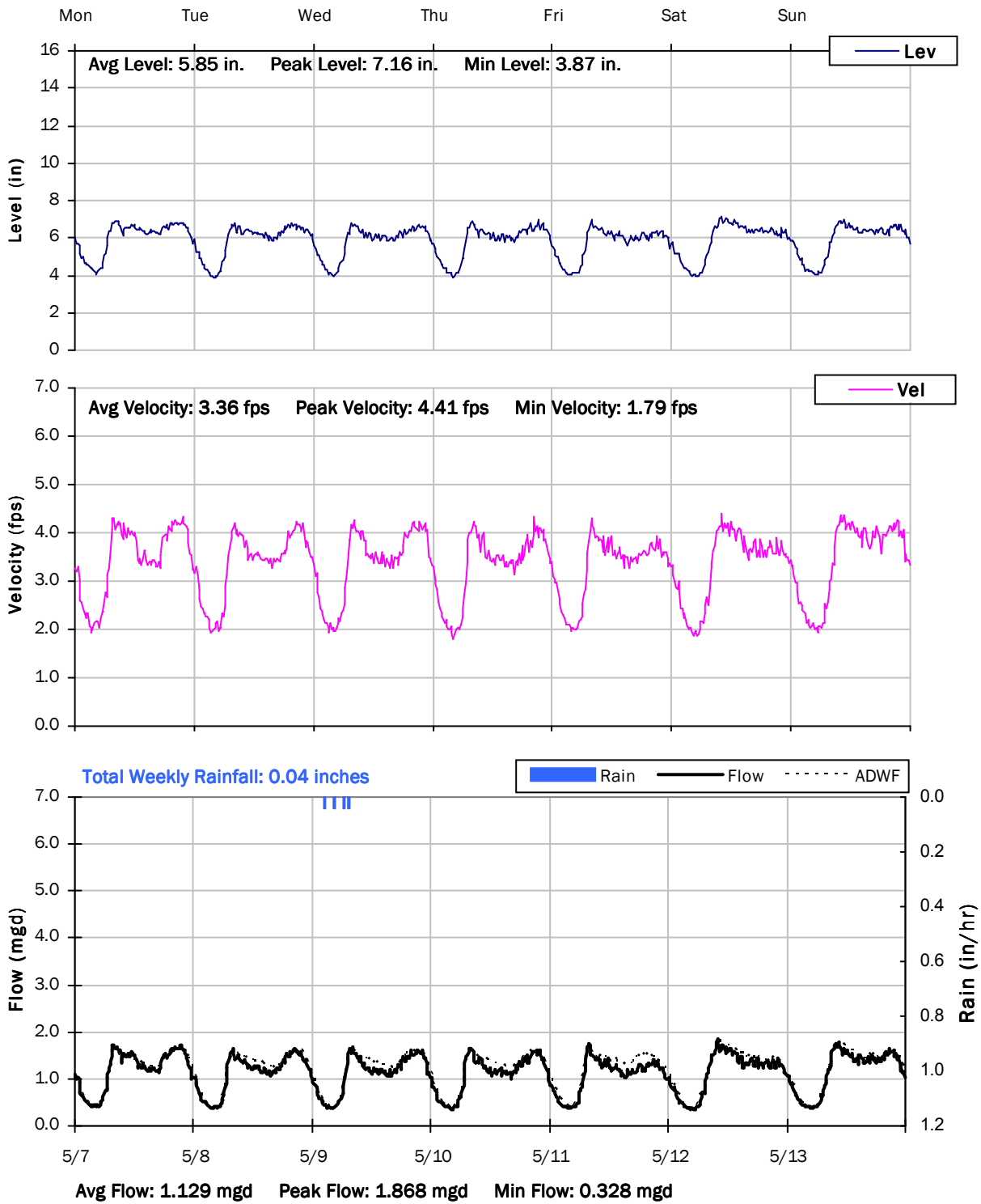
SITE 6

Weekly Level, Velocity and Flow Hydrographs

4/30/2018 to 5/7/2018



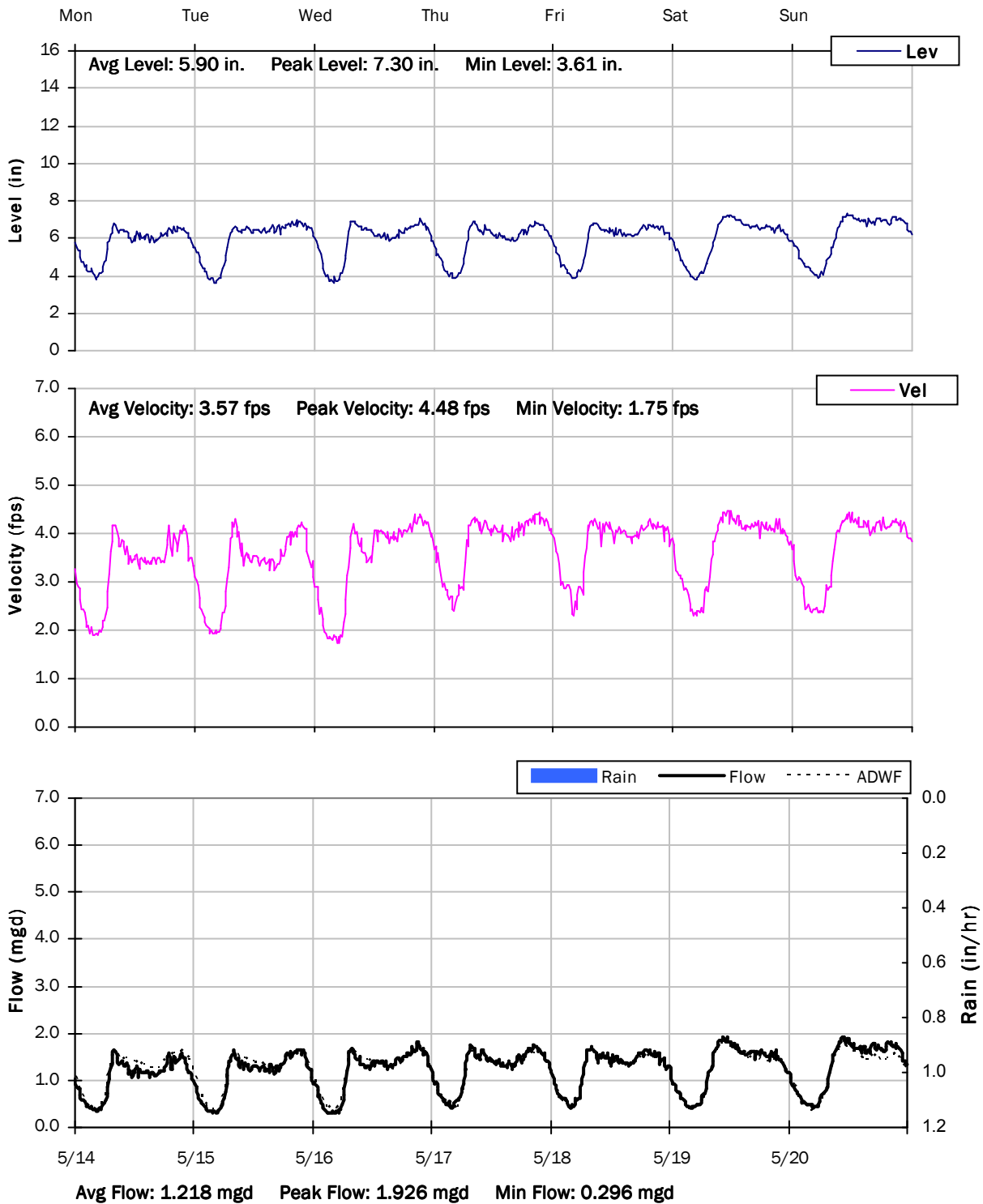
SITE 6
Weekly Level, Velocity and Flow Hydrographs
5/7/2018 to 5/14/2018



SITE 6

Weekly Level, Velocity and Flow Hydrographs

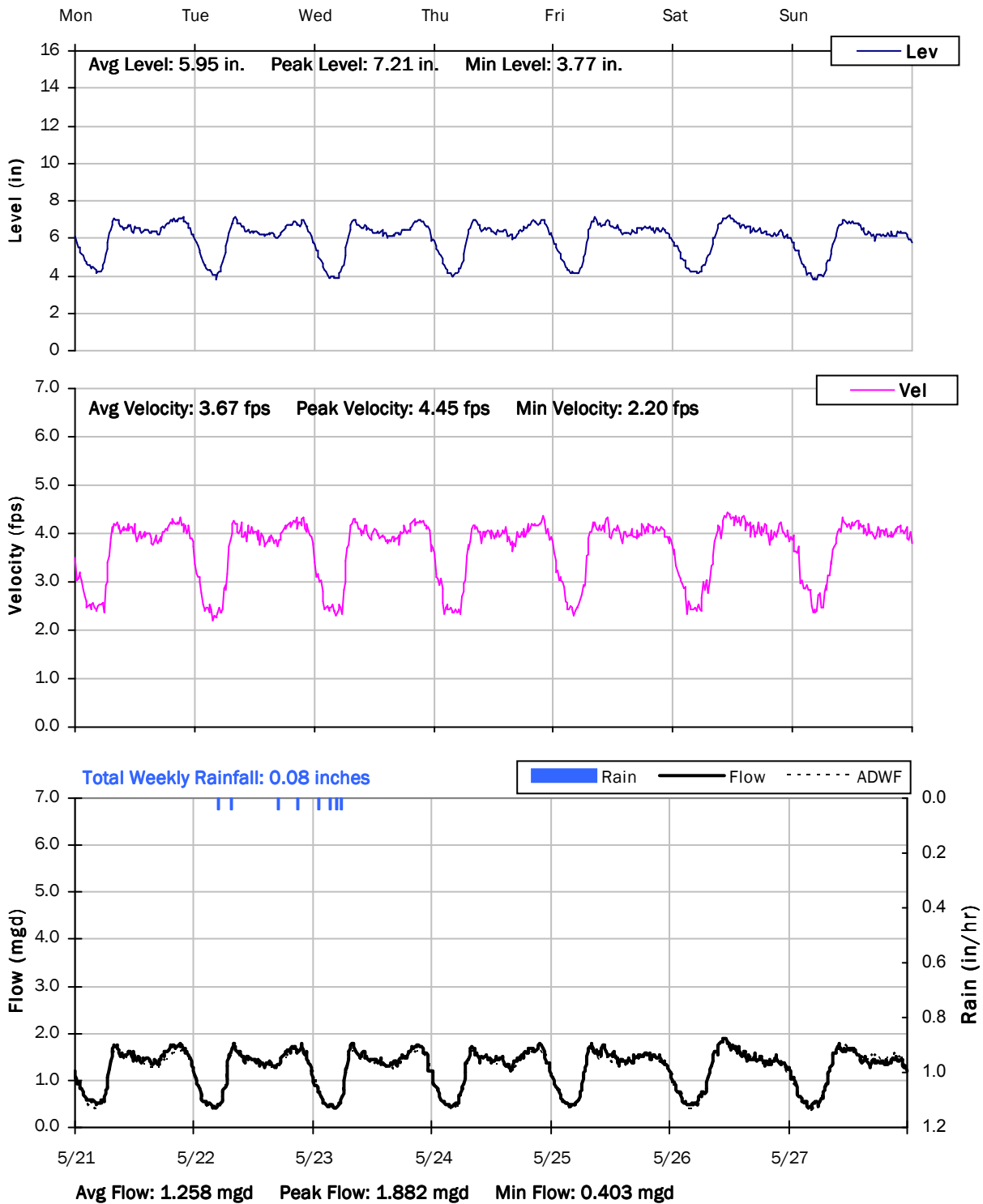
5/14/2018 to 5/21/2018



SITE 6

Weekly Level, Velocity and Flow Hydrographs

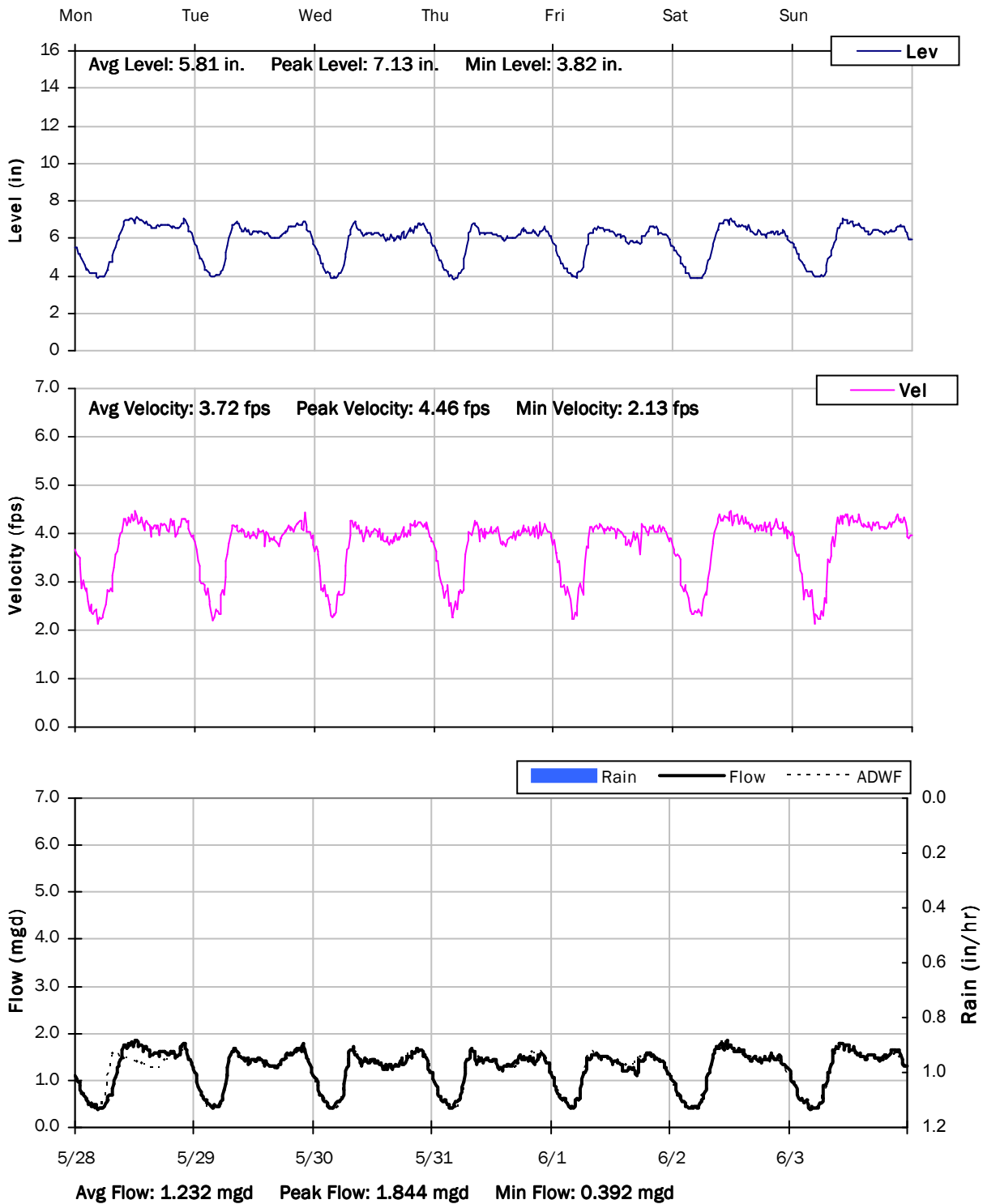
5/21/2018 to 5/28/2018



SITE 6

Weekly Level, Velocity and Flow Hydrographs

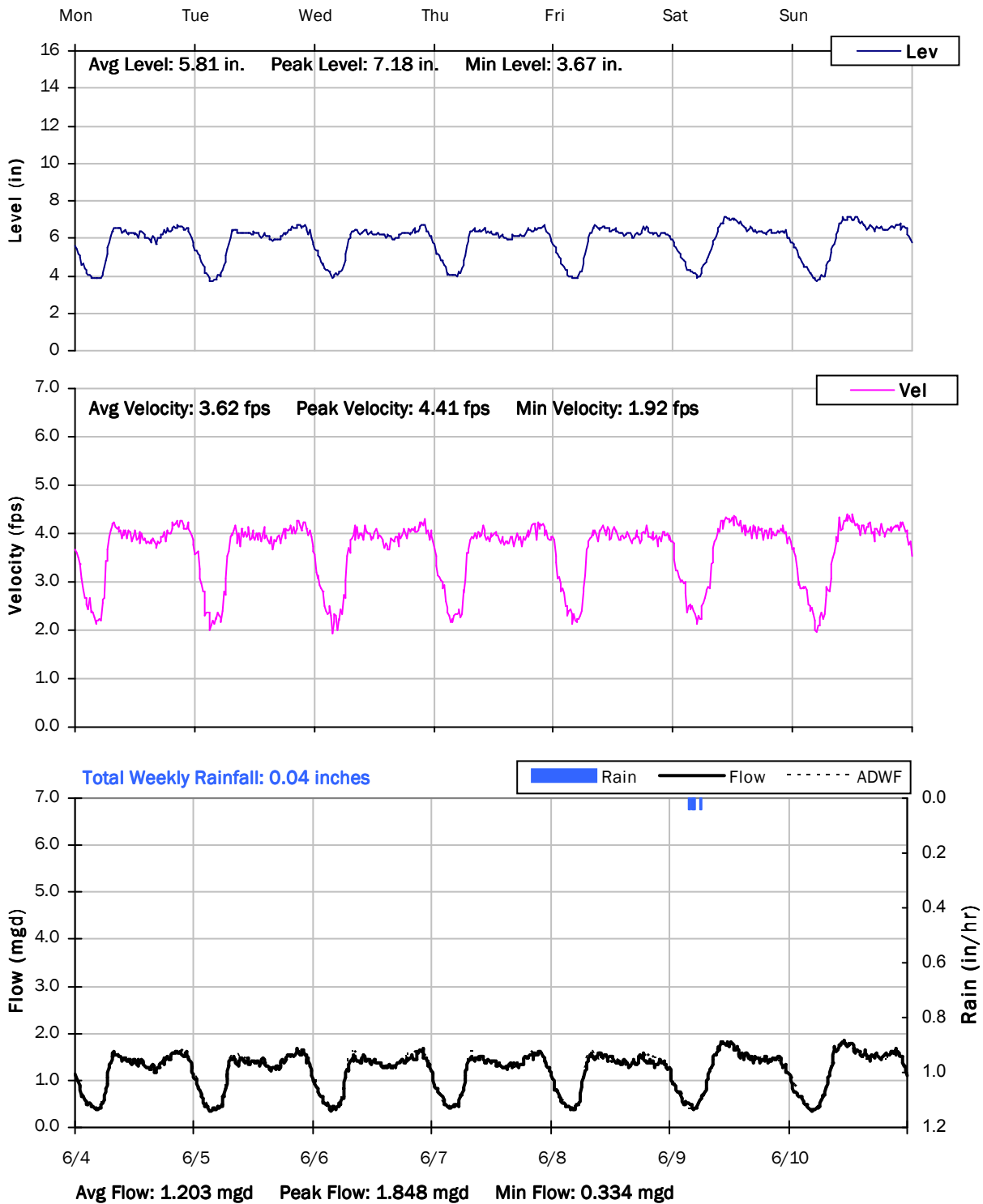
5/28/2018 to 6/4/2018



SITE 6

Weekly Level, Velocity and Flow Hydrographs

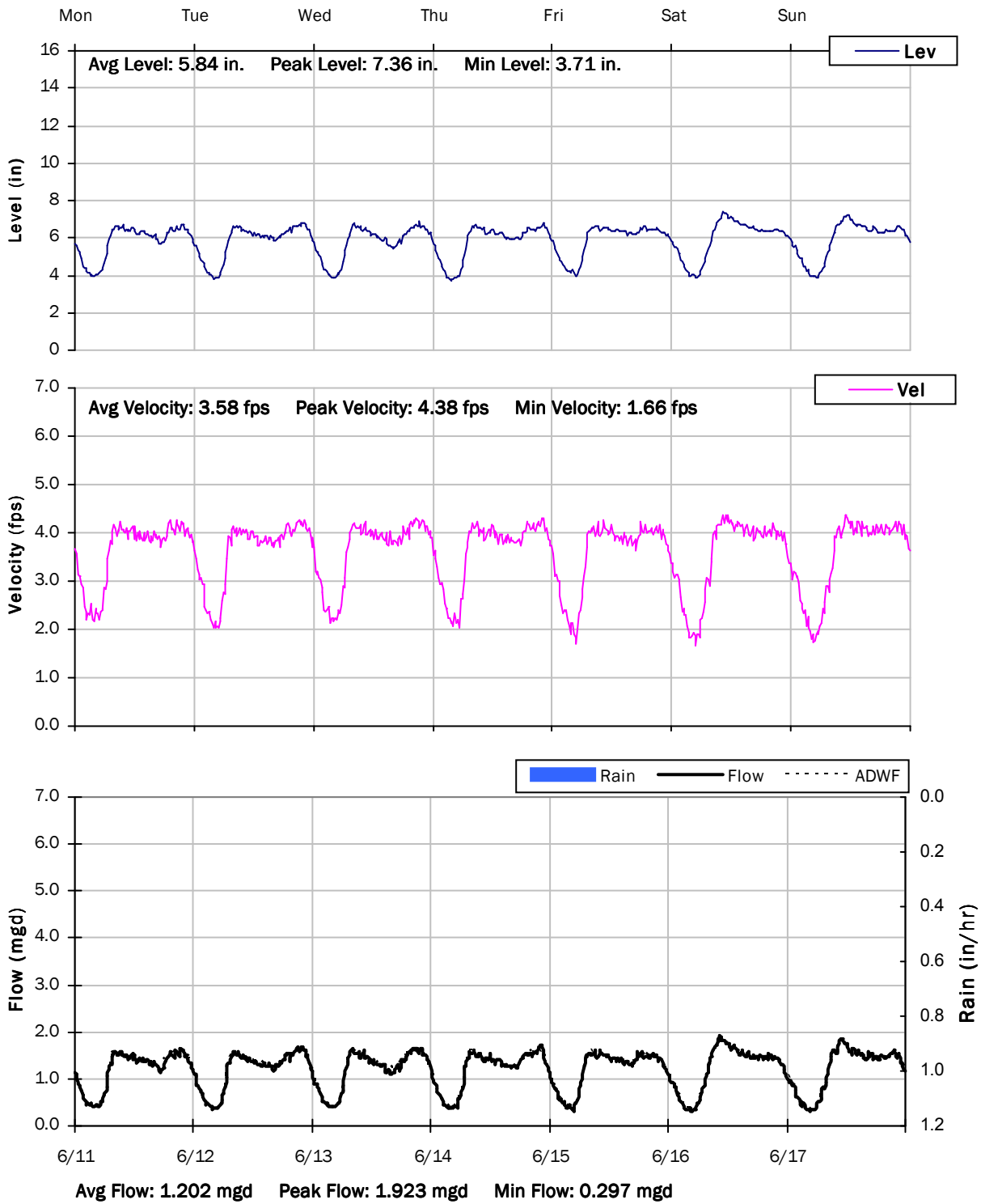
6/4/2018 to 6/11/2018



SITE 6

Weekly Level, Velocity and Flow Hydrographs

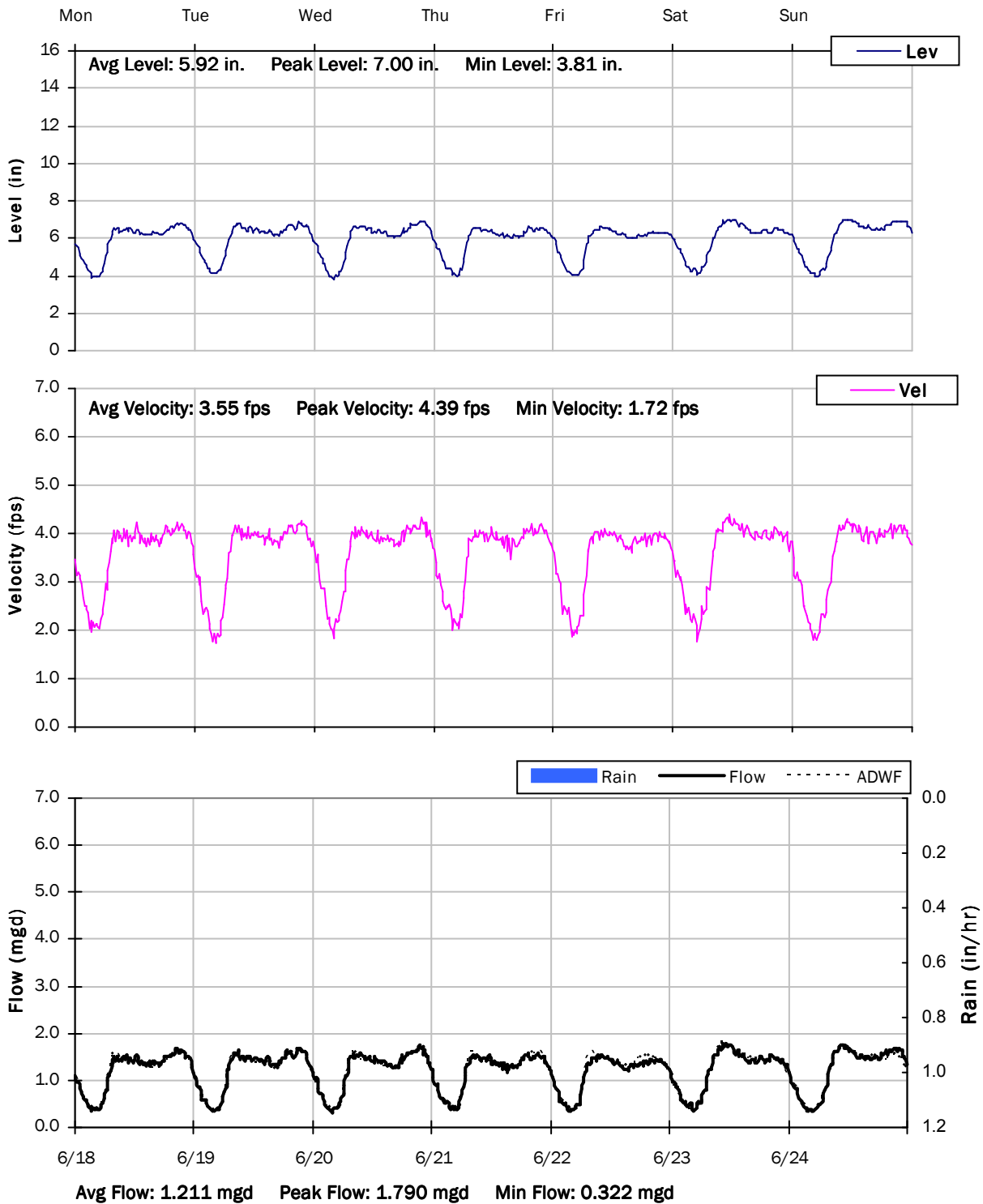
6/11/2018 to 6/18/2018



SITE 6

Weekly Level, Velocity and Flow Hydrographs

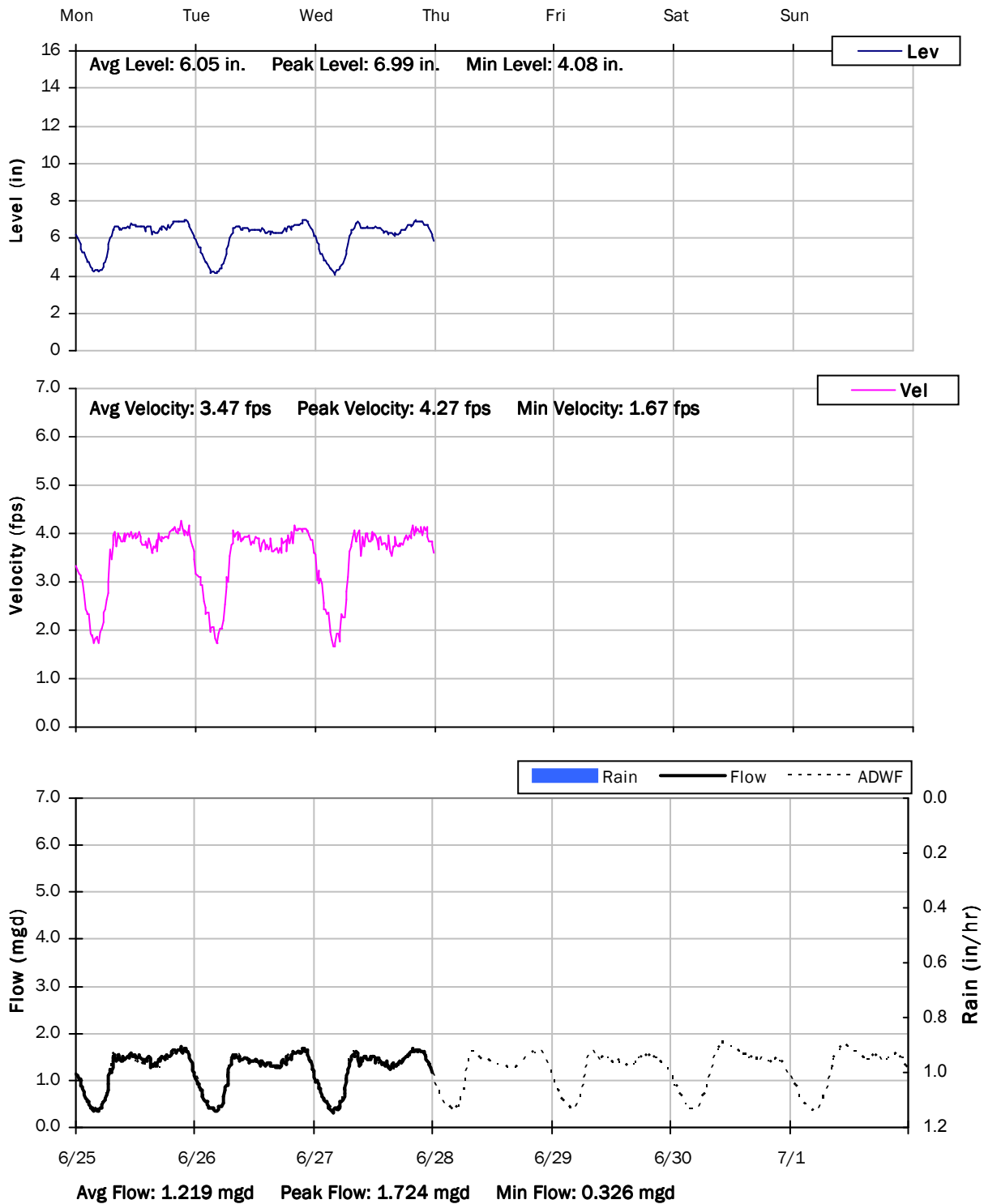
6/18/2018 to 6/25/2018



SITE 6

Weekly Level, Velocity and Flow Hydrographs

6/25/2018 to 7/2/2018



City of South San Francisco

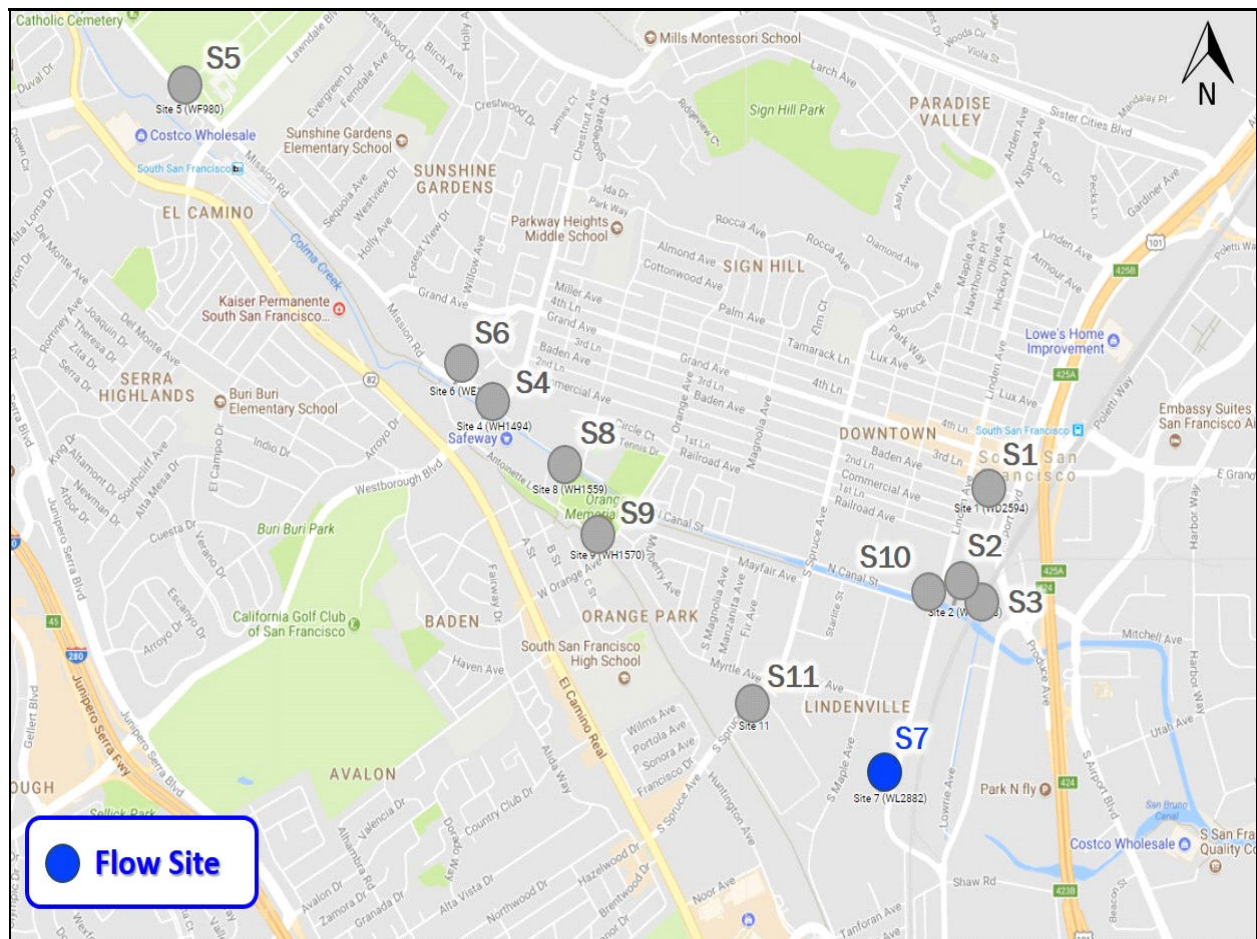
Sanitary Sewer Flow Monitoring

February 26- June 28, 2018

Monitoring Site: Site 7

Location: 141 South Linden Avenue, exit gate of AT&T yard

Data Summary Report

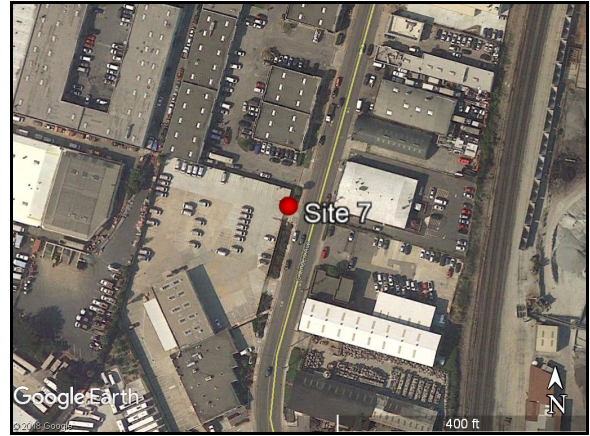


Vicinity Map: Site 7

SITE 7

Site Information

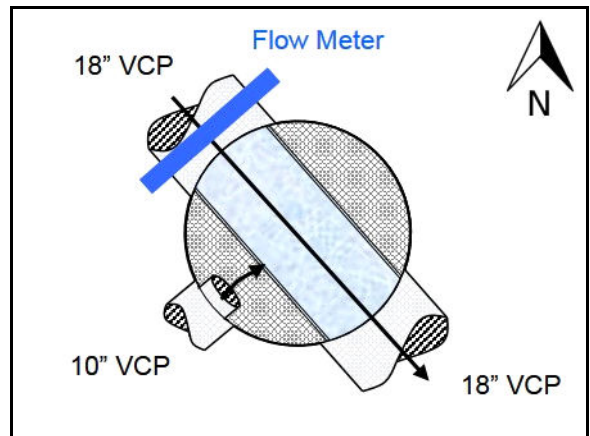
MH ID:	WL2882
Location:	141 South Linden Avenue, exit gate of AT&T yard
Coordinates:	122.4141° W, 37.6442° N
Rim Elevation (Earth):	12 feet
Pipe Diameter:	18 inches
Sediment:	0.75 inches
ADWF:	0.537 mgd
Peak Measured Flow:	2.204 mgd



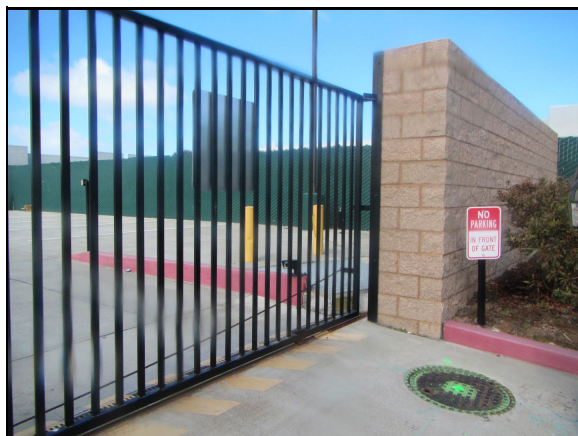
Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 7

Additional Site Photos

Effluent Pipe



Northwest Influent Pipe



SITE 7

Additional Site Photos

Southwest Influent Pipe

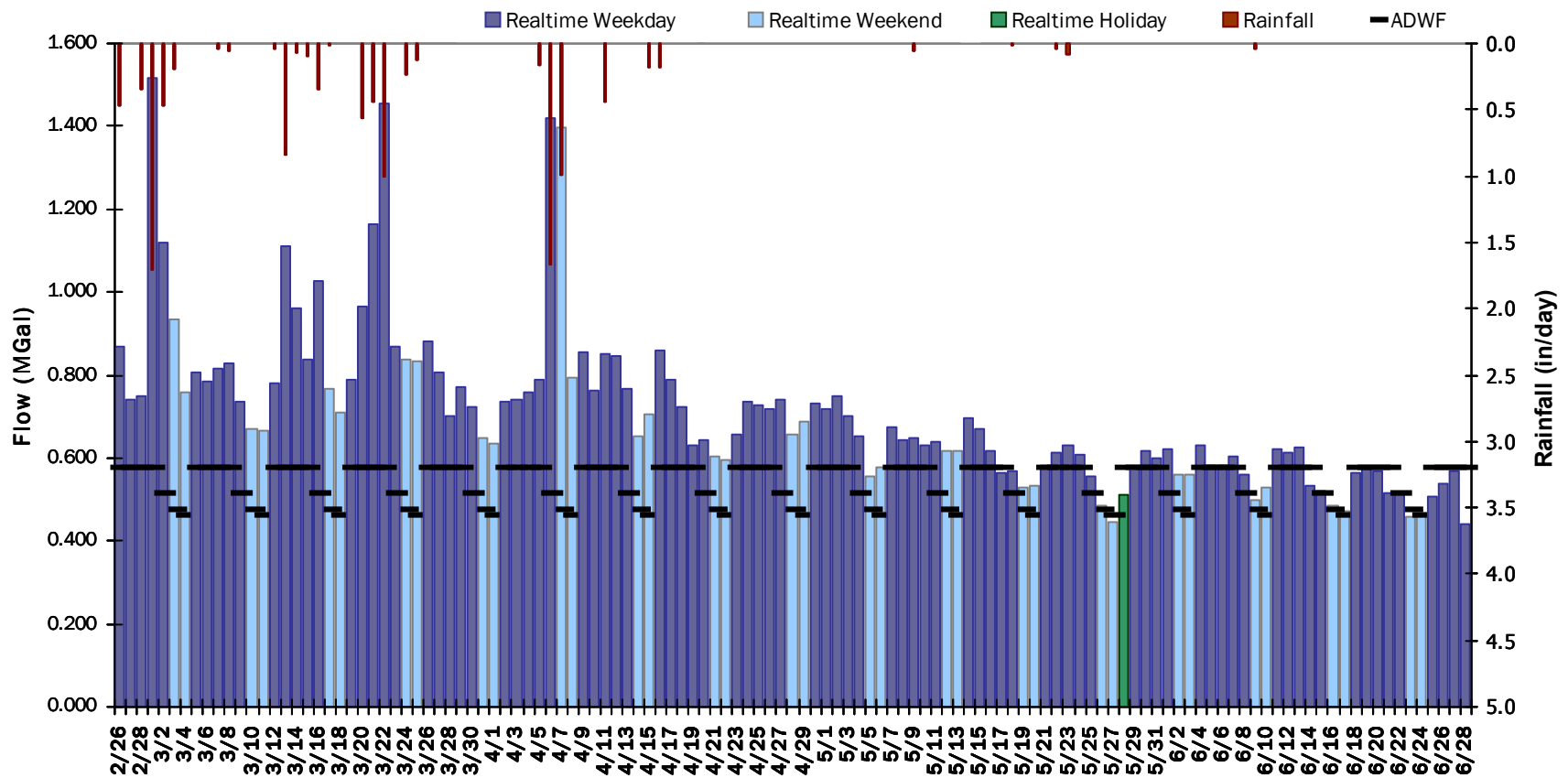


SITE 7

Period Flow Summary: Daily Flow Totals

Avg Period Flow: 0.707 MGal Peak Daily Flow: 1.515 MGal Min Daily Flow: 0.441 MGal

Total Period Rainfall: 10.46 inches



SITE 7

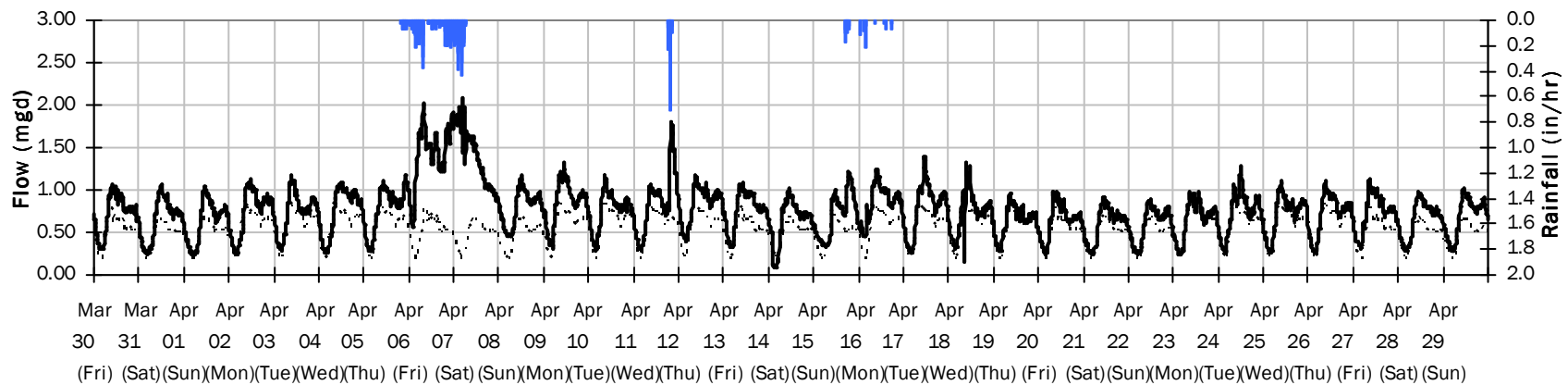
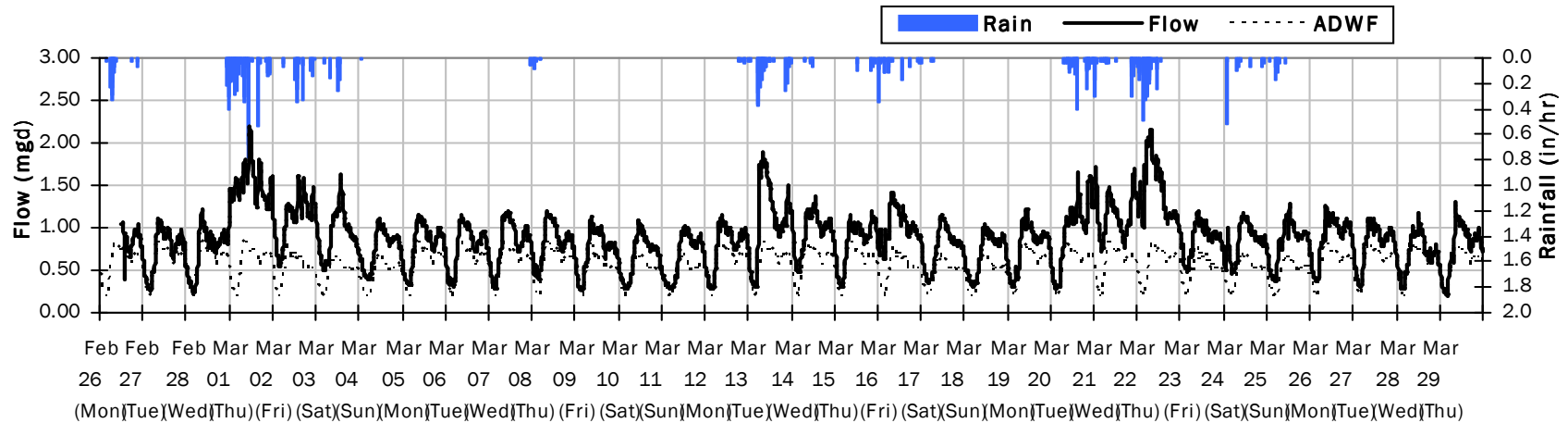
Flow Summary: 2/26/2018 to 4/29/2018

Total Period Rainfall: 10.68 inches

Avg Flow: 0.827 mgd

Peak Flow: 2.204 mgd

Min Flow: 0.095 mgd



SITE 7

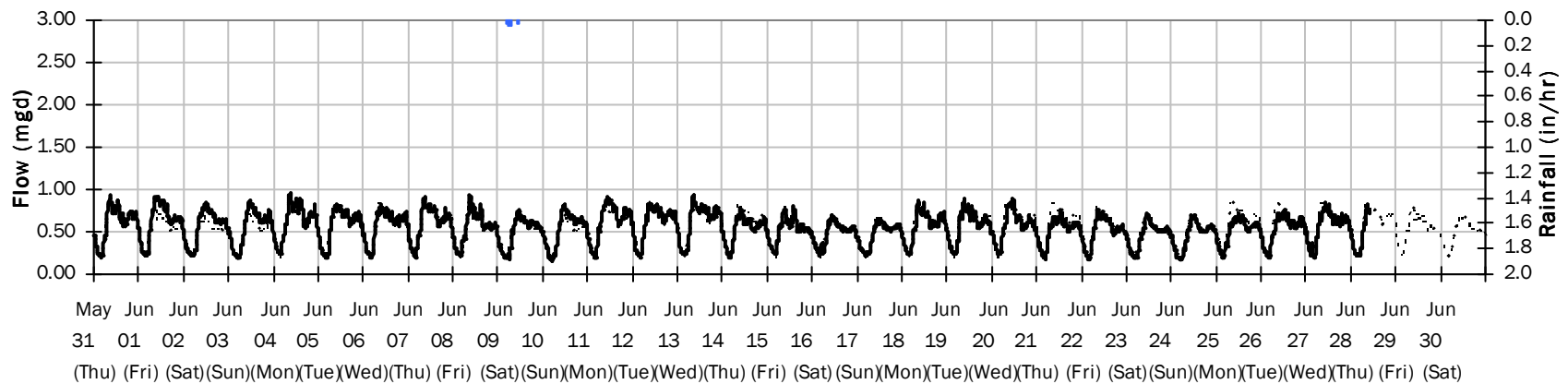
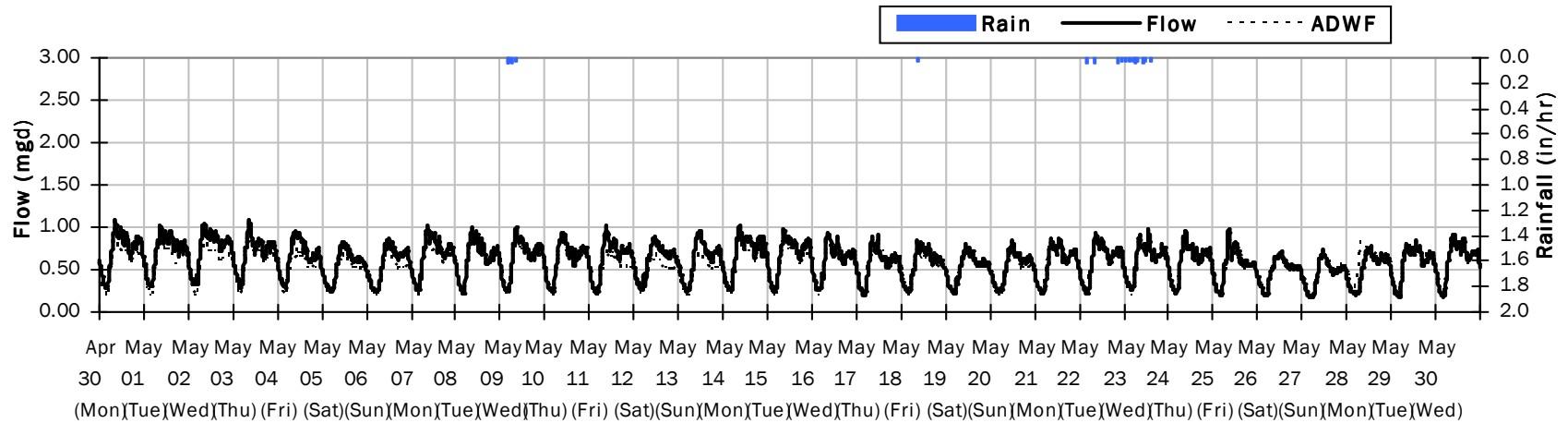
Flow Summary: 4/30/2018 to 6/30/2018

Total Period Rainfall: 0.22 inches

Avg Flow: 0.583 mgd

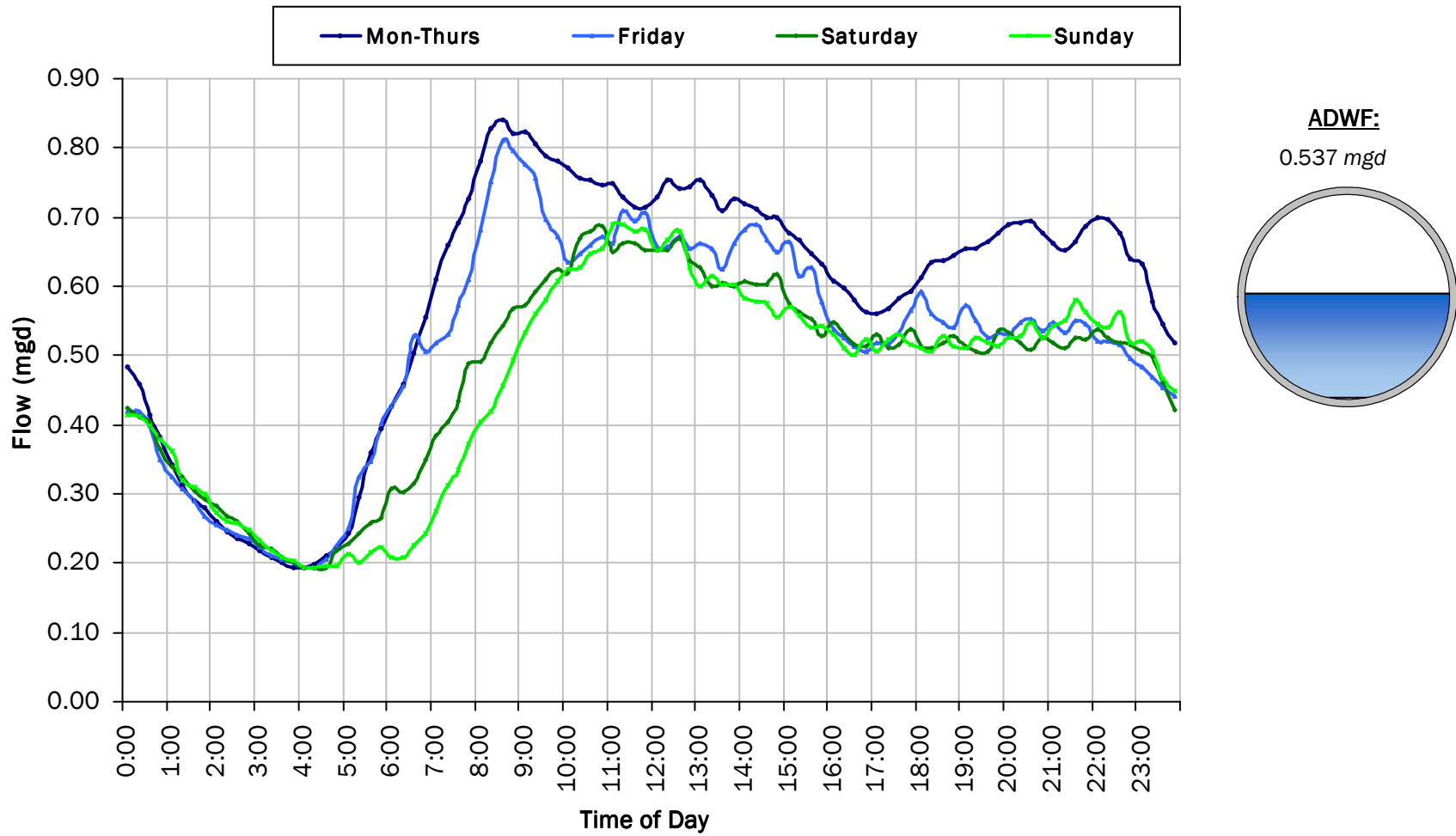
Peak Flow: 1.082 mgd

Min Flow: 0.158 mgd



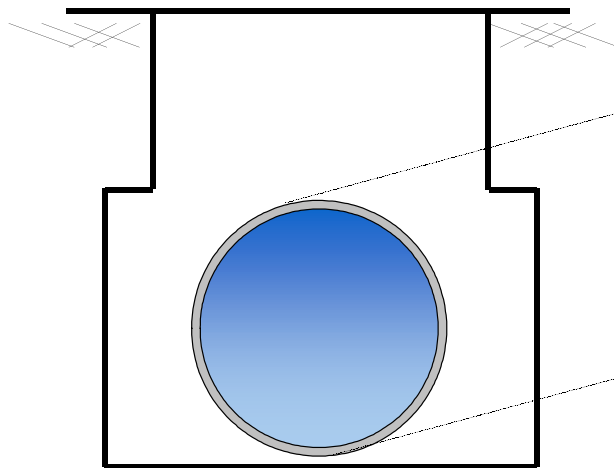
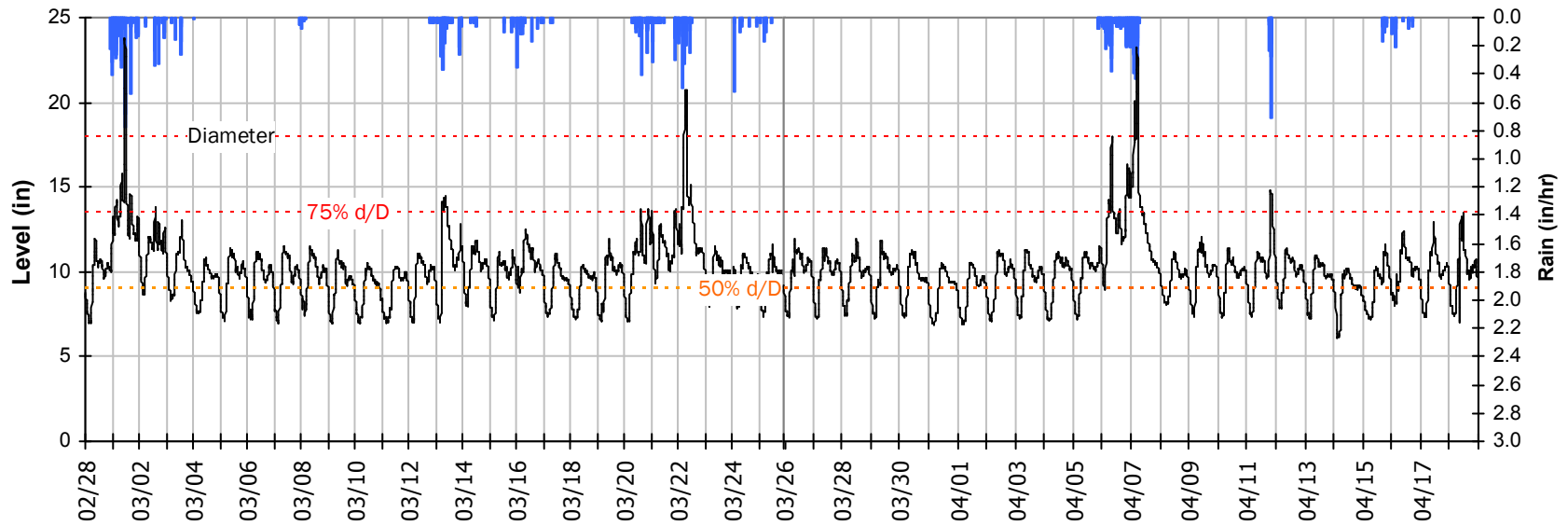
SITE 7

Average Dry Weather Flow Hydrographs



SITE 7 Site Capacity and Surge Summary

Realtime Flow Levels with Rainfall Data over Monitoring (High Capacity) Period



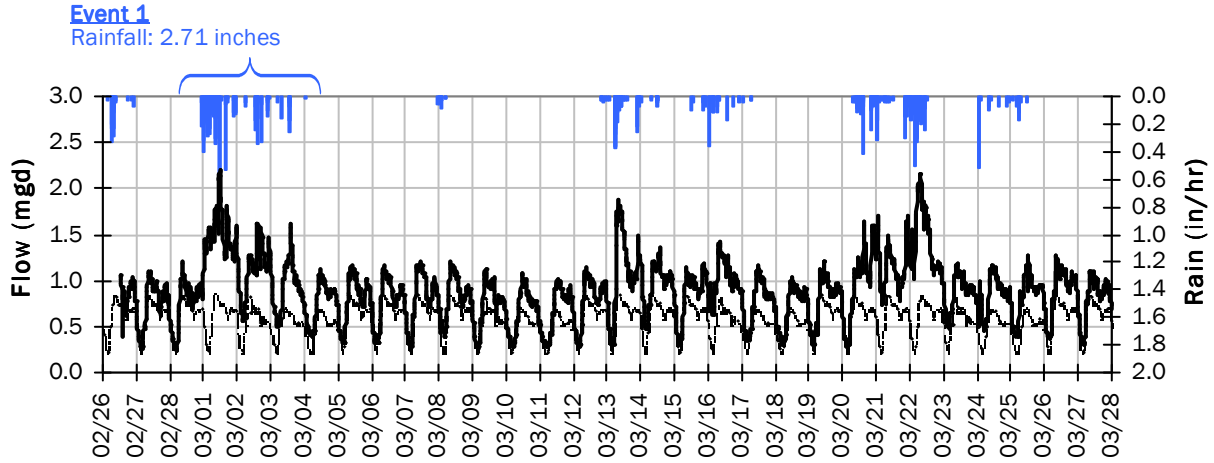
Pipe Diameter: 18 inches
Peak Measured Level: 23.7 inches
Peak d/D Ratio: 1.32

Surcharged 5.7 inches over crown

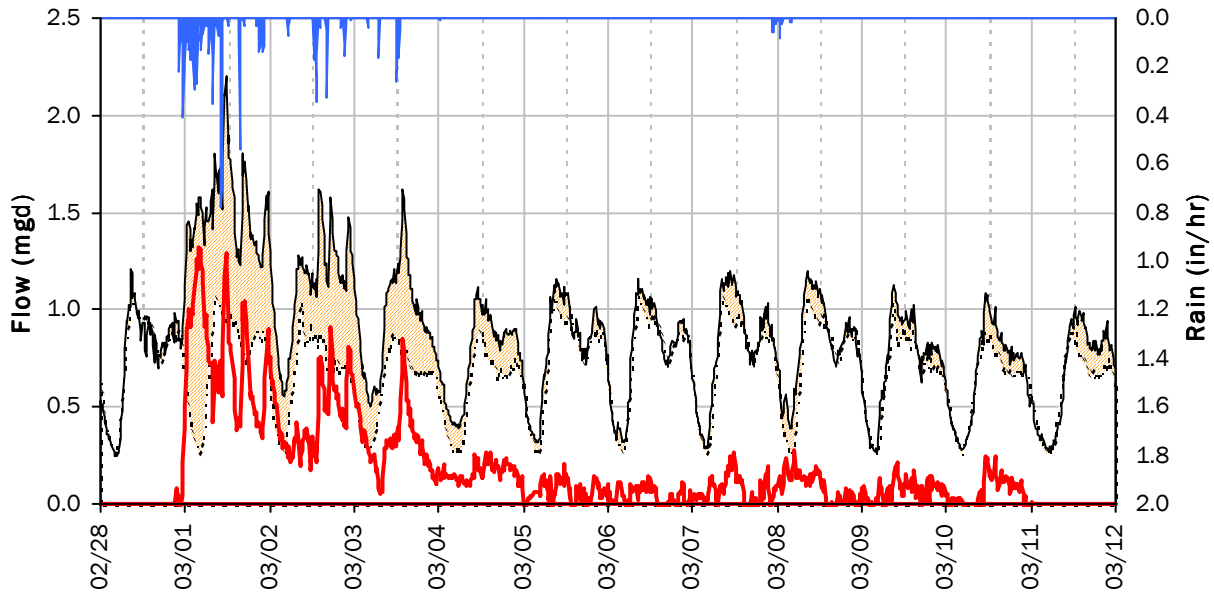
SITE 7

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



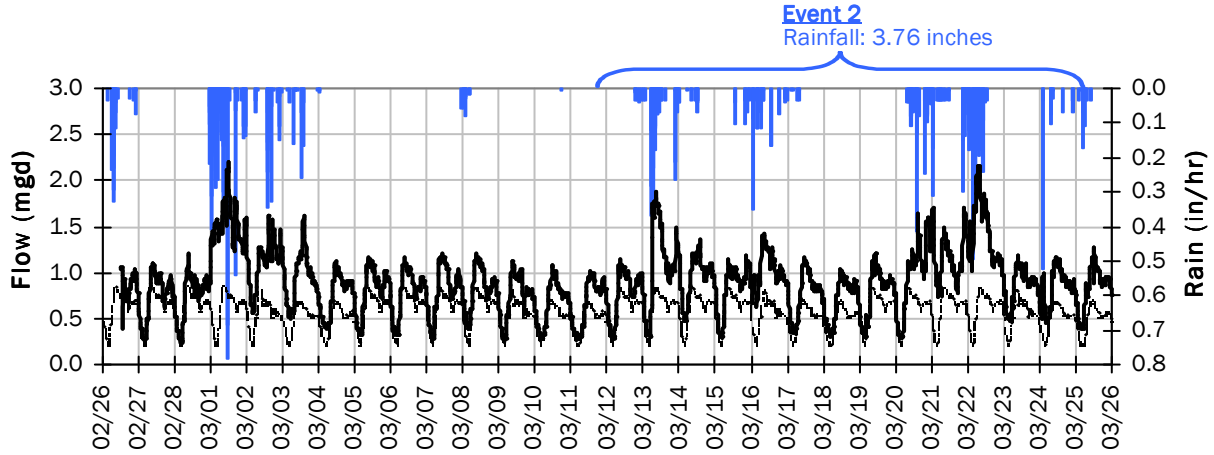
Storm Event I/I Analysis (Rain = 2.71 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	2.20 mgd	Peak I/I Rate:	1.32 mgd
PF:	4.10	Total I/I:	2,111,000 gallons
Peak Level:	23.67 in		
d/D Ratio:	1.32		

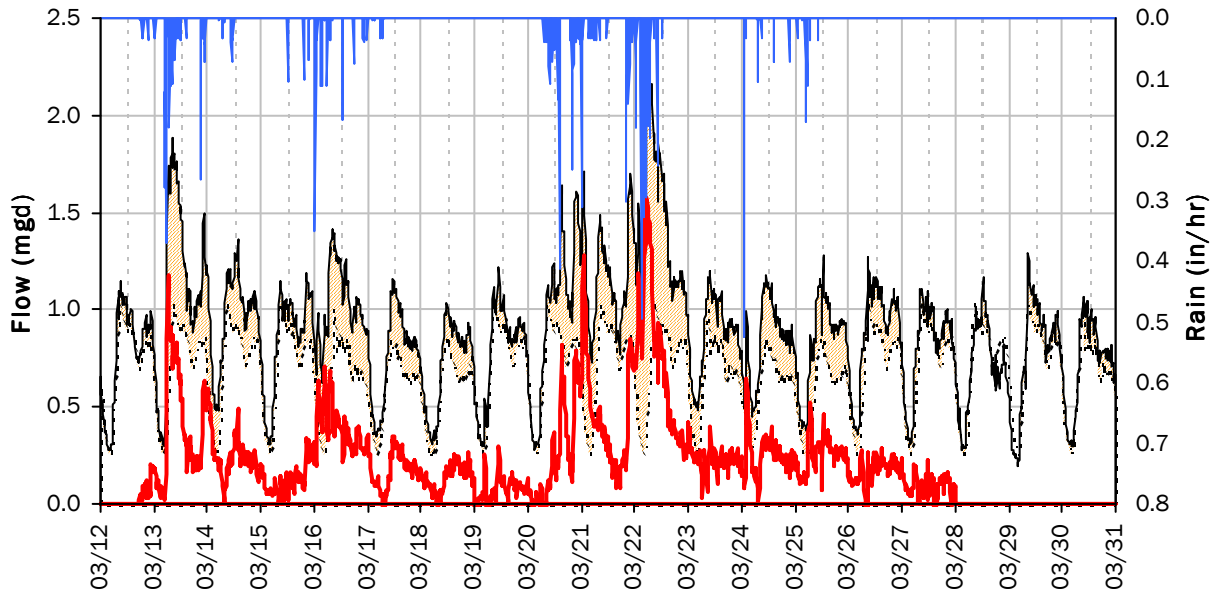
SITE 7

I/I Summary: Event 2

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 2 Detail Graph



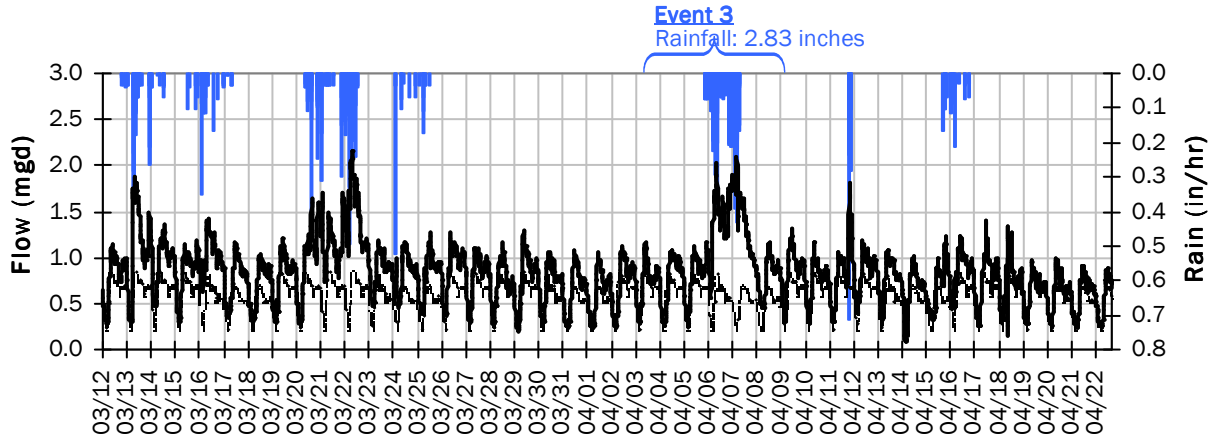
Storm Event I/I Analysis (Rain = 3.76 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	2.16 mgd	Peak I/I Rate:	1.58 mgd
PF:	4.02	Total I/I:	4,017,000 gallons
Peak Level:	20.71 in		
d/D Ratio:	1.15		

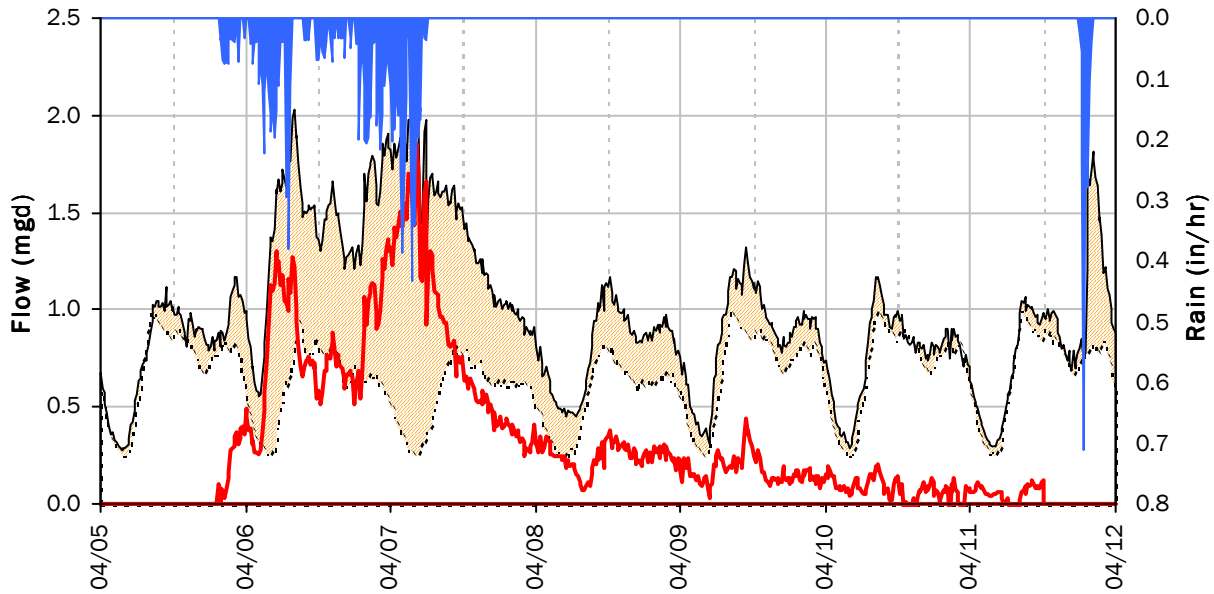
SITE 7

I/I Summary: Event 3

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



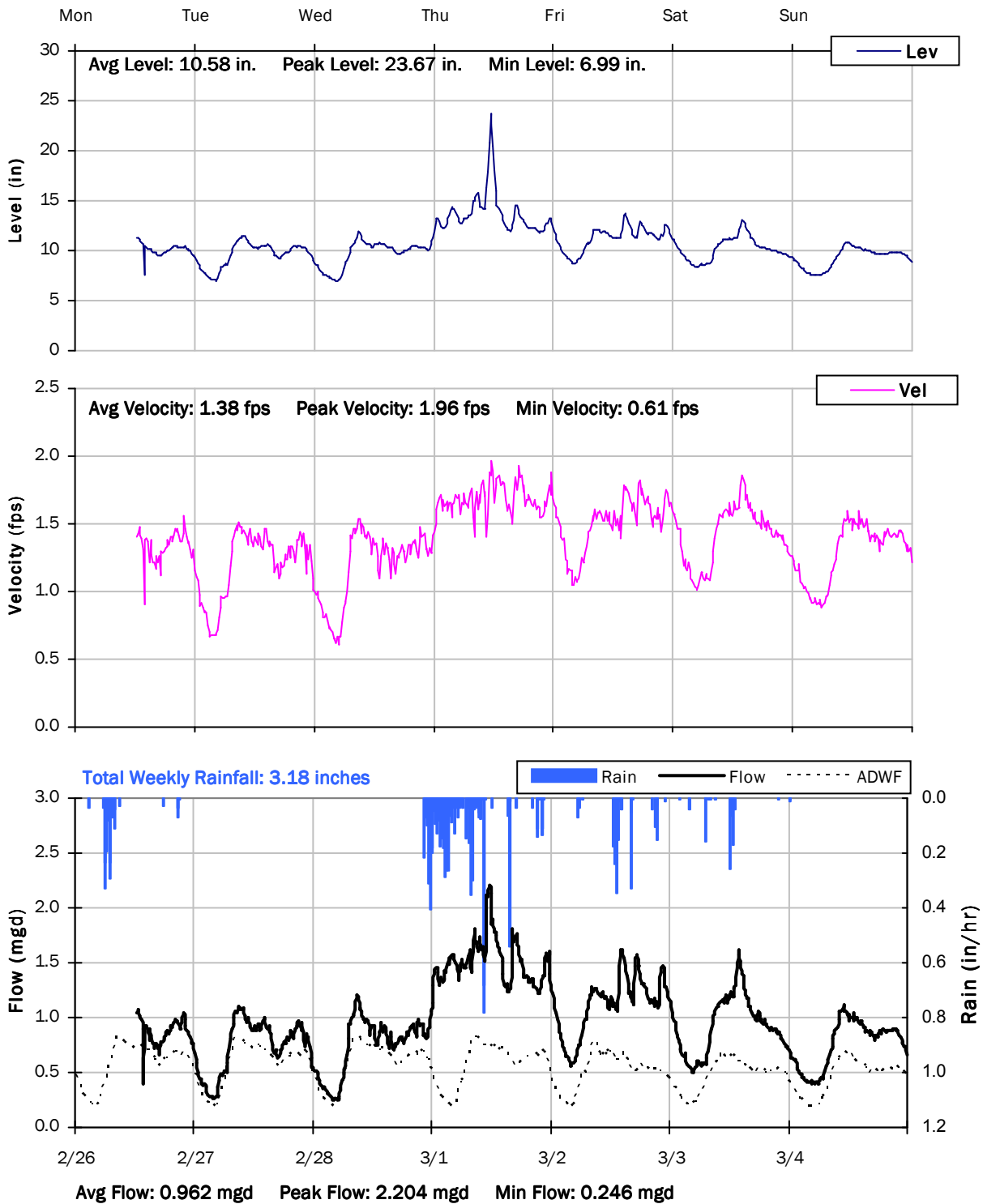
Event 3 Detail Graph



Storm Event I/I Analysis (Rain = 2.83 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	2.09 mgd	Peak I/I Rate:	1.85 mgd
PF:	3.89	Total I/I:	2,201,000 gallons
Peak Level:	23.28 in		
d/D Ratio:	1.29		

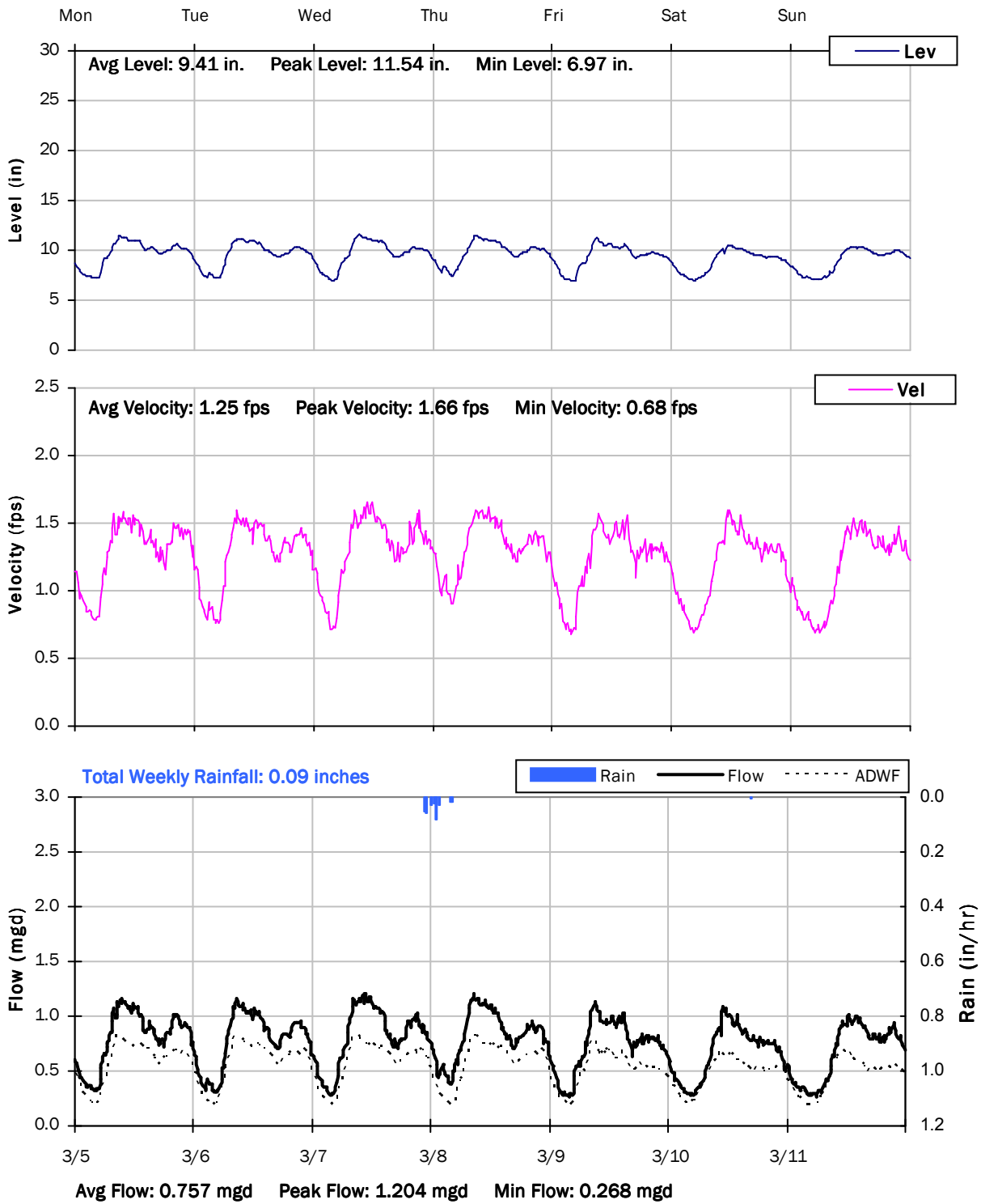
SITE 7
Weekly Level, Velocity and Flow Hydrographs
2/26/2018 to 3/5/2018



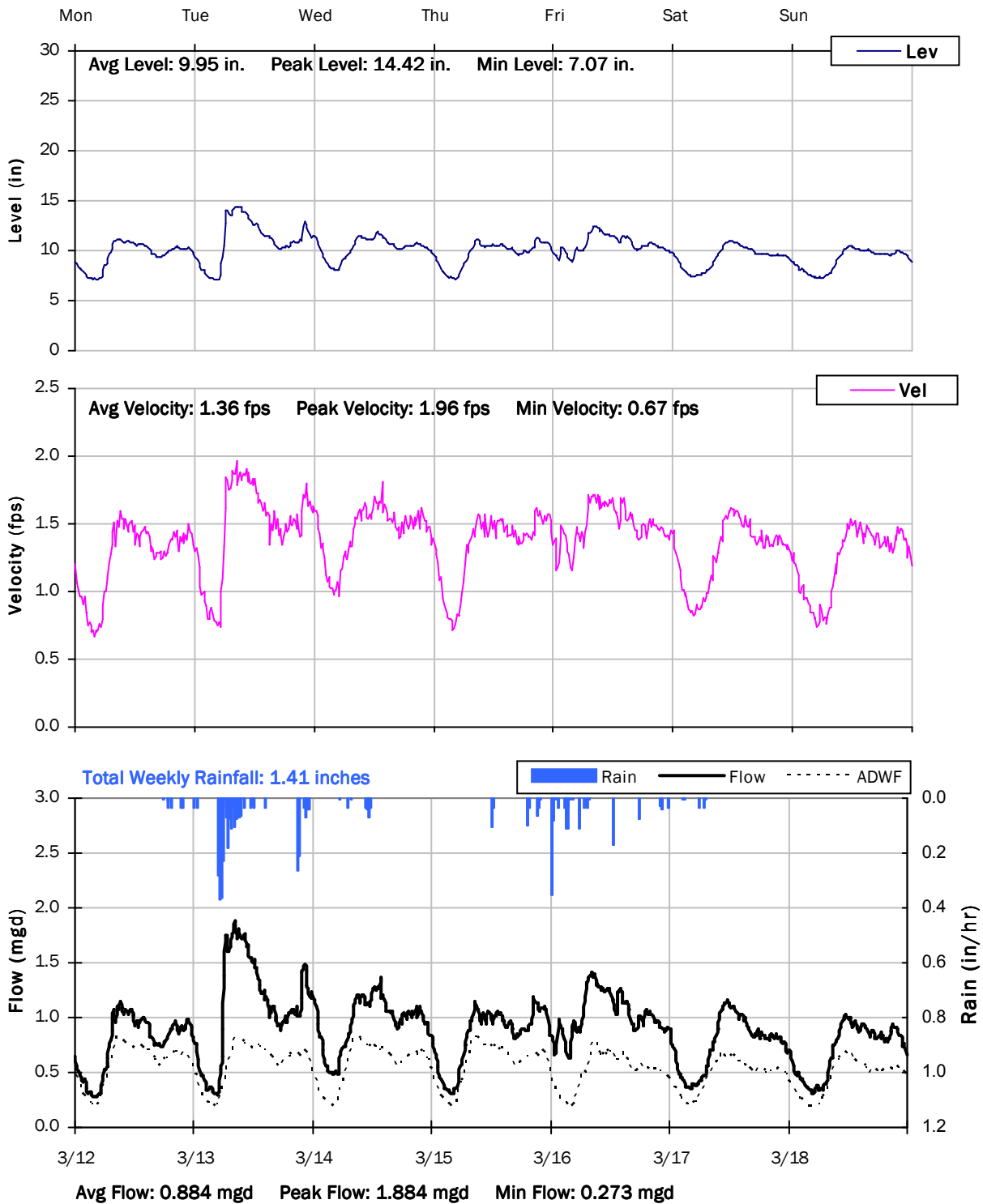
SITE 7

Weekly Level, Velocity and Flow Hydrographs

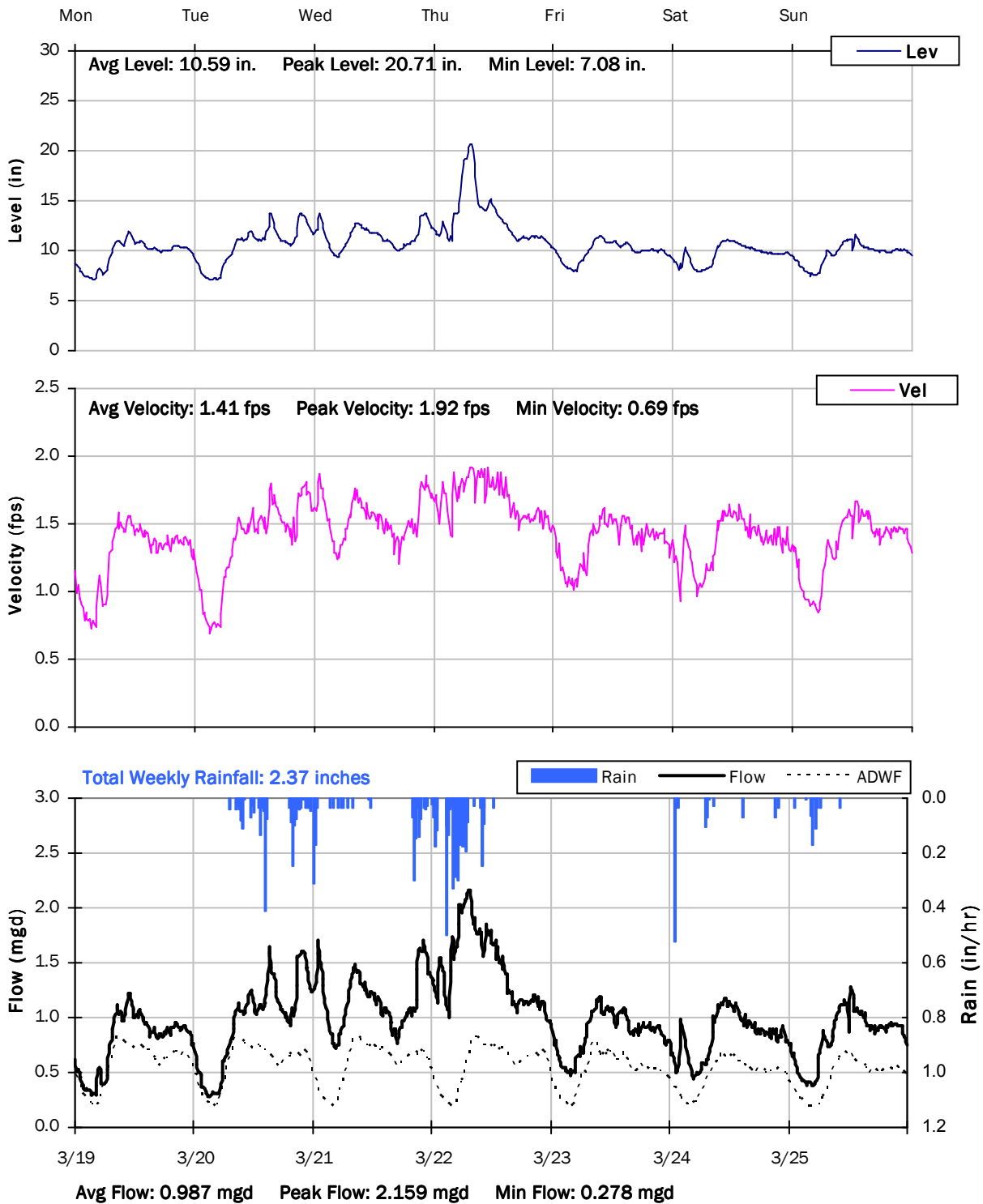
3/5/2018 to 3/12/2018



SITE 7
Weekly Level, Velocity and Flow Hydrographs
3/12/2018 to 3/19/2018



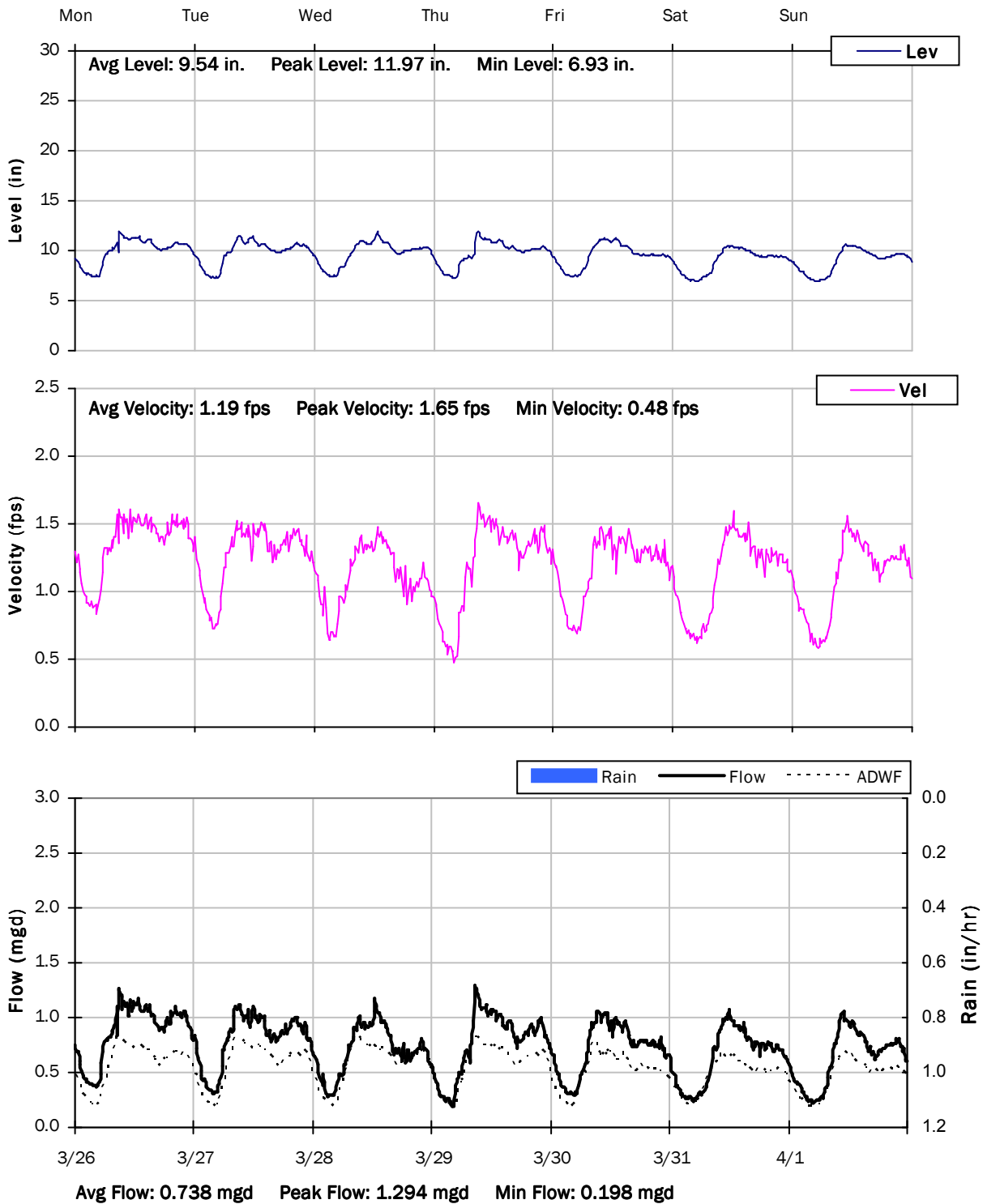
SITE 7
Weekly Level, Velocity and Flow Hydrographs
3/19/2018 to 3/26/2018



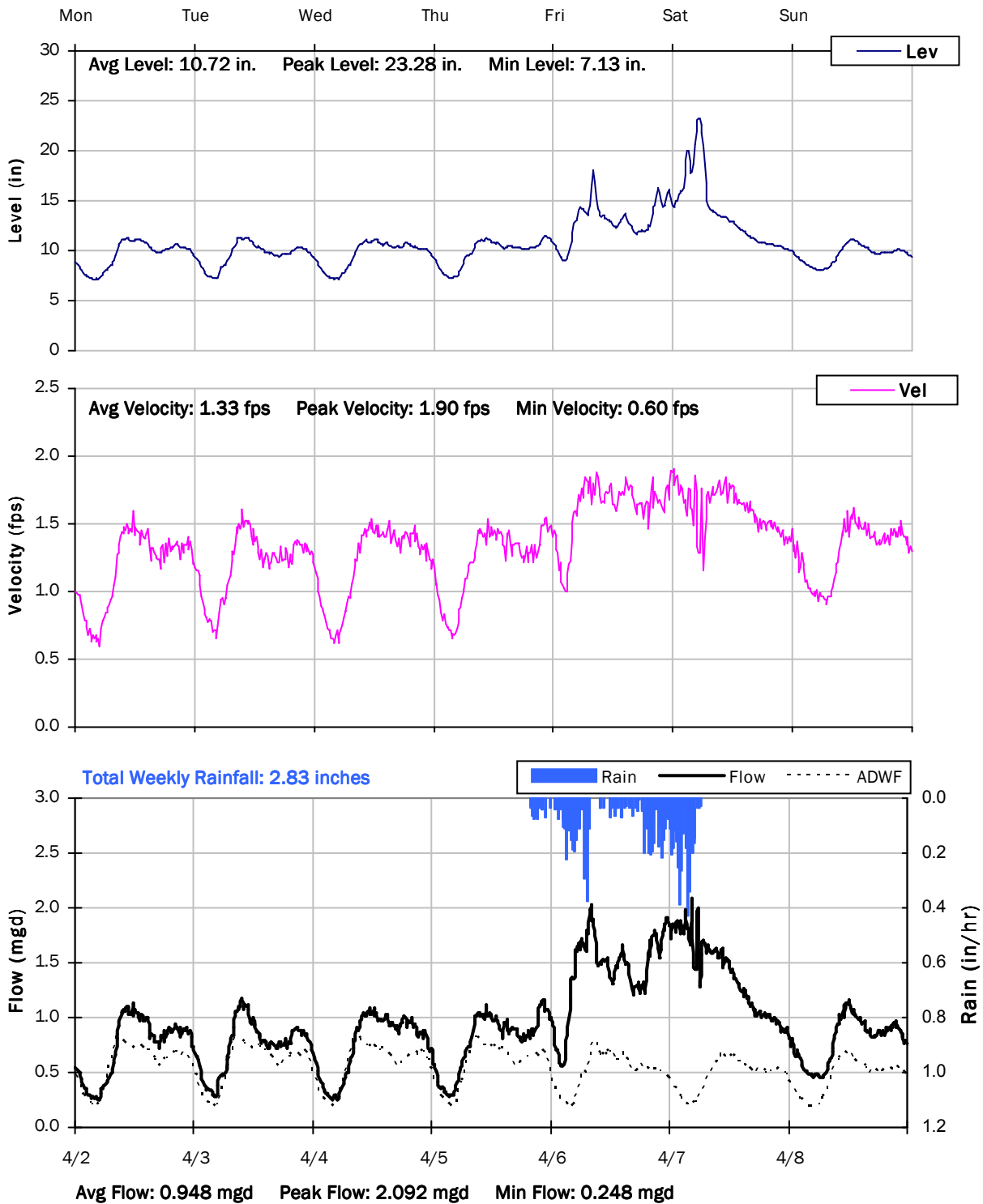
SITE 7

Weekly Level, Velocity and Flow Hydrographs

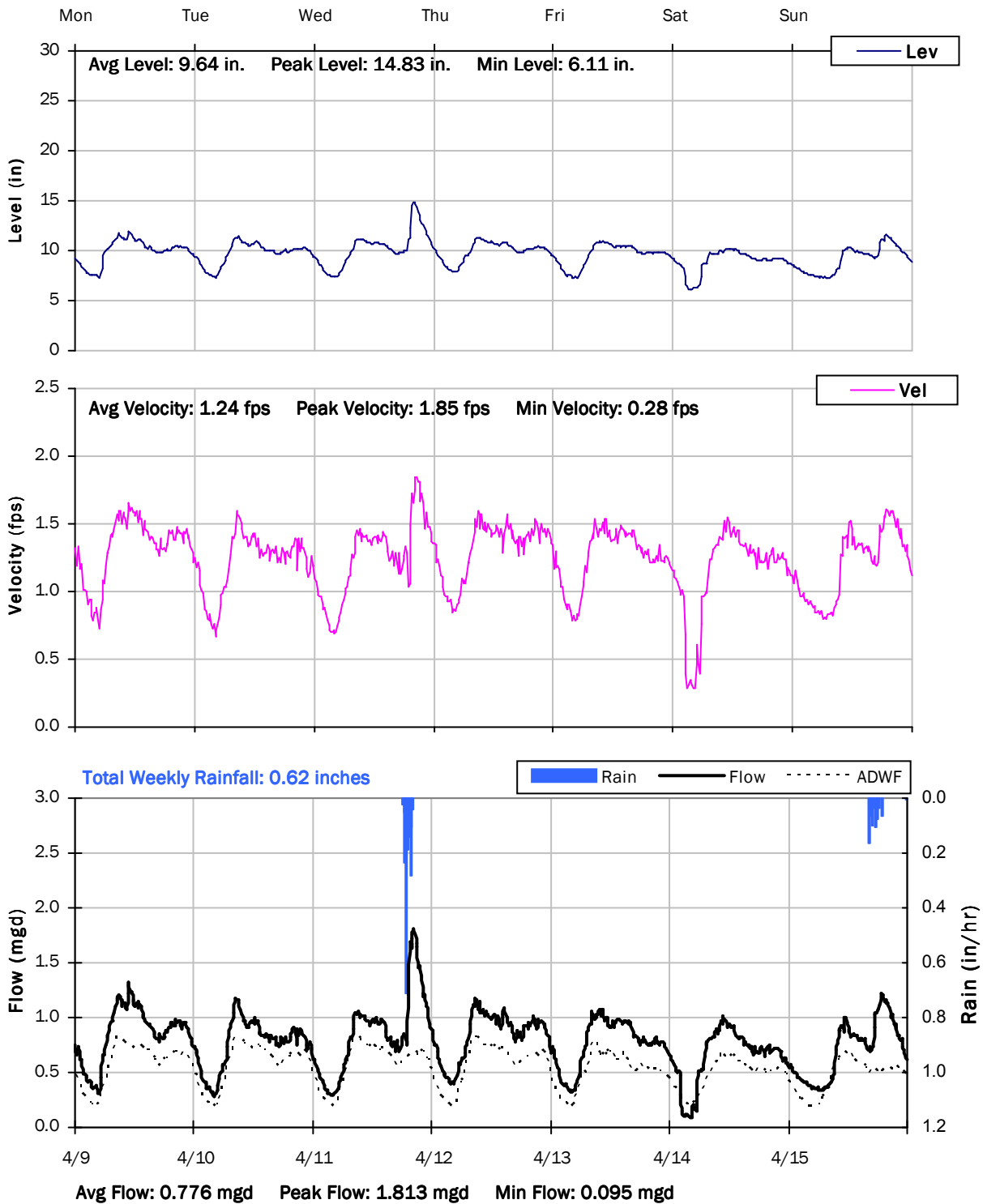
3/26/2018 to 4/2/2018



SITE 7
Weekly Level, Velocity and Flow Hydrographs
4/2/2018 to 4/9/2018



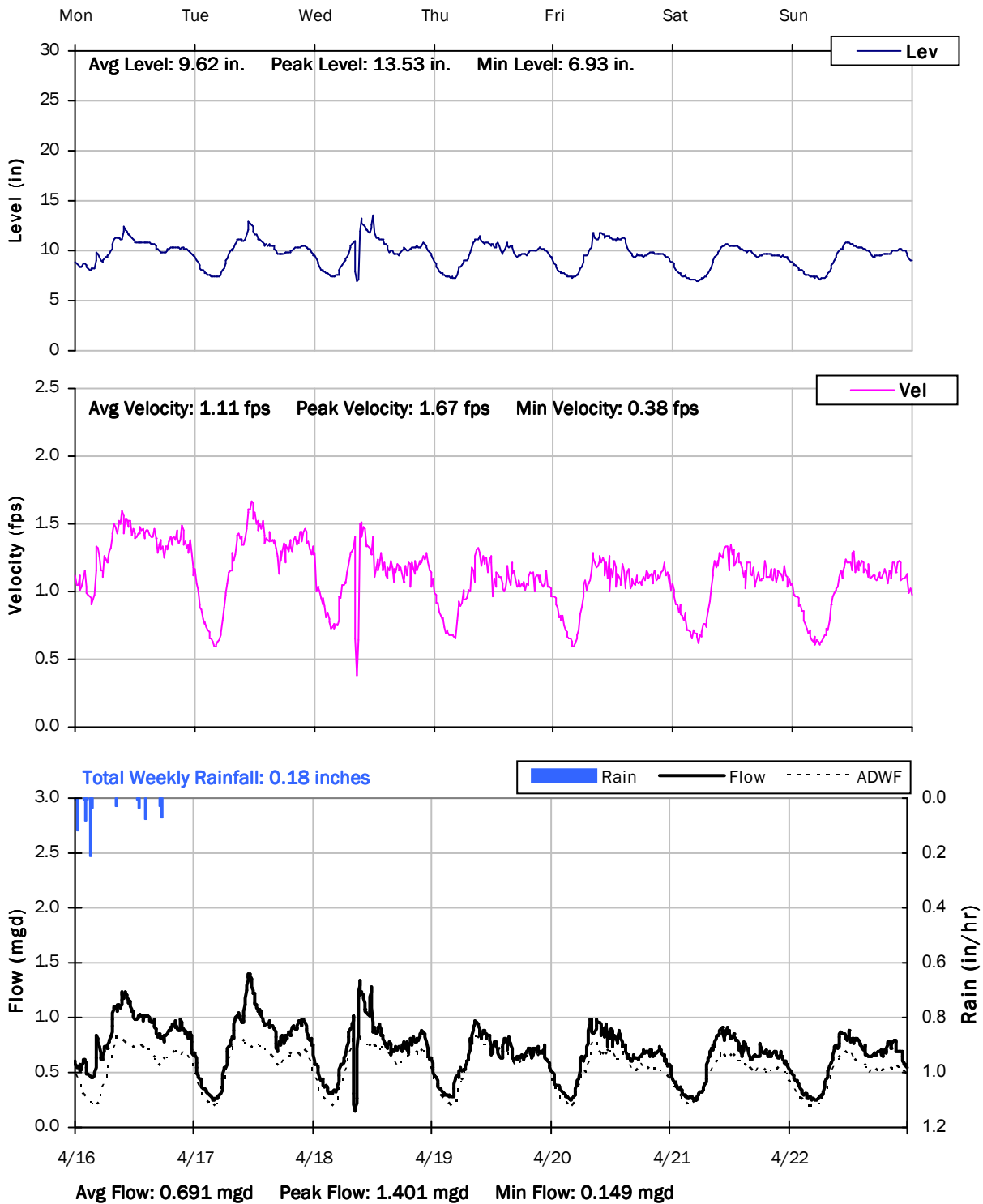
SITE 7
Weekly Level, Velocity and Flow Hydrographs
4/9/2018 to 4/16/2018



SITE 7

Weekly Level, Velocity and Flow Hydrographs

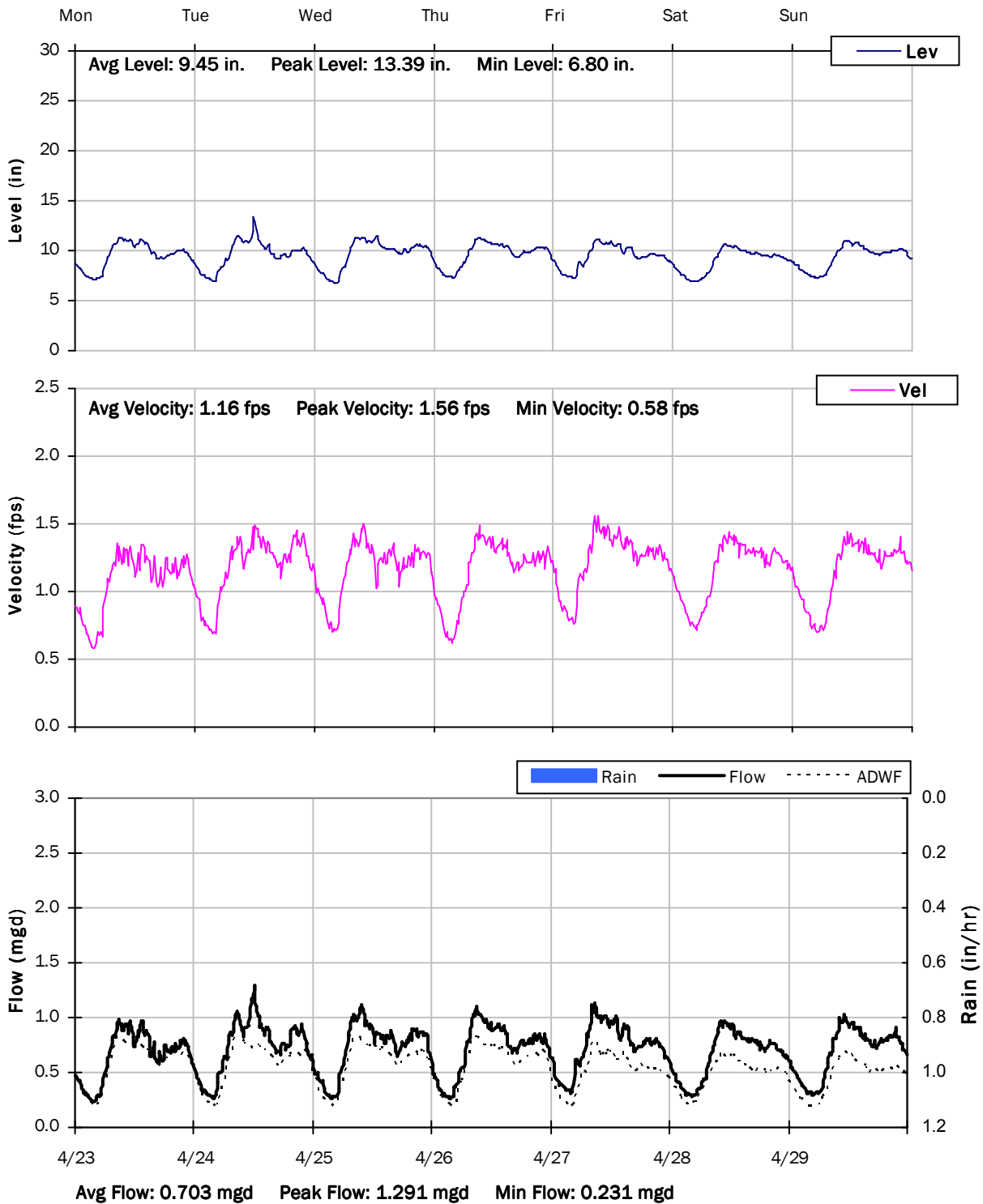
4/16/2018 to 4/23/2018



SITE 7

Weekly Level, Velocity and Flow Hydrographs

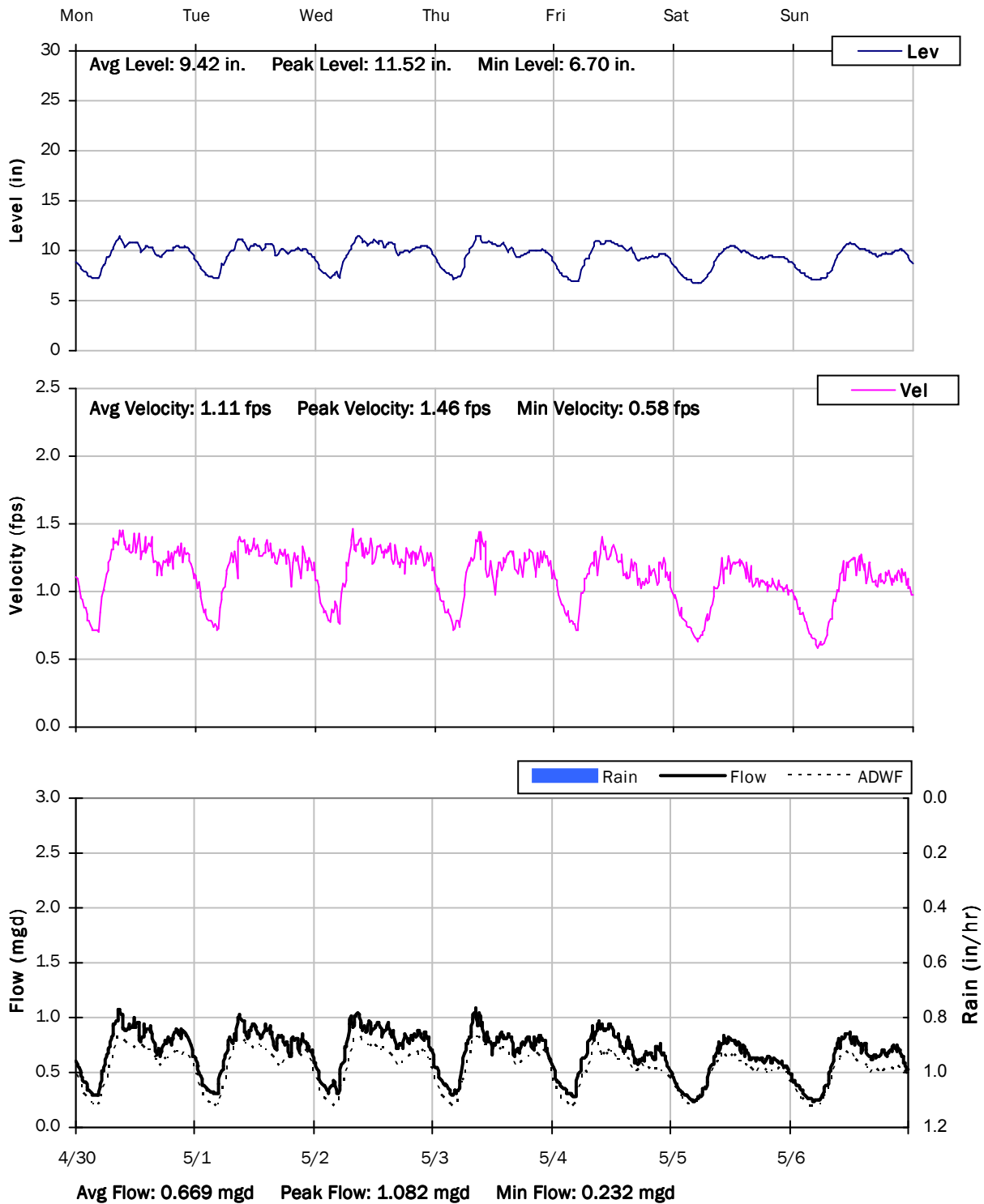
4/23/2018 to 4/30/2018



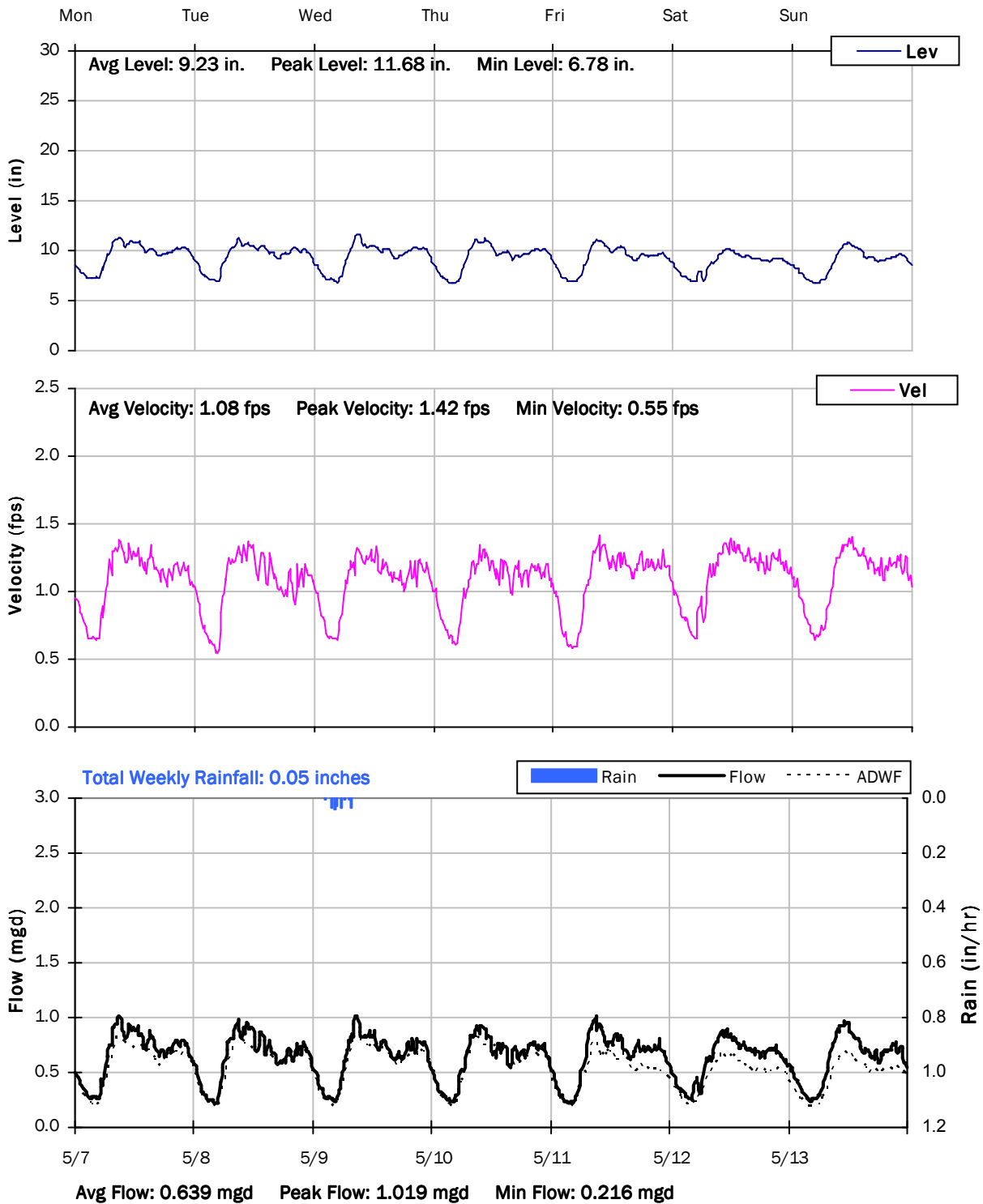
SITE 7

Weekly Level, Velocity and Flow Hydrographs

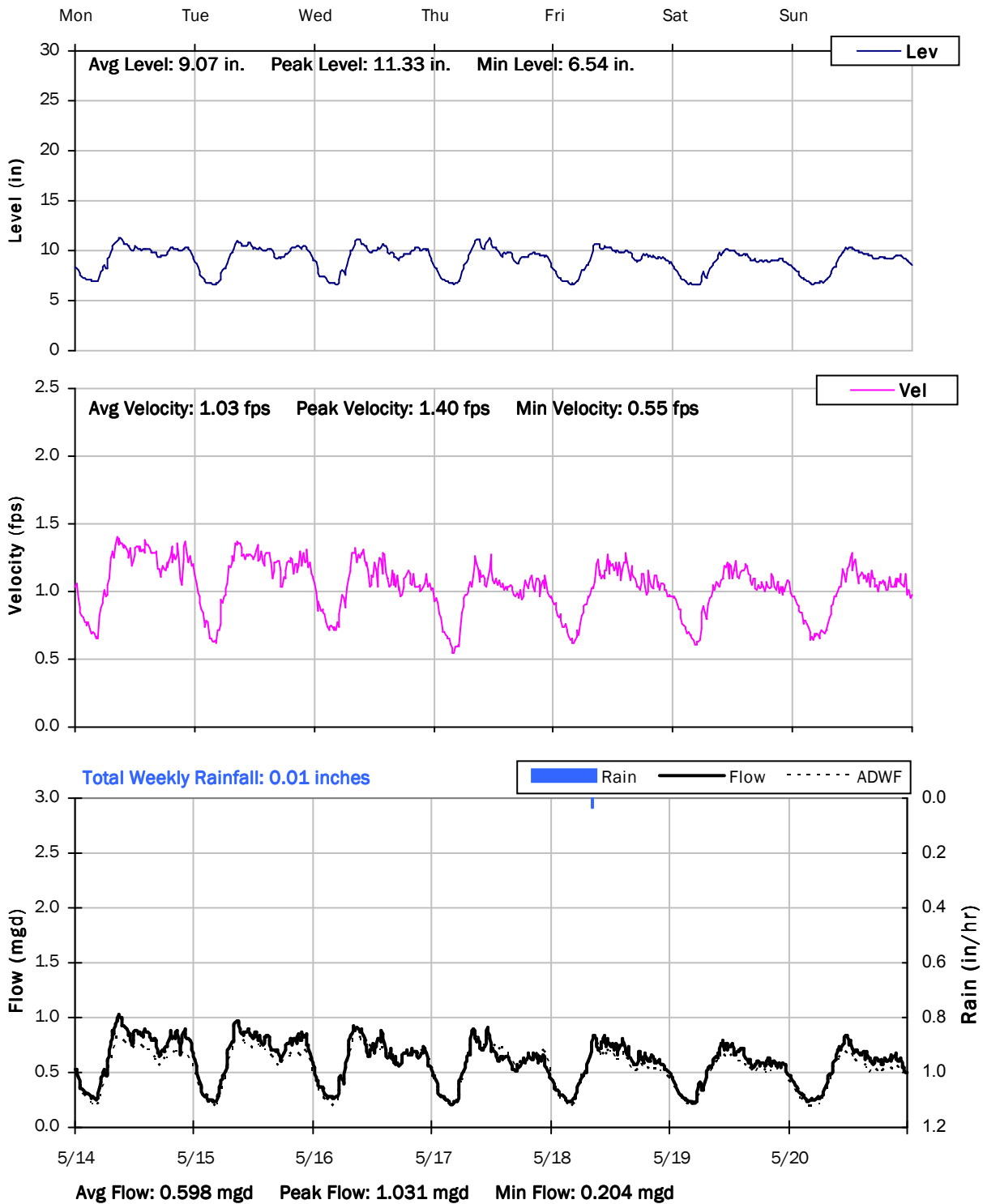
4/30/2018 to 5/7/2018



SITE 7
Weekly Level, Velocity and Flow Hydrographs
5/7/2018 to 5/14/2018



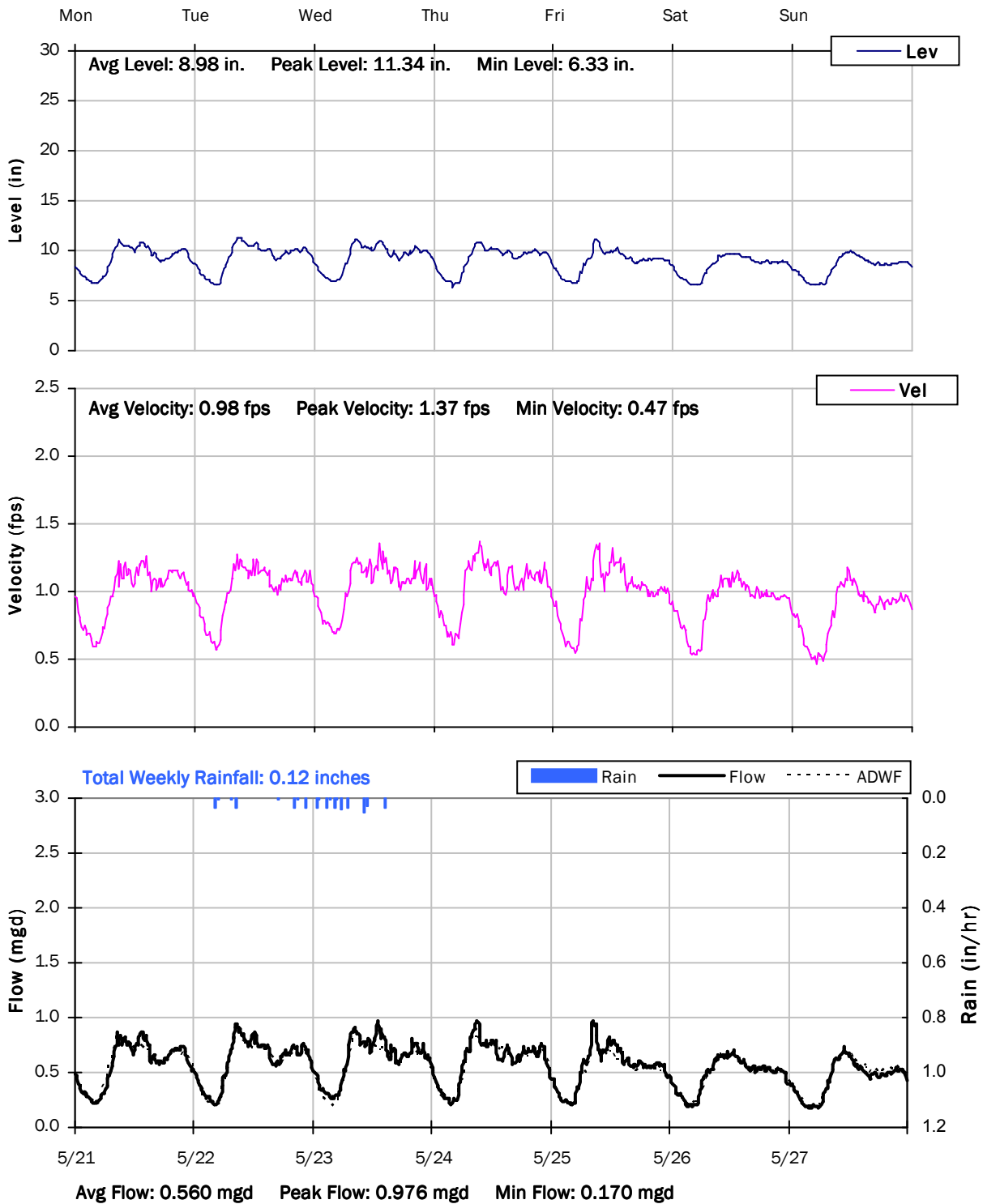
SITE 7
Weekly Level, Velocity and Flow Hydrographs
5/14/2018 to 5/21/2018



SITE 7

Weekly Level, Velocity and Flow Hydrographs

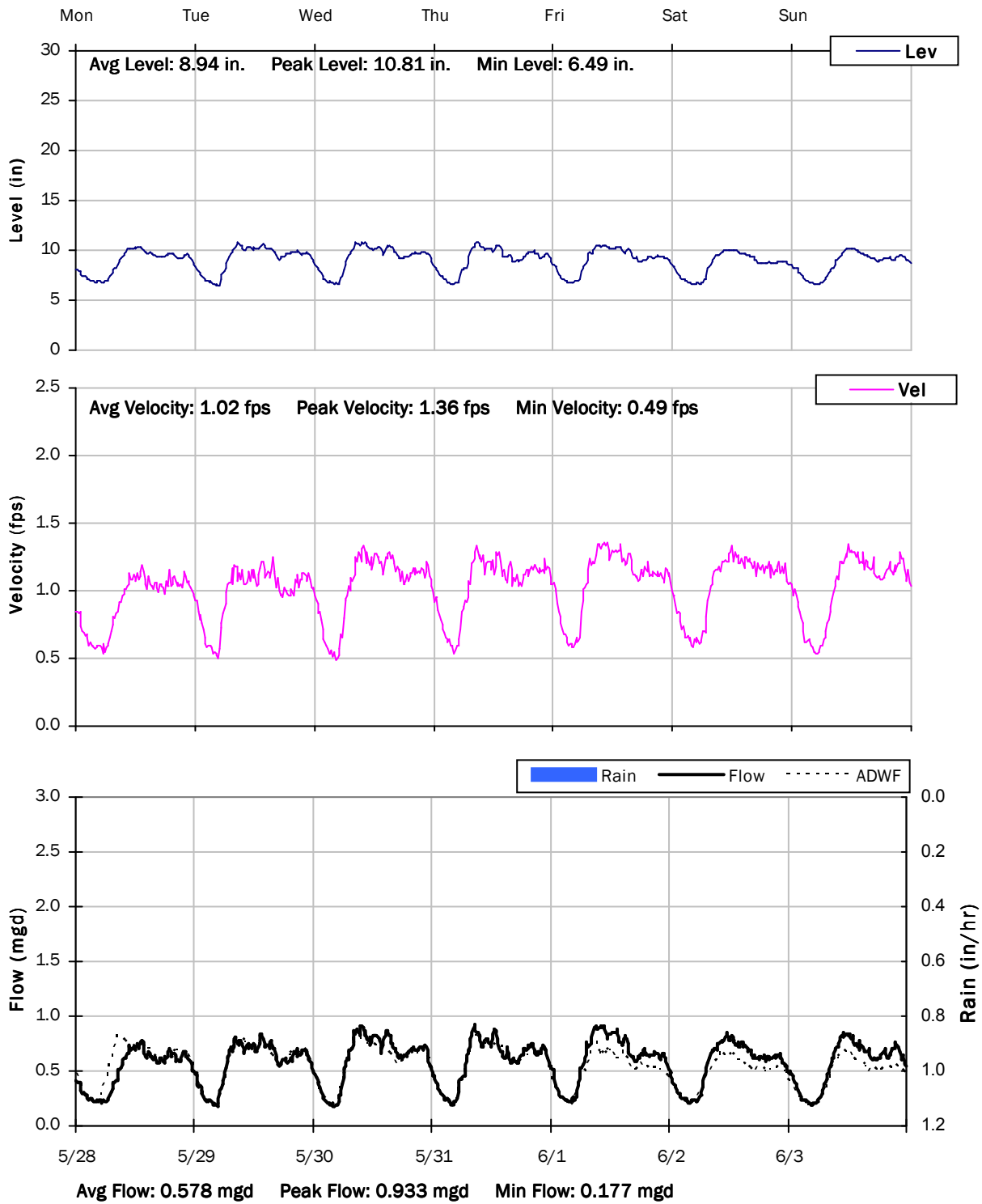
5/21/2018 to 5/28/2018



SITE 7

Weekly Level, Velocity and Flow Hydrographs

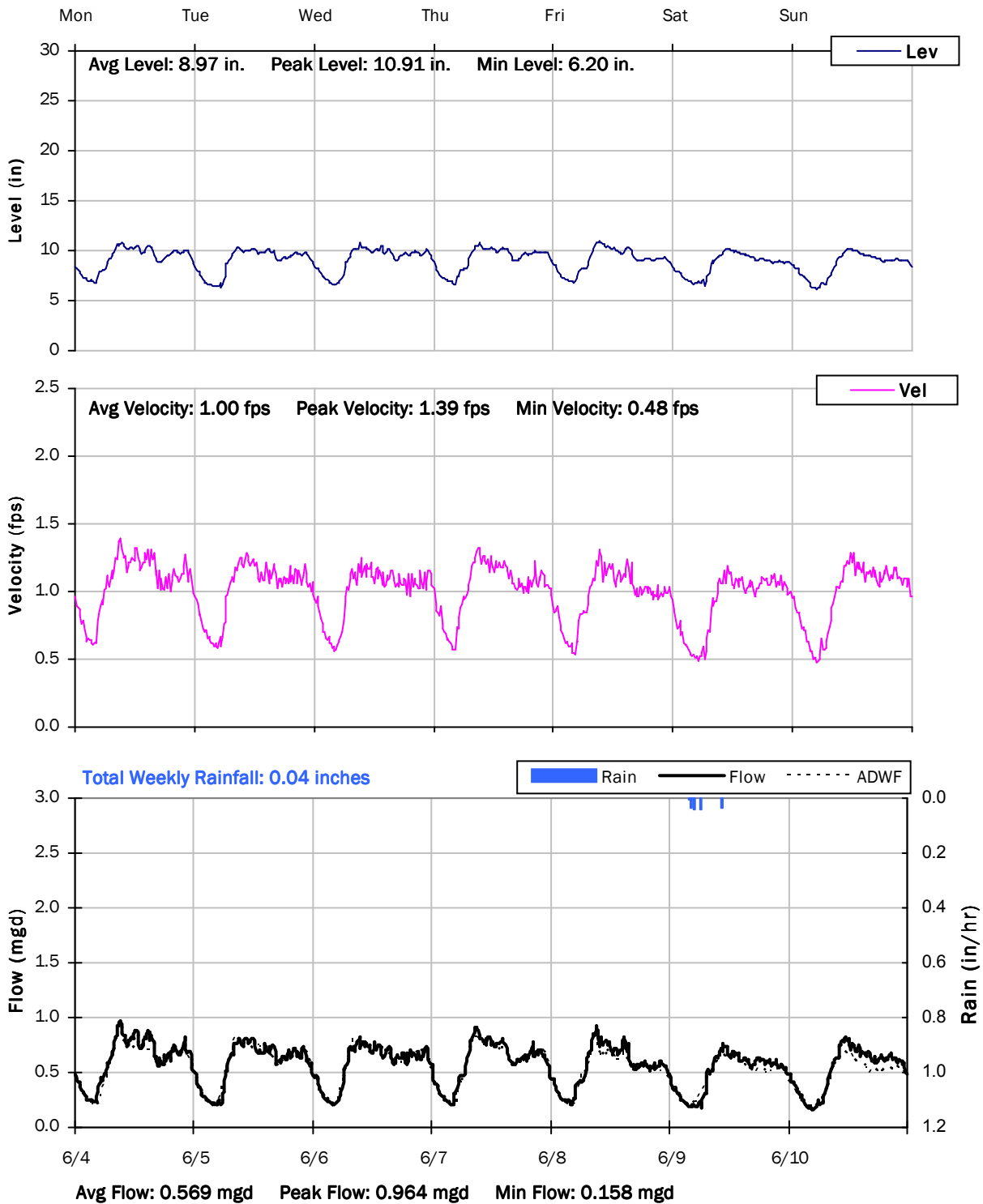
5/28/2018 to 6/4/2018



SITE 7

Weekly Level, Velocity and Flow Hydrographs

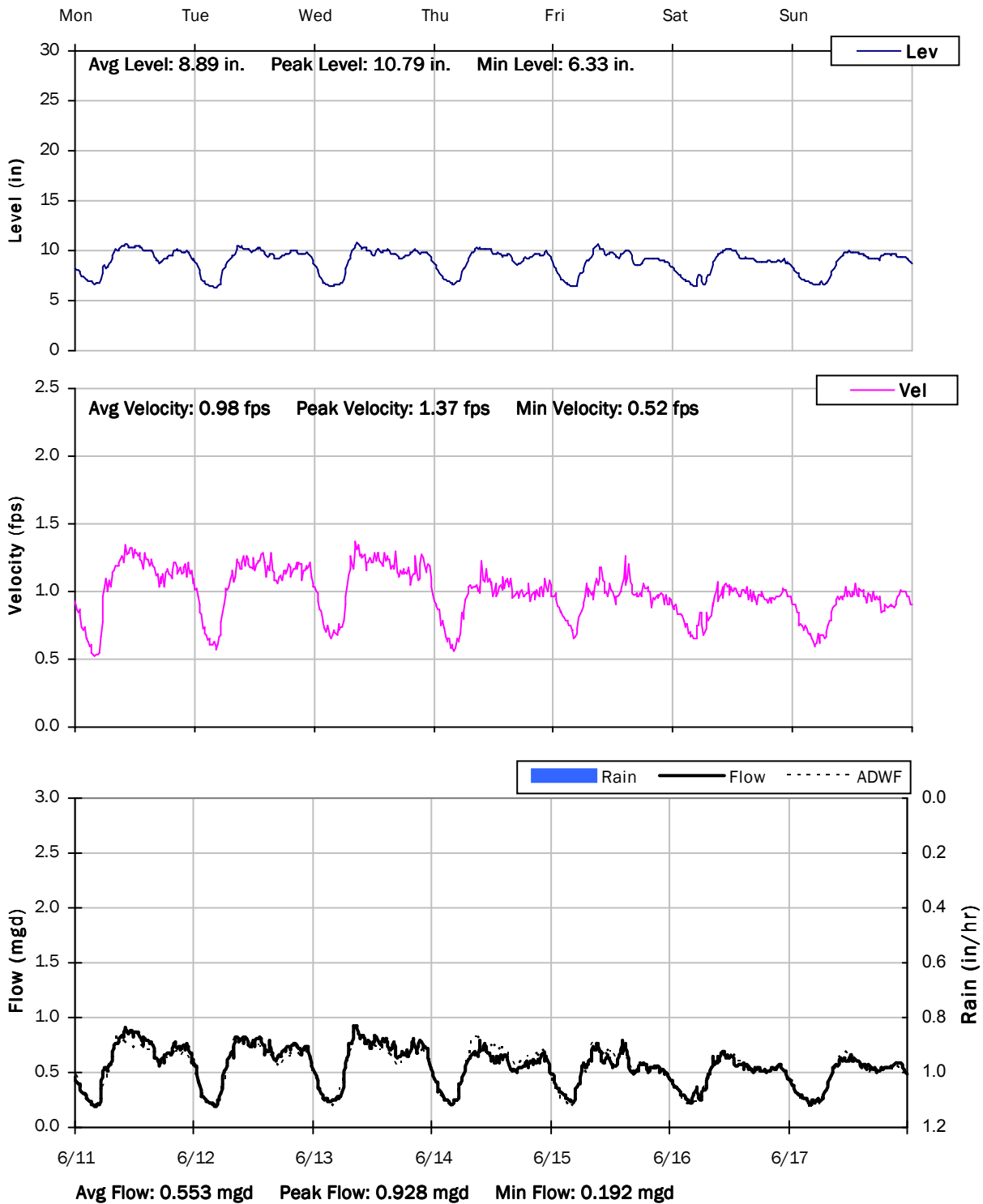
6/4/2018 to 6/11/2018



SITE 7

Weekly Level, Velocity and Flow Hydrographs

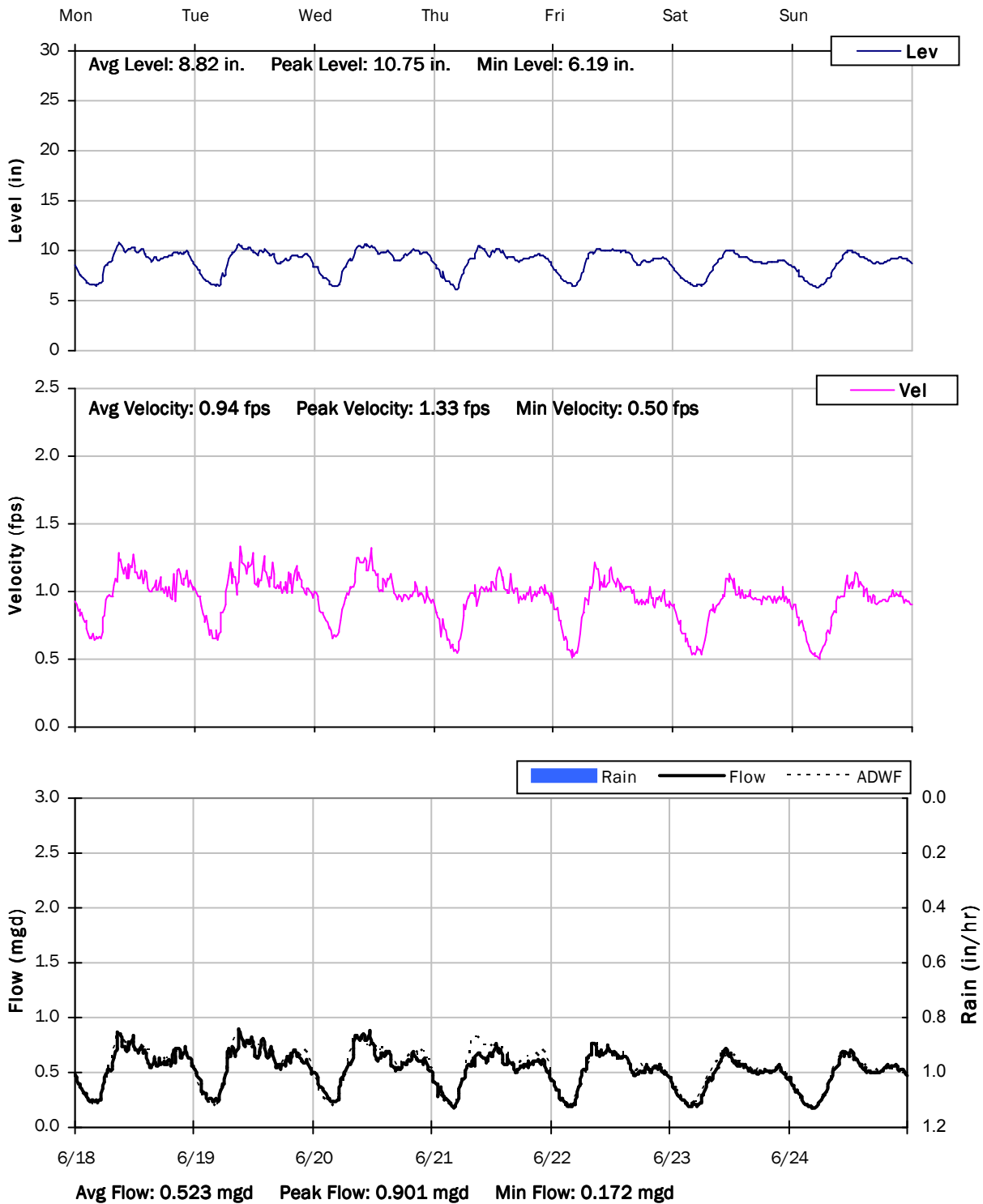
6/11/2018 to 6/18/2018



SITE 7

Weekly Level, Velocity and Flow Hydrographs

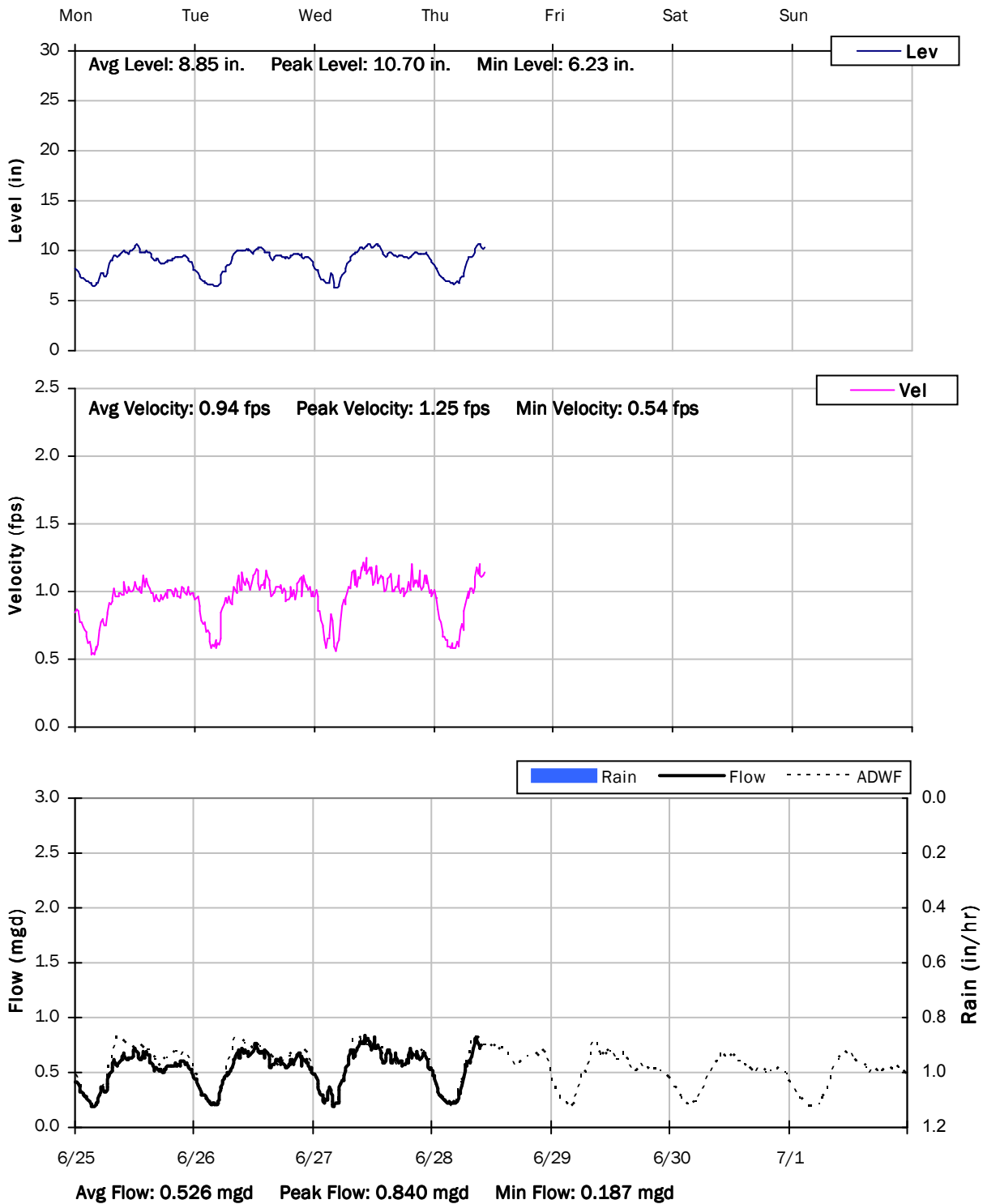
6/18/2018 to 6/25/2018



SITE 7

Weekly Level, Velocity and Flow Hydrographs

6/25/2018 to 7/2/2018

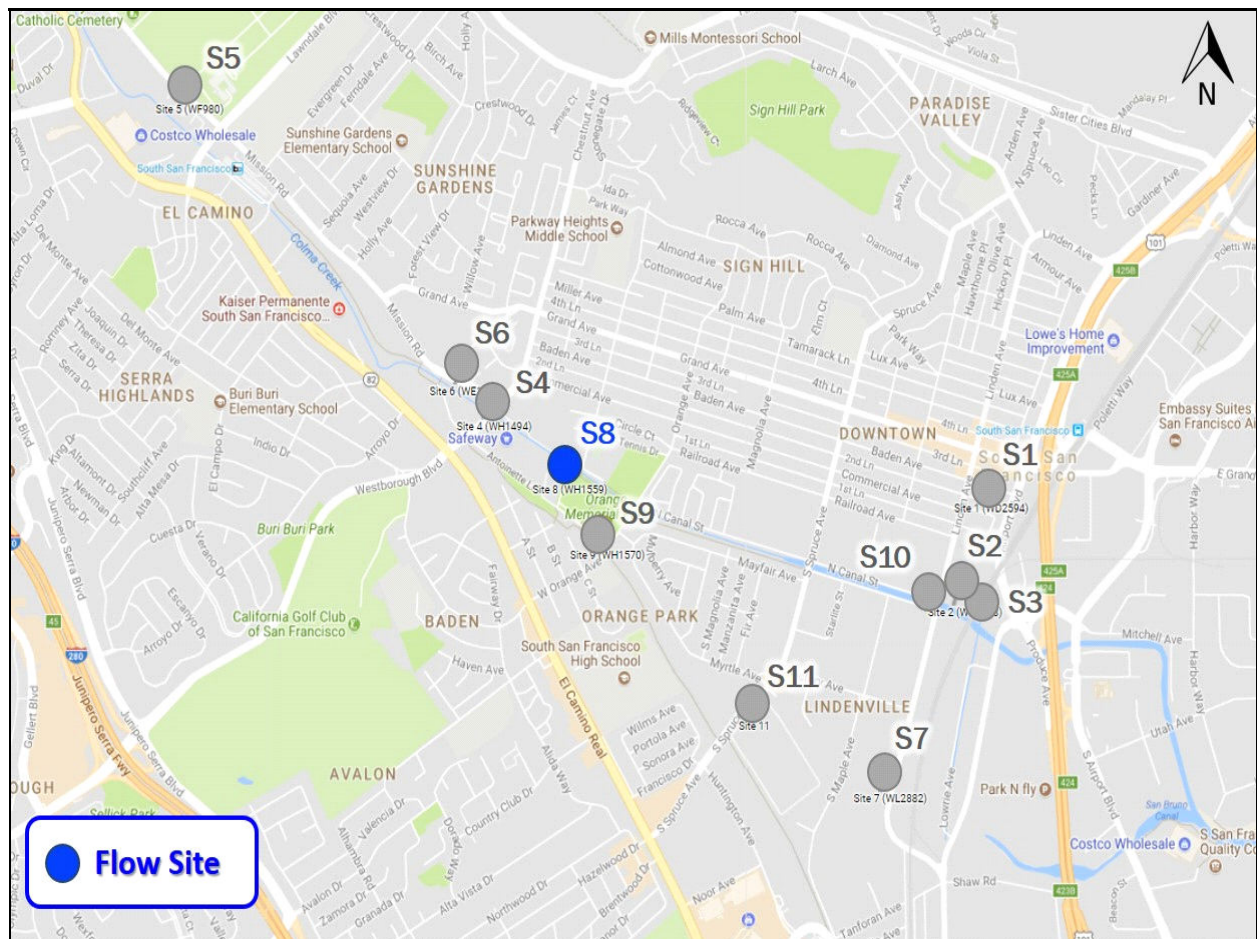


City of South San Francisco Sanitary Sewer Flow Monitoring February 26- June 28, 2018

Monitoring Site: Site 8

Location: Parking lot in northwest corner of Orange Memorial Park

Data Summary Report



Vicinity Map: Site 8

SITE 8

Site Information

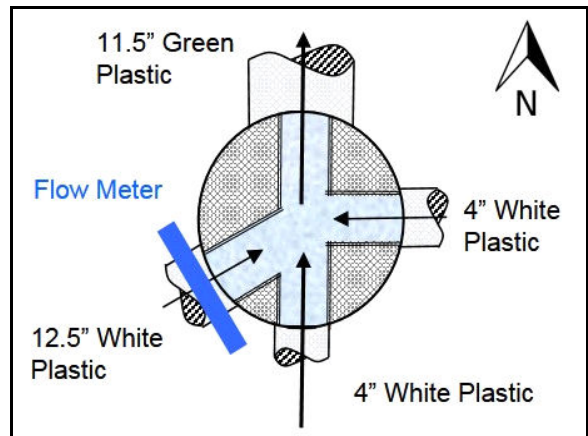
MH ID:	WH1559
Location:	Parking lot in northwest corner of Orange Memorial Park
Coordinates:	122.4288° W, 37.6542° N
Rim Elevation (Earth):	29 feet
Pipe Diameter:	12.5 inches
Sediment:	1.50 inches
ADWF:	0.133 mgd
Peak Measured Flow:	0.372 mgd



Satellite Map



Sewer Map



Flow Sketch



Street View

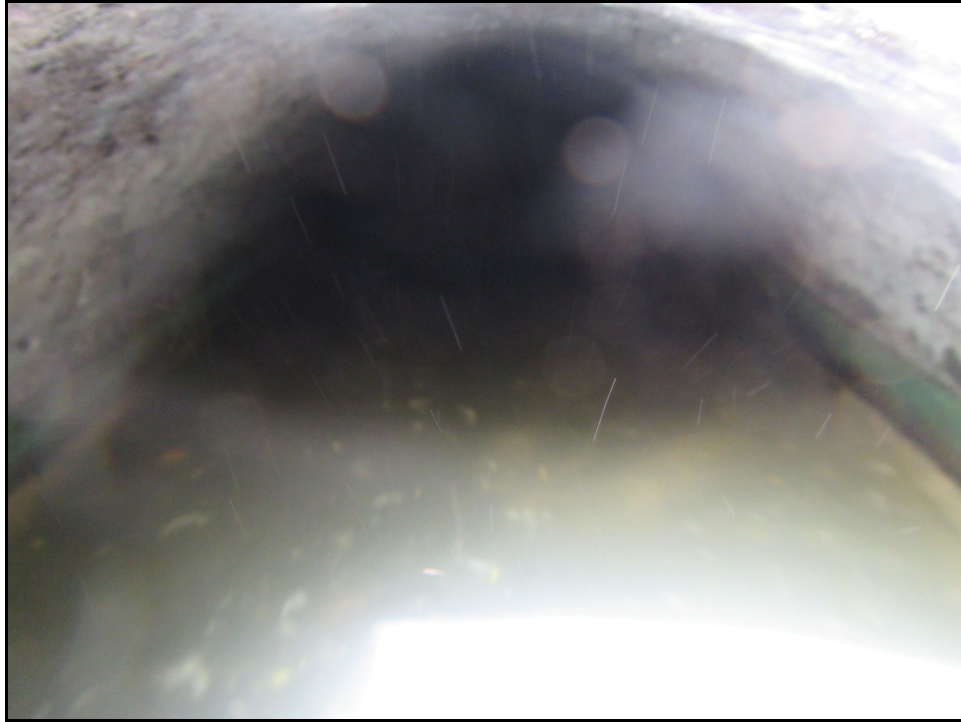


Plan View

SITE 8

Additional Site Photos

Effluent Pipe



Influent Pipe

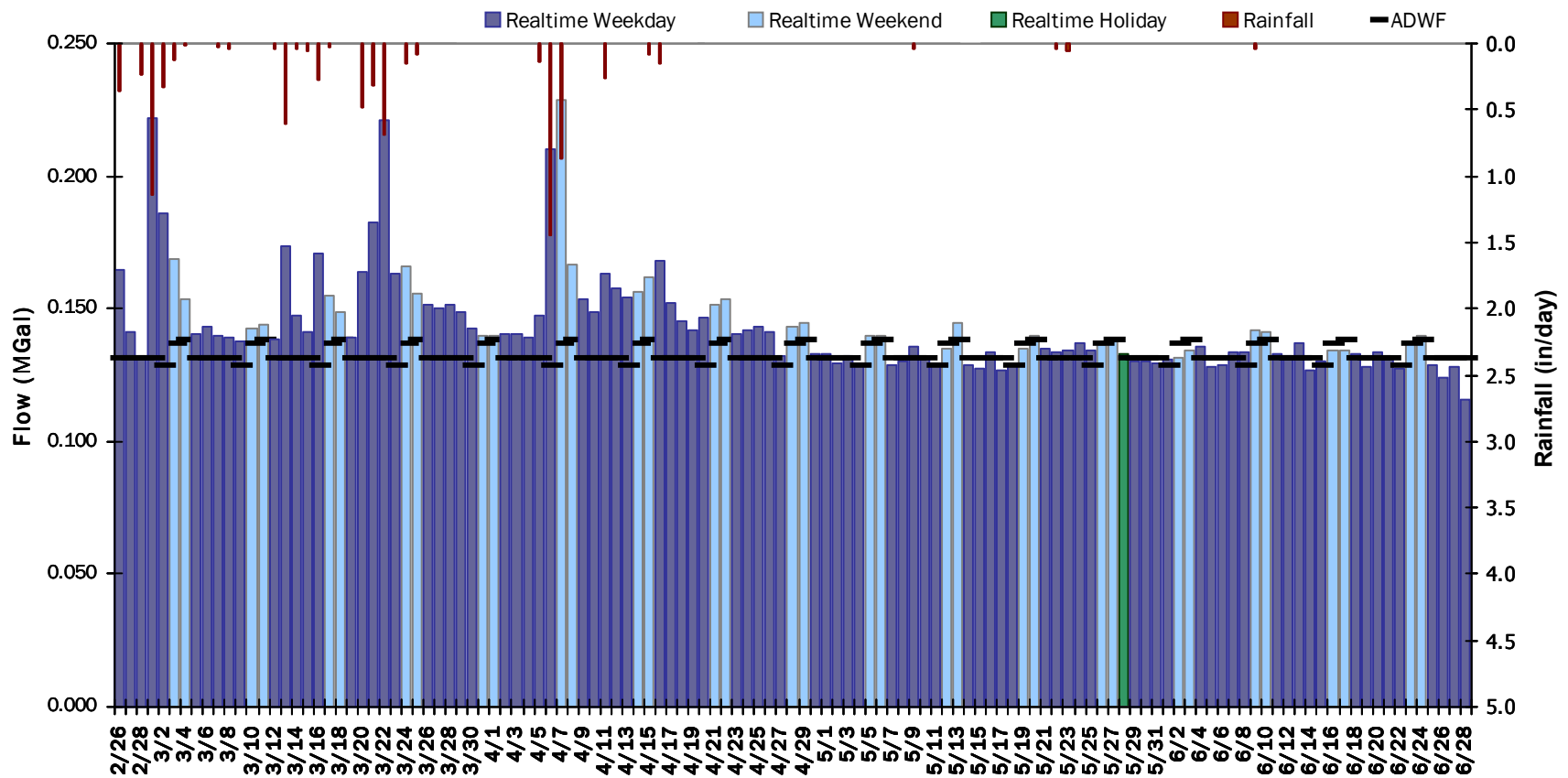


SITE 8

Period Flow Summary: Daily Flow Totals

Avg Period Flow: 0.144 MGal Peak Daily Flow: 0.228 MGal Min Daily Flow: 0.116 MGal

Total Period Rainfall: 7.82 inches



SITE 8

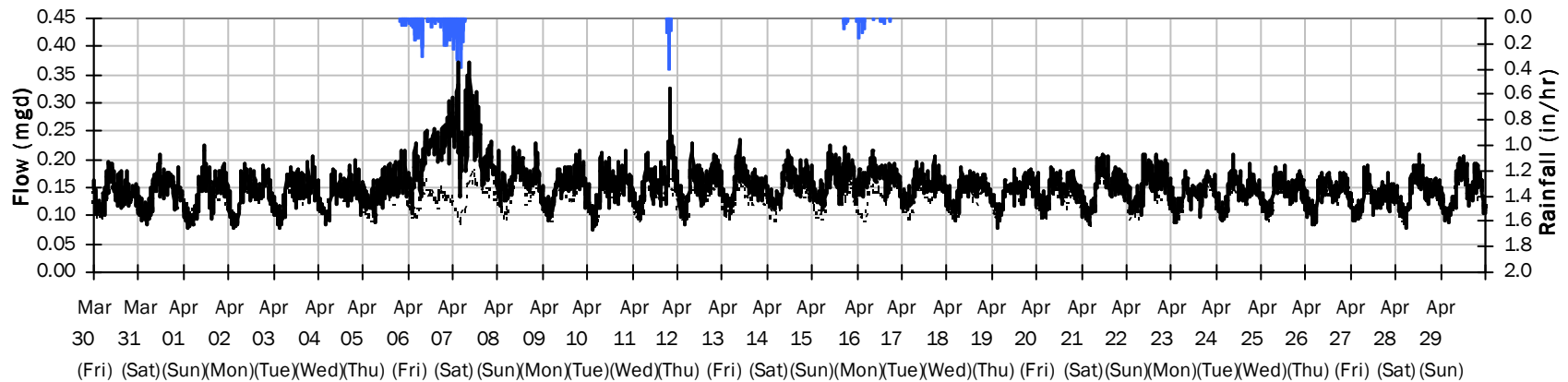
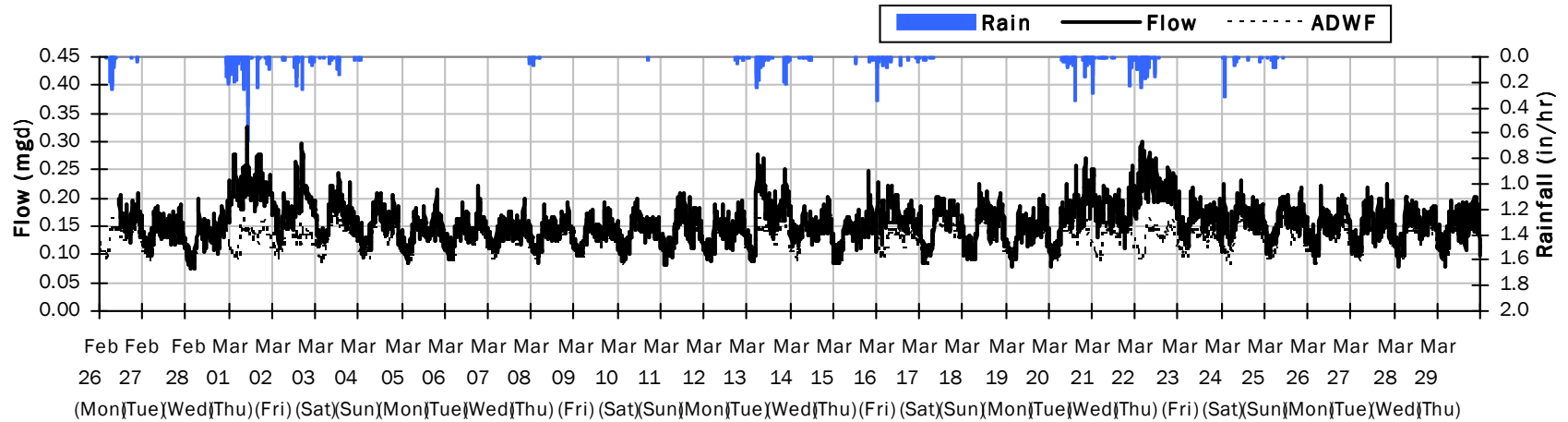
Flow Summary: 2/26/2018 to 4/29/2018

Total Period Rainfall: 7.96 inches

Avg Flow: 0.155 mgd

Peak Flow: 0.372 mgd

Min Flow: 0.075 mgd



SITE 8

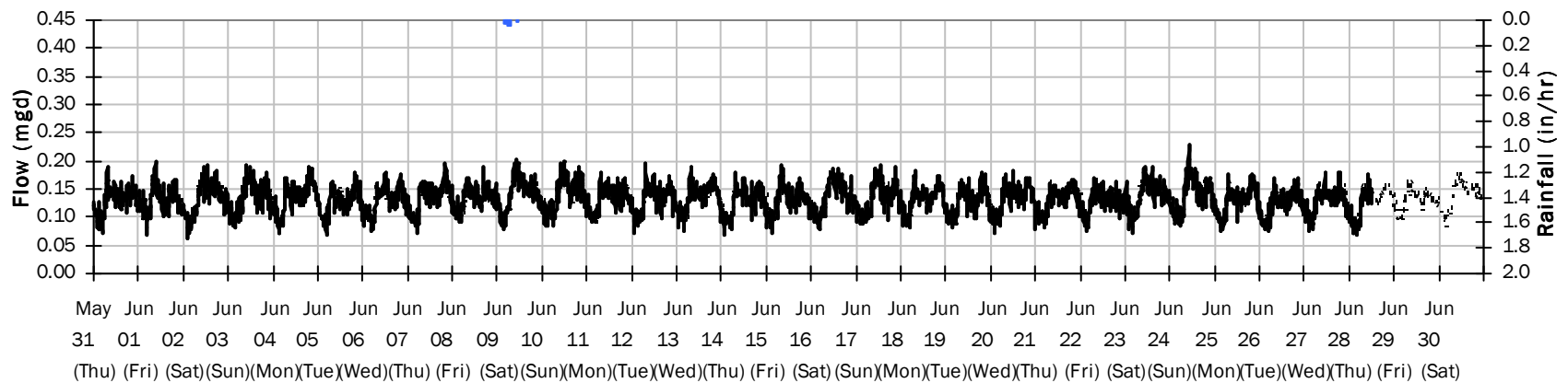
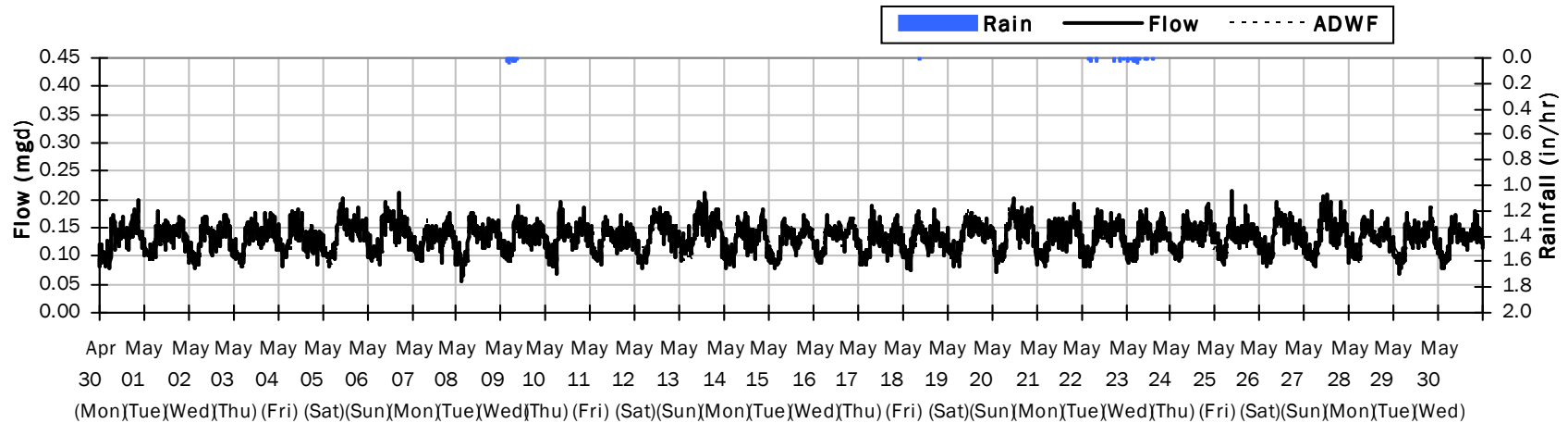
Flow Summary: 4/30/2018 to 6/30/2018

Total Period Rainfall: 0.18 inches

Avg Flow: 0.133 mgd

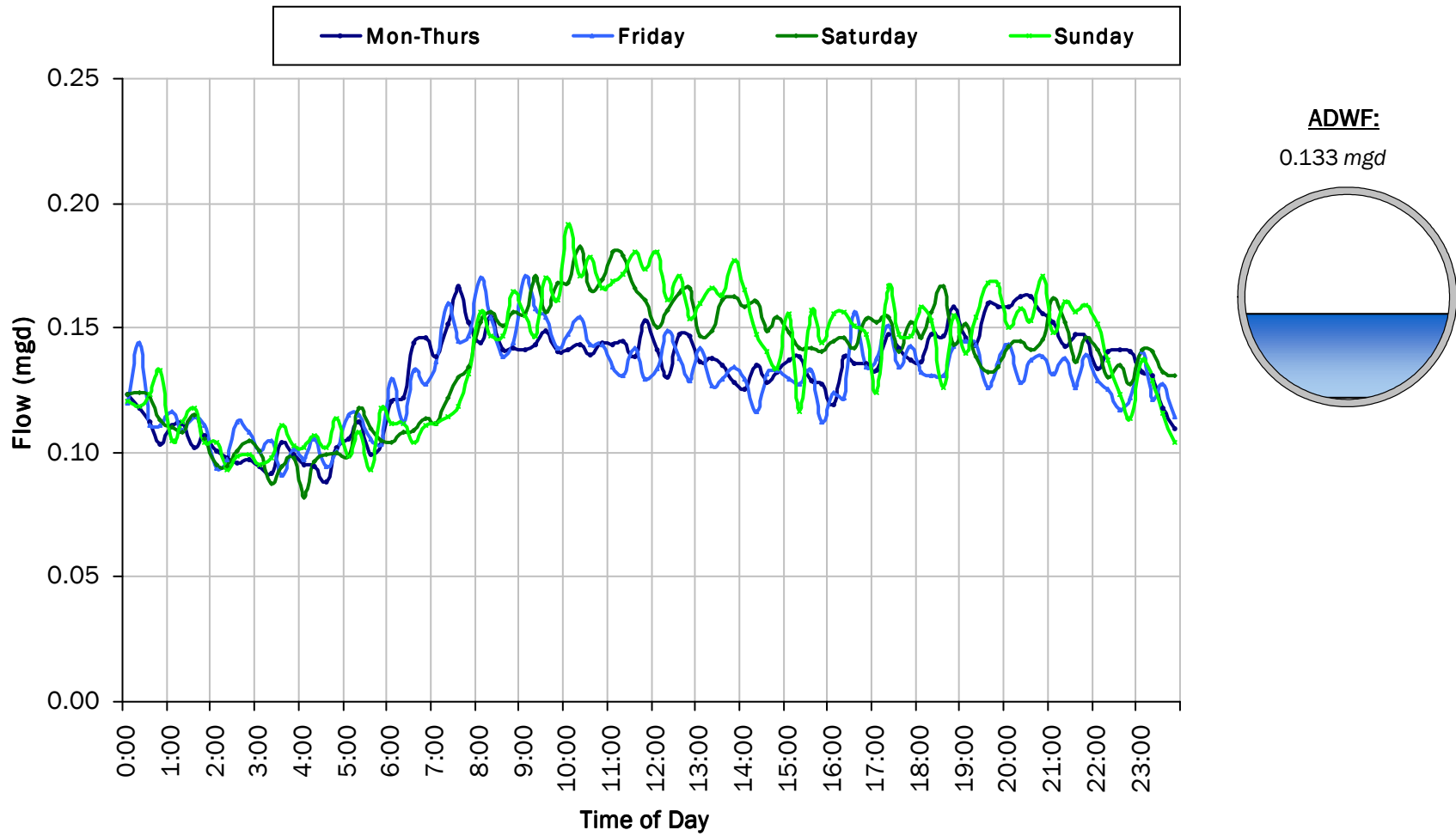
Peak Flow: 0.229 mgd

Min Flow: 0.055 mgd



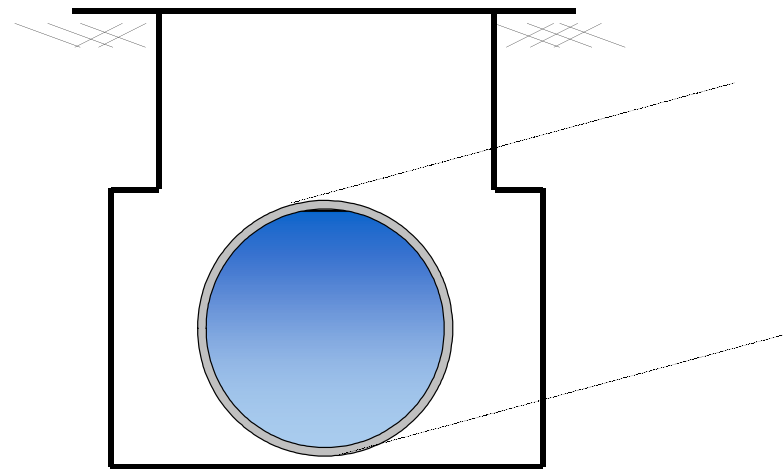
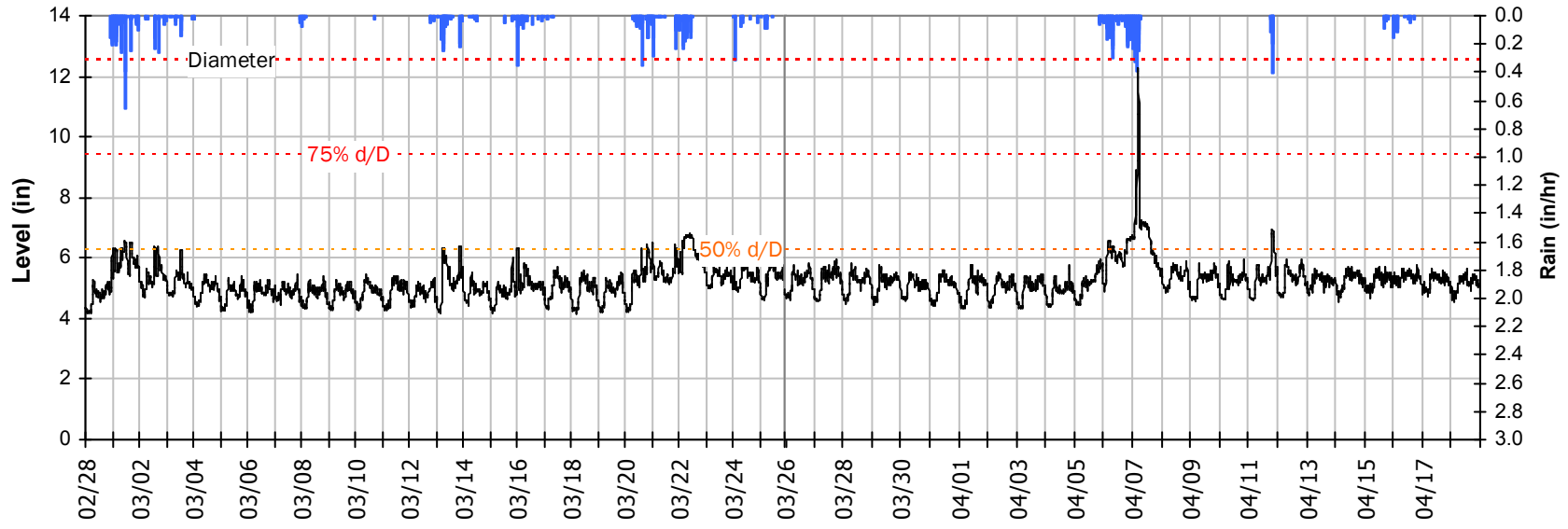
SITE 8

Average Dry Weather Flow Hydrographs



SITE 8
Site Capacity and Surge Summary

Realtime Flow Levels with Rainfall Data over Monitoring (High Capacity) Period

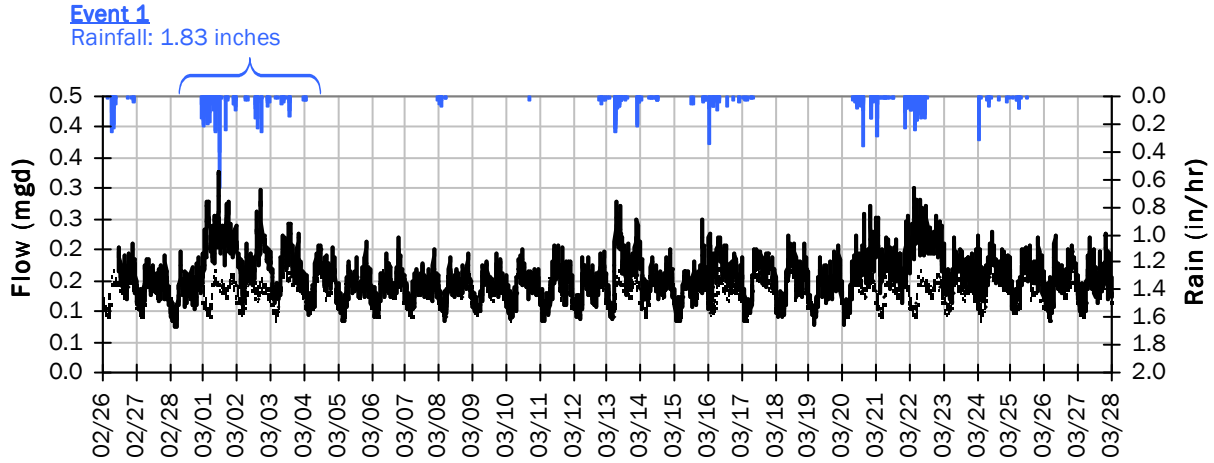


Pipe Diameter:	12.5	inches
Peak Measured Level:	12.3	inches
Peak d/D Ratio:	0.98	

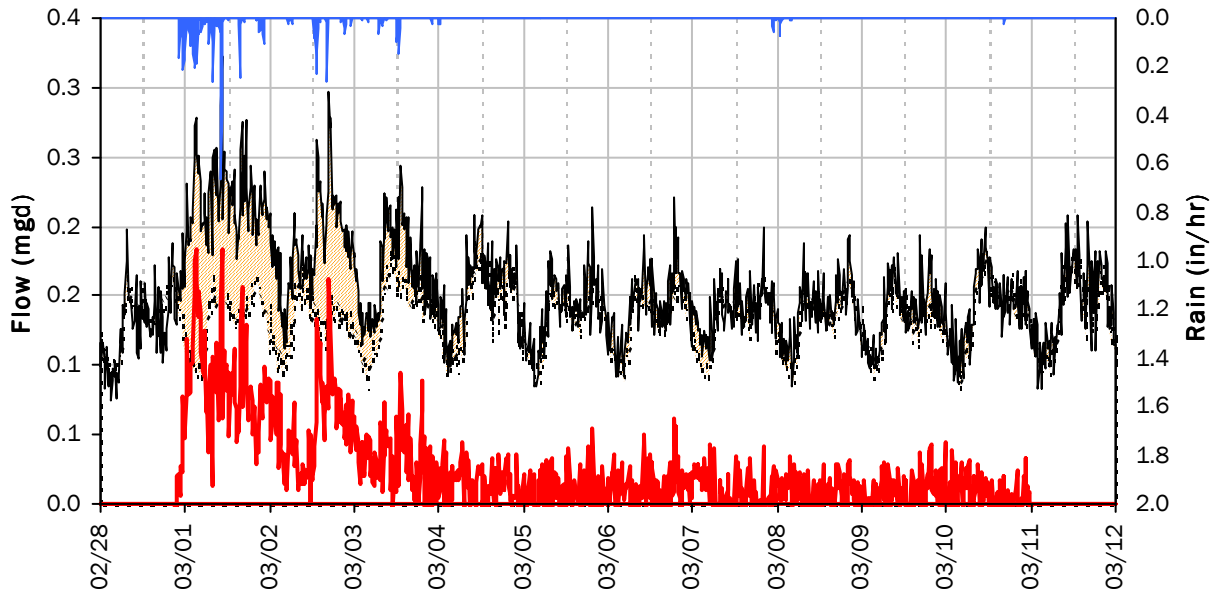
SITE 8

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



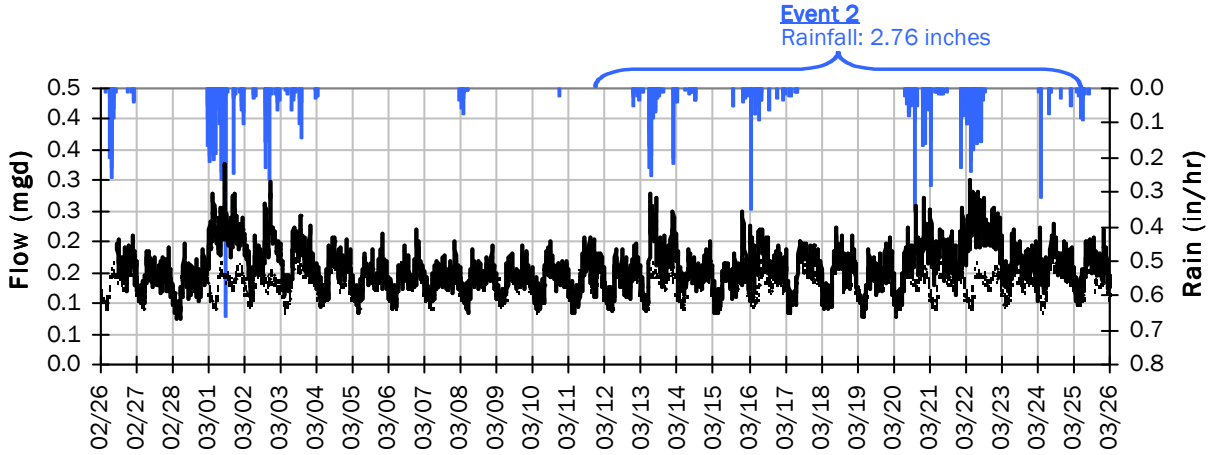
Storm Event I/I Analysis (Rain = 1.83 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	0.32 mgd	Peak I/I Rate:	0.18 mgd
PF:	2.43	Total I/I:	248,000 gallons
Peak Level:	6.59 in		
d/D Ratio:	0.53		

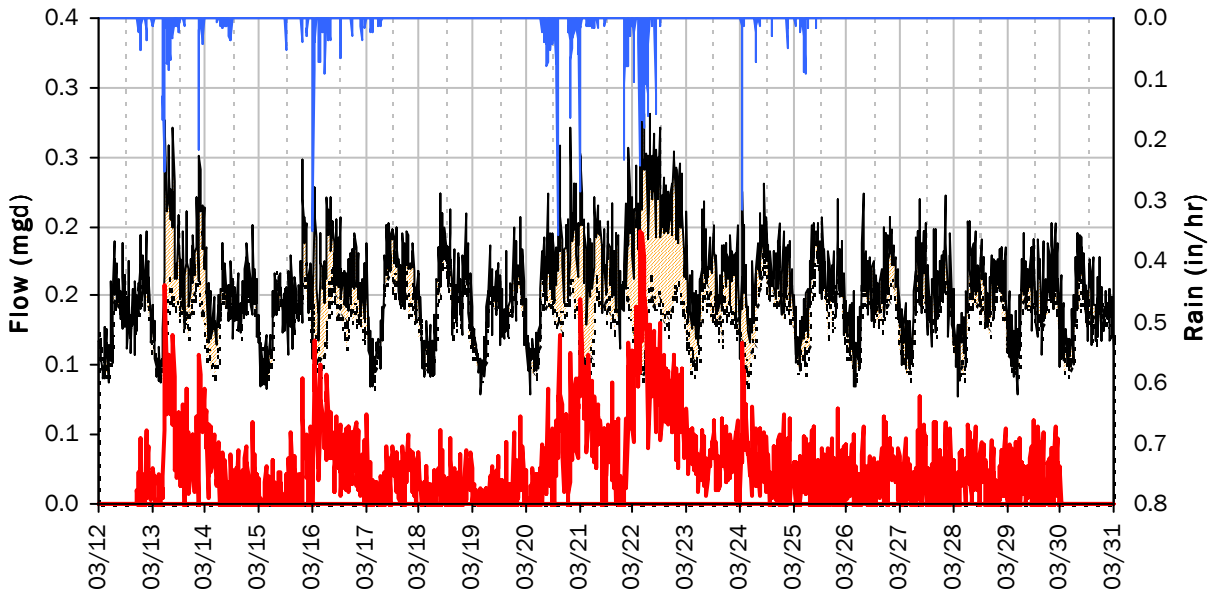
SITE 8

I/I Summary: Event 2

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 2 Detail Graph



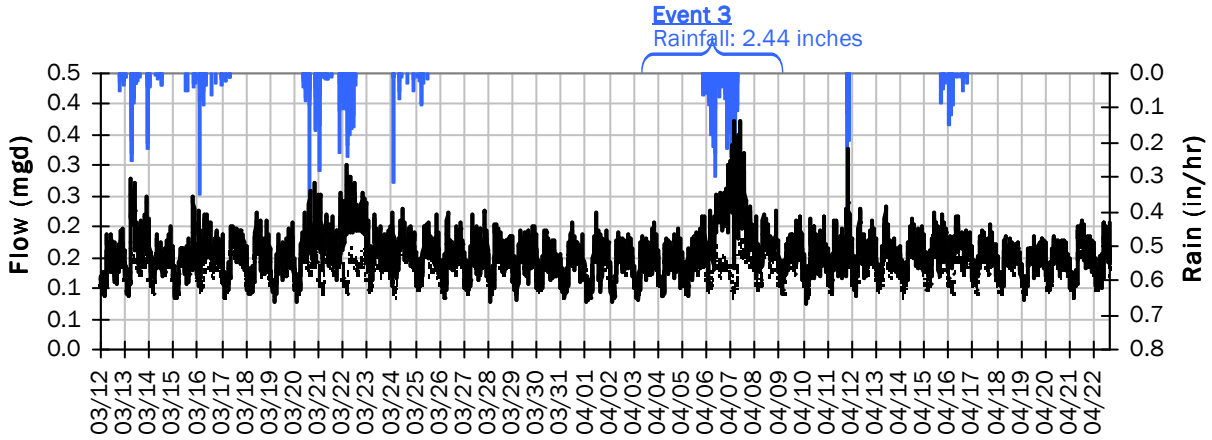
Storm Event I/I Analysis (Rain = 2.76 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	0.30 mgd	Peak I/I Rate:	0.20 mgd
PF:	2.26	Total I/I:	479,000 gallons
Peak Level:	6.81 in		
d/D Ratio:	0.54		

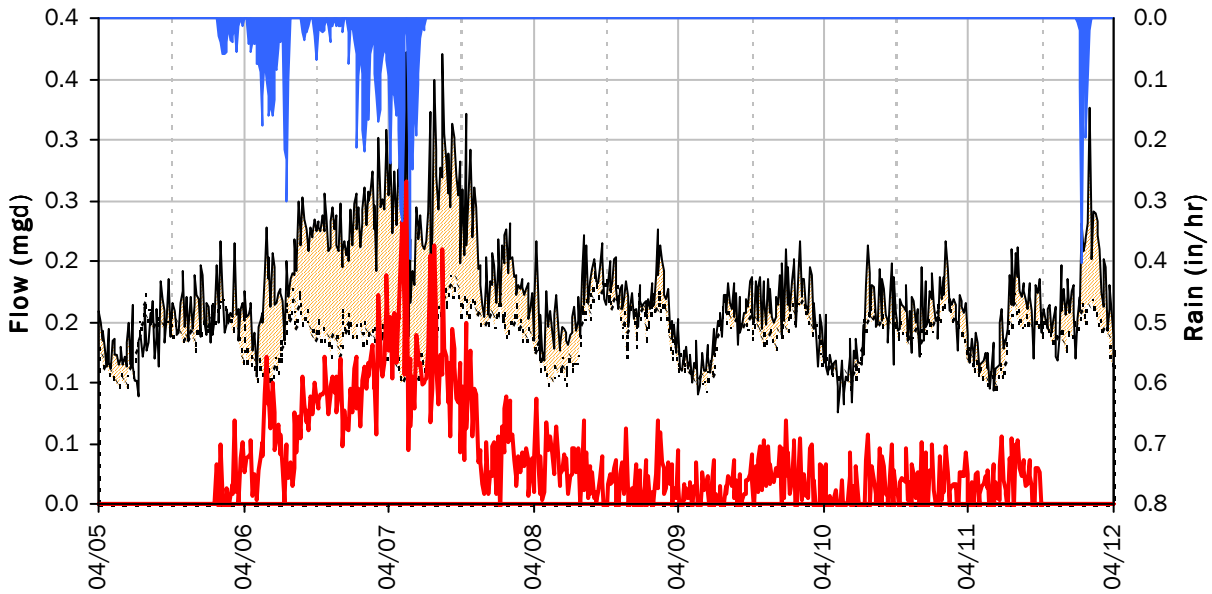
SITE 8

I/I Summary: Event 3

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 3 Detail Graph



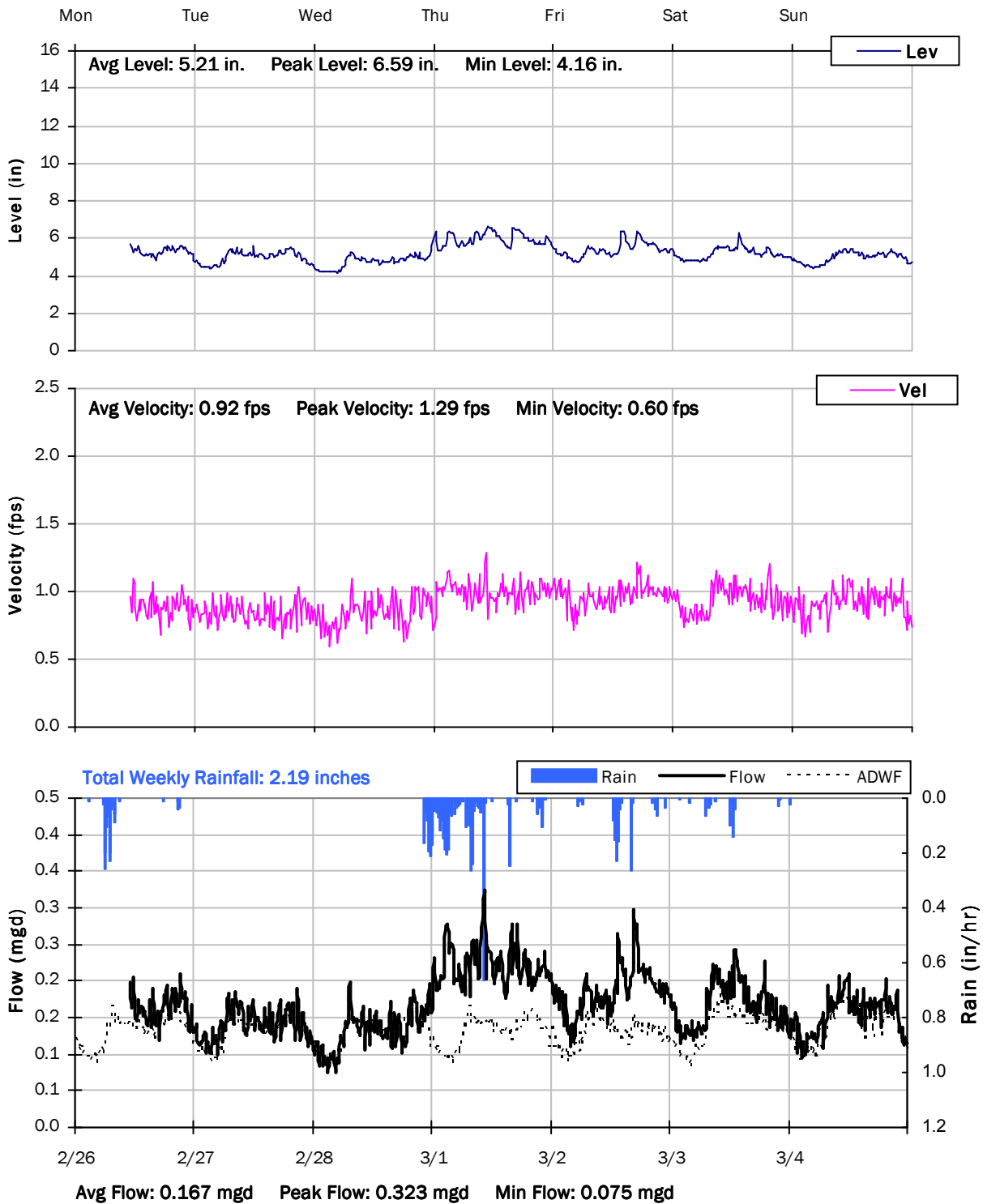
Storm Event I/I Analysis (Rain = 2.44 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	0.37 mgd	Peak I/I Rate:	0.27 mgd
PF:	2.80	Total I/I:	227,000 gallons
Peak Level:	12.29 in		
d/D Ratio:	0.98		

SITE 8

Weekly Level, Velocity and Flow Hydrographs

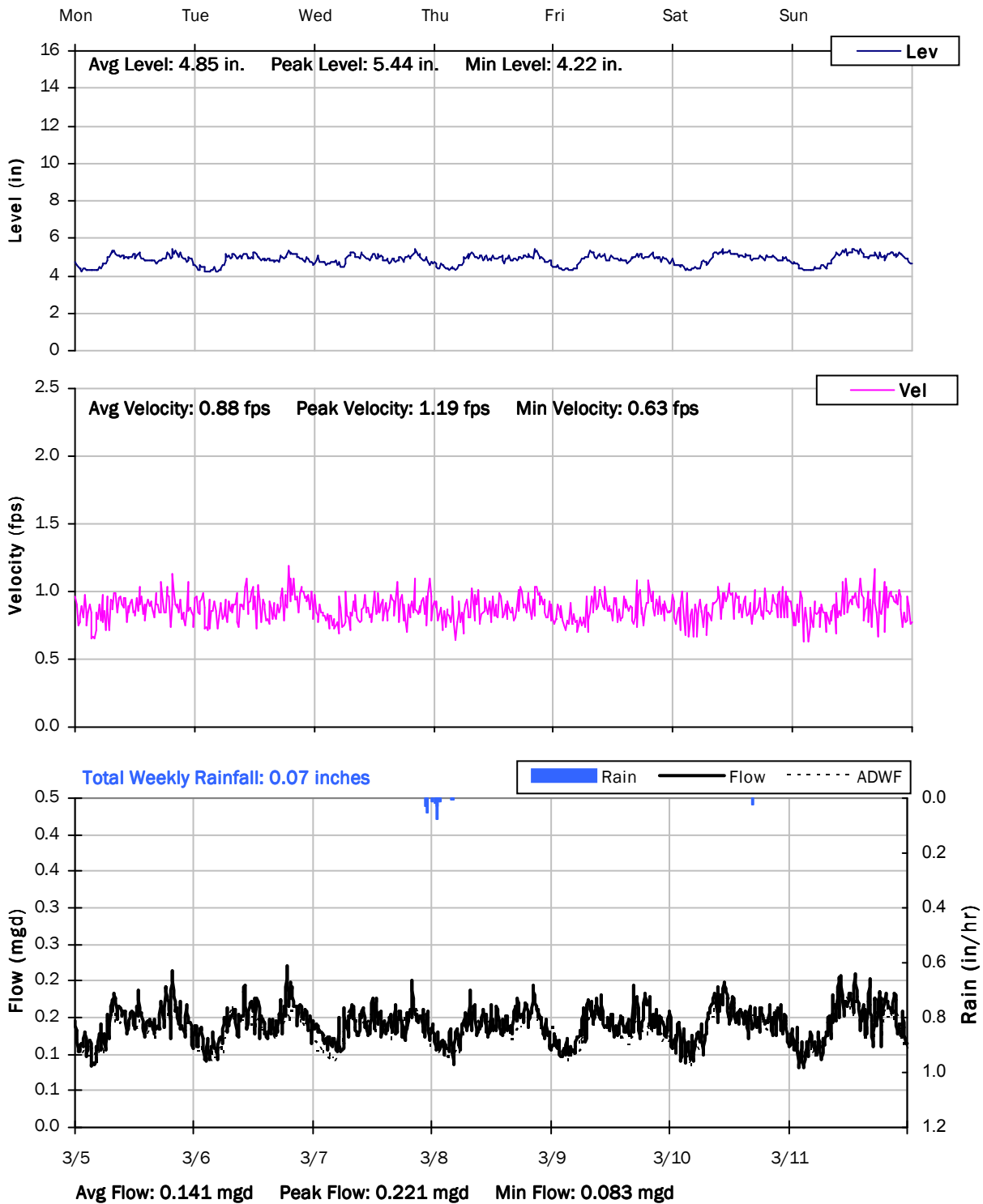
2/26/2018 to 3/5/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

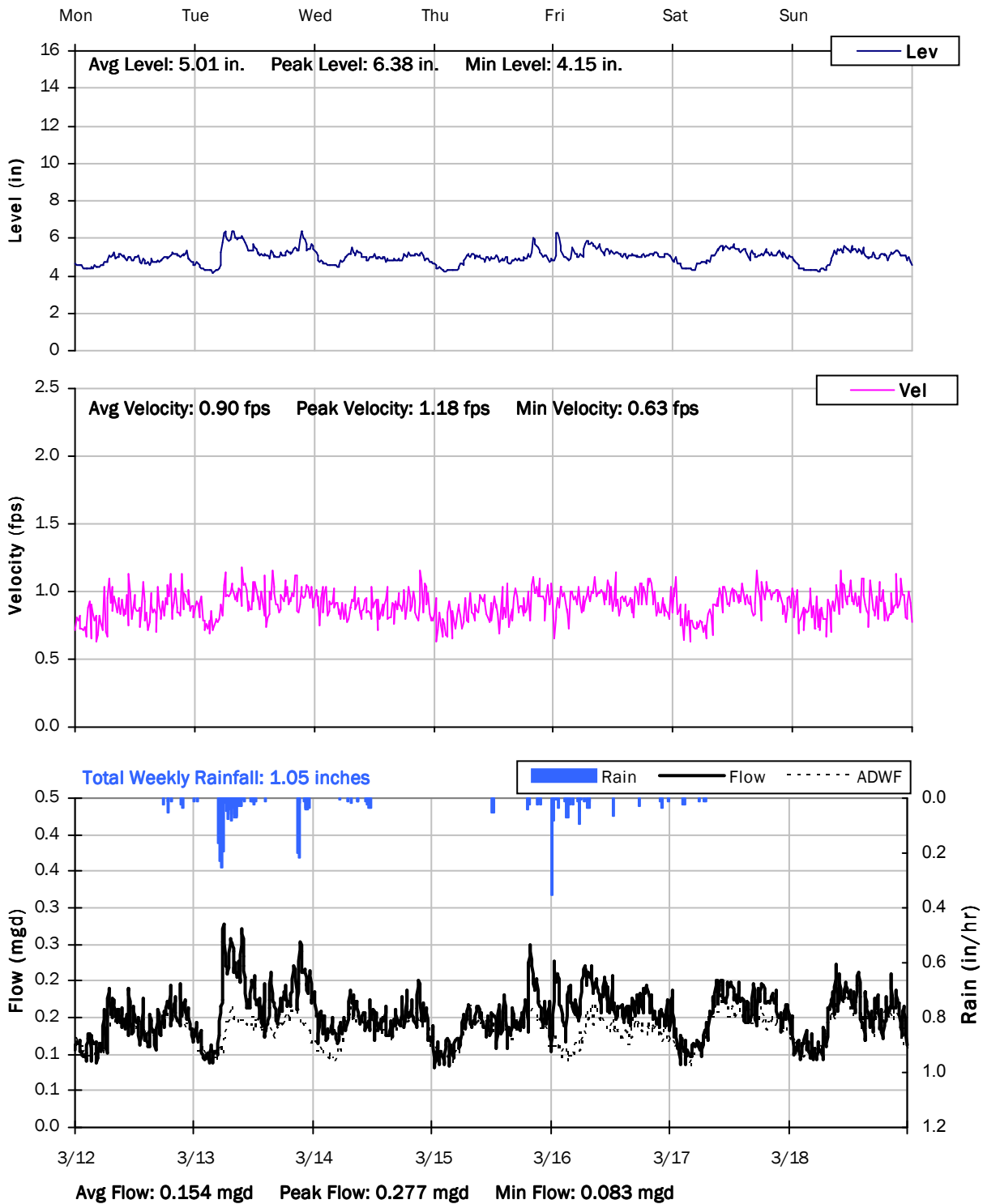
3/5/2018 to 3/12/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

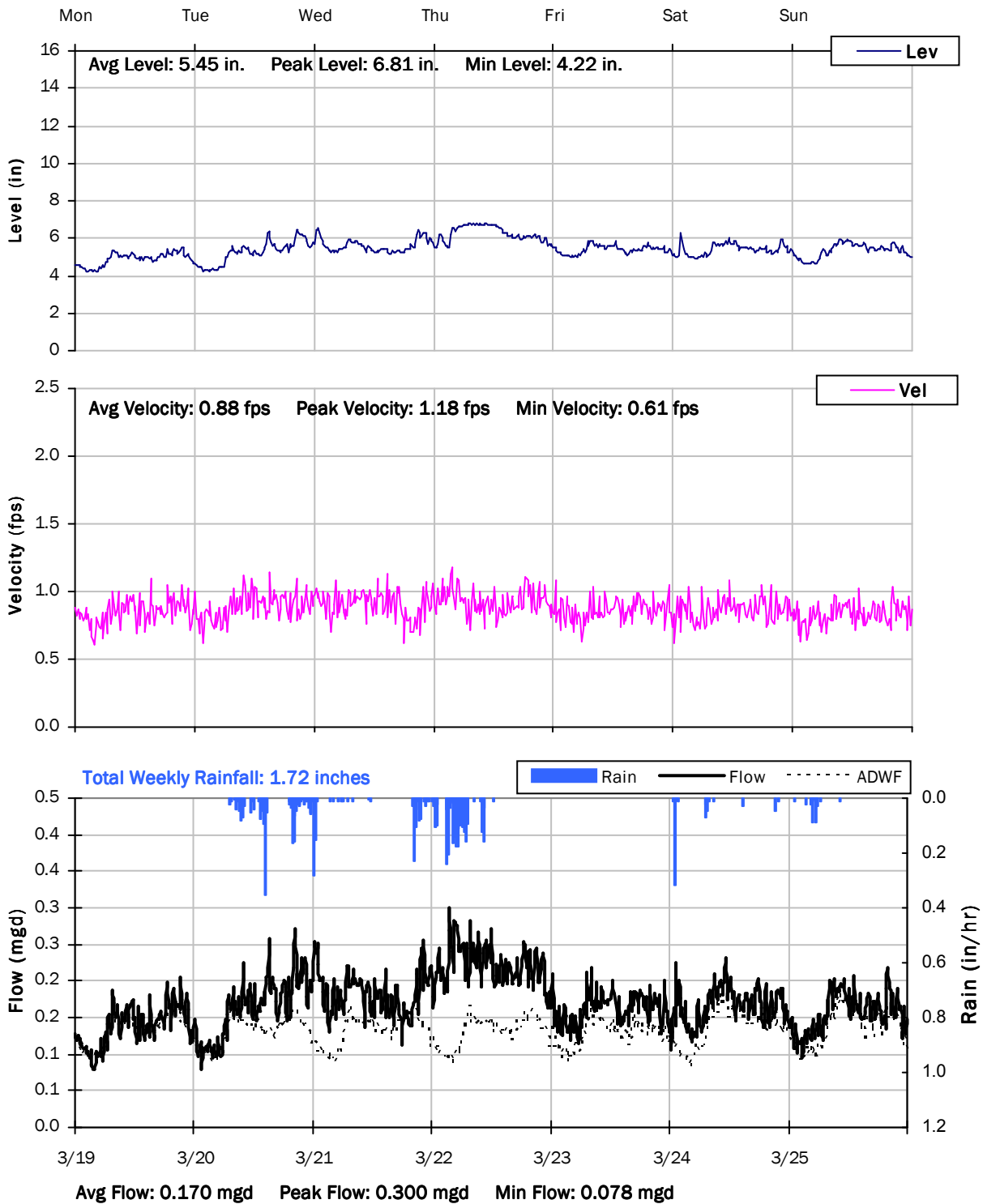
3/12/2018 to 3/19/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

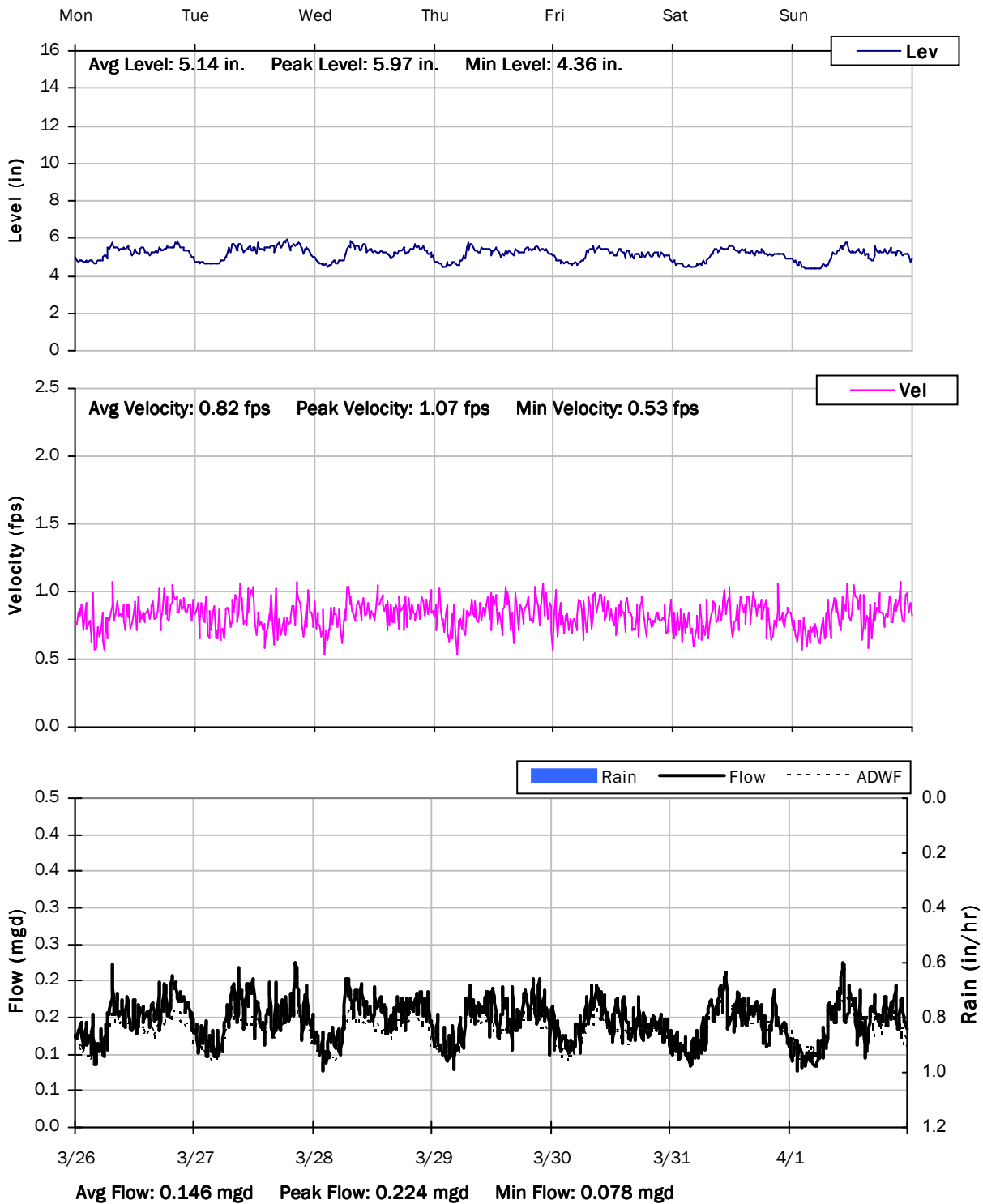
3/19/2018 to 3/26/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

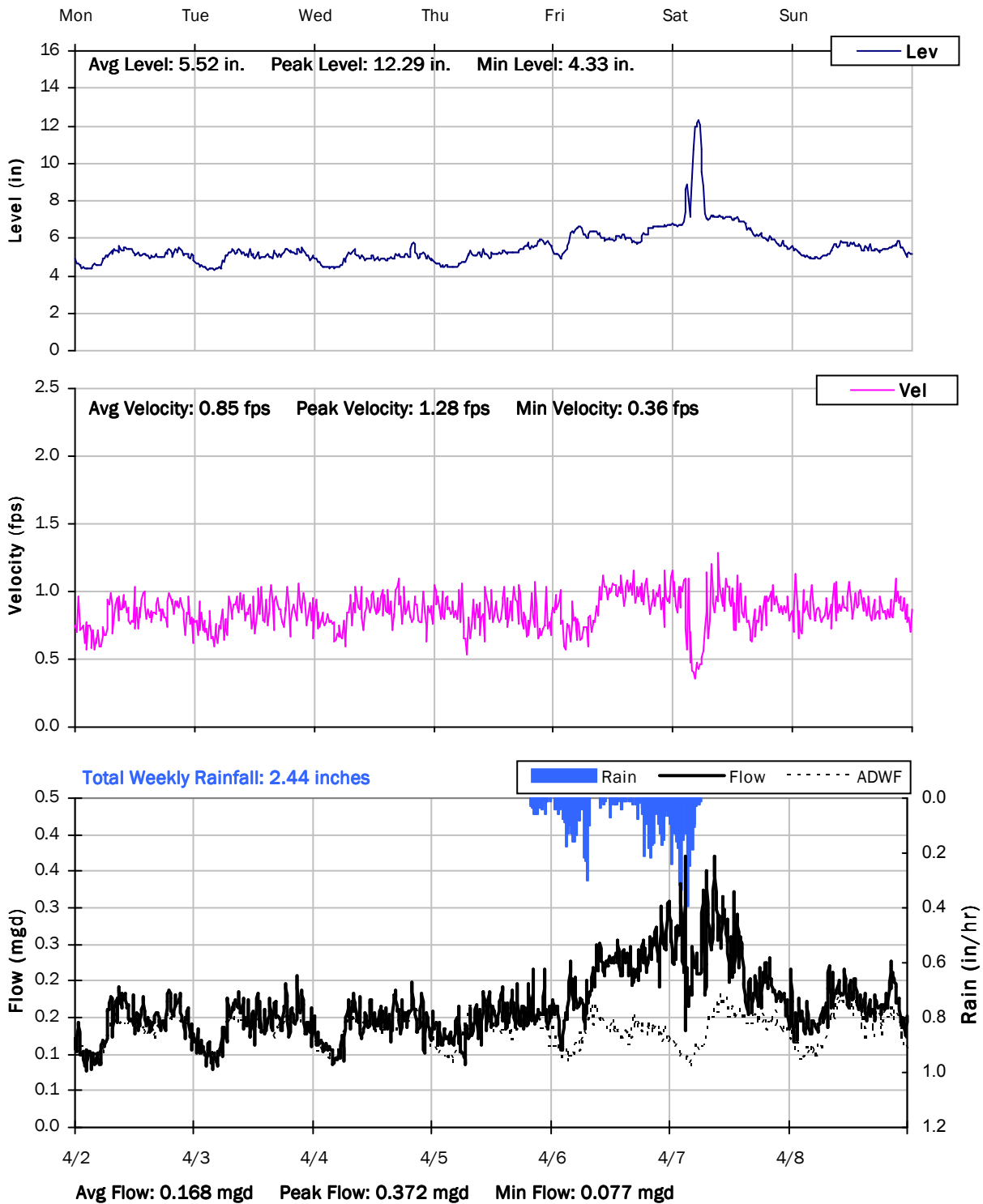
3/26/2018 to 4/2/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

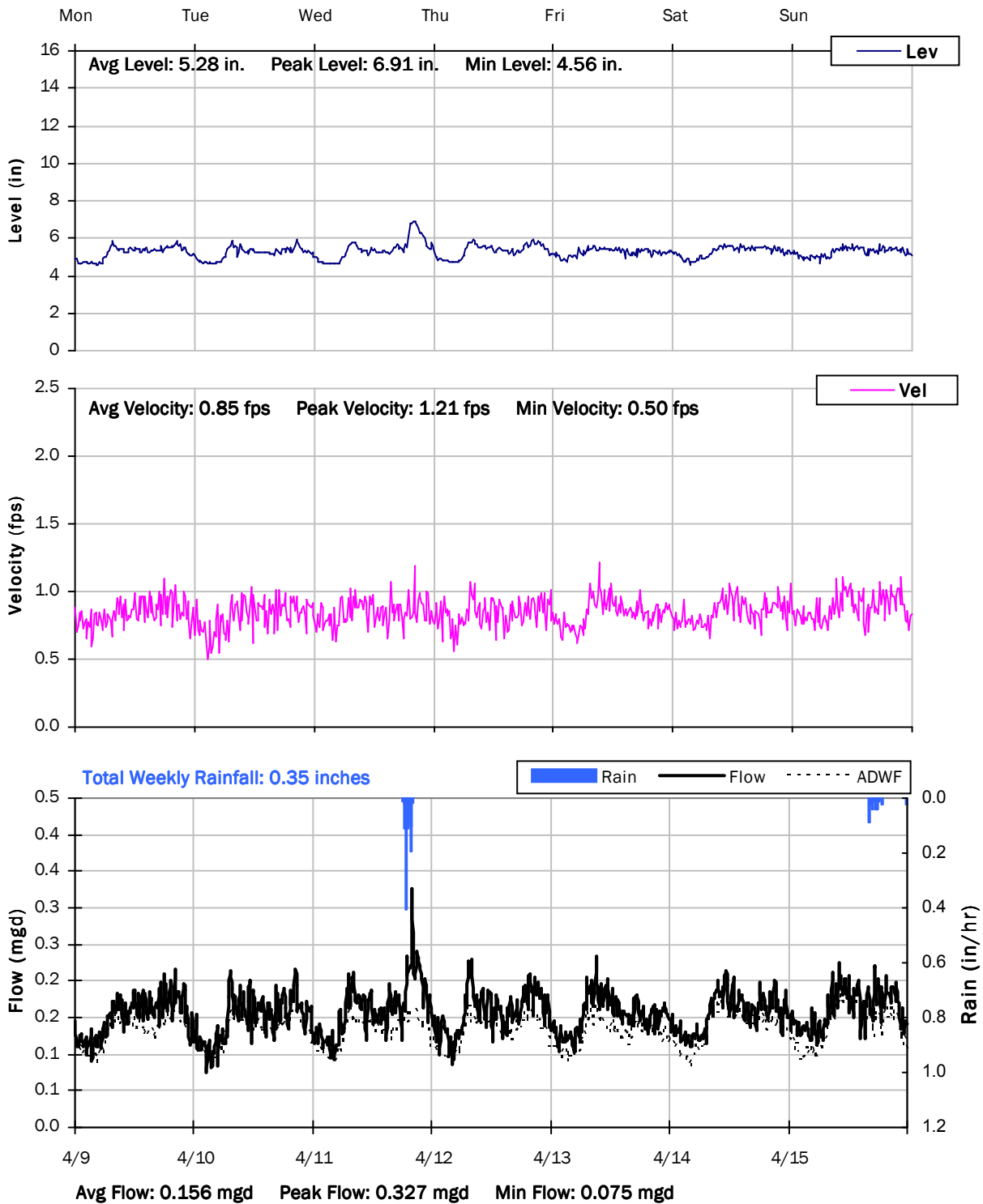
4/2/2018 to 4/9/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

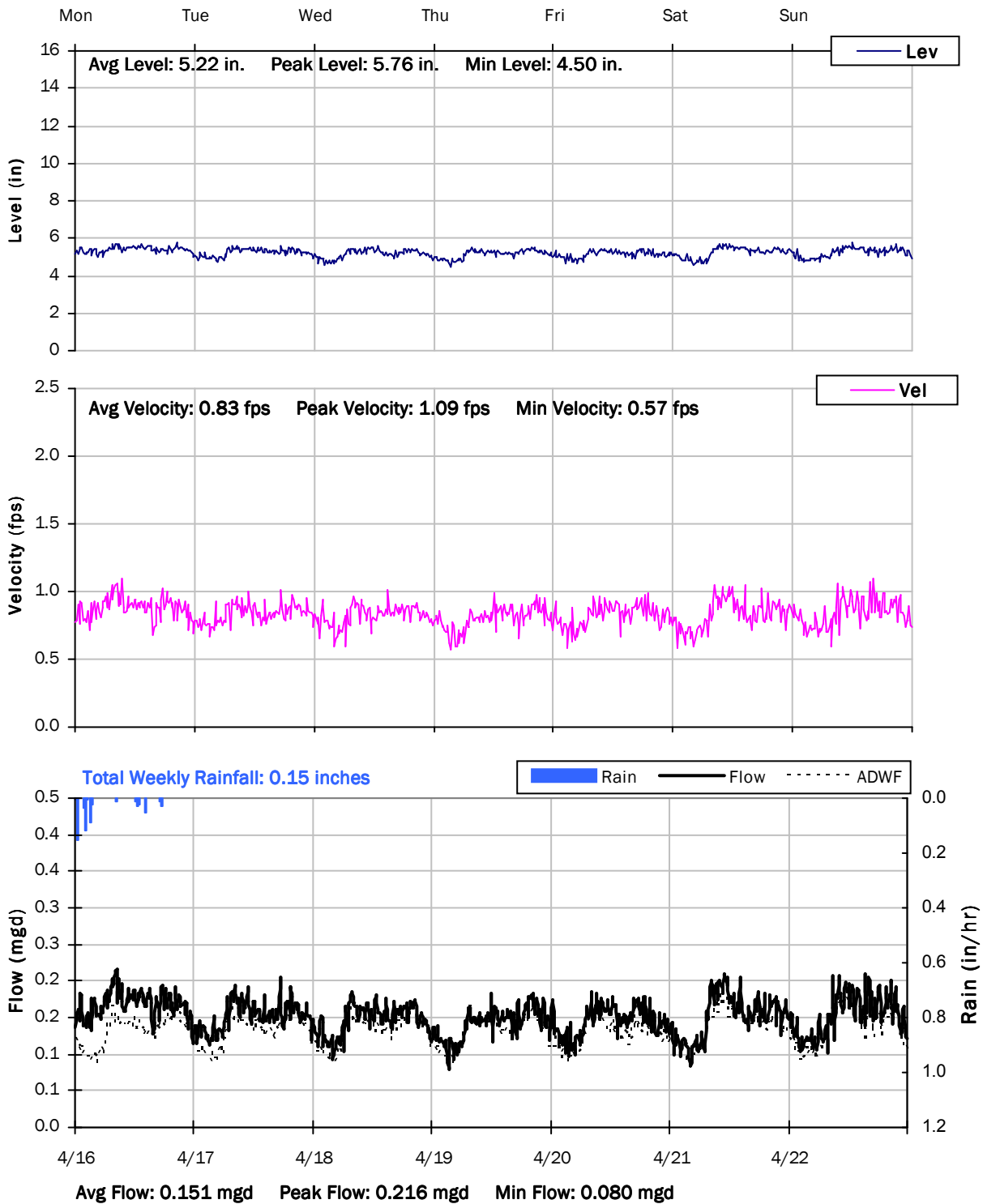
4/9/2018 to 4/16/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

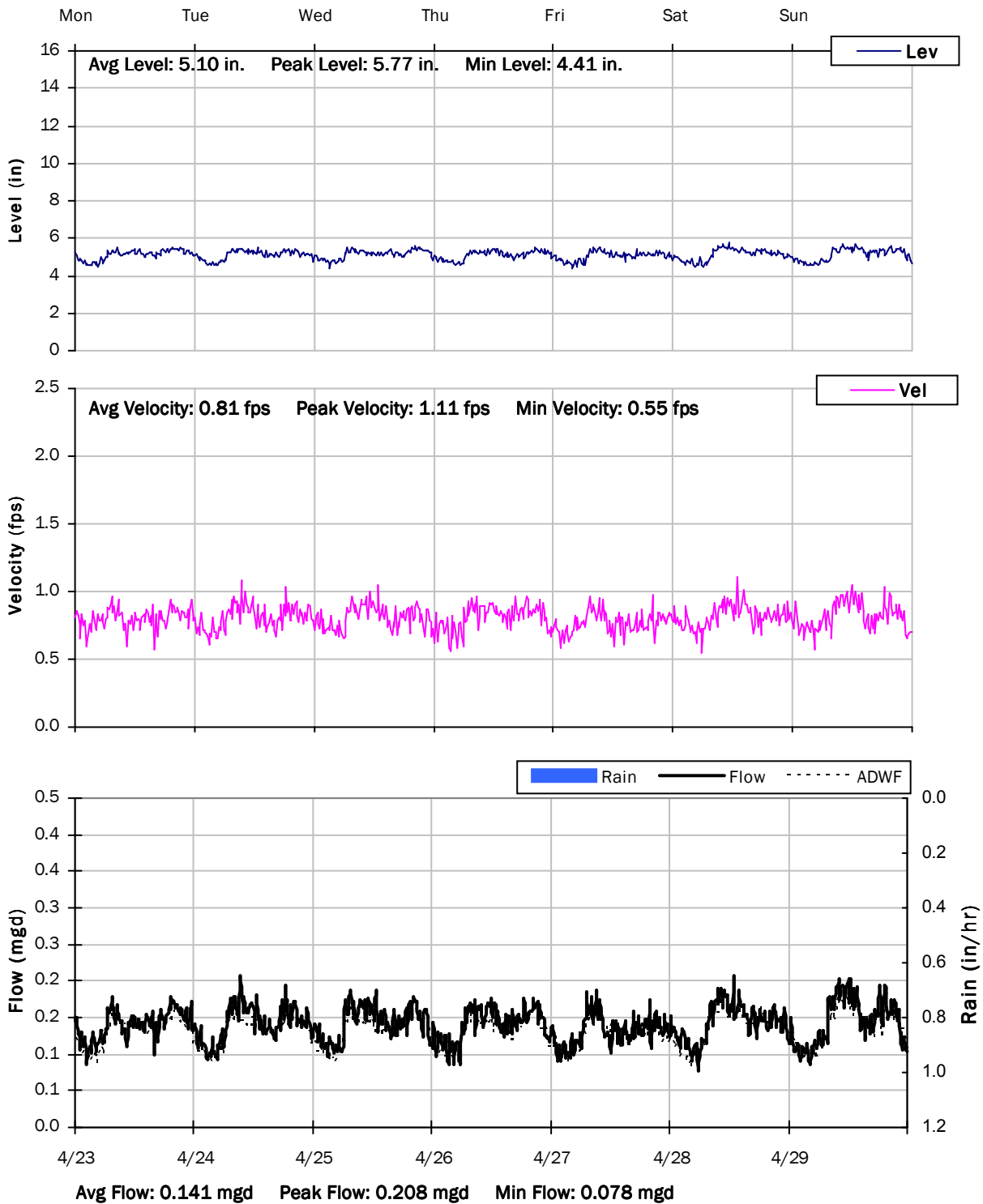
4/16/2018 to 4/23/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

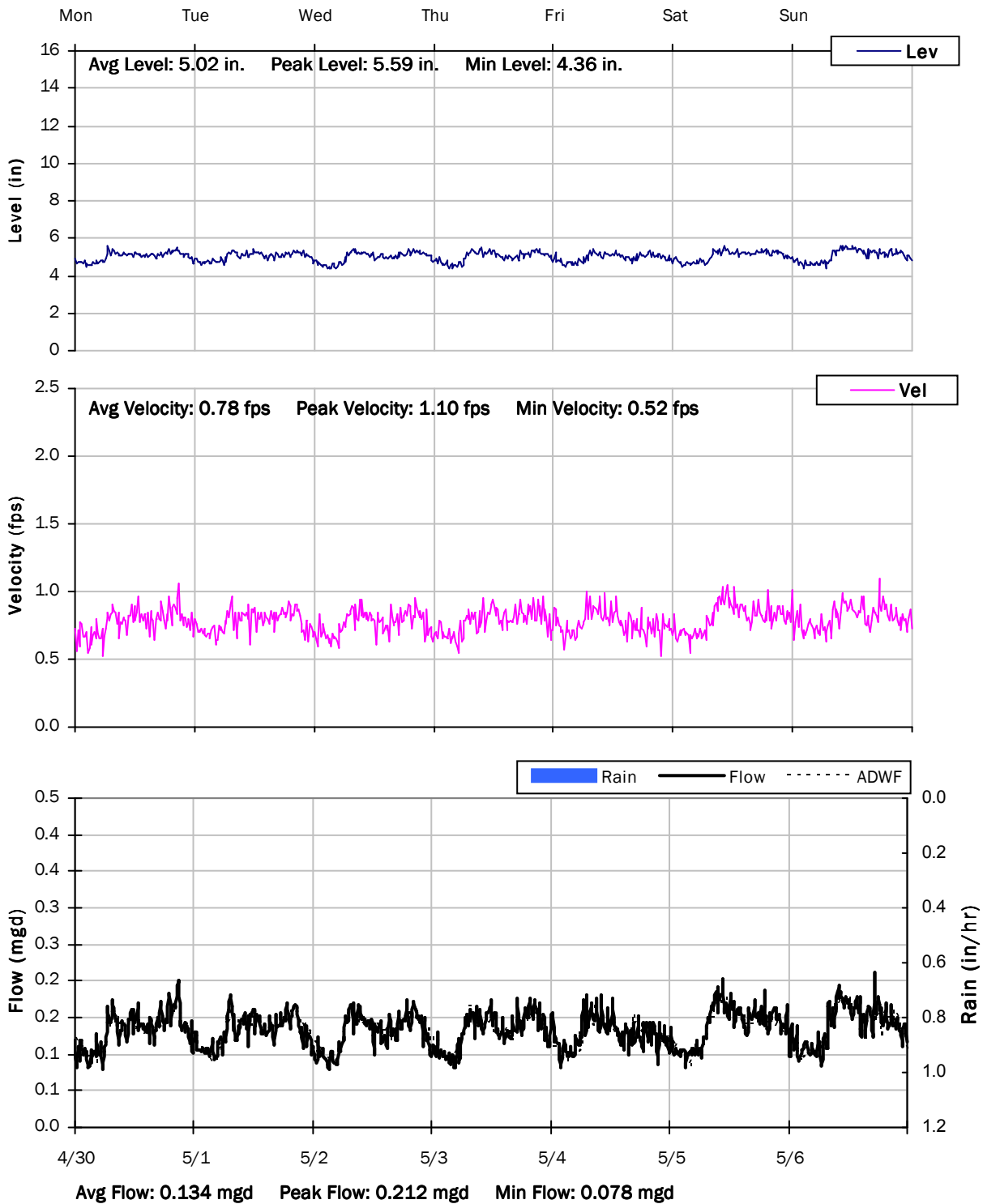
4/23/2018 to 4/30/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

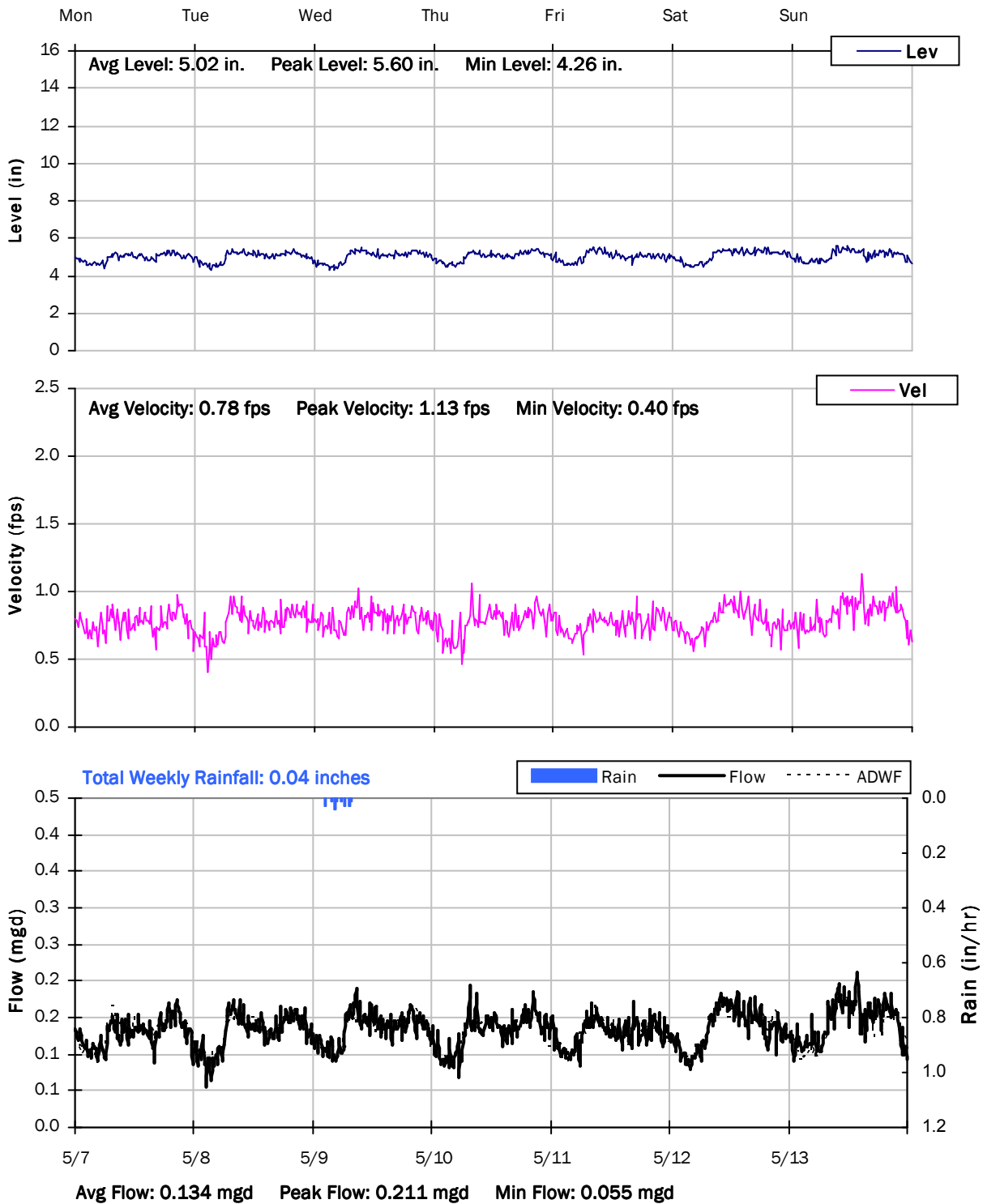
4/30/2018 to 5/7/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

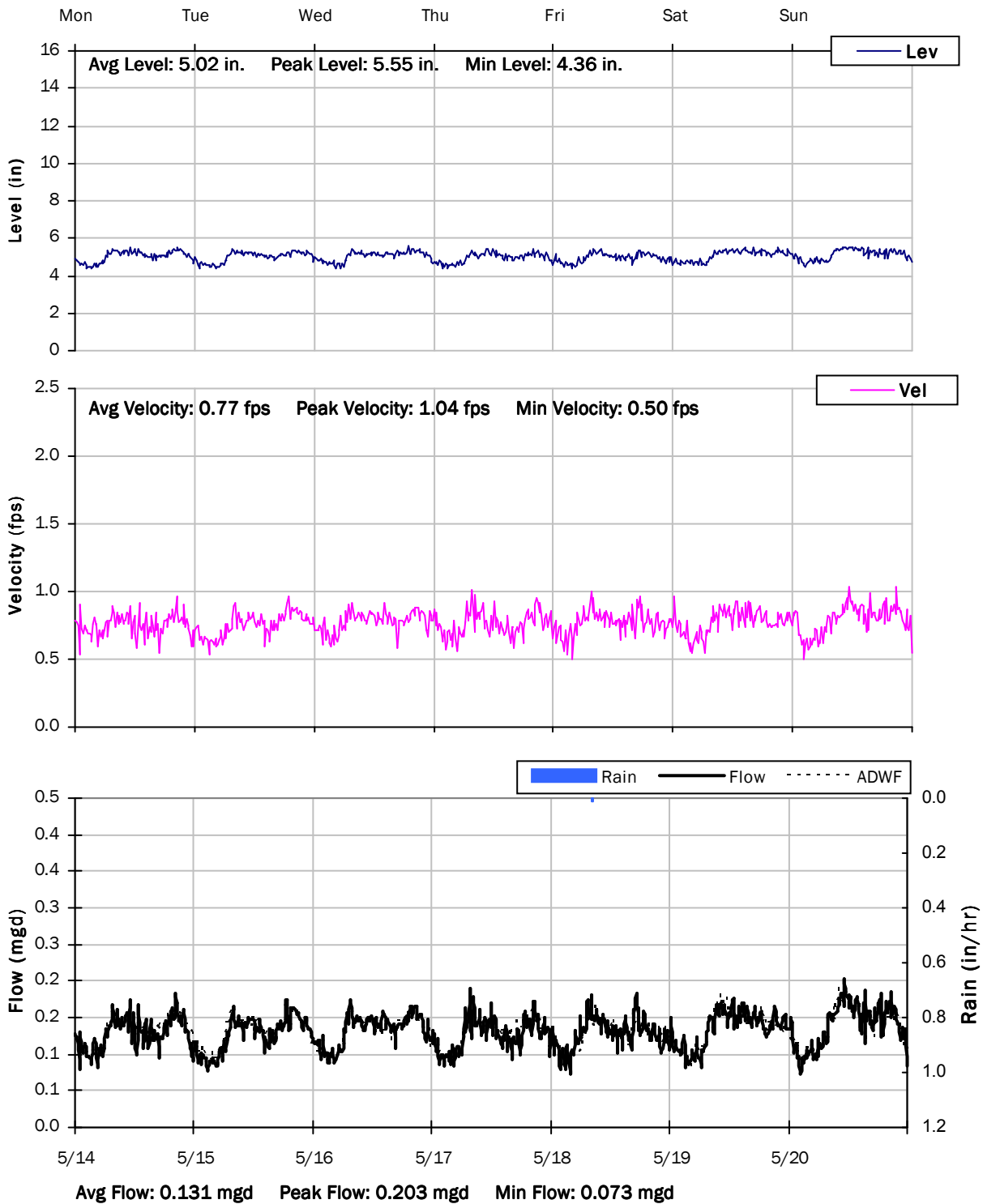
5/7/2018 to 5/14/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

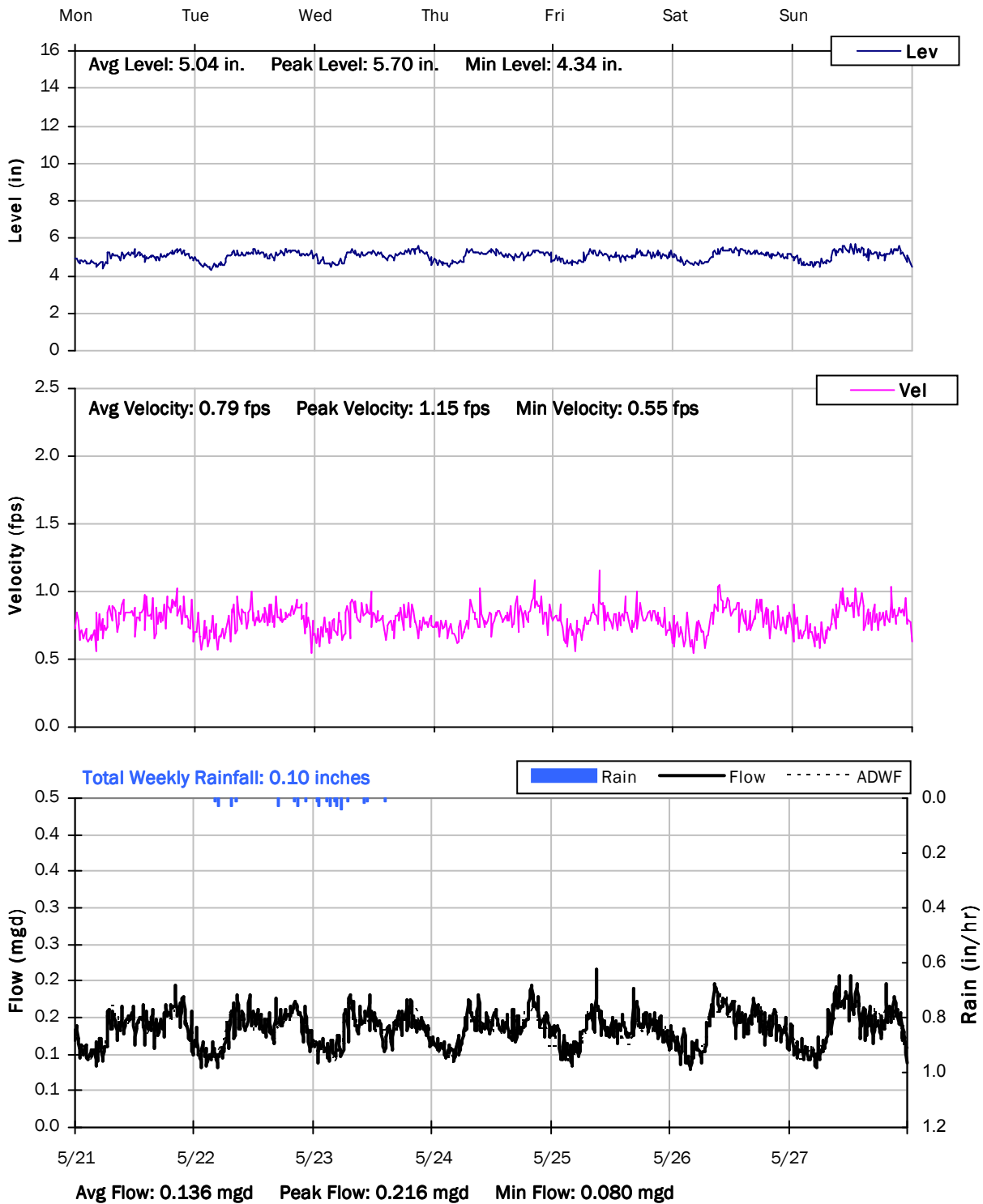
5/14/2018 to 5/21/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

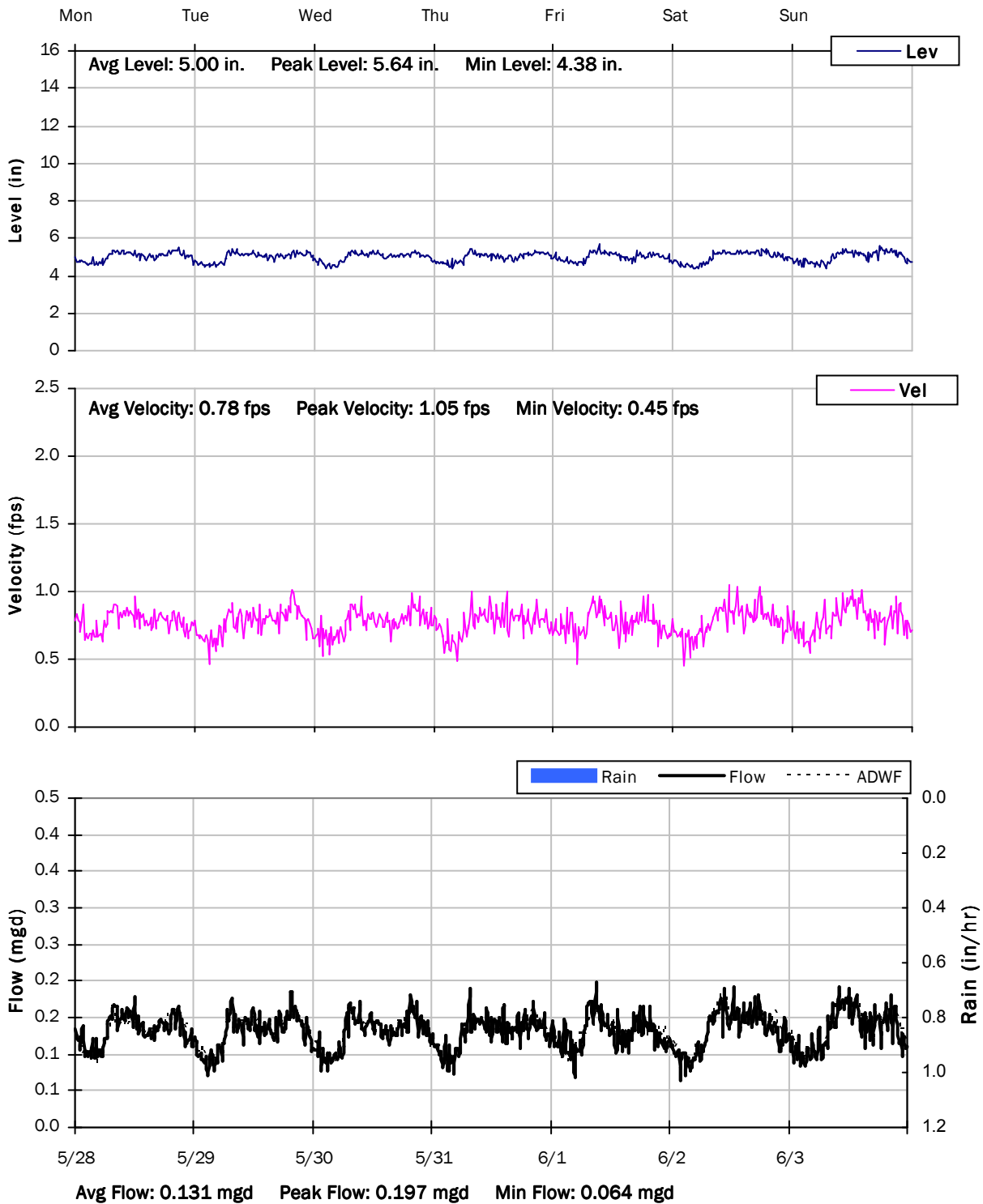
5/21/2018 to 5/28/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

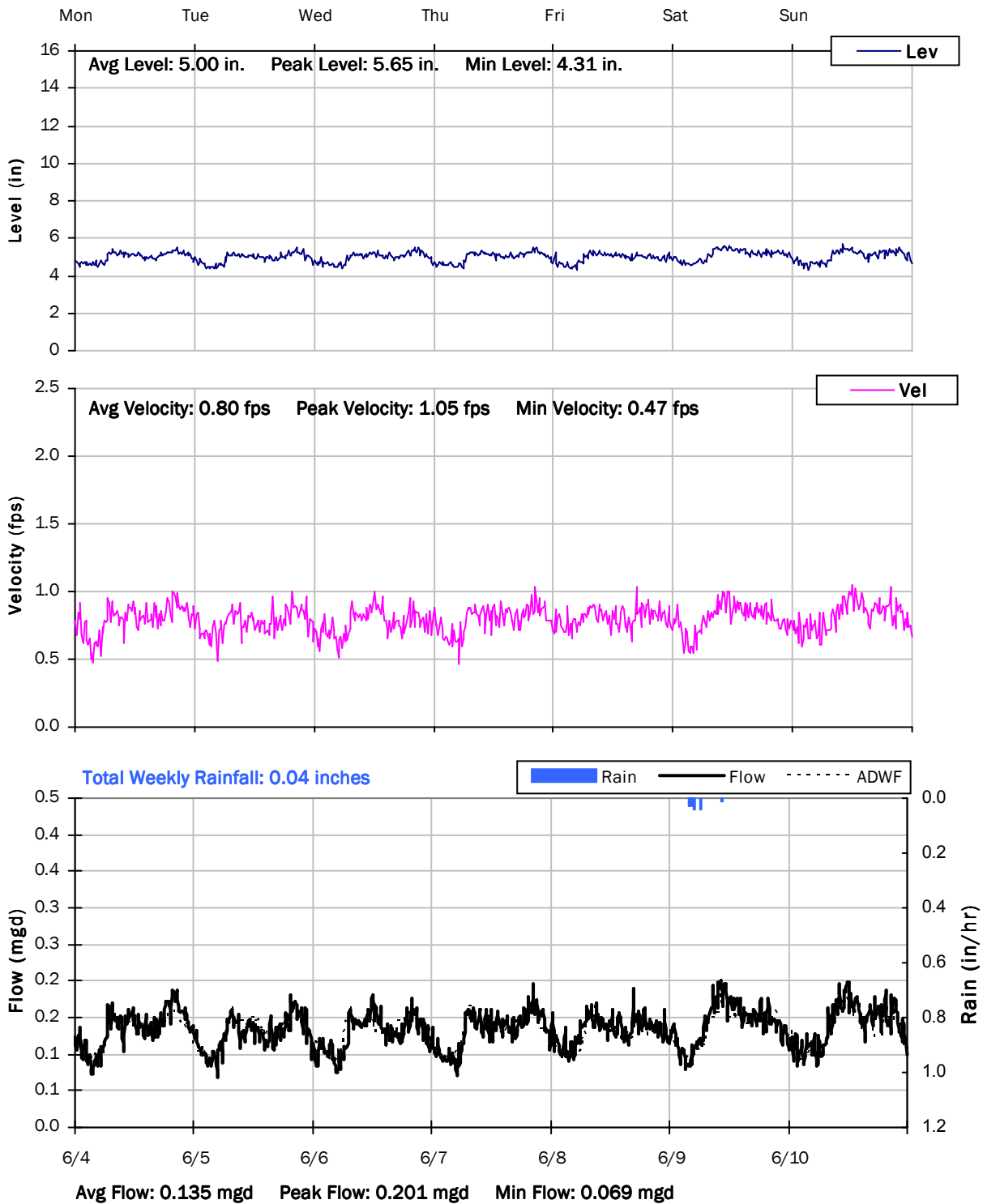
5/28/2018 to 6/4/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

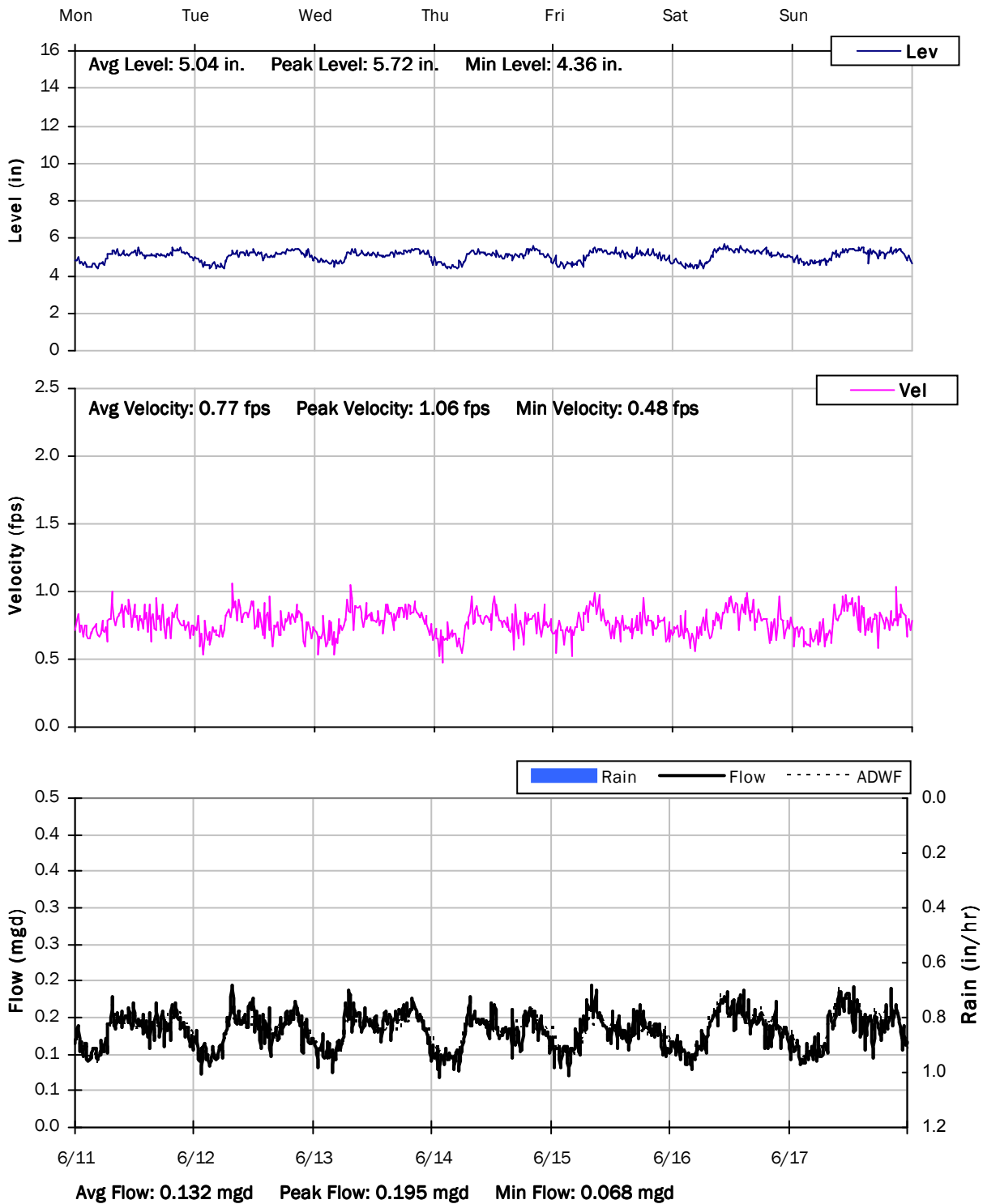
6/4/2018 to 6/11/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

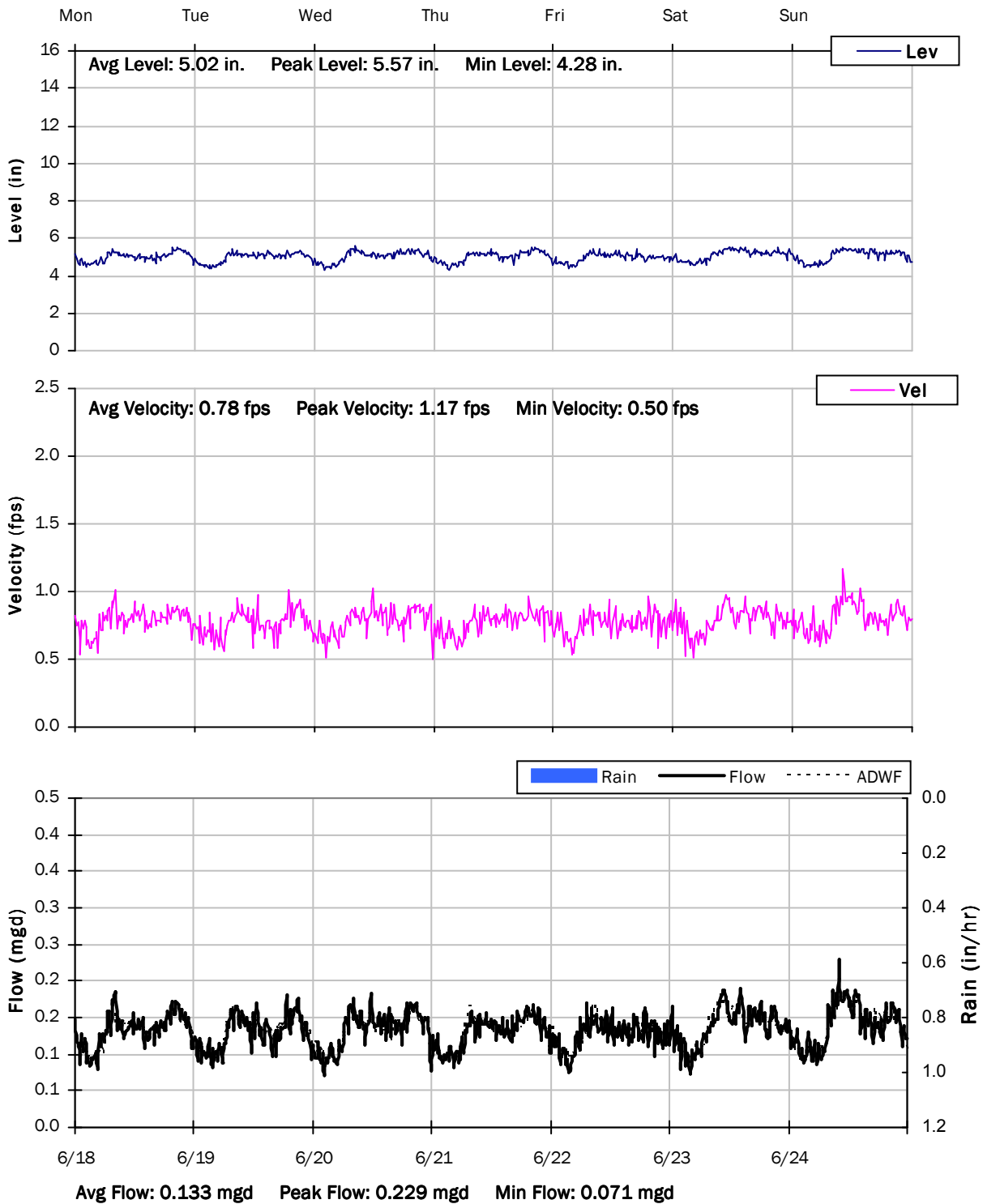
6/11/2018 to 6/18/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

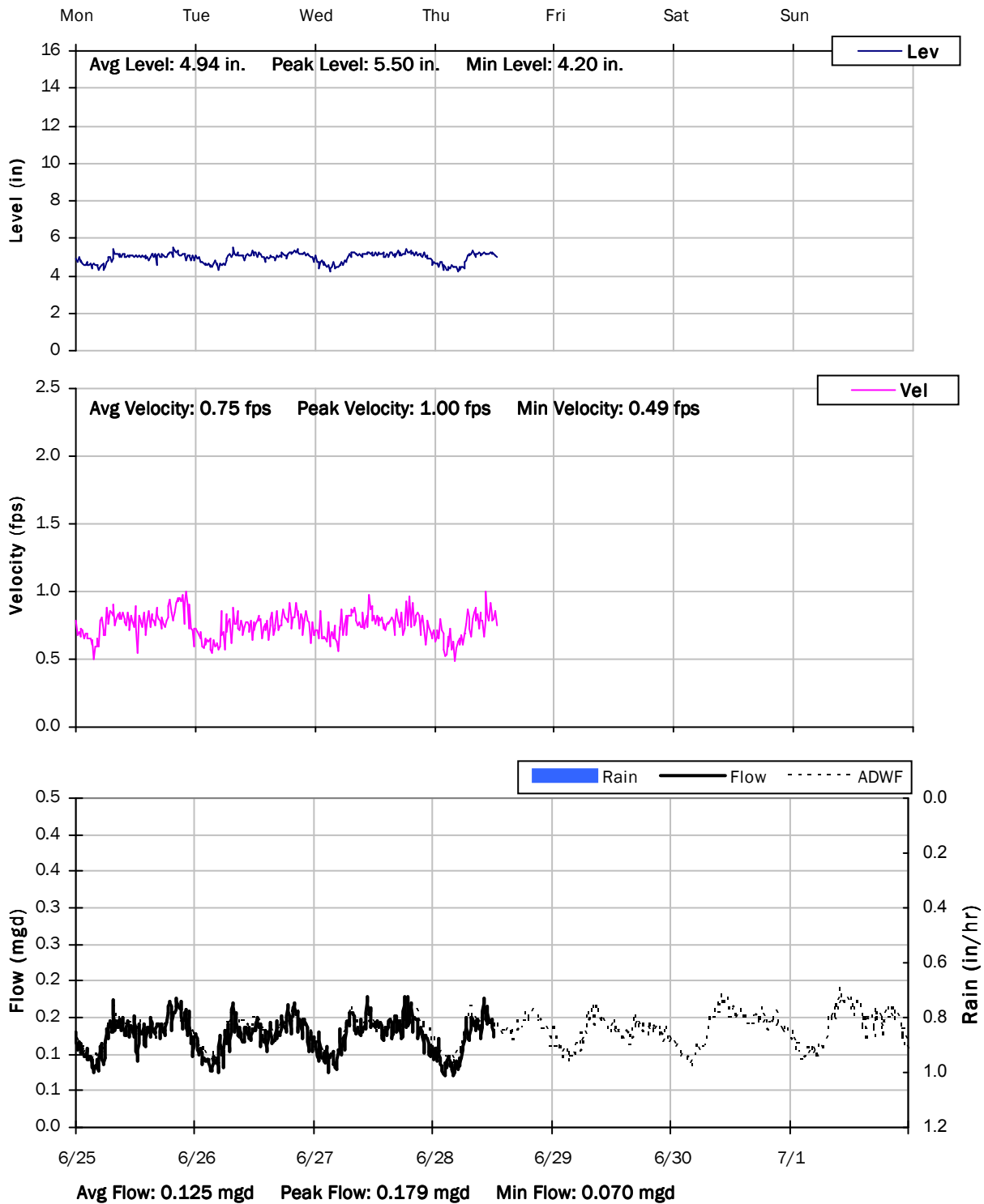
6/18/2018 to 6/25/2018



SITE 8

Weekly Level, Velocity and Flow Hydrographs

6/25/2018 to 7/2/2018



City of South San Francisco

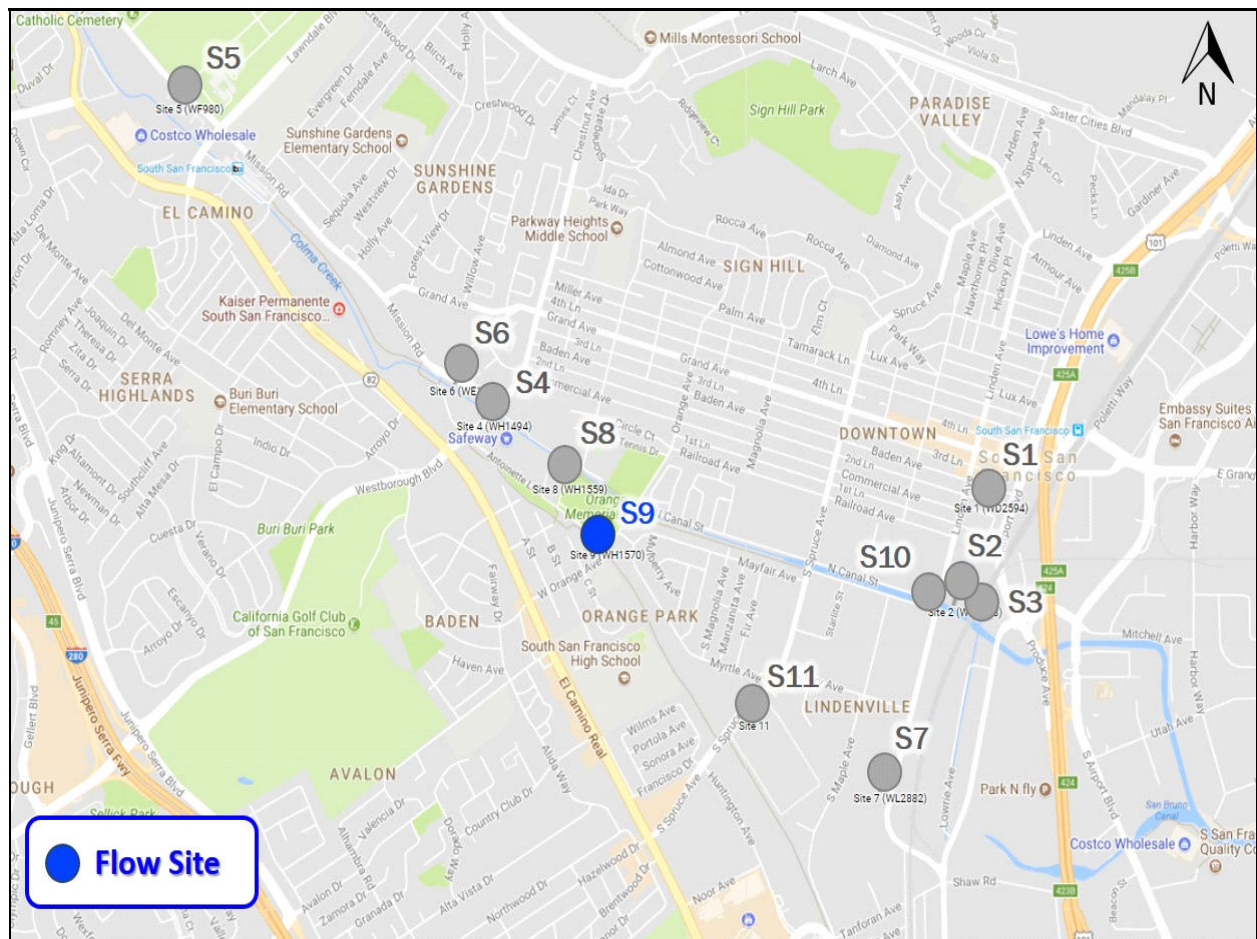
Sanitary Sewer Flow Monitoring

February 26- June 28, 2018

Monitoring Site: Site 9

Location: Memorial Drive and West Orange Avenue, southeast corner of Orange Memorial Park

Data Summary Report

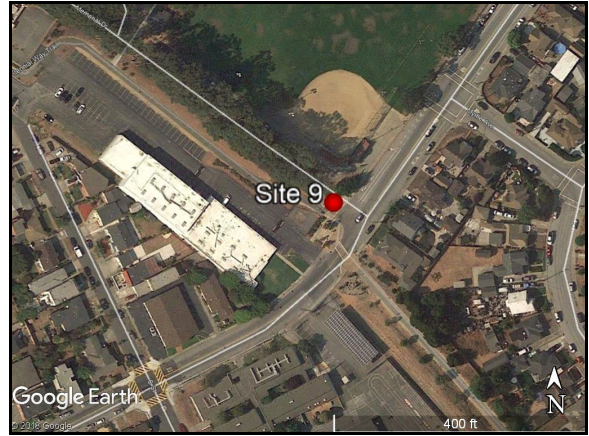


Vicinity Map: Site 9

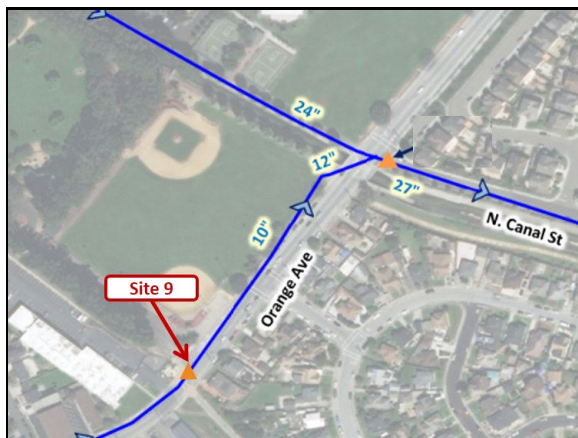
SITE 9

Site Information

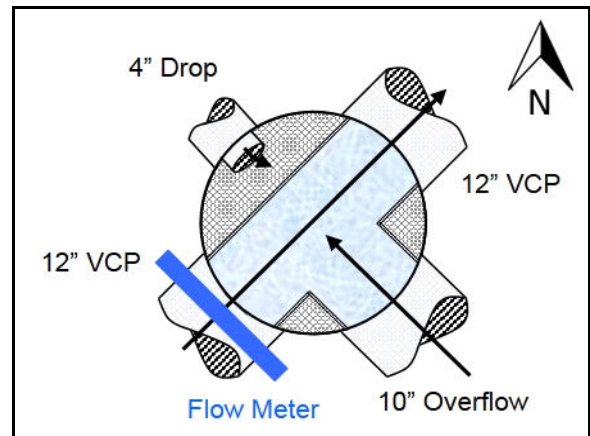
MH ID:	WH1570
Location:	Memorial Drive and West Orange Avenue, southeast corner of Orange Memorial Park
Coordinates:	122.4271° W, 37.6521° N
Rim Elevation (Earth):	27 feet
Pipe Diameter:	12 inches
Sediment:	0.25 inches
ADWF:	0.084 mgd
Peak Measured Flow:	0.768 mgd



Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 9

Additional Site Photos

Effluent Pipe



Northwest Influent Pipe



SITE 9

Additional Site Photos

Northeast Influent Pipe



Southwest Influent Pipe

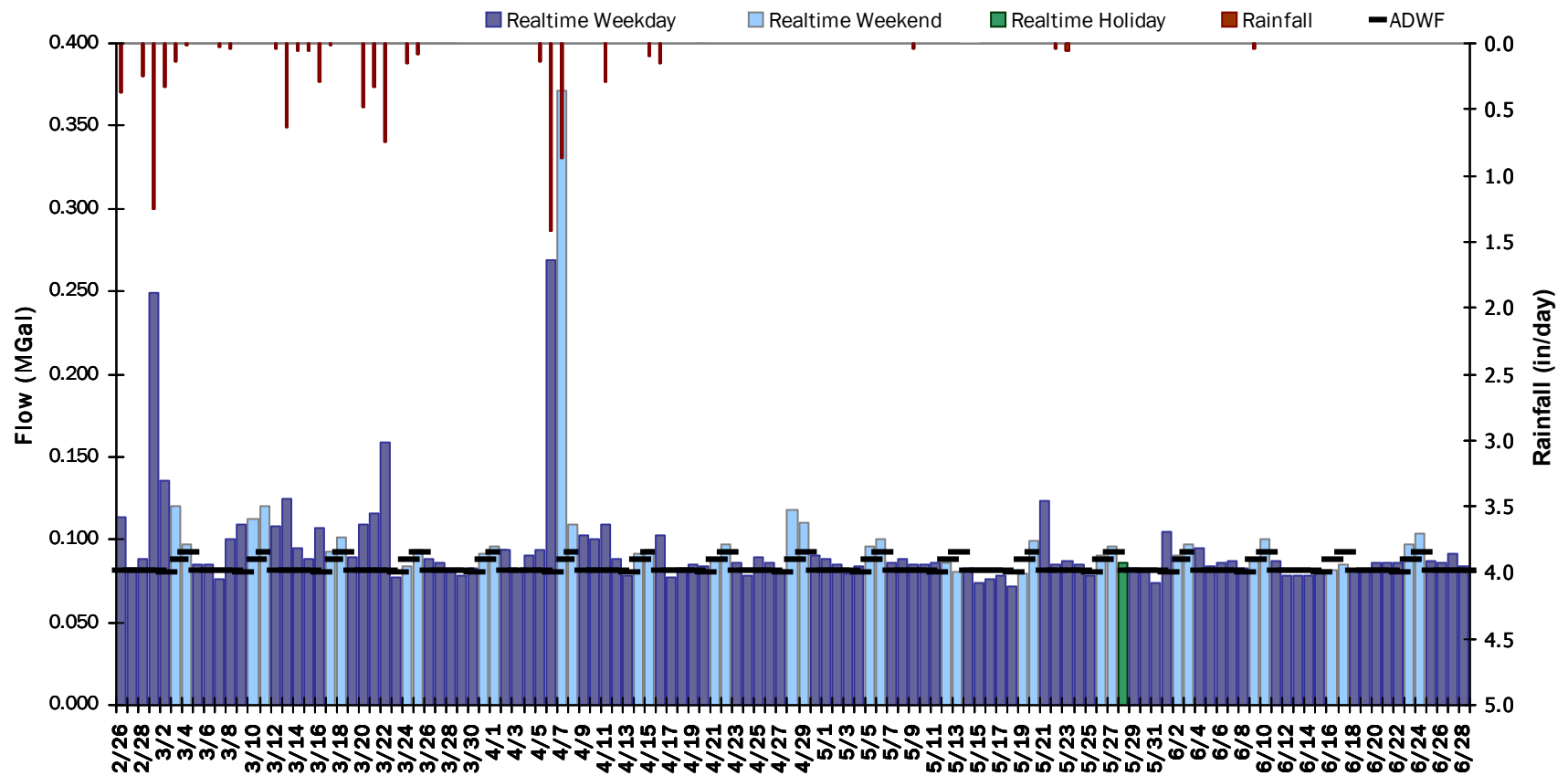


SITE 9

Period Flow Summary: Daily Flow Totals

Avg Period Flow: 0.096 MGal Peak Daily Flow: 0.371 MGal Min Daily Flow: 0.072 MGal

Total Period Rainfall: 8.10 inches



SITE 9

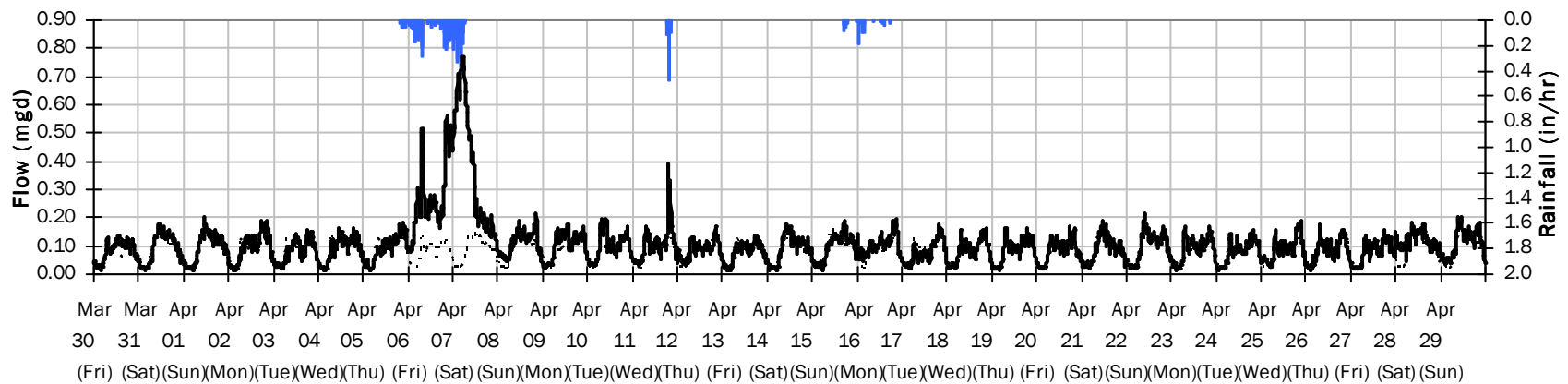
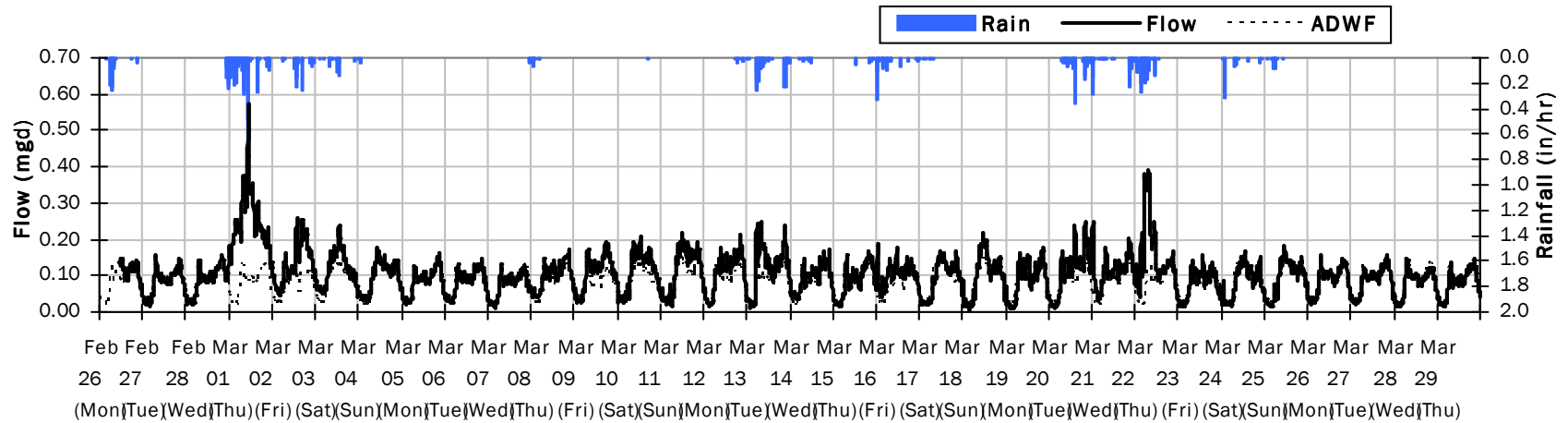
Flow Summary: 2/26/2018 to 4/29/2018

Total Period Rainfall: 8.26 inches

Avg Flow: 0.106 mgd

Peak Flow: 0.768 mgd

Min Flow: 0.007 mgd



SITE 9

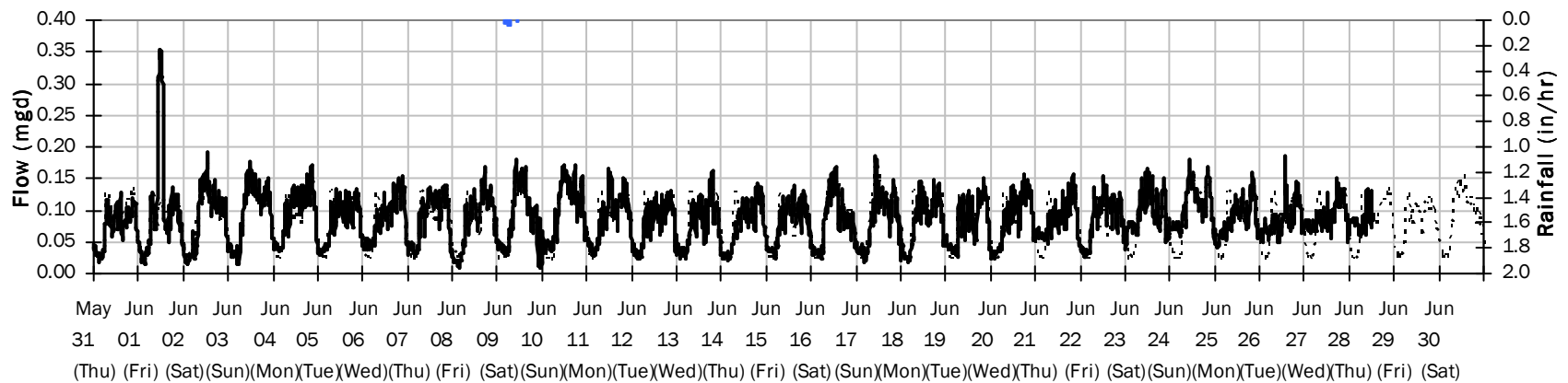
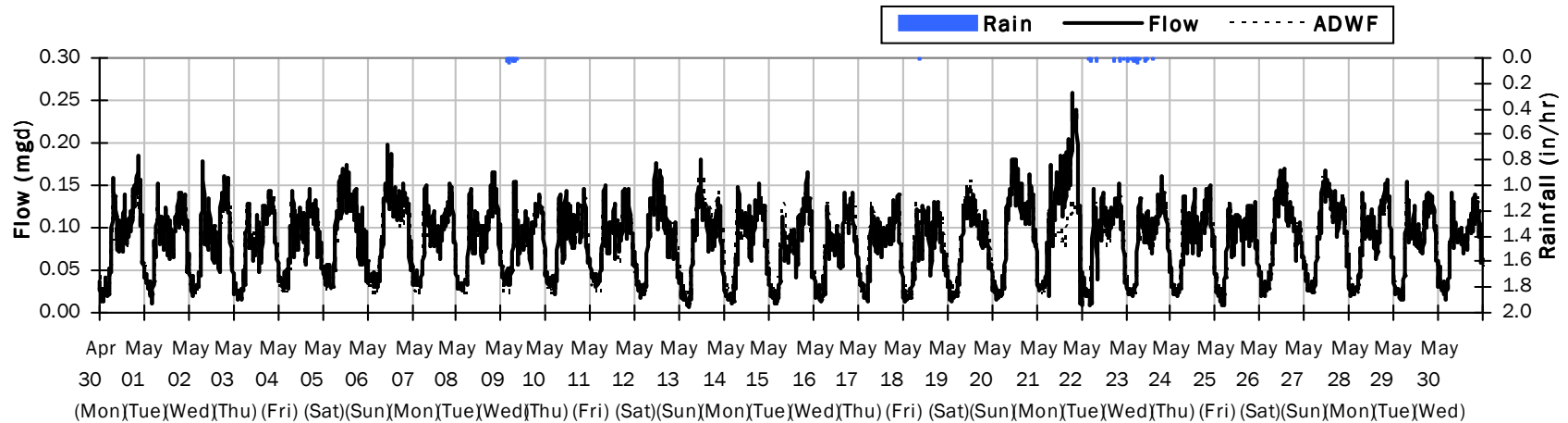
Flow Summary: 4/30/2018 to 6/30/2018

Total Period Rainfall: 0.19 inches

Avg Flow: 0.087 mgd

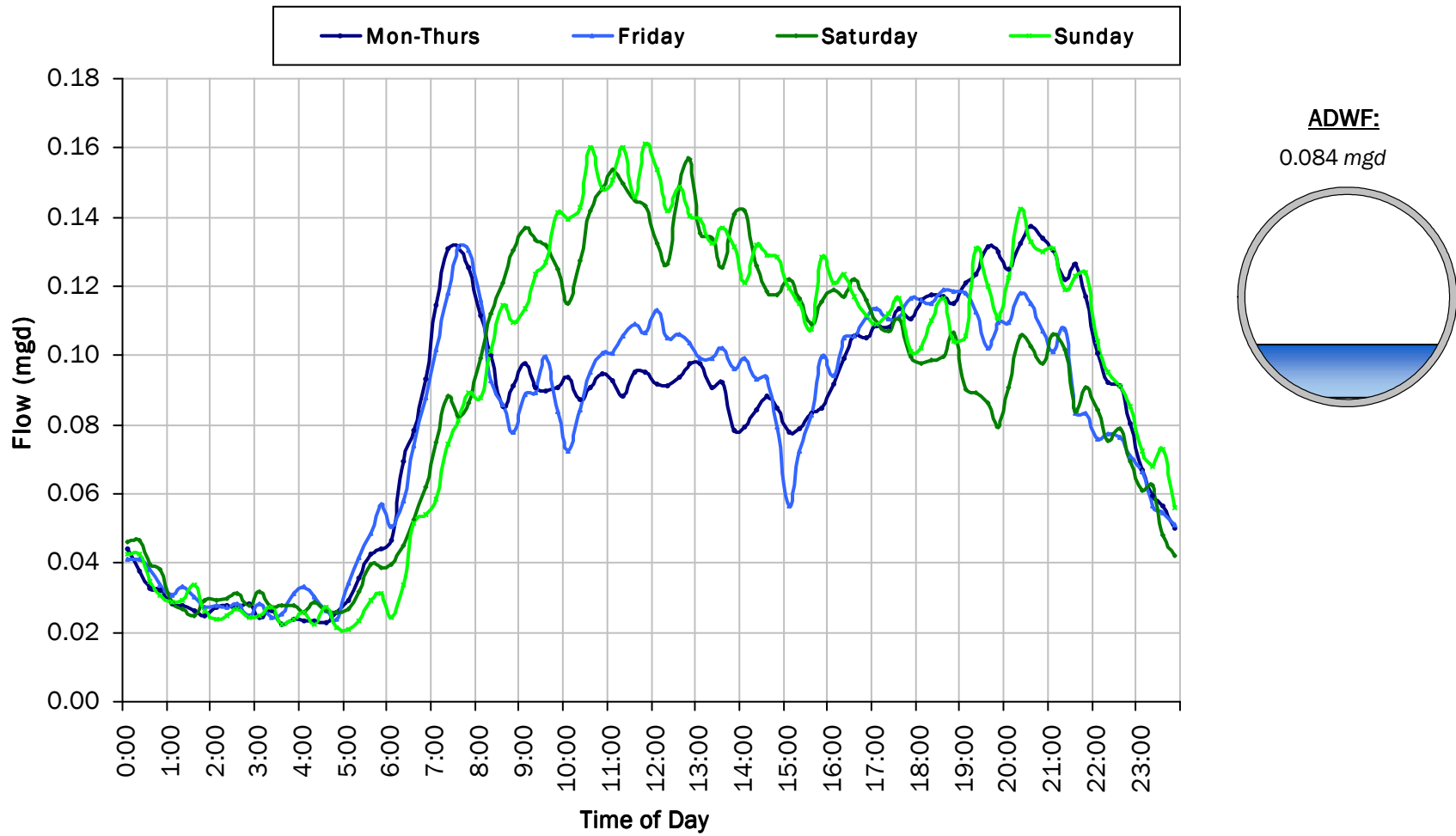
Peak Flow: 0.355 mgd

Min Flow: 0.007 mgd



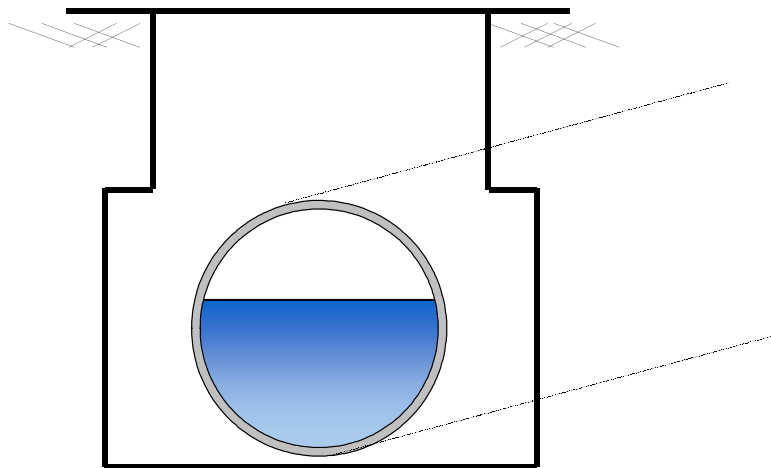
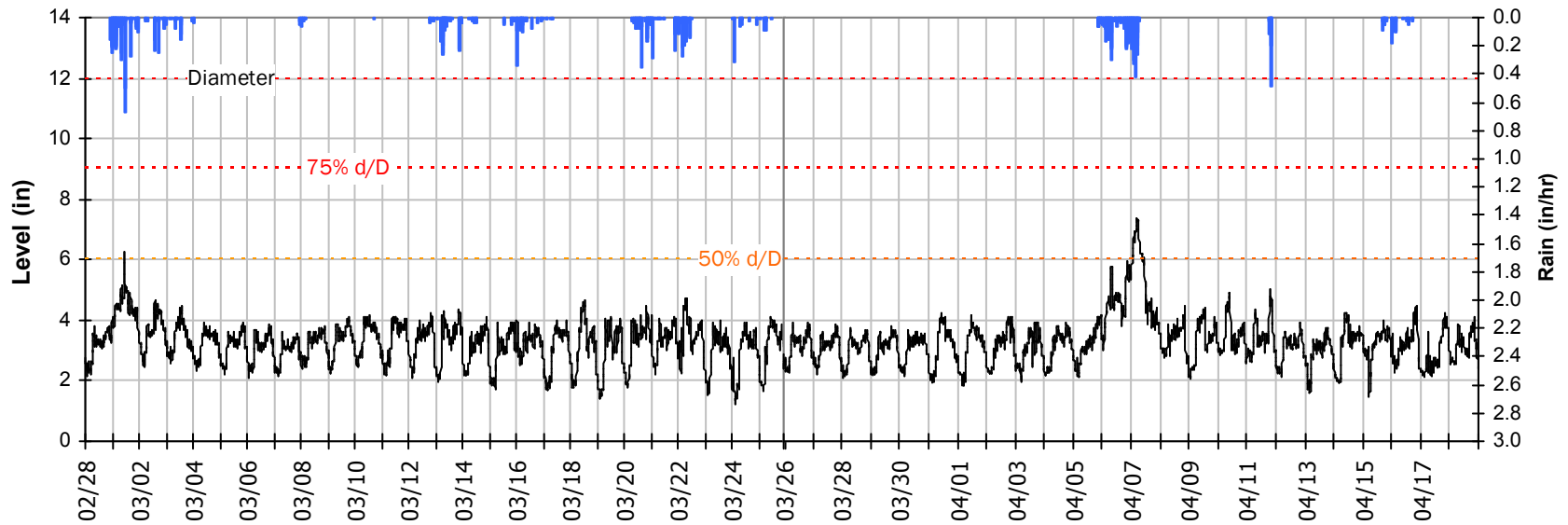
SITE 9

Average Dry Weather Flow Hydrographs



SITE 9 Site Capacity and Surge Summary

Realtime Flow Levels with Rainfall Data over Monitoring (High Capacity) Period

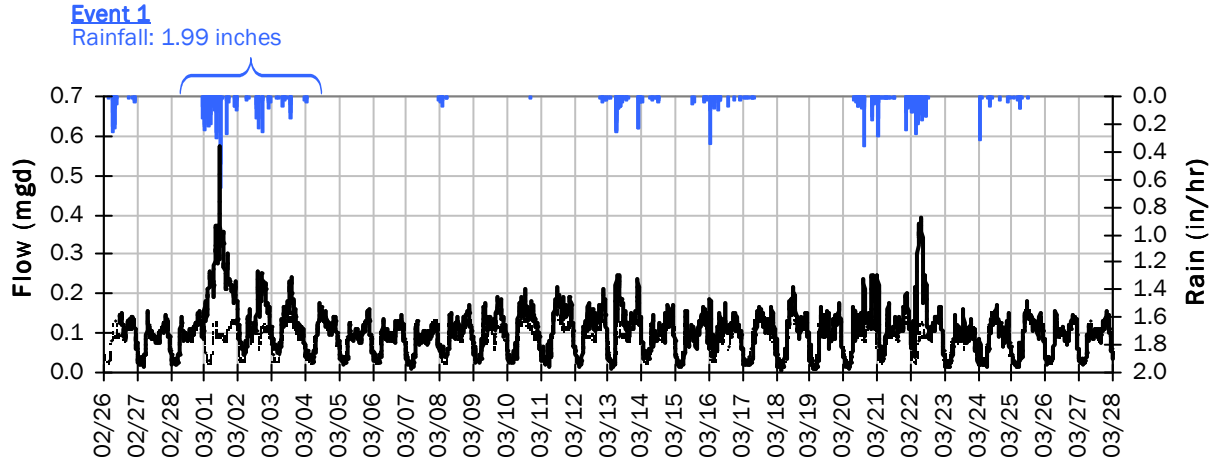


Pipe Diameter:	12	inches
Peak Measured Level:	7.34	inches
Peak d/D Ratio:	0.61	

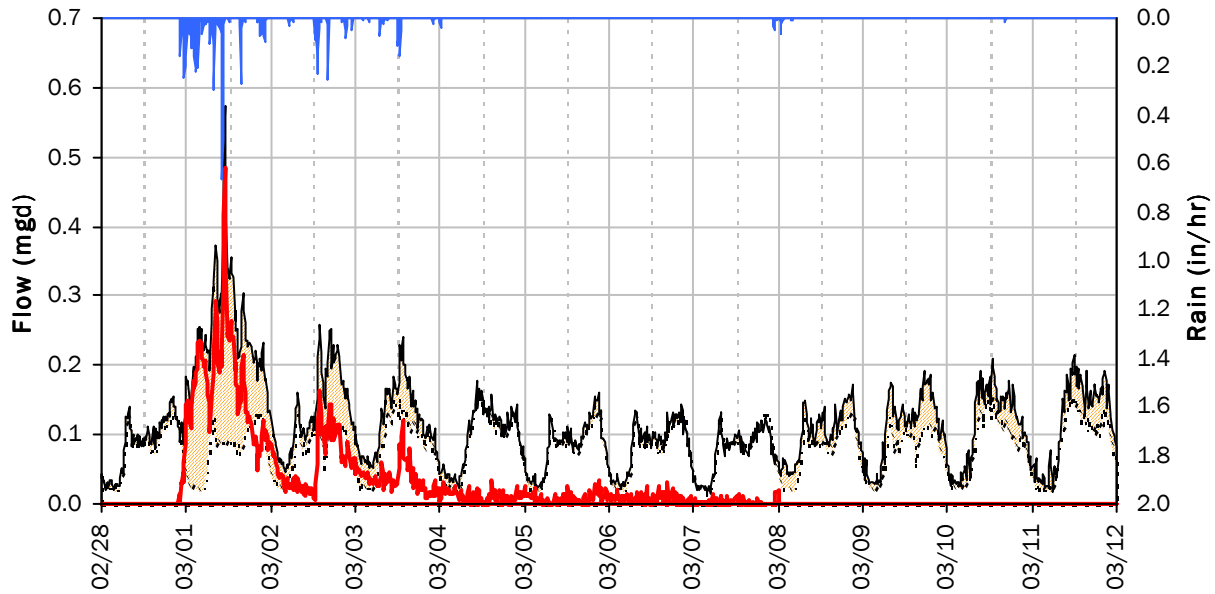
SITE 9

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



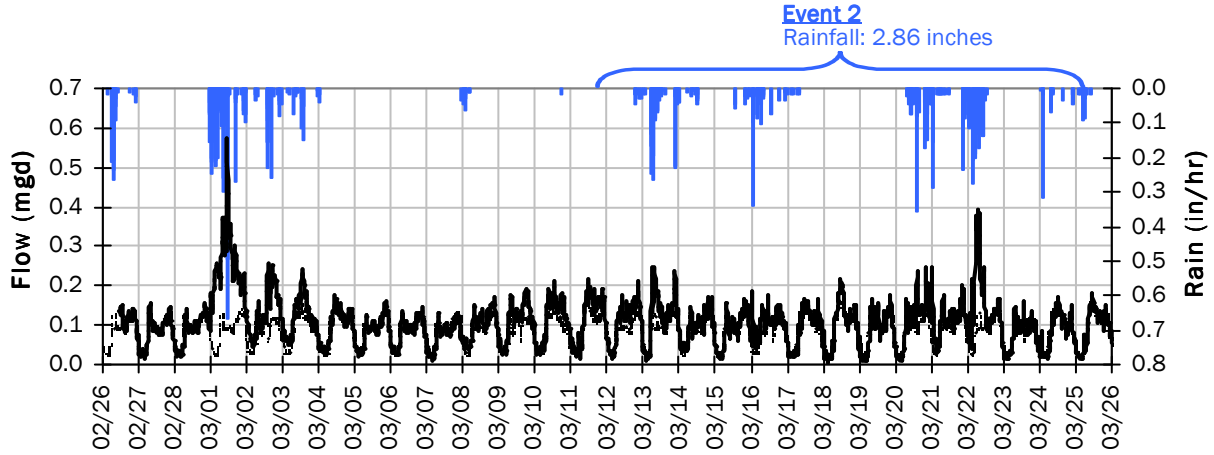
Storm Event I/I Analysis (Rain = 1.99 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	0.57 <i>mgd</i>	Peak I/I Rate:	0.49 <i>mgd</i>
PF:	6.85	Total I/I:	300,000 <i>gallons</i>
Peak Level:	6.24 <i>in</i>		
d/D Ratio:	0.52		

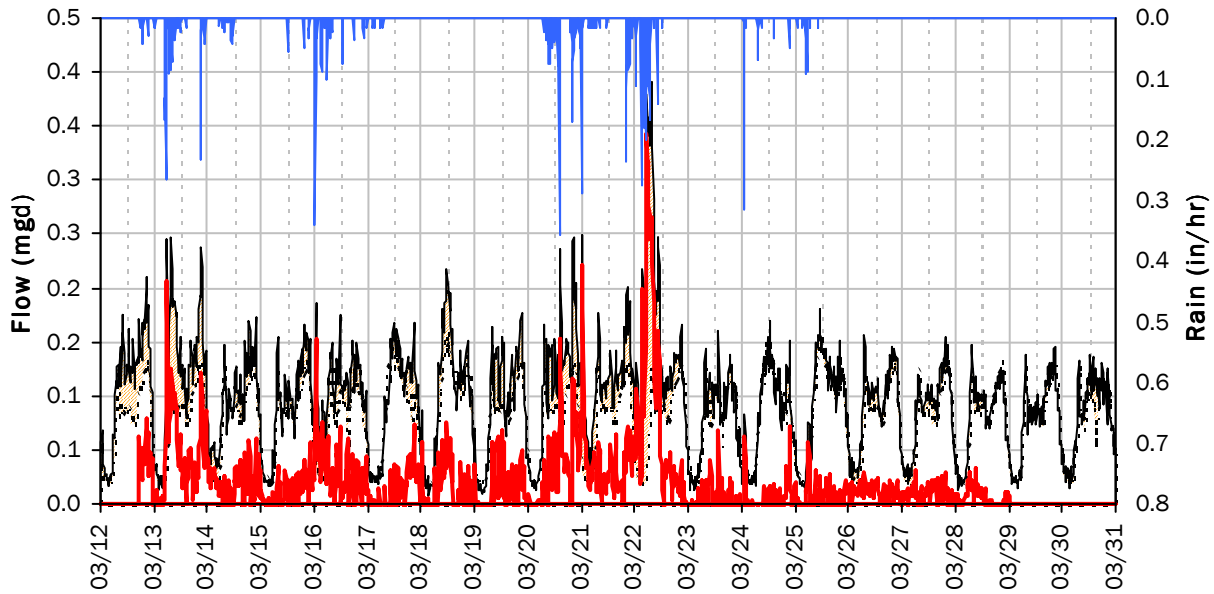
SITE 9

I/I Summary: Event 2

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 2 Detail Graph



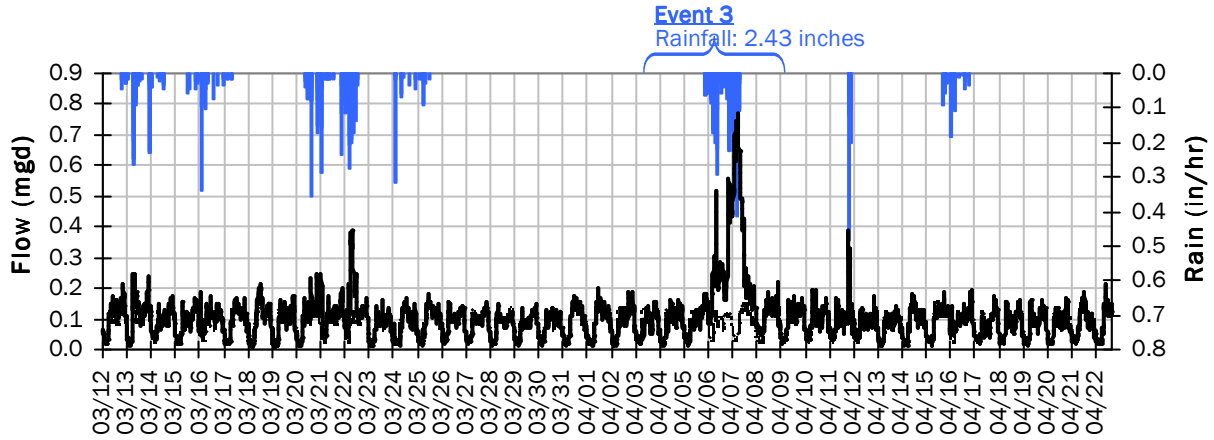
Storm Event I/I Analysis (Rain = 2.86 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	0.39 <i>mgd</i>	Peak I/I Rate:	0.34 <i>mgd</i>
PF:	4.68	Total I/I:	345,000 <i>gallons</i>
Peak Level:	4.72 <i>in</i>		
d/D Ratio:	0.39		

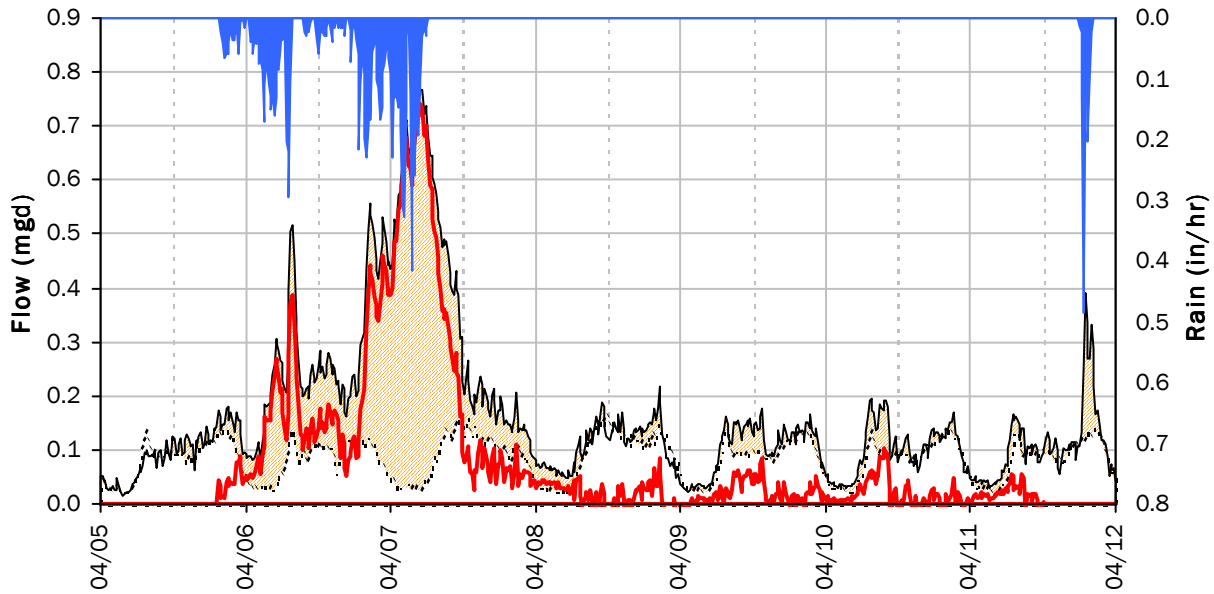
SITE 9

I/I Summary: Event 3

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



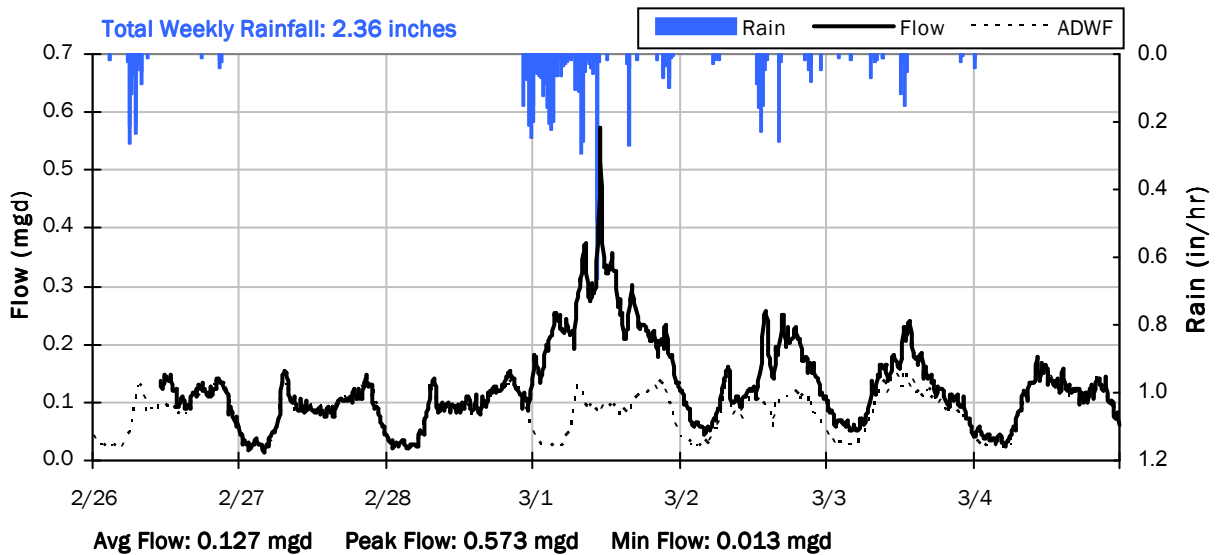
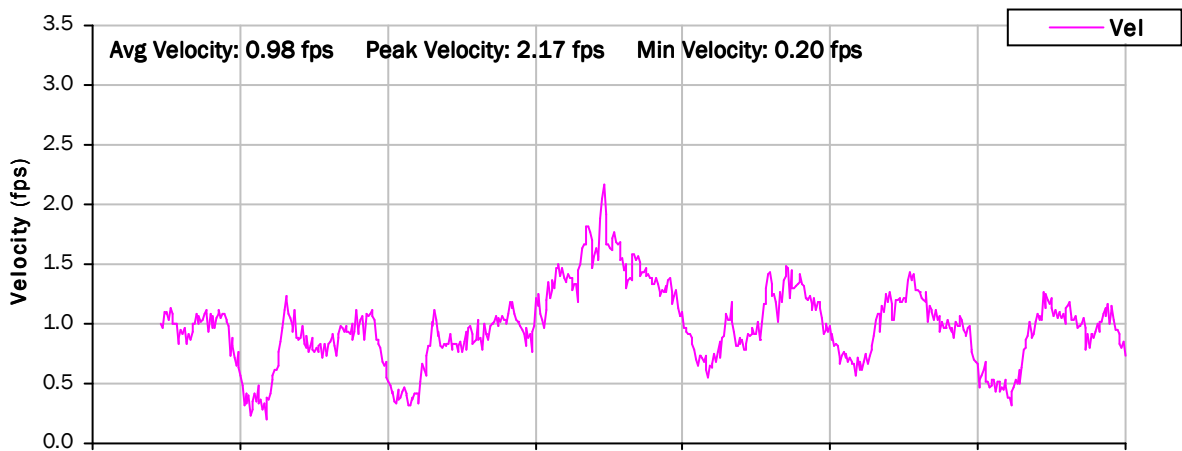
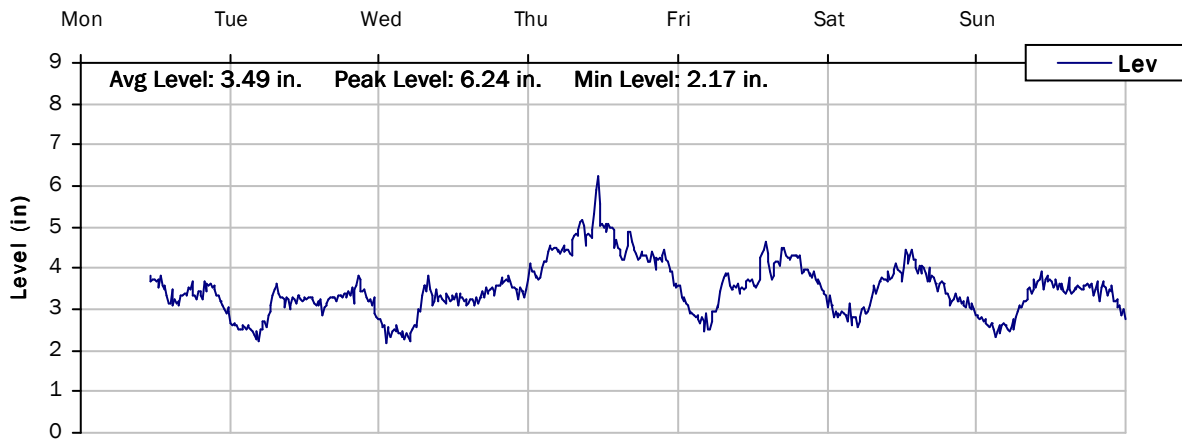
Event 3 Detail Graph



Storm Event I/I Analysis (Rain = 2.43 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	0.77 mgd	Peak I/I Rate:	0.74 mgd
PF:	9.17	Total I/I:	546,000 gallons
Peak Level:	7.34 in		
d/D Ratio:	0.61		

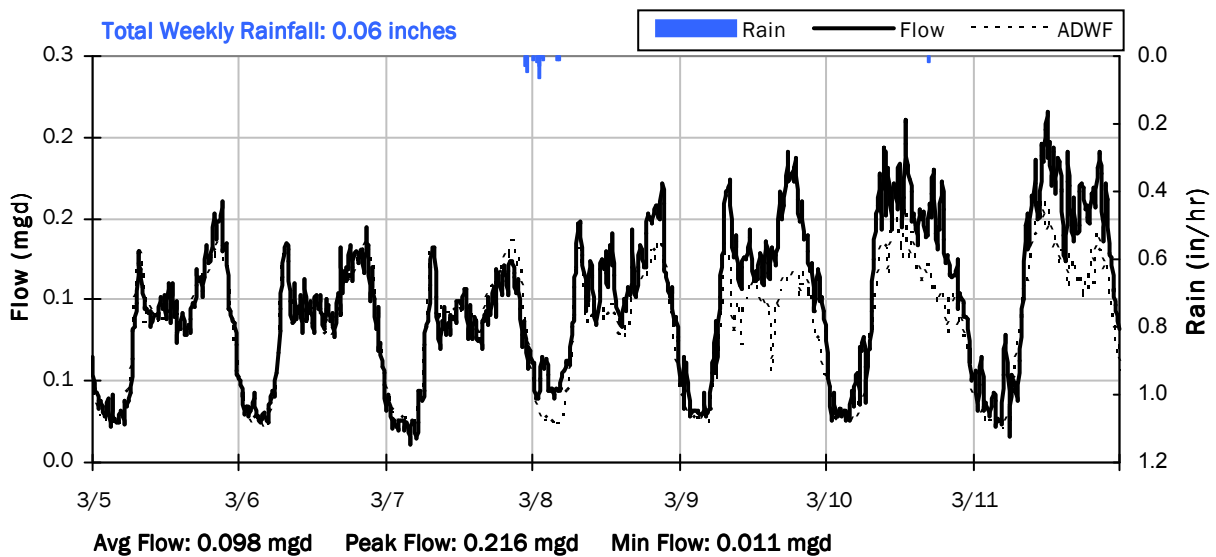
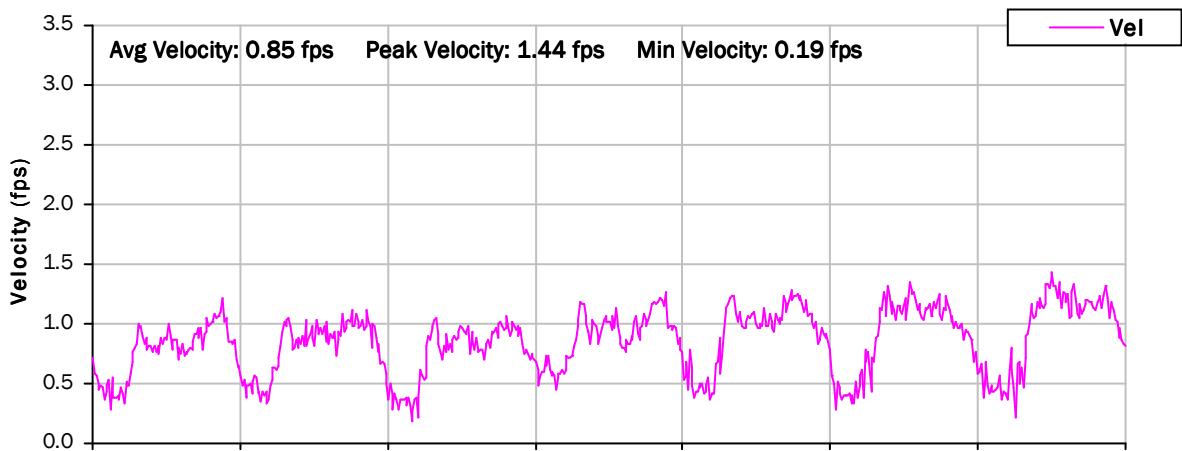
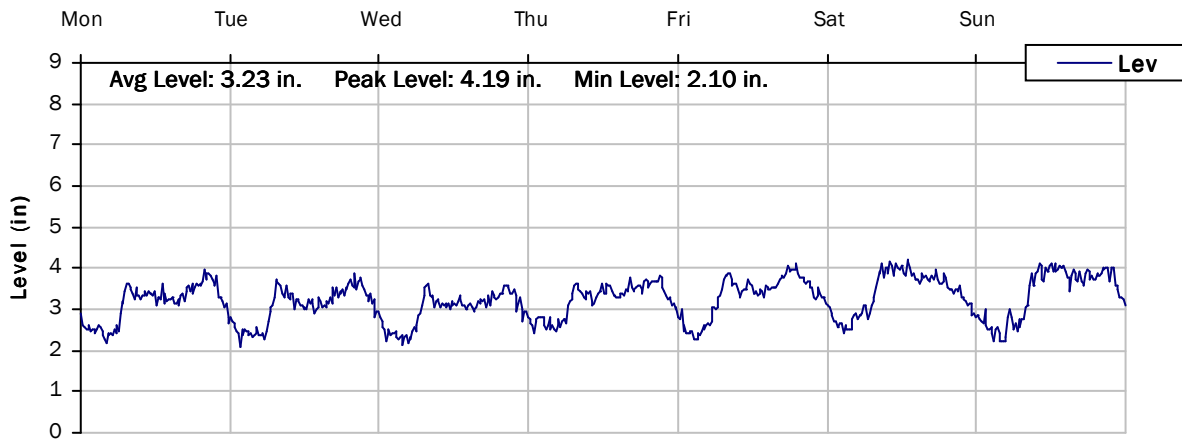
SITE 9
Weekly Level, Velocity and Flow Hydrographs
2/26/2018 to 3/5/2018



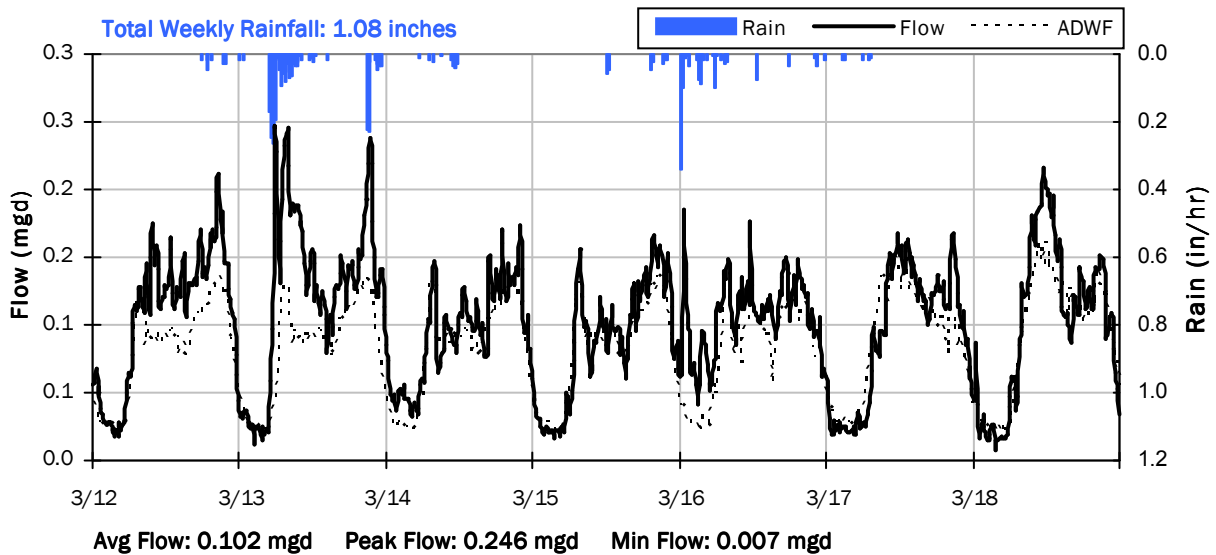
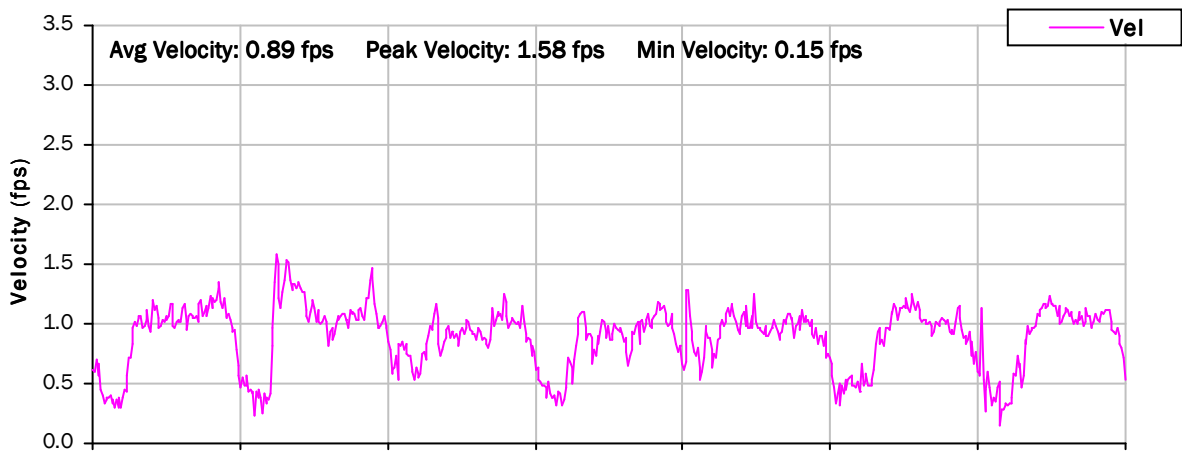
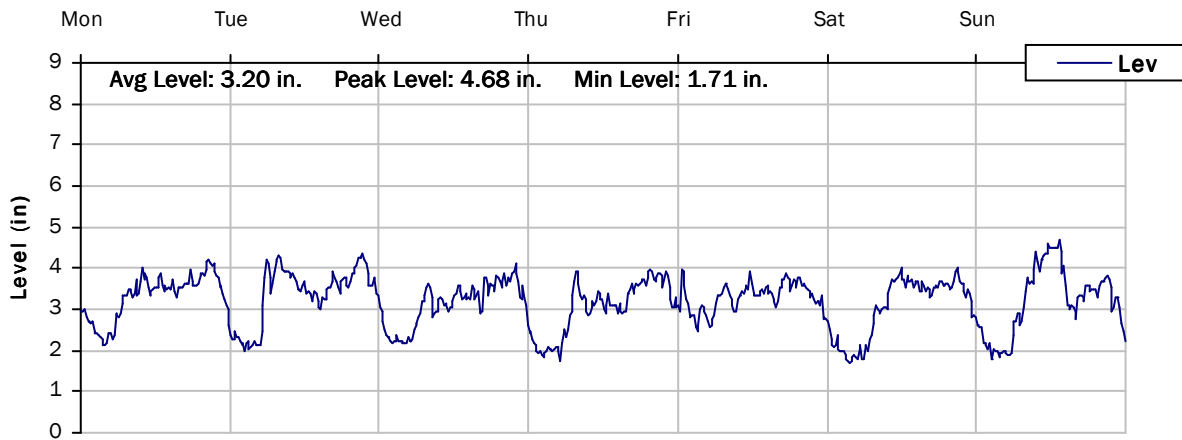
SITE 9

Weekly Level, Velocity and Flow Hydrographs

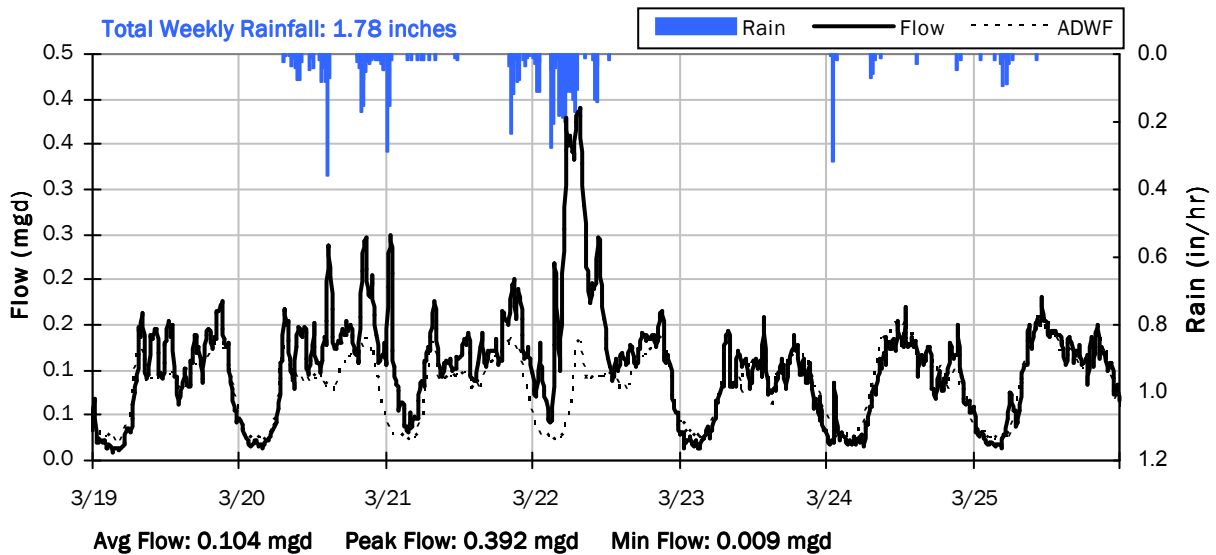
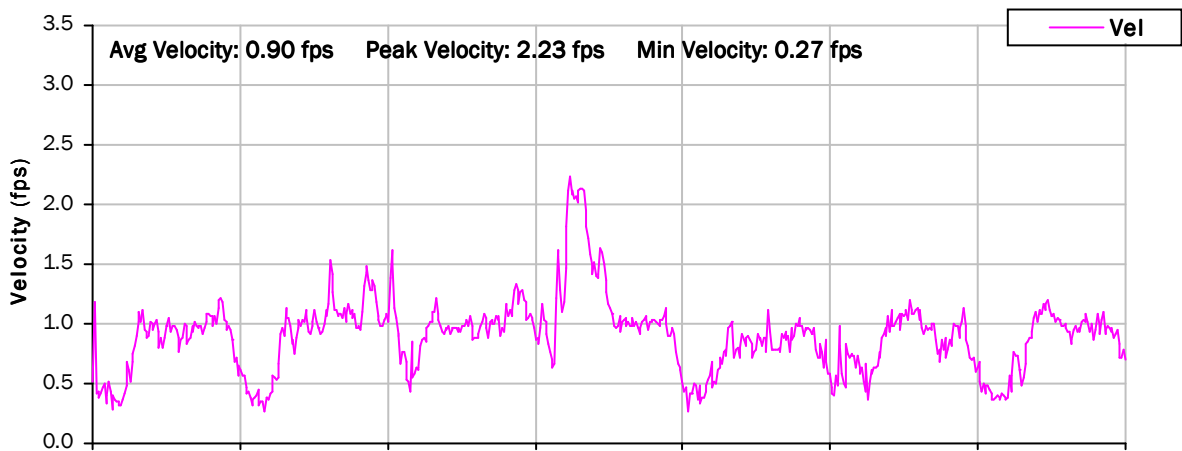
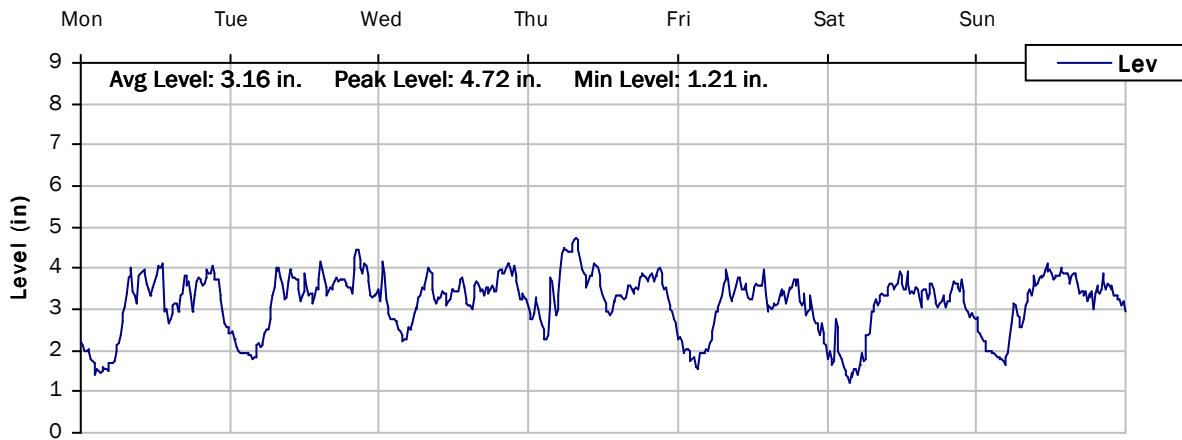
3/5/2018 to 3/12/2018



SITE 9
Weekly Level, Velocity and Flow Hydrographs
3/12/2018 to 3/19/2018



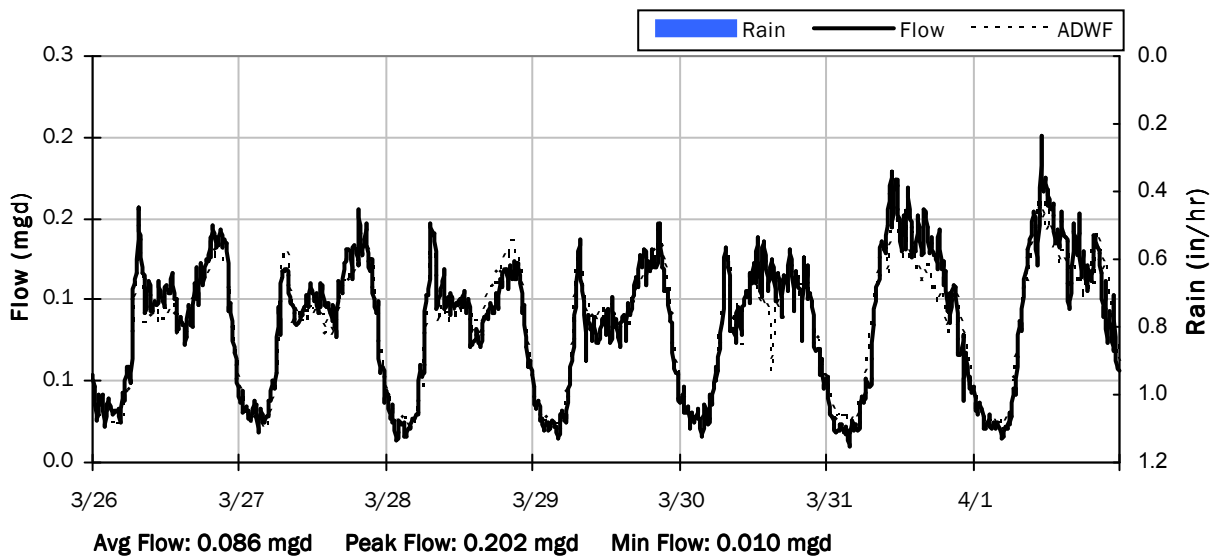
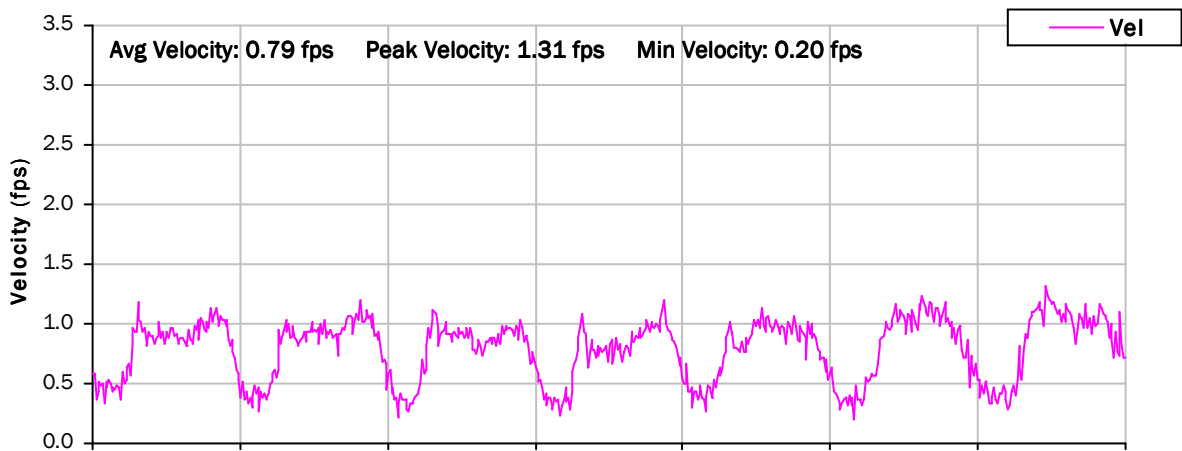
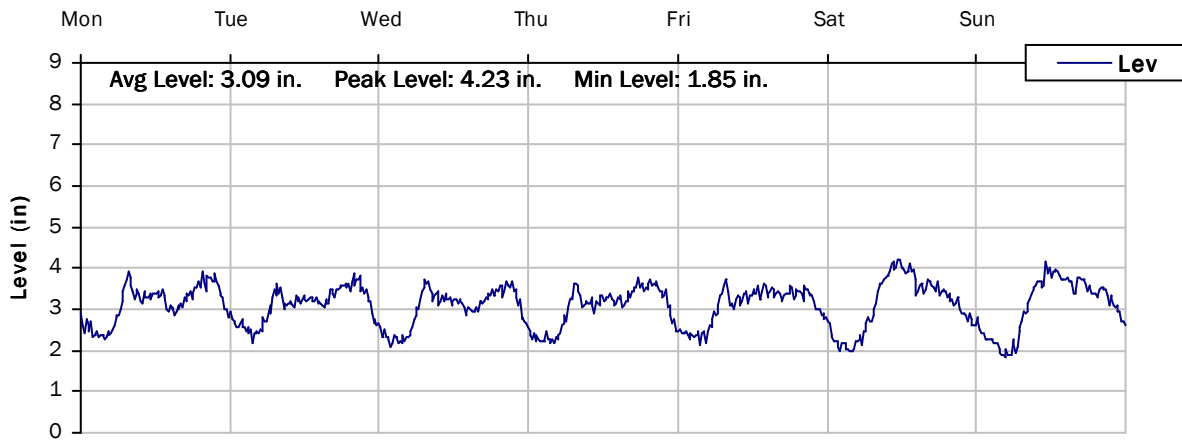
SITE 9
Weekly Level, Velocity and Flow Hydrographs
3/19/2018 to 3/26/2018



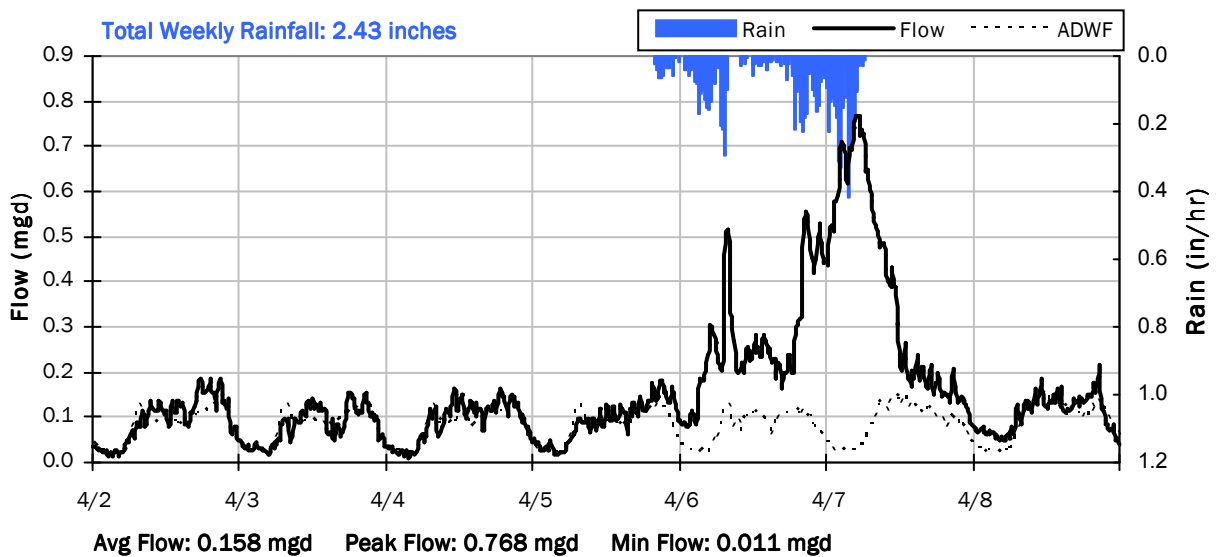
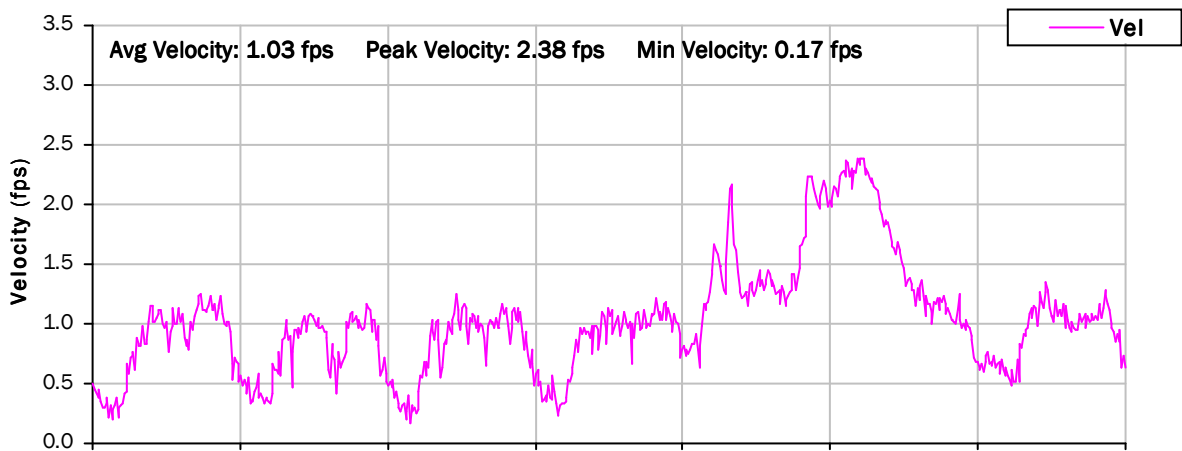
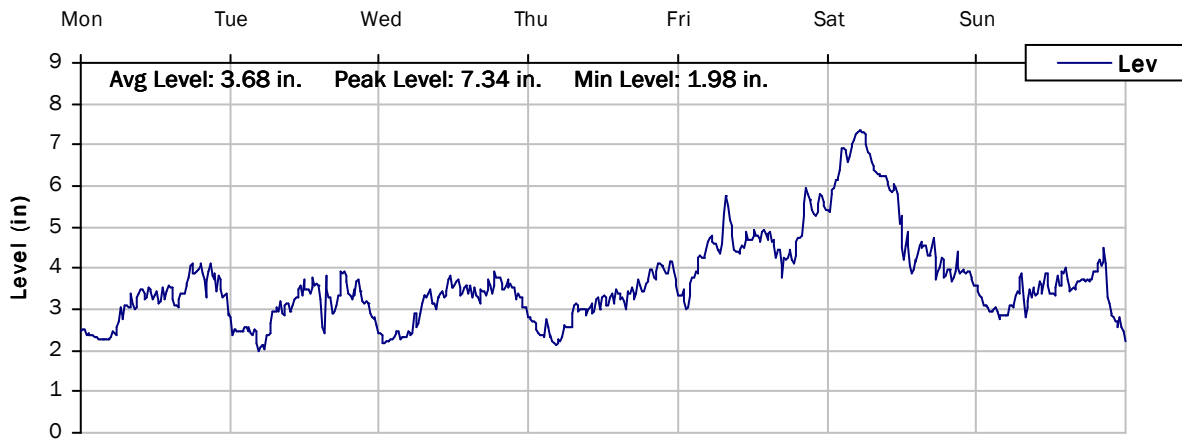
SITE 9

Weekly Level, Velocity and Flow Hydrographs

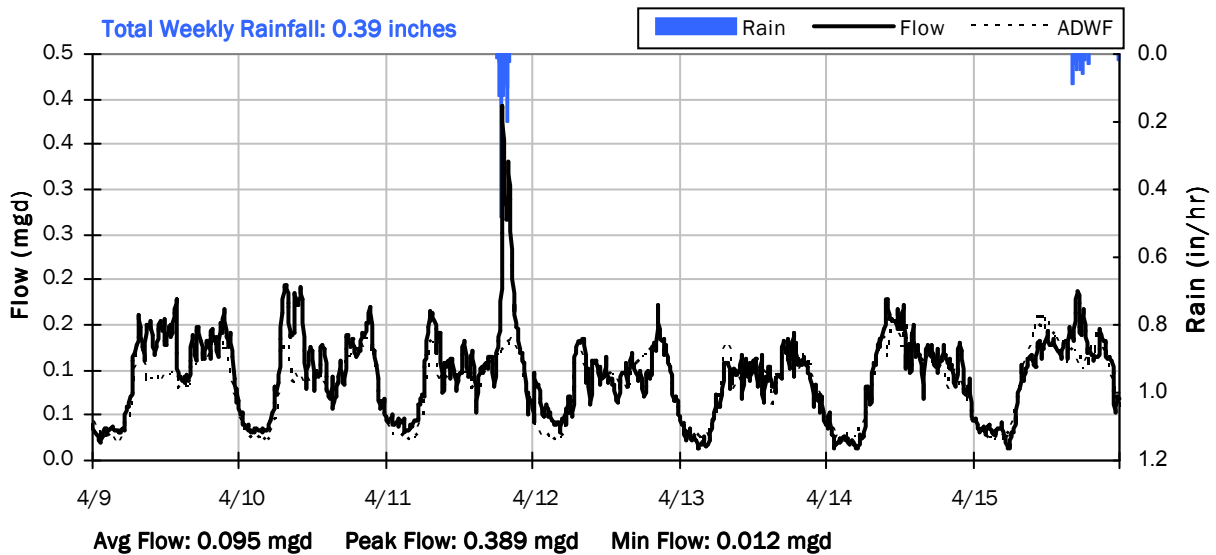
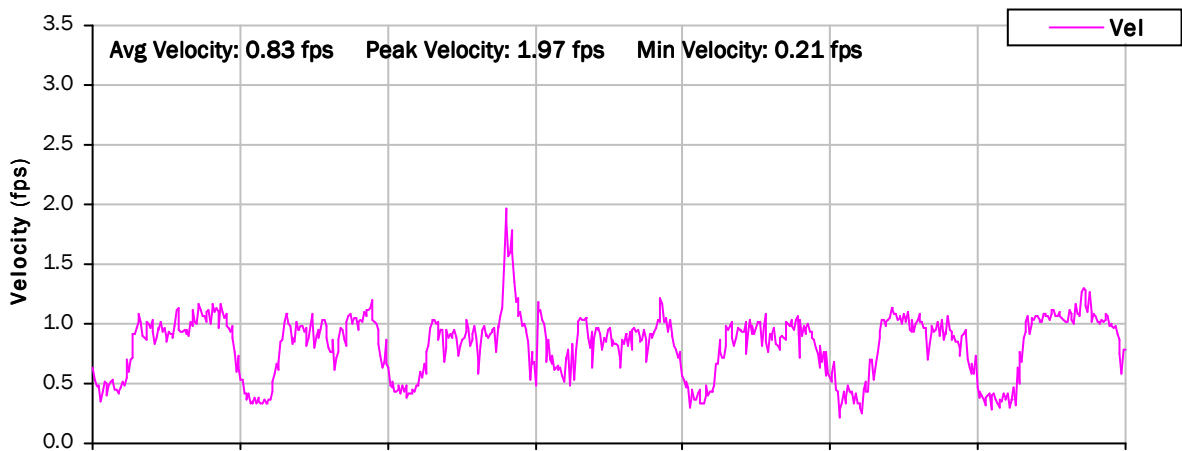
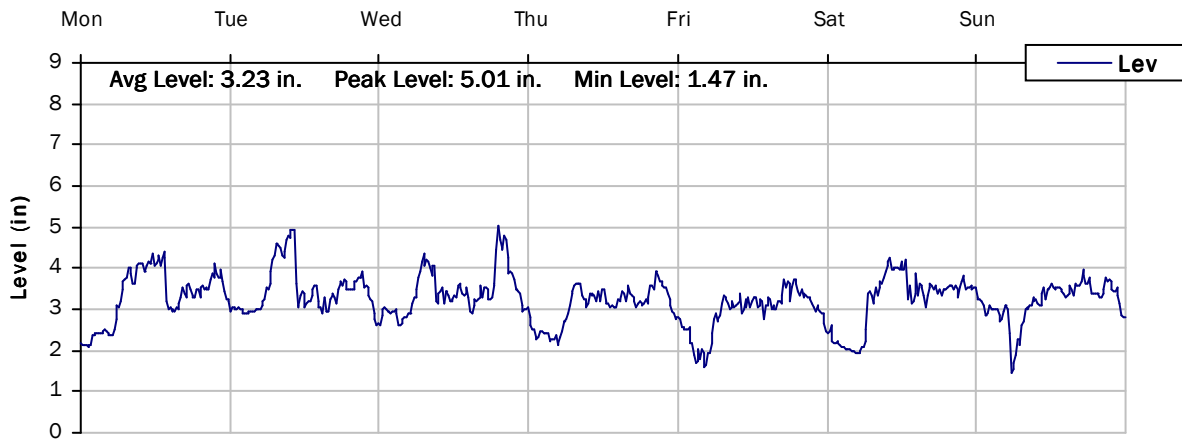
3/26/2018 to 4/2/2018



SITE 9
Weekly Level, Velocity and Flow Hydrographs
4/2/2018 to 4/9/2018



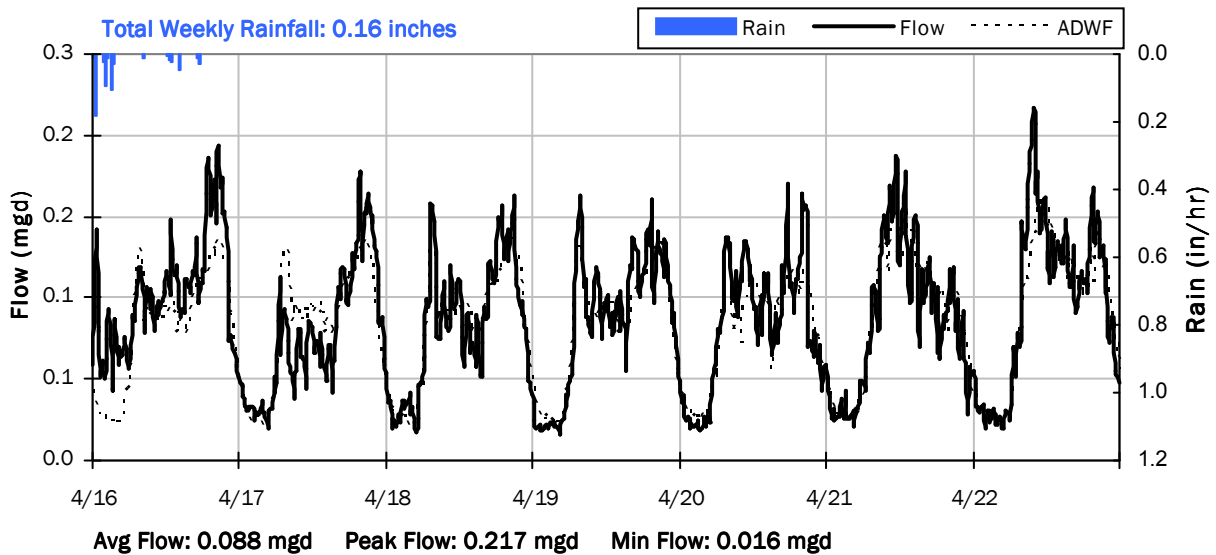
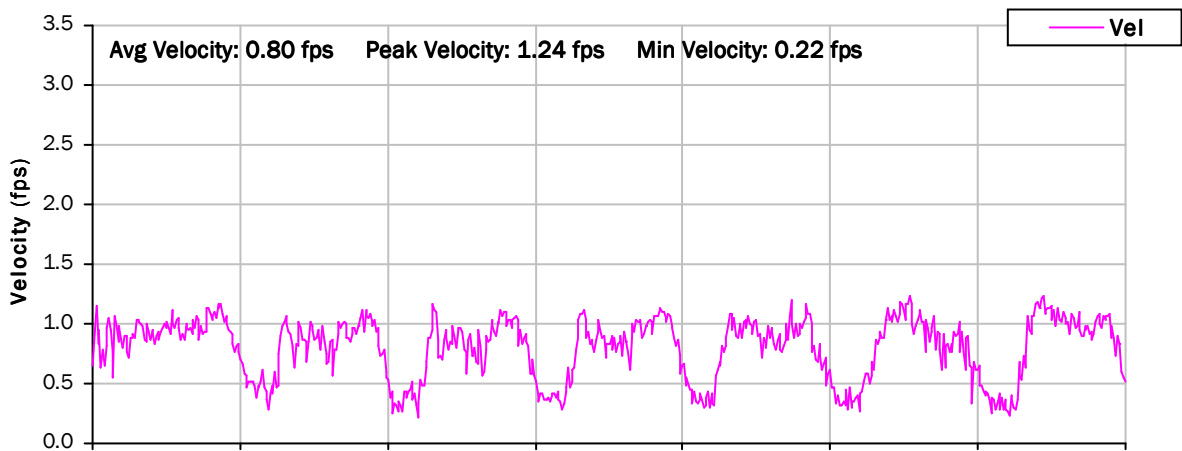
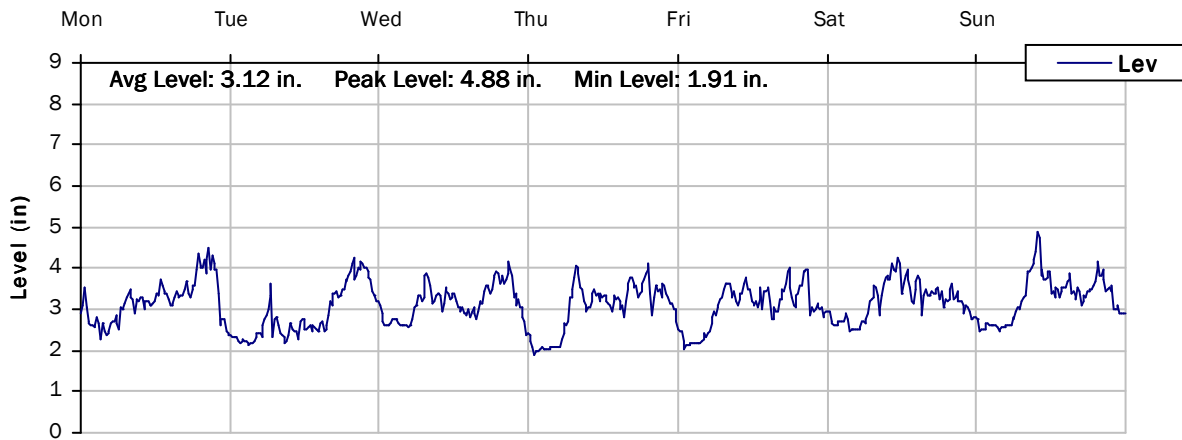
SITE 9
Weekly Level, Velocity and Flow Hydrographs
4/9/2018 to 4/16/2018



SITE 9

Weekly Level, Velocity and Flow Hydrographs

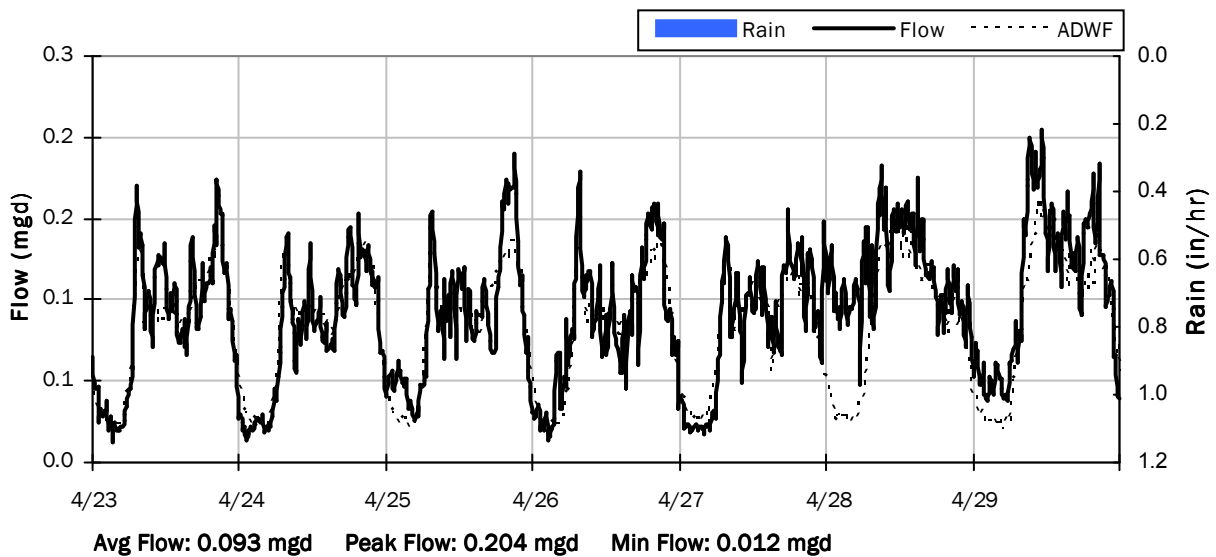
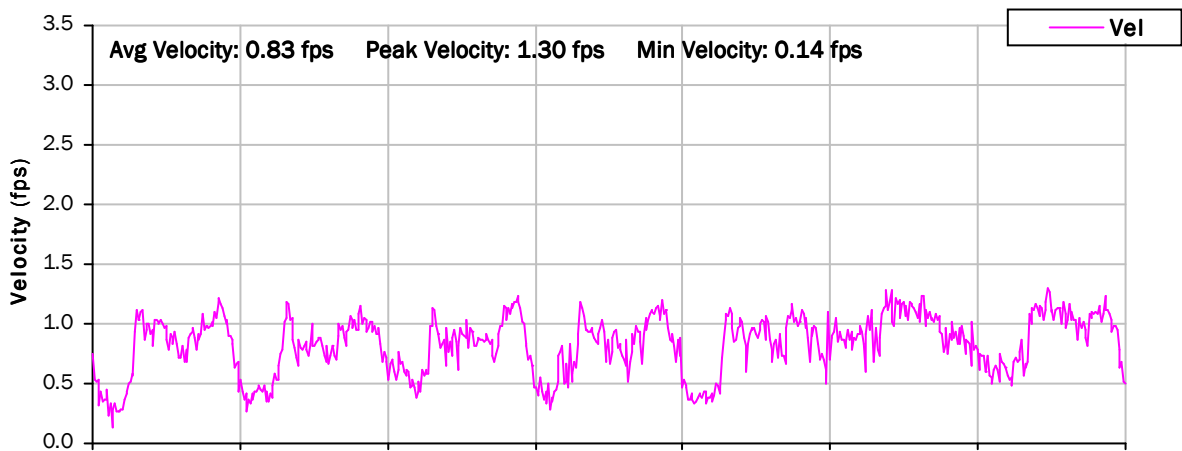
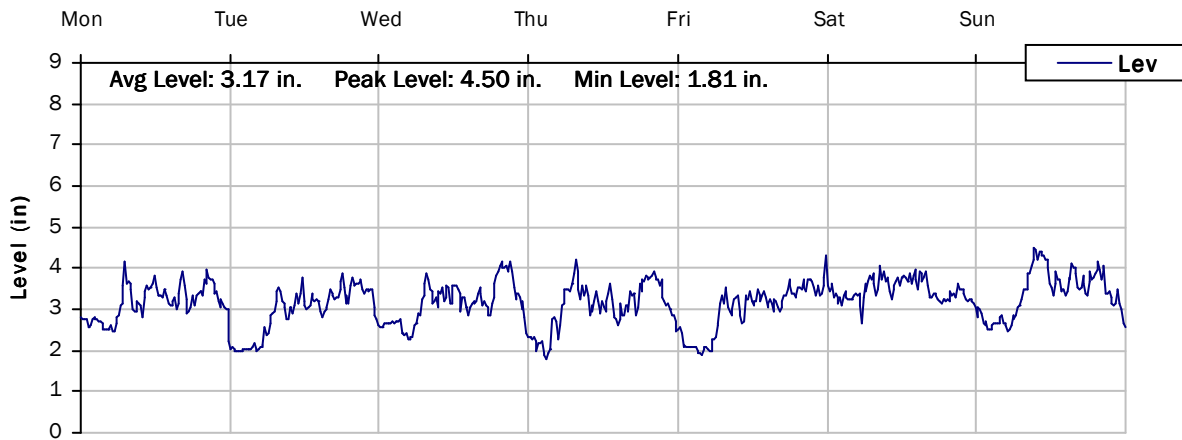
4/16/2018 to 4/23/2018



SITE 9

Weekly Level, Velocity and Flow Hydrographs

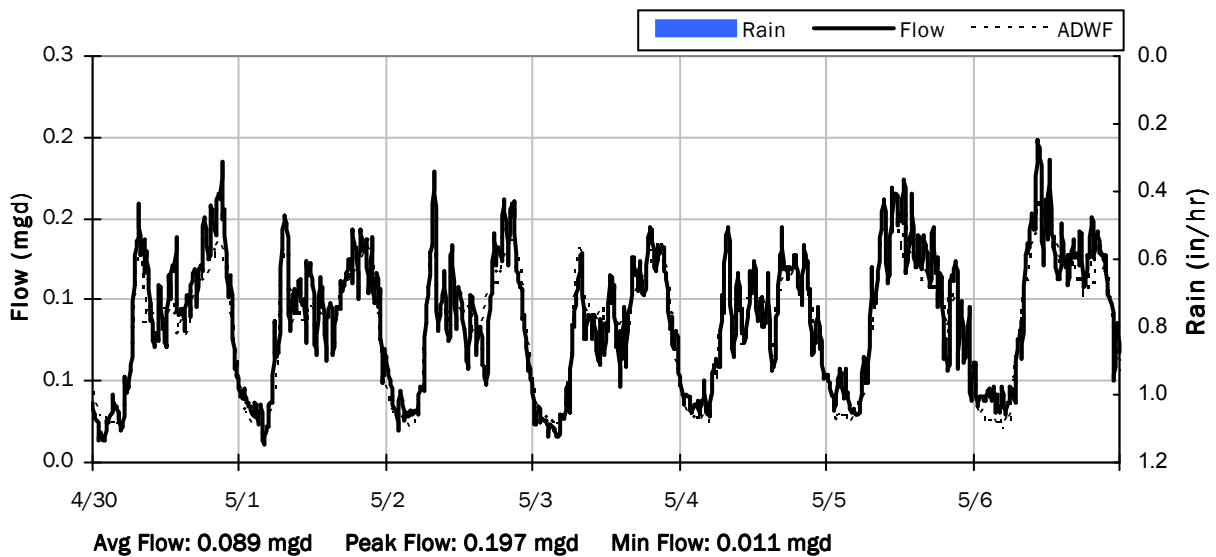
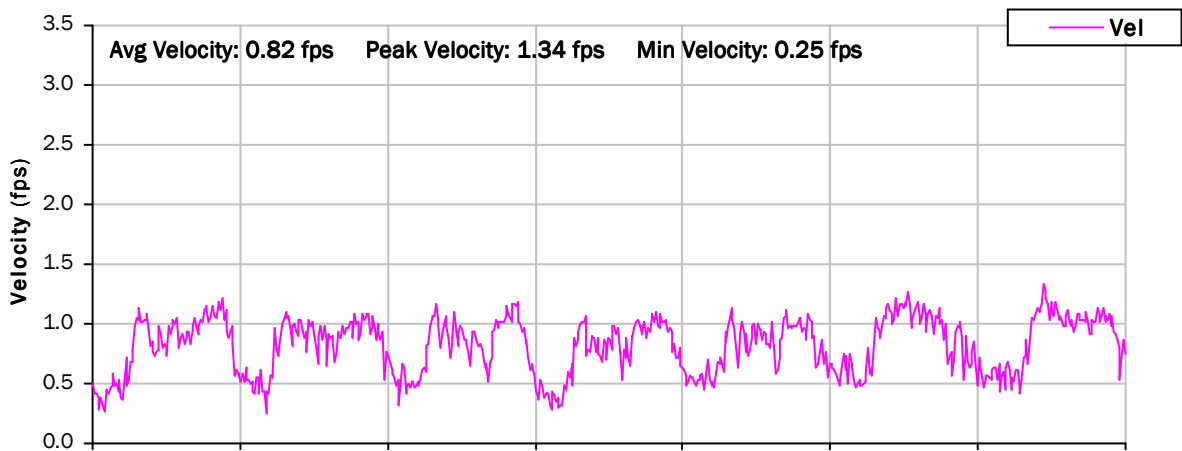
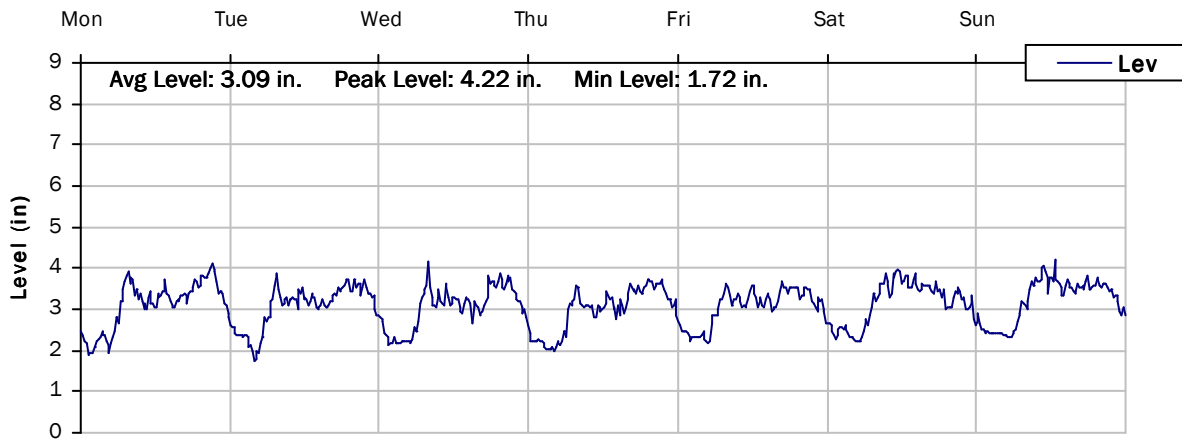
4/23/2018 to 4/30/2018



SITE 9

Weekly Level, Velocity and Flow Hydrographs

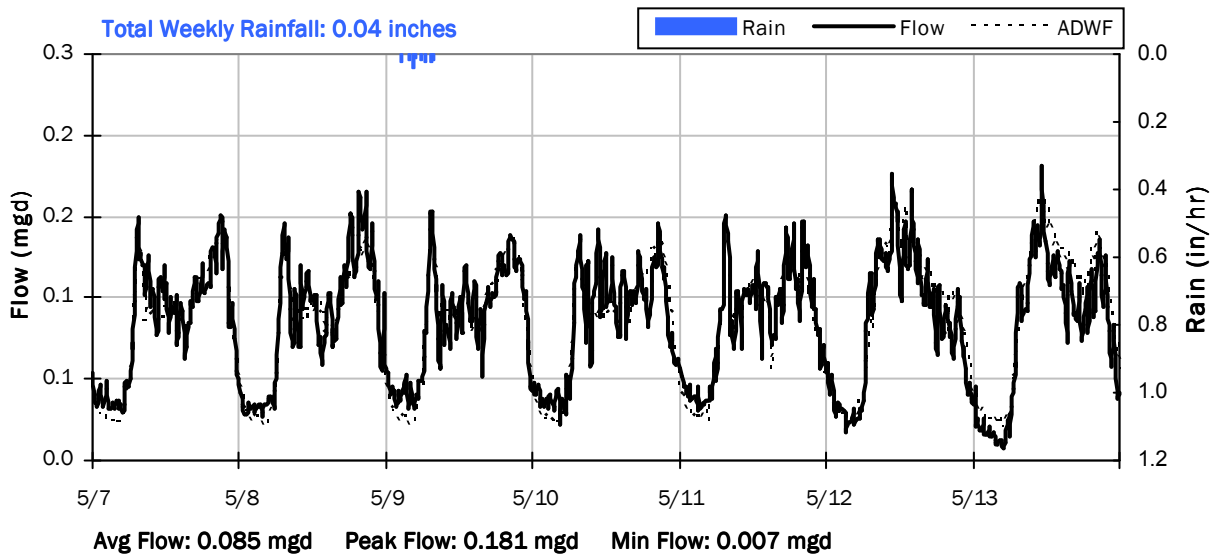
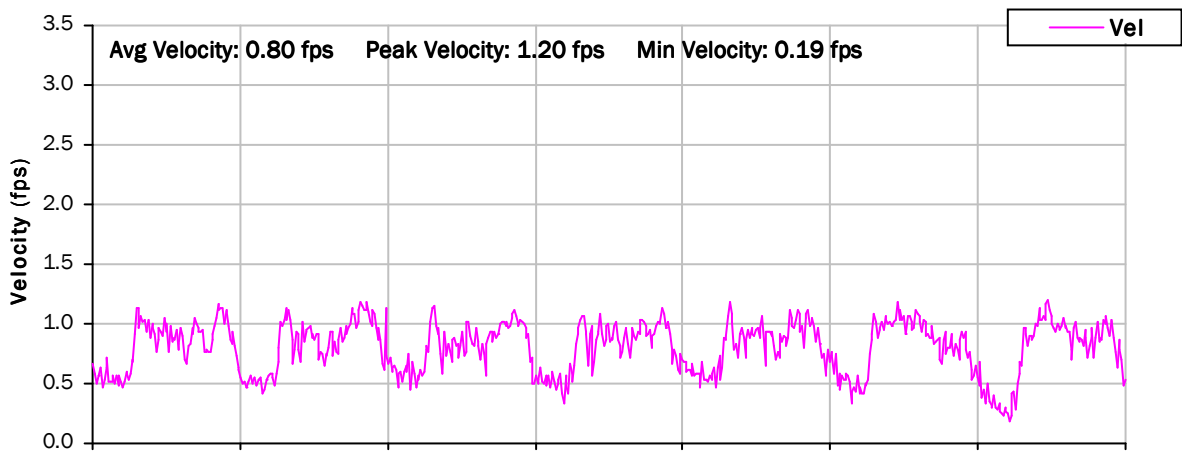
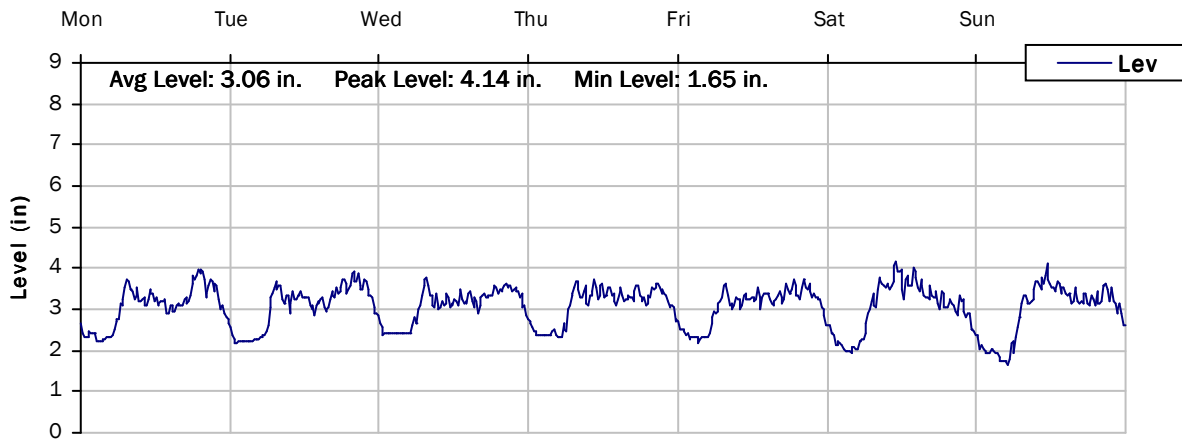
4/30/2018 to 5/7/2018



SITE 9

Weekly Level, Velocity and Flow Hydrographs

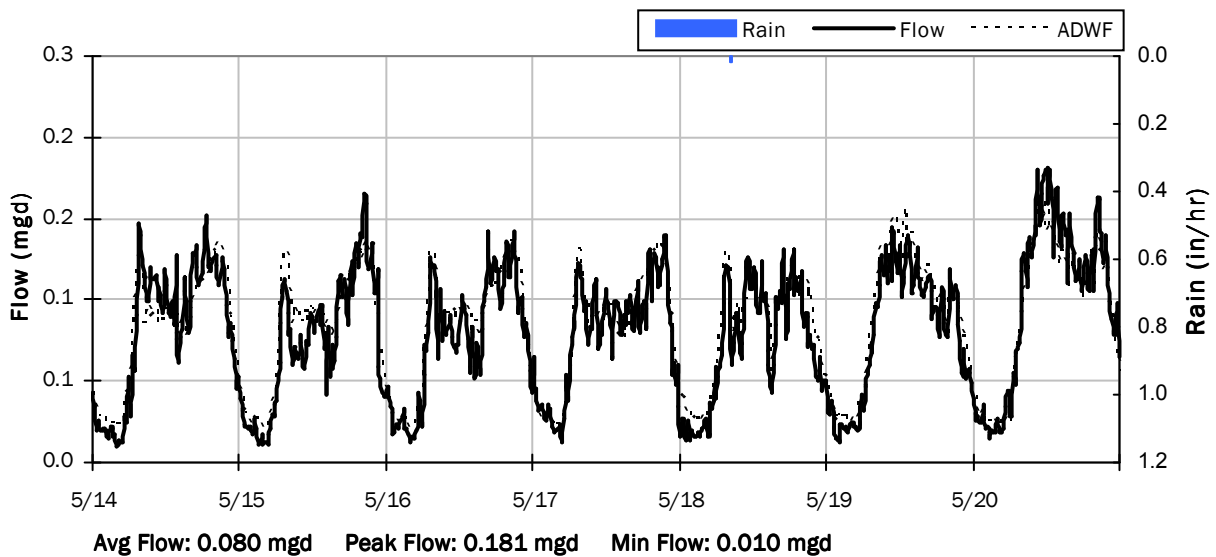
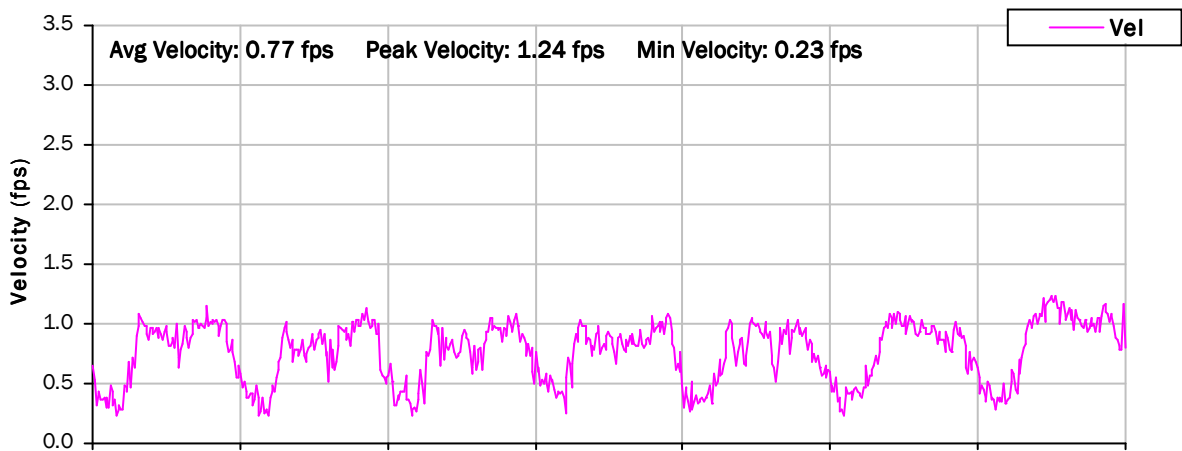
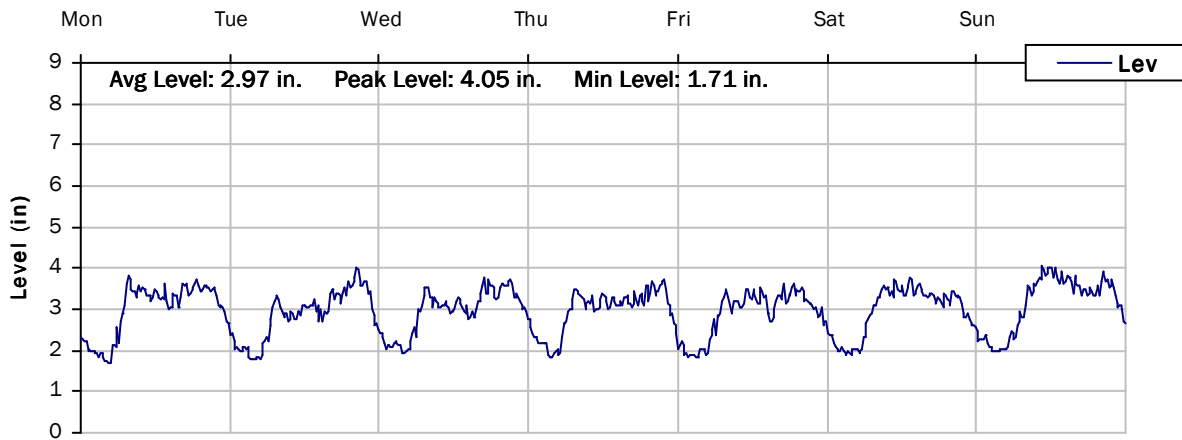
5/7/2018 to 5/14/2018



SITE 9

Weekly Level, Velocity and Flow Hydrographs

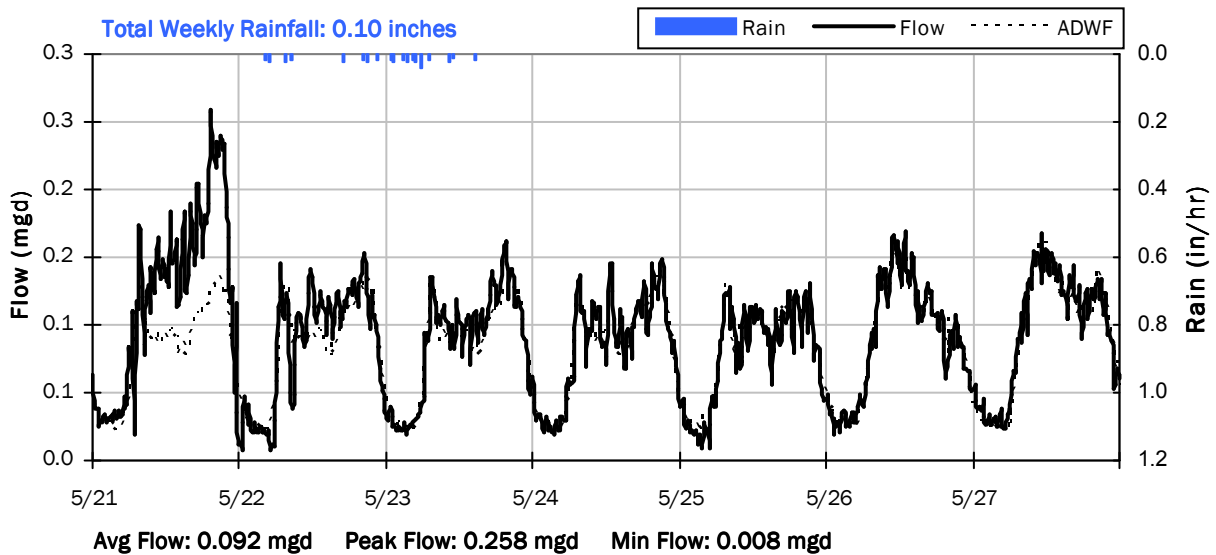
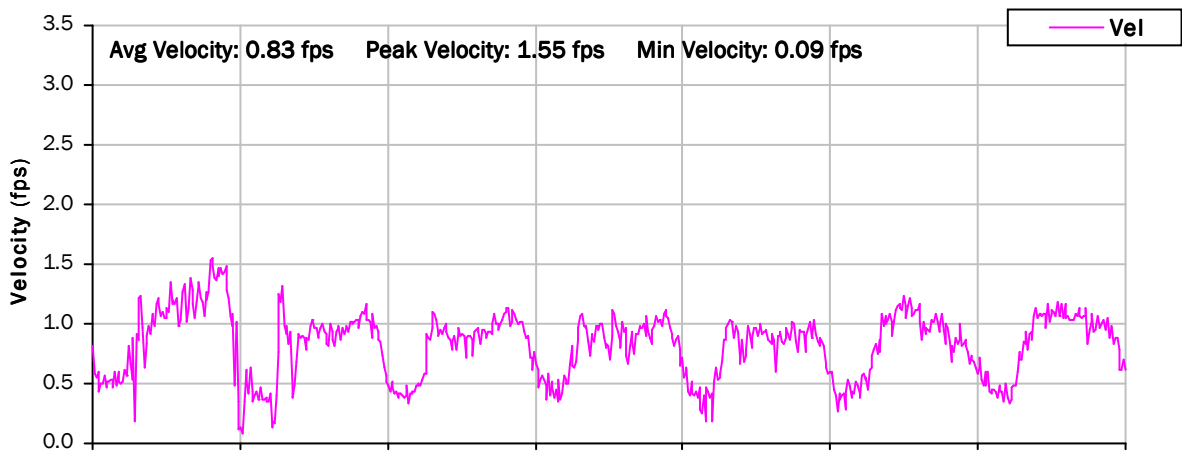
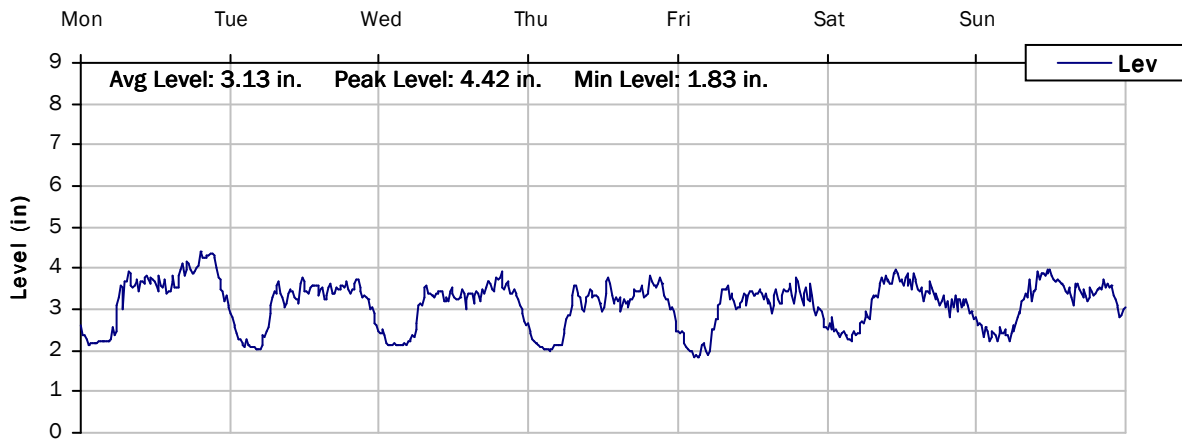
5/14/2018 to 5/21/2018



SITE 9

Weekly Level, Velocity and Flow Hydrographs

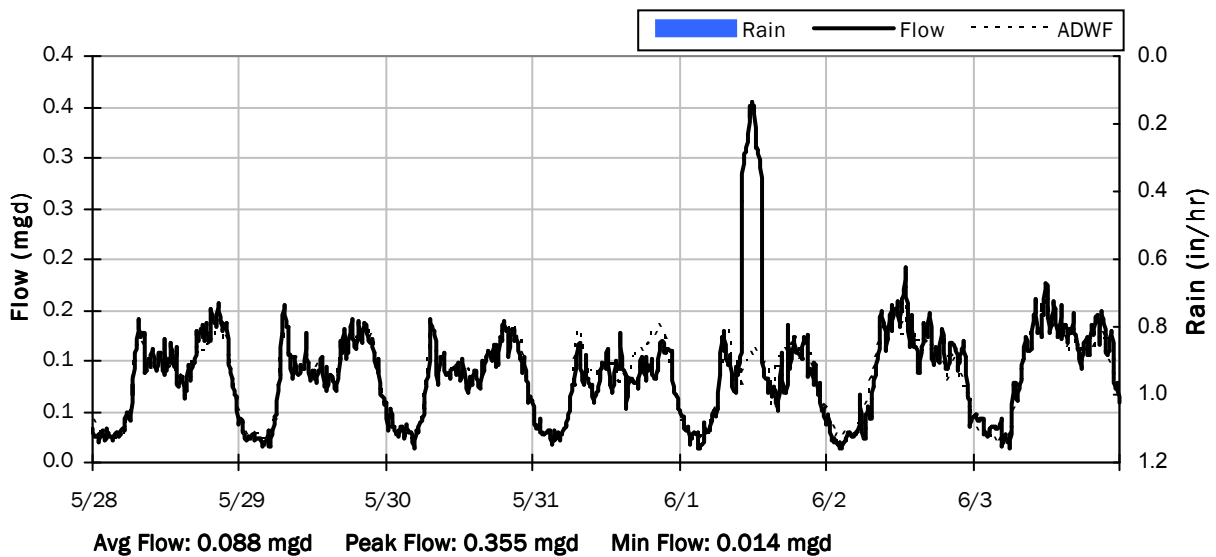
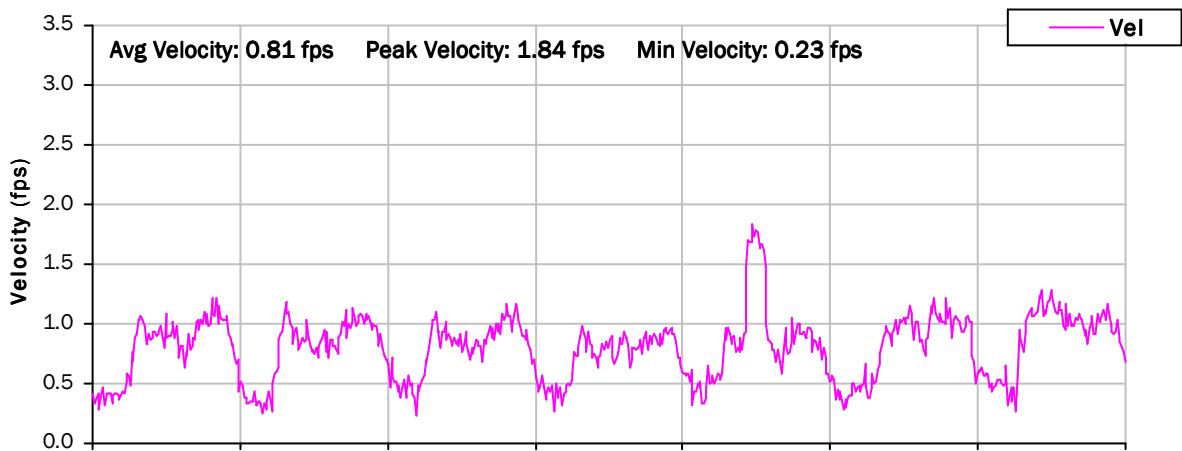
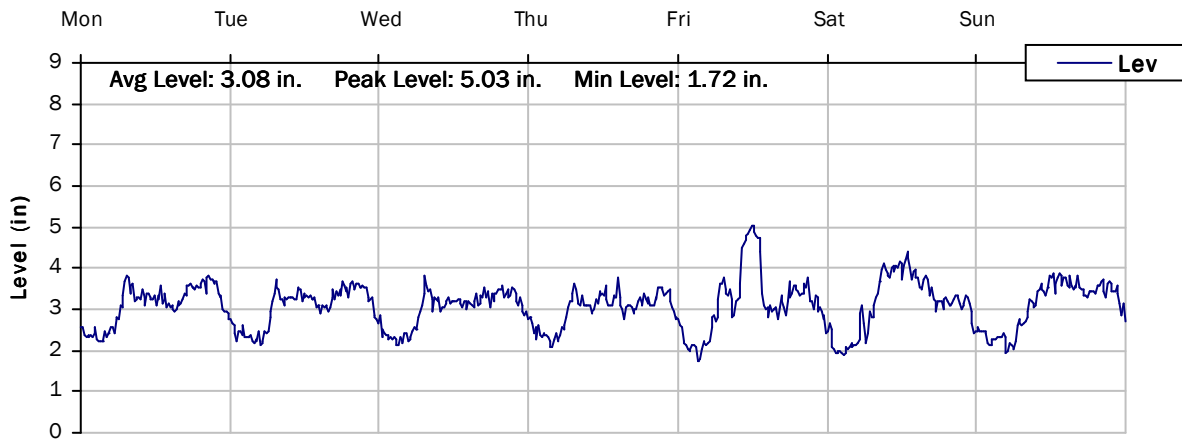
5/21/2018 to 5/28/2018



SITE 9

Weekly Level, Velocity and Flow Hydrographs

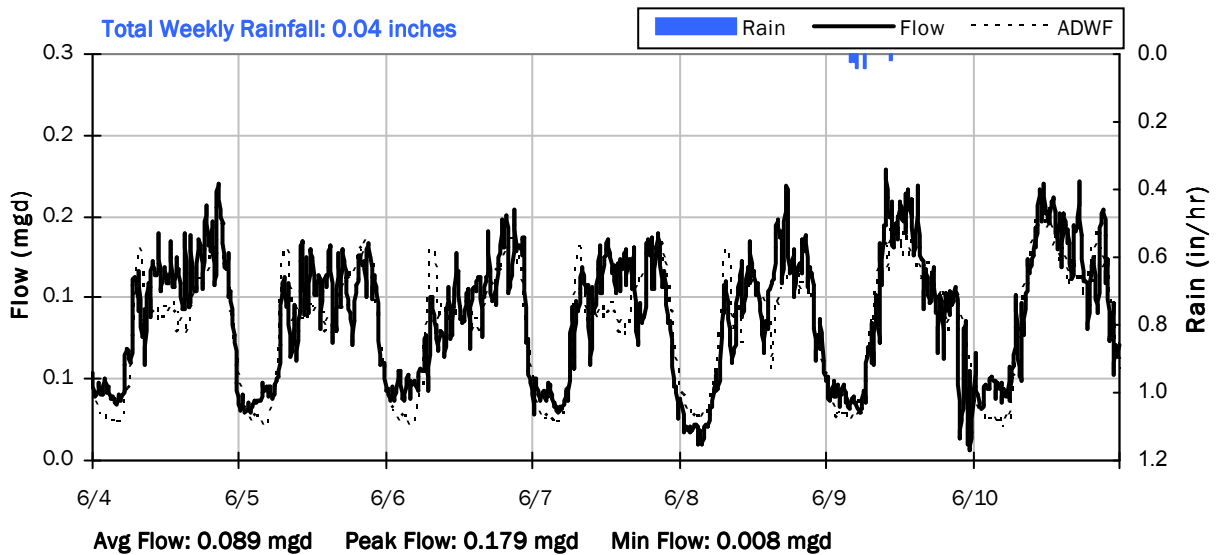
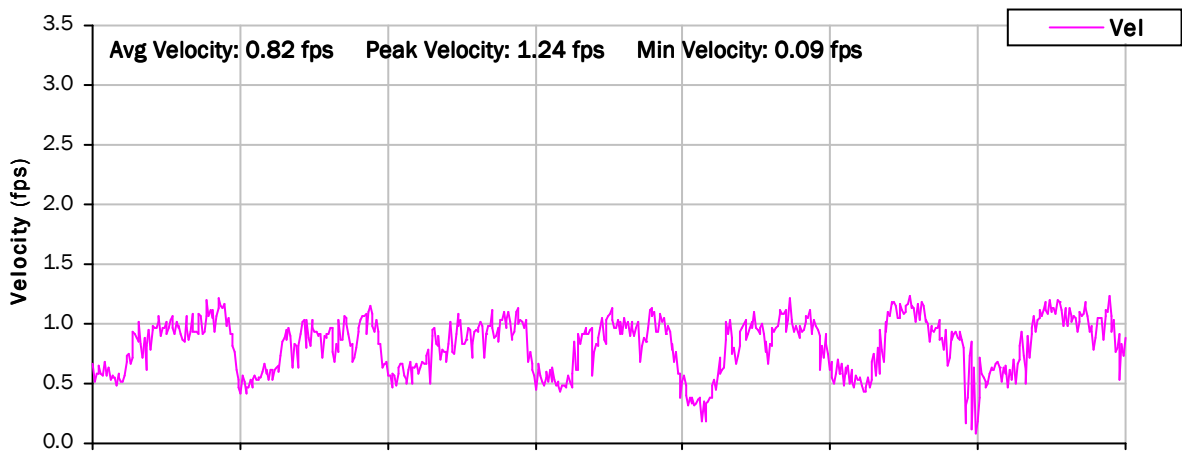
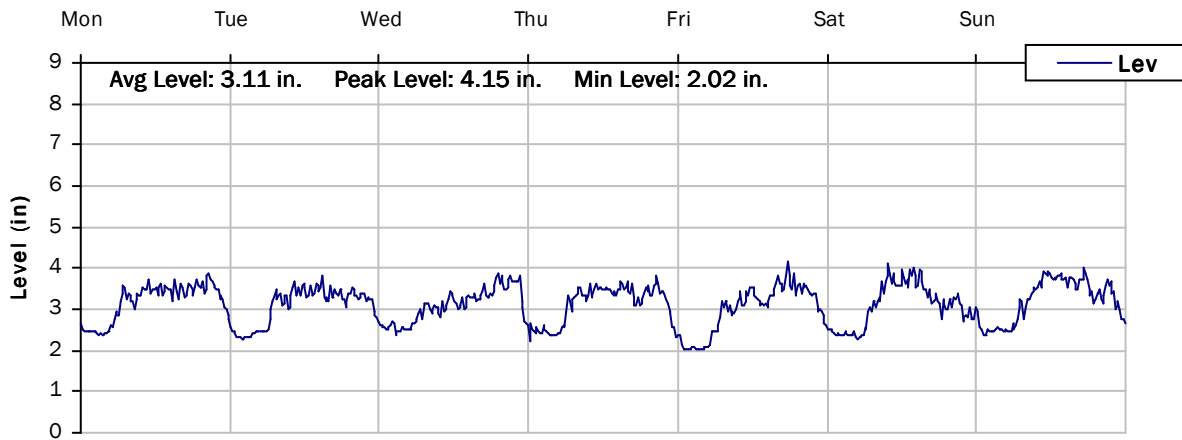
5/28/2018 to 6/4/2018



SITE 9

Weekly Level, Velocity and Flow Hydrographs

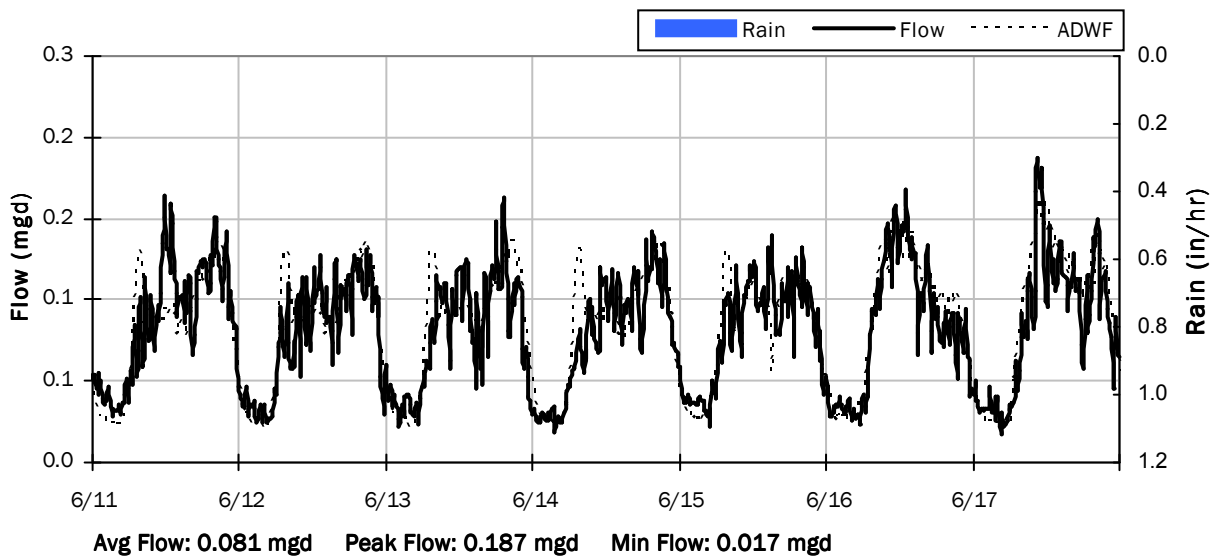
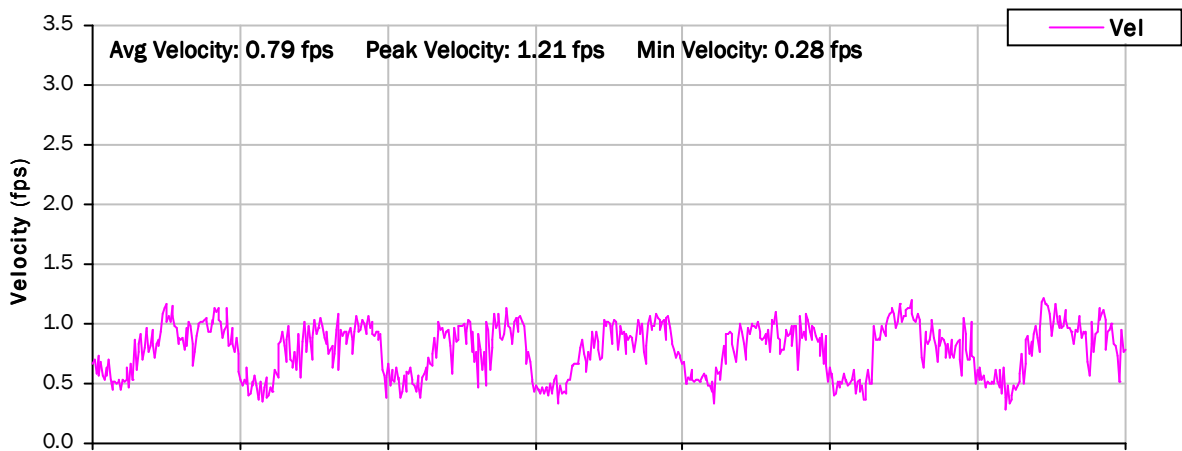
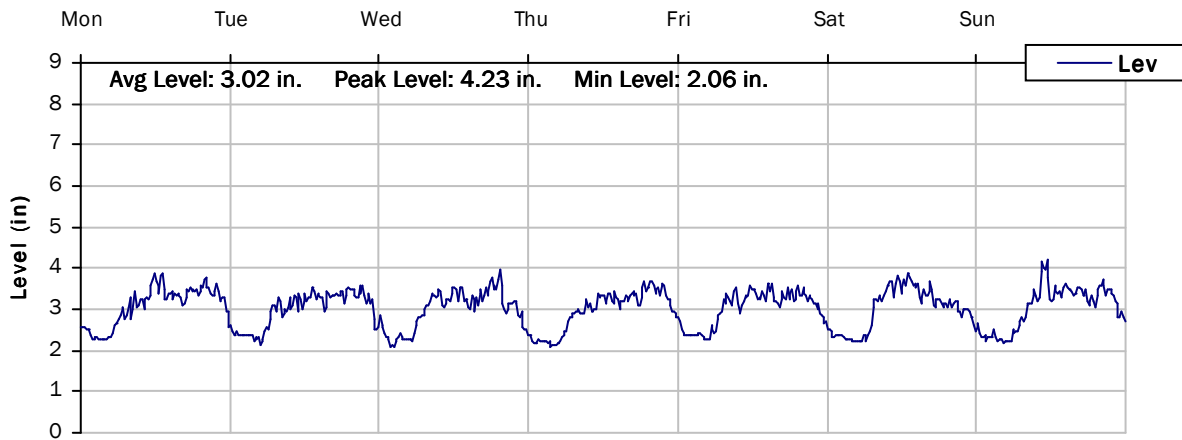
6/4/2018 to 6/11/2018



SITE 9

Weekly Level, Velocity and Flow Hydrographs

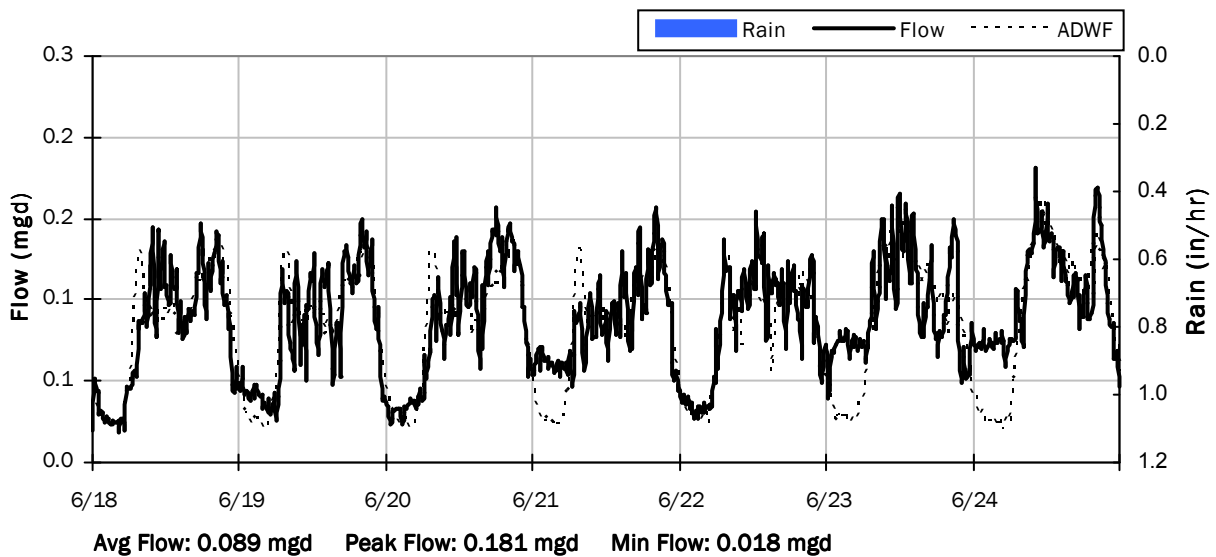
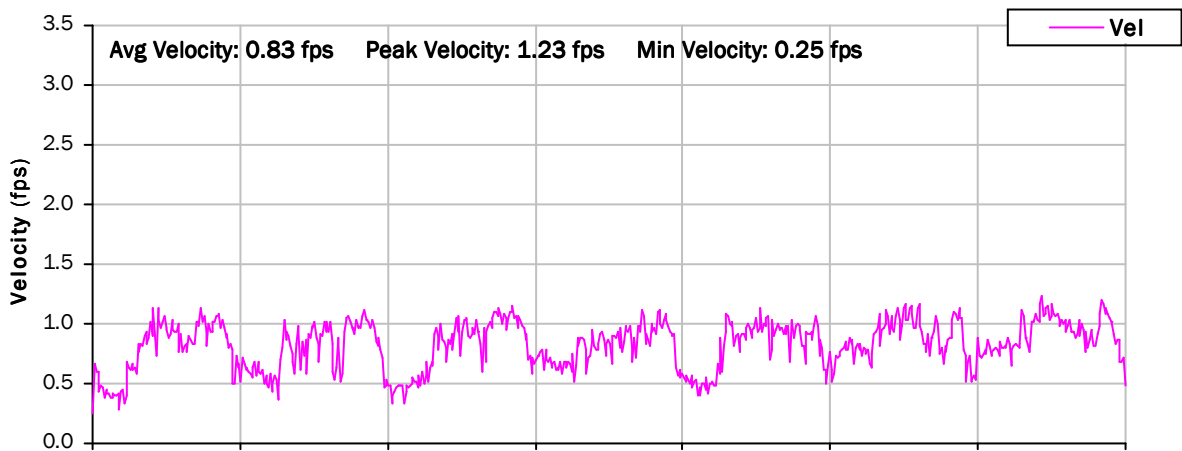
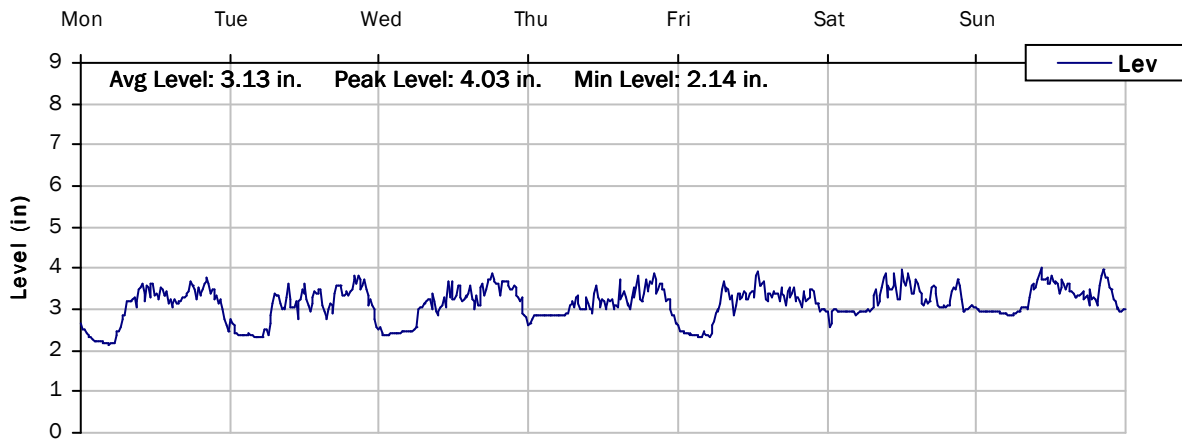
6/11/2018 to 6/18/2018



SITE 9

Weekly Level, Velocity and Flow Hydrographs

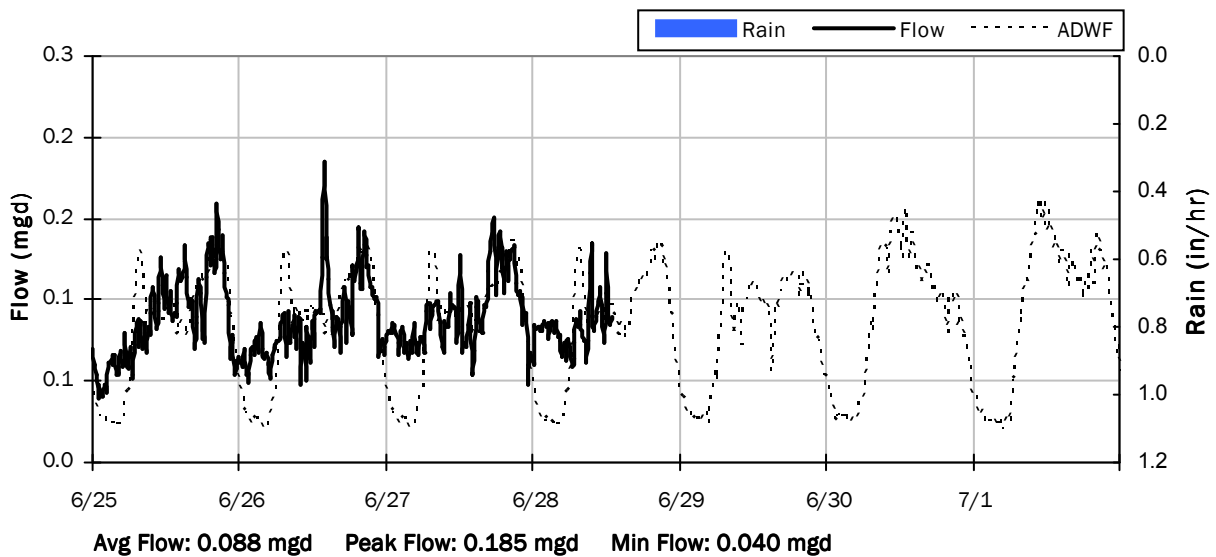
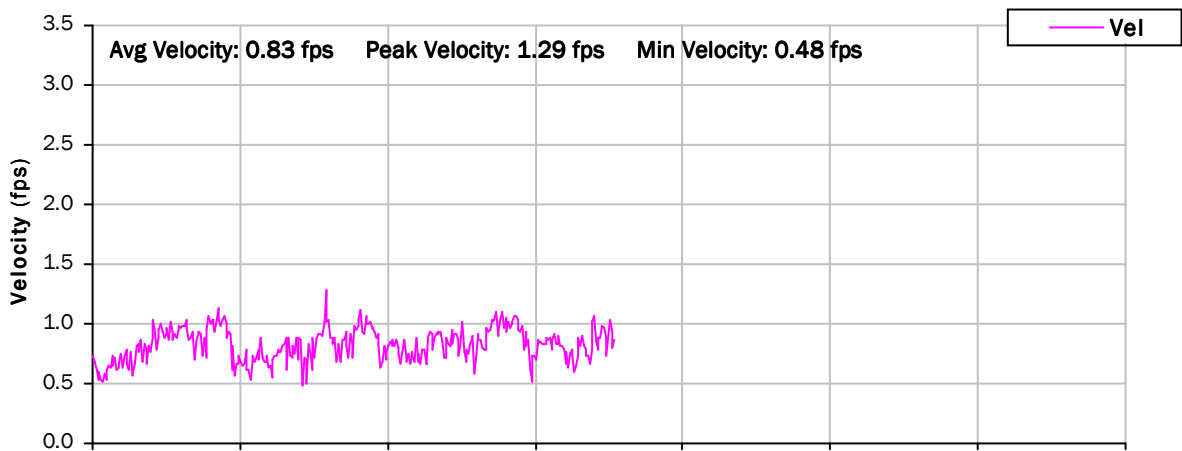
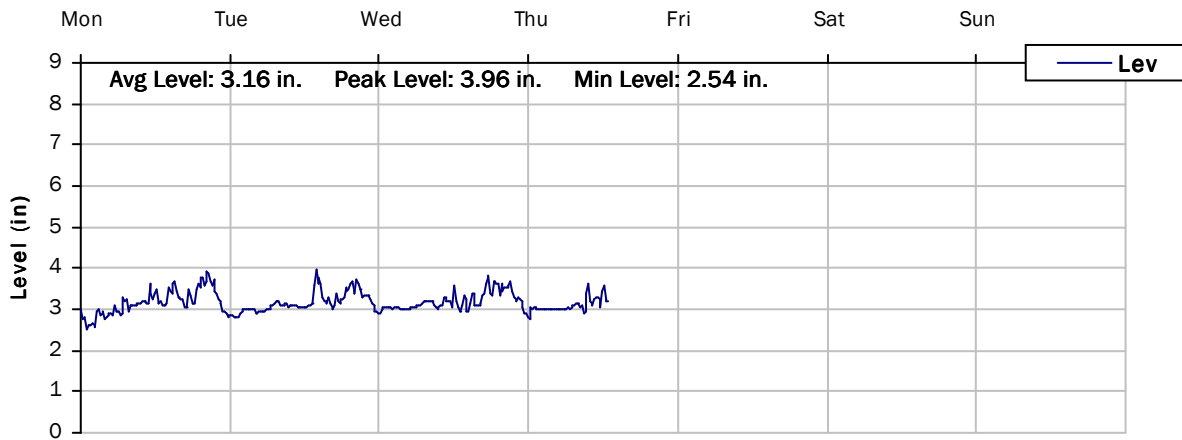
6/18/2018 to 6/25/2018



SITE 9

Weekly Level, Velocity and Flow Hydrographs

6/25/2018 to 7/2/2018

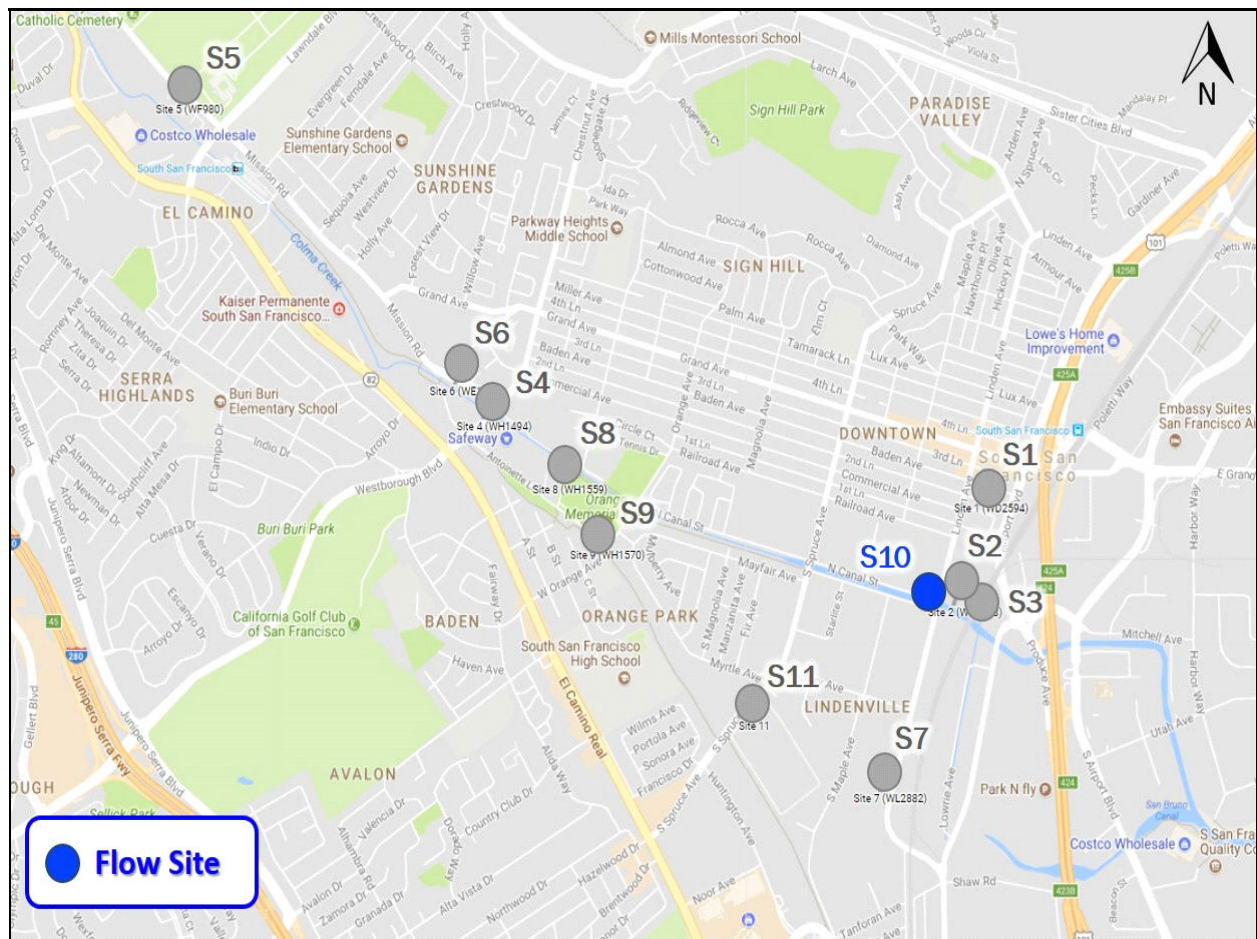


City of South San Francisco Sanitary Sewer Flow Monitoring February 26- June 28, 2018

Monitoring Site: Site 10

Location: South Linden Avenue and South Canal Street, in Flyers gas station

Data Summary Report

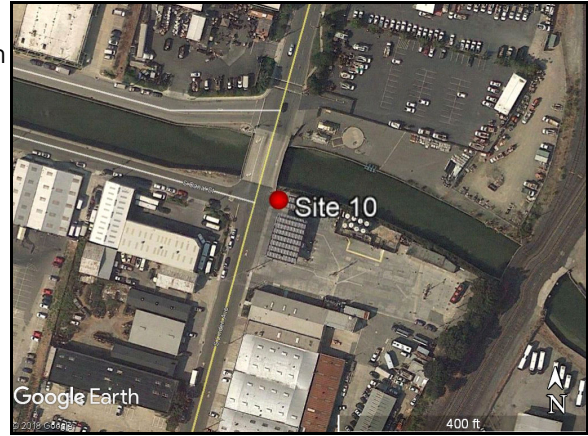


Vicinity Map: Site 10

SITE 10

Site Information

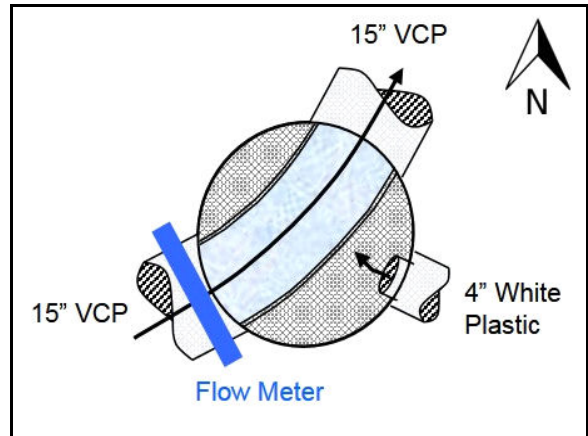
MH ID:	WL2651
Location:	South Linden Avenue and South Canal Street, in Flyers gas station
Coordinates:	122.4118° W, 37.6500° N
Rim Elevation (Earth):	14 feet
Pipe Diameter:	15 inches
Sediment:	0.00 inches
ADWF:	0.132 mgd
Peak Measured Flow:	1.216 mgd



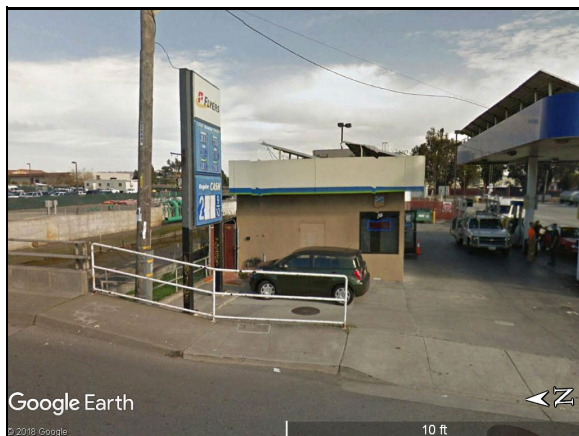
Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 10

Additional Site Photos

Effluent Pipe



Southwest Influent Pipe



SITE 10

Additional Site Photos

Southeast Influent Pipe

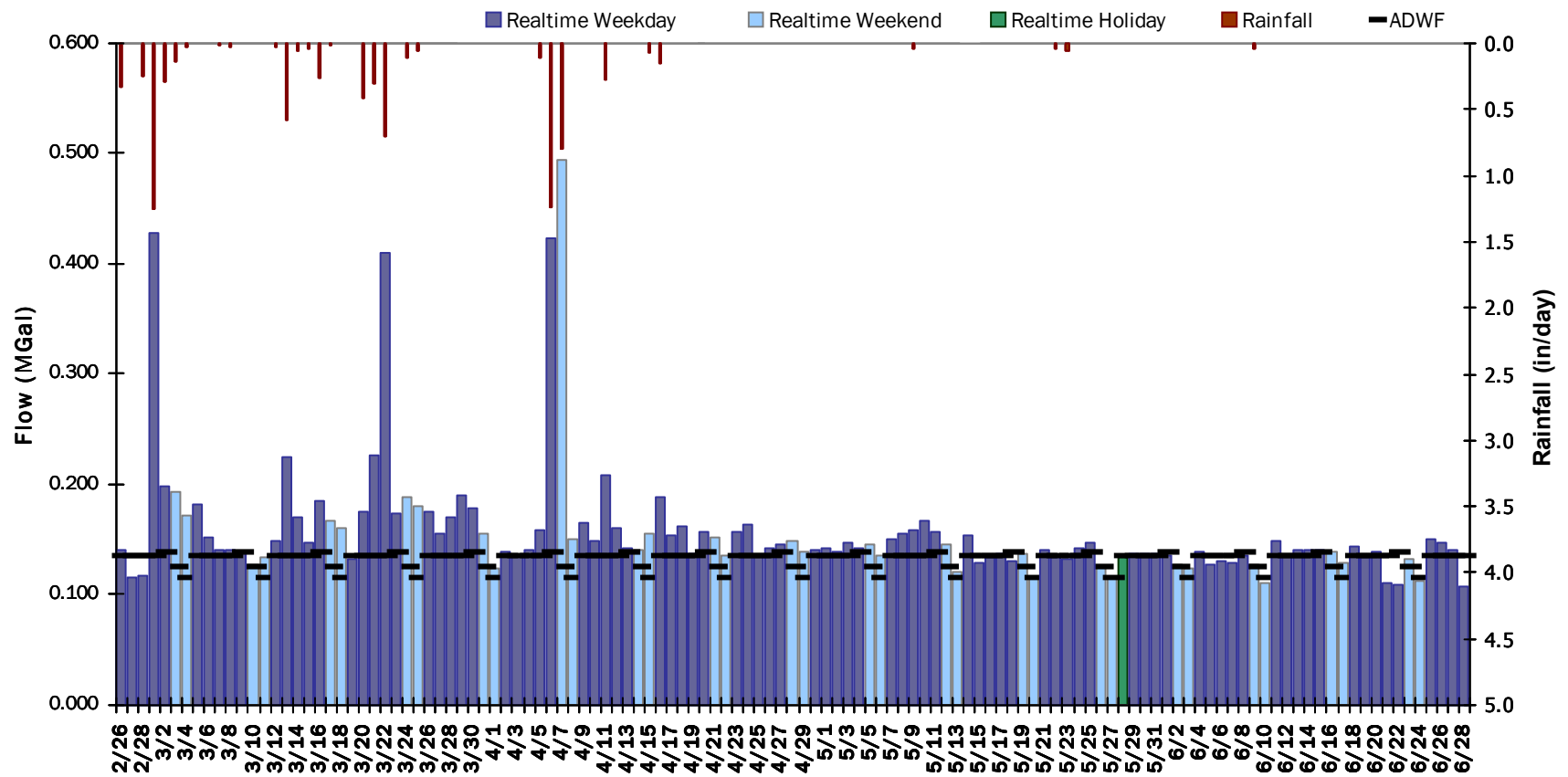


SITE 10

Period Flow Summary: Daily Flow Totals

Avg Period Flow: 0.156 MGal Peak Daily Flow: 0.494 MGal Min Daily Flow: 0.108 MGal

Total Period Rainfall: 7.40 inches



SITE 10

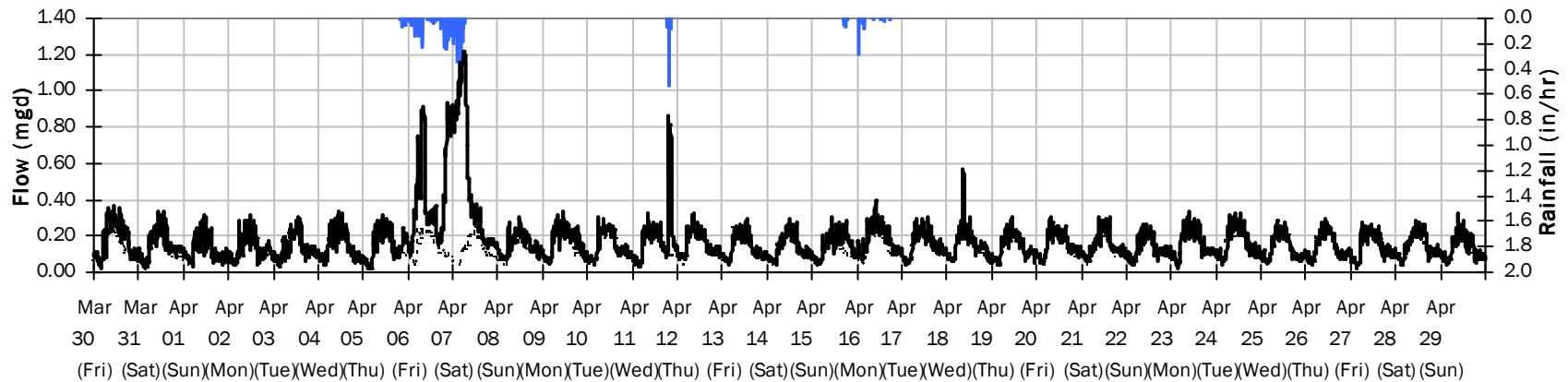
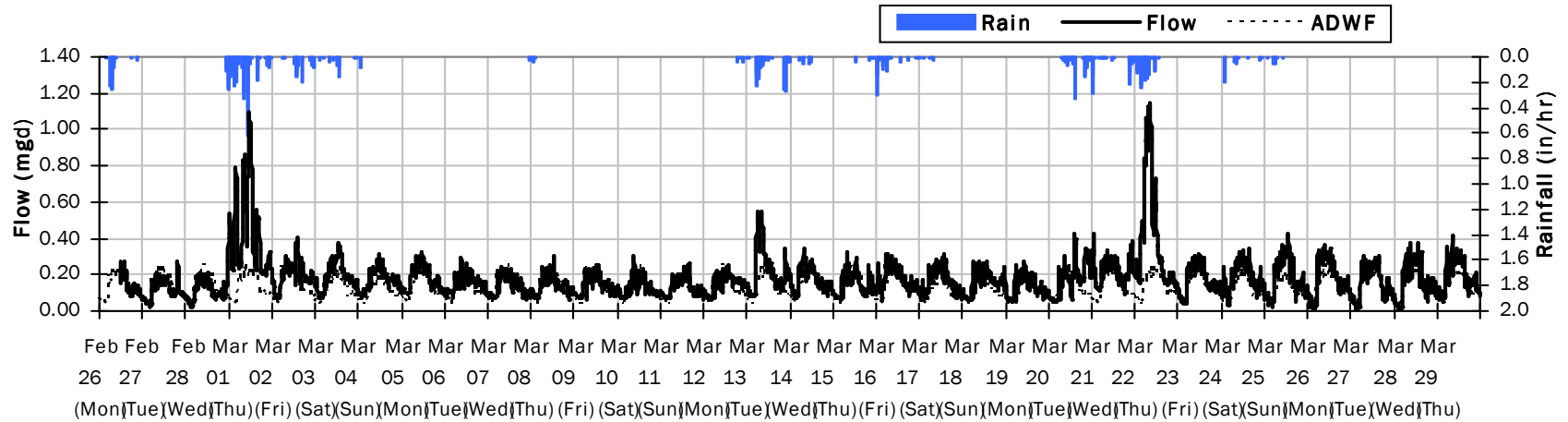
Flow Summary: 2/26/2018 to 4/29/2018

Total Period Rainfall: 7.55 inches

Avg Flow: 0.176 mgd

Peak Flow: 1.216 mgd

Min Flow: 0.011 mgd



SITE 10

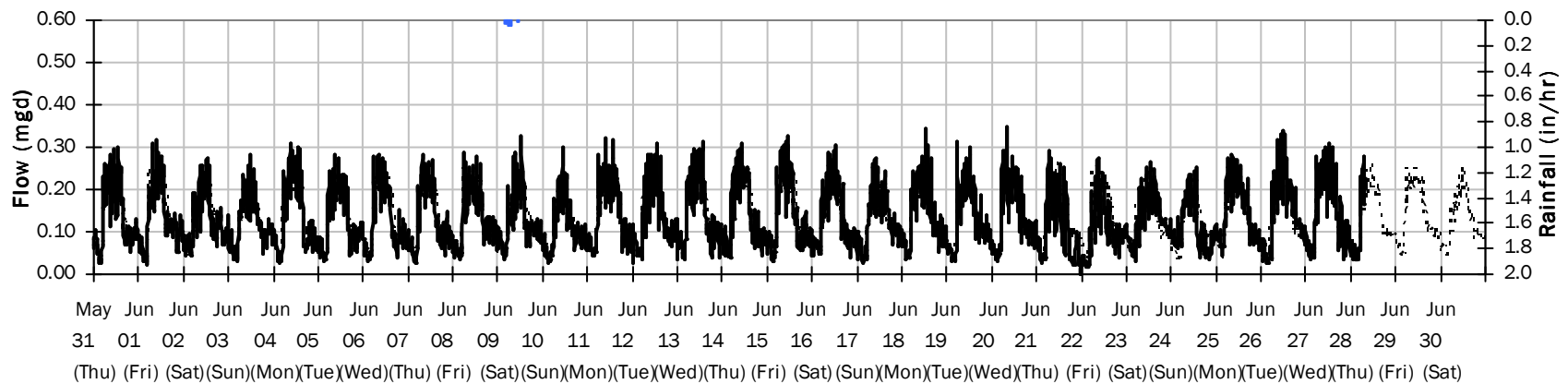
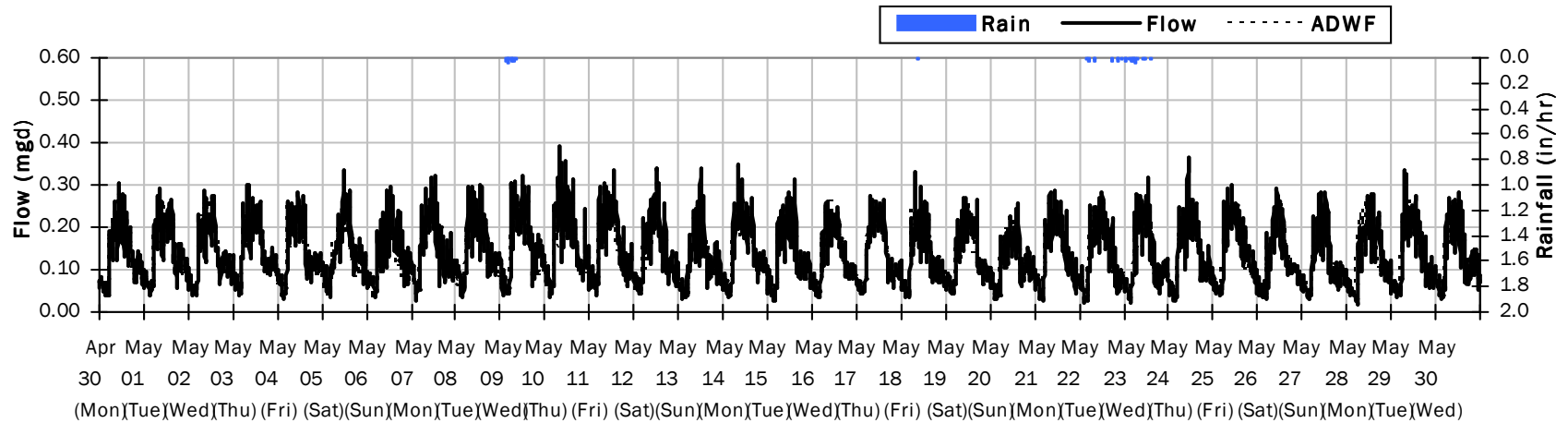
Flow Summary: 4/30/2018 to 6/30/2018

Total Period Rainfall: 0.18 inches

Avg Flow: 0.136 mgd

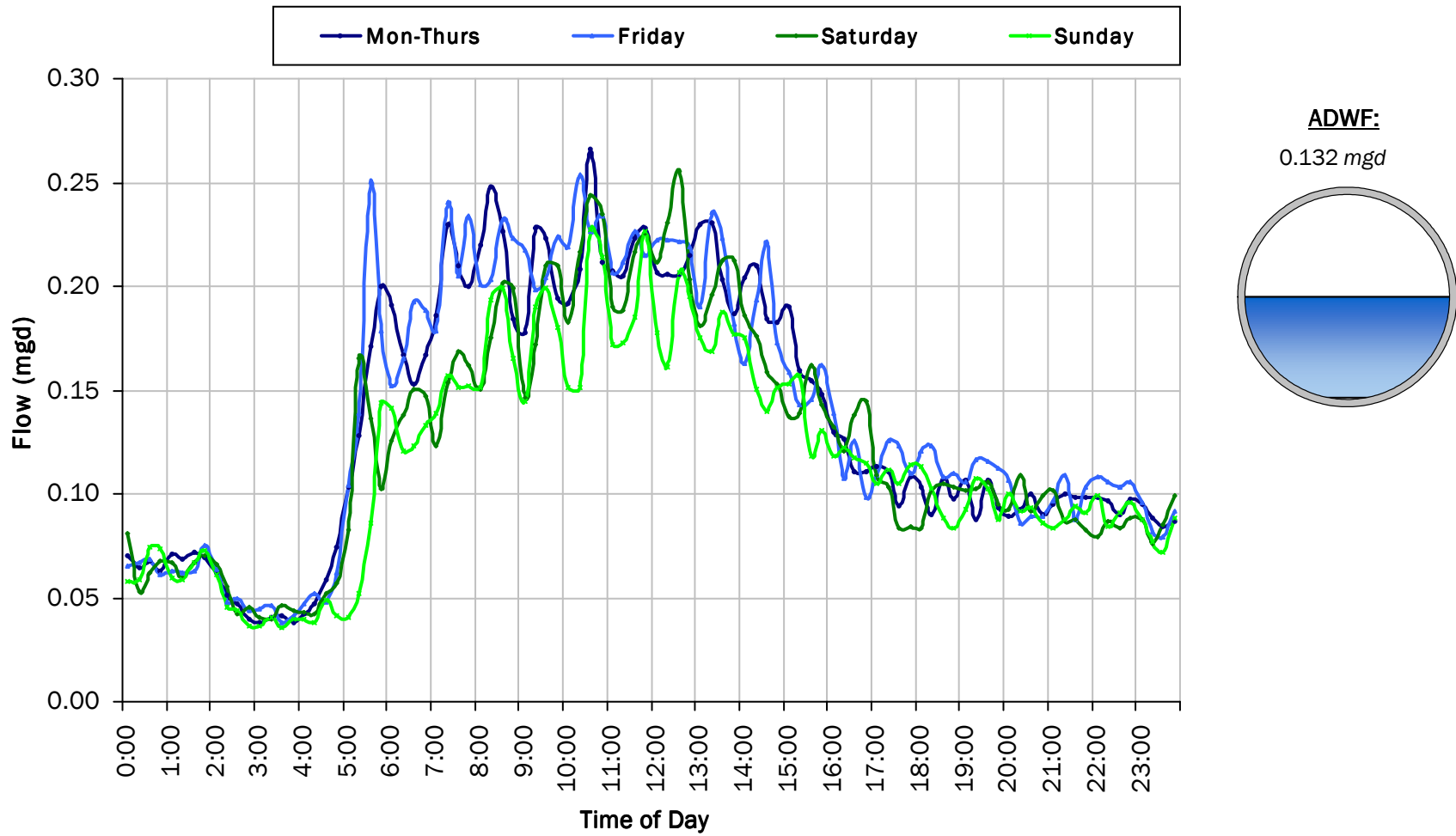
Peak Flow: 0.393 mgd

Min Flow: 0.000 mgd



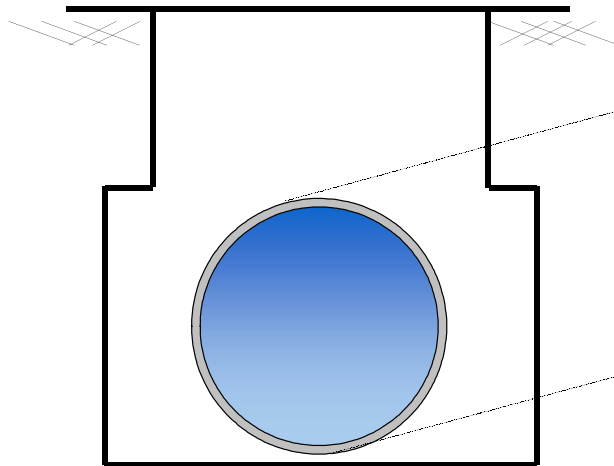
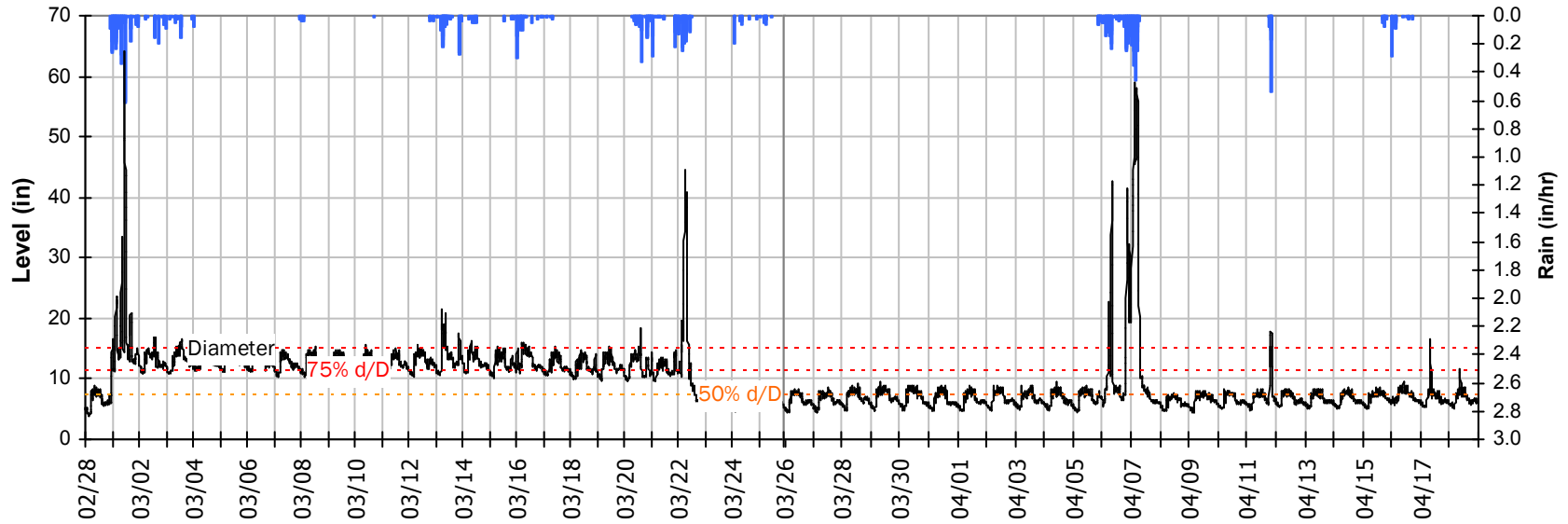
SITE 10

Average Dry Weather Flow Hydrographs



SITE 10 Site Capacity and Surge Summary

Realtime Flow Levels with Rainfall Data over Monitoring (High Capacity) Period



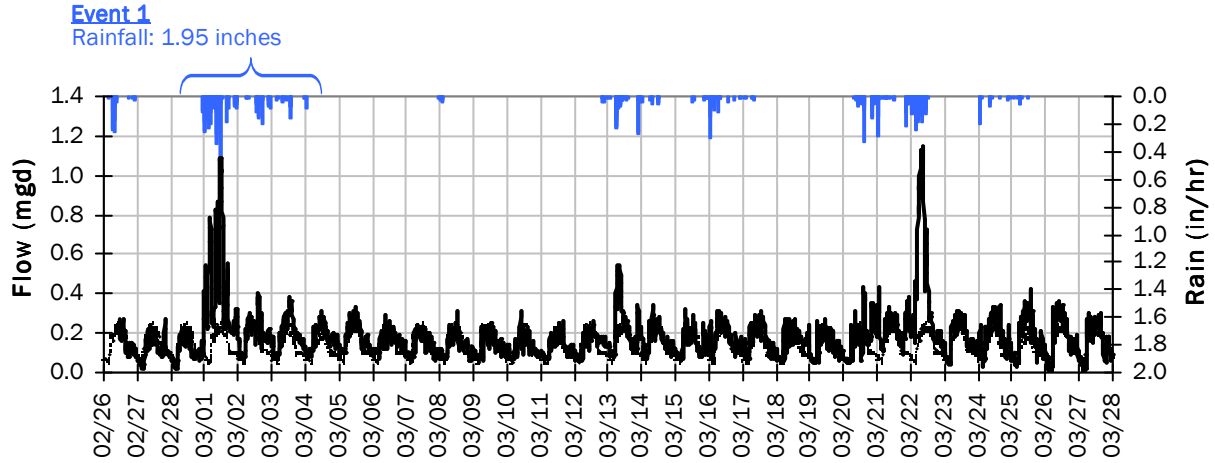
Pipe Diameter: 15 inches
Peak Measured Level: 64.2 inches
Peak d/D Ratio: 4.28

Surcharged 49.2 inches over crown

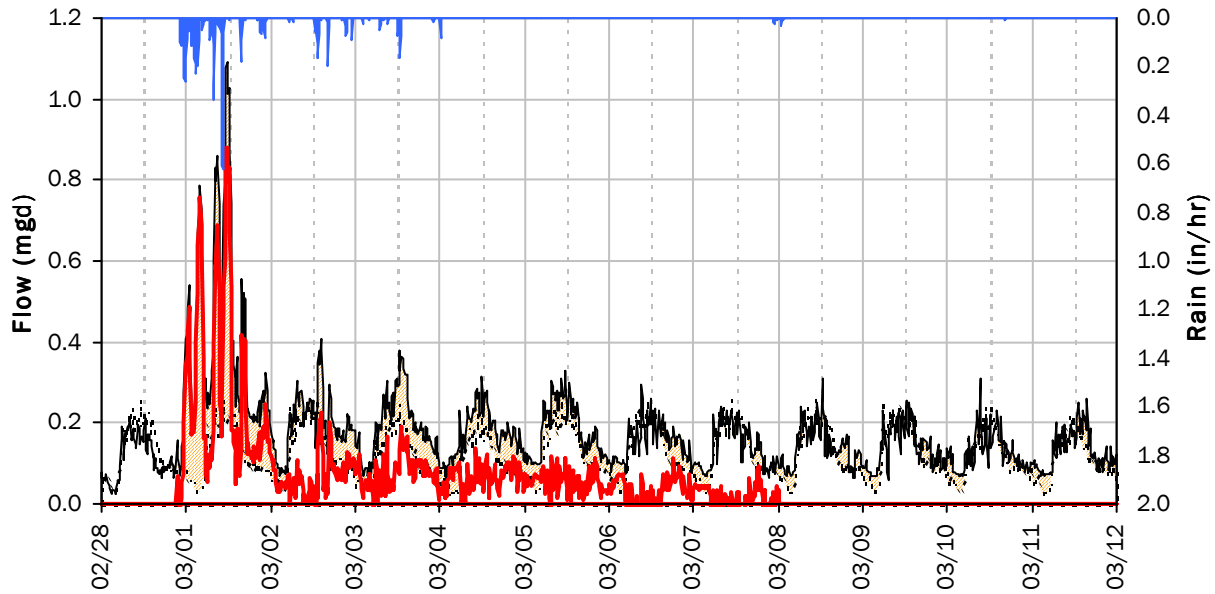
SITE 10

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



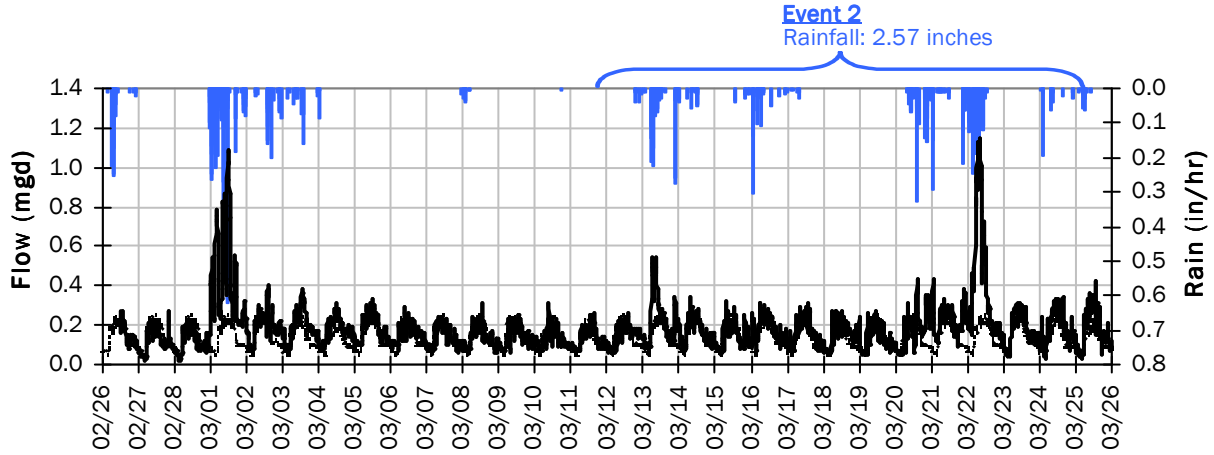
Storm Event I/I Analysis (Rain = 1.95 inches)

Capacity		Inflow / Infiltration	
Peak Flow:	1.09 <i>mgd</i>	Peak I/I Rate:	0.88 <i>mgd</i>
PF:	8.30	Total I/I:	622,000 <i>gallons</i>
Peak Level:	64.23 <i>in</i>		
d/D Ratio:	4.28		

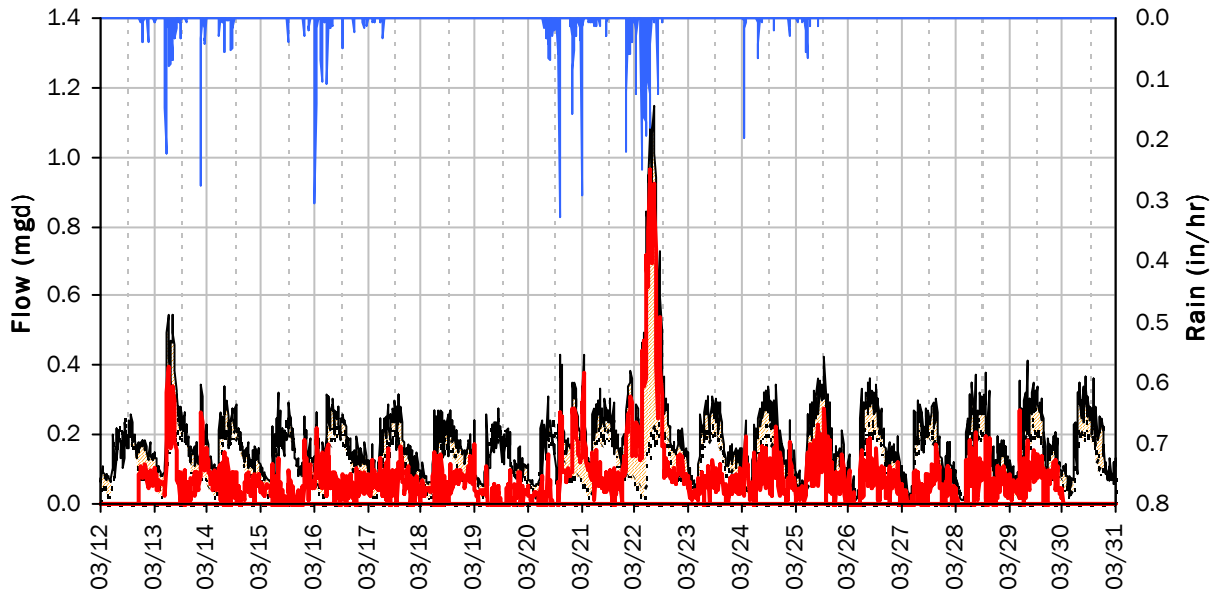
SITE 10

I/I Summary: Event 2

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 2 Detail Graph



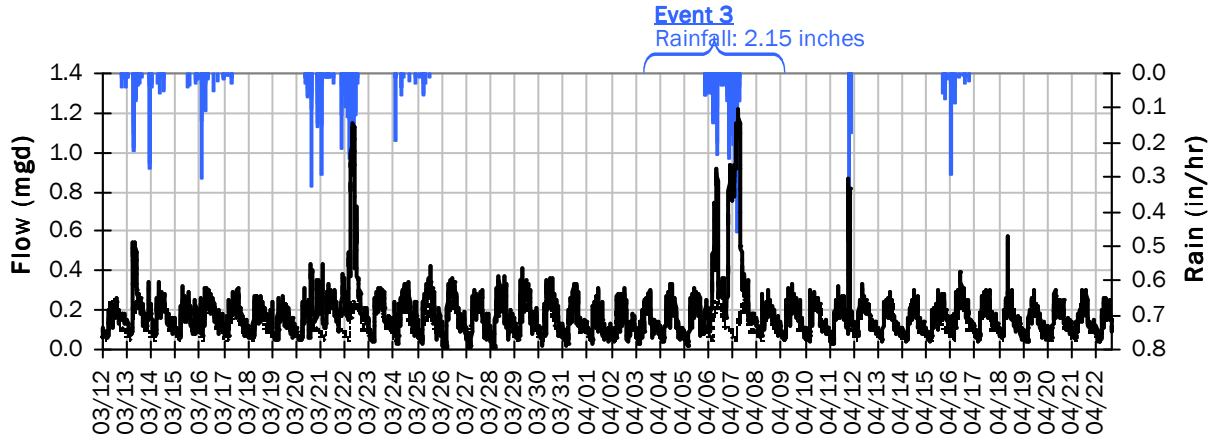
Storm Event I/I Analysis (Rain = 2.57 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	1.15 mgd	Peak I/I Rate:	0.96 mgd
PF:	8.74	Total I/I:	1,344,000 gallons
Peak Level:	44.51 in		
d/D Ratio:	2.97		

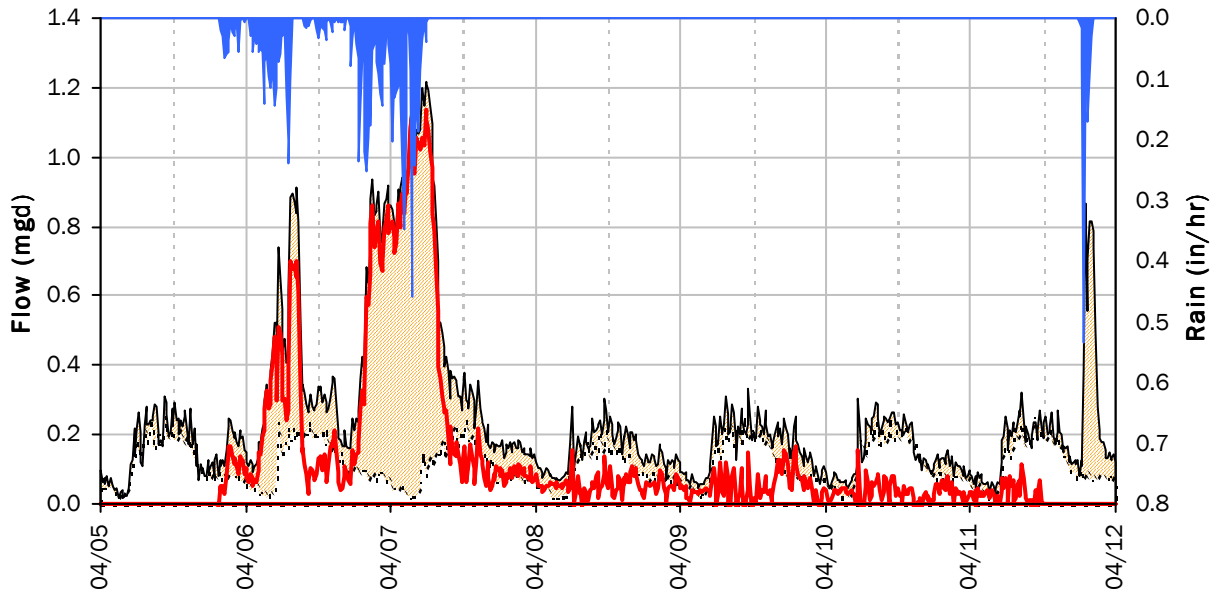
SITE 10

I/I Summary: Event 3

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



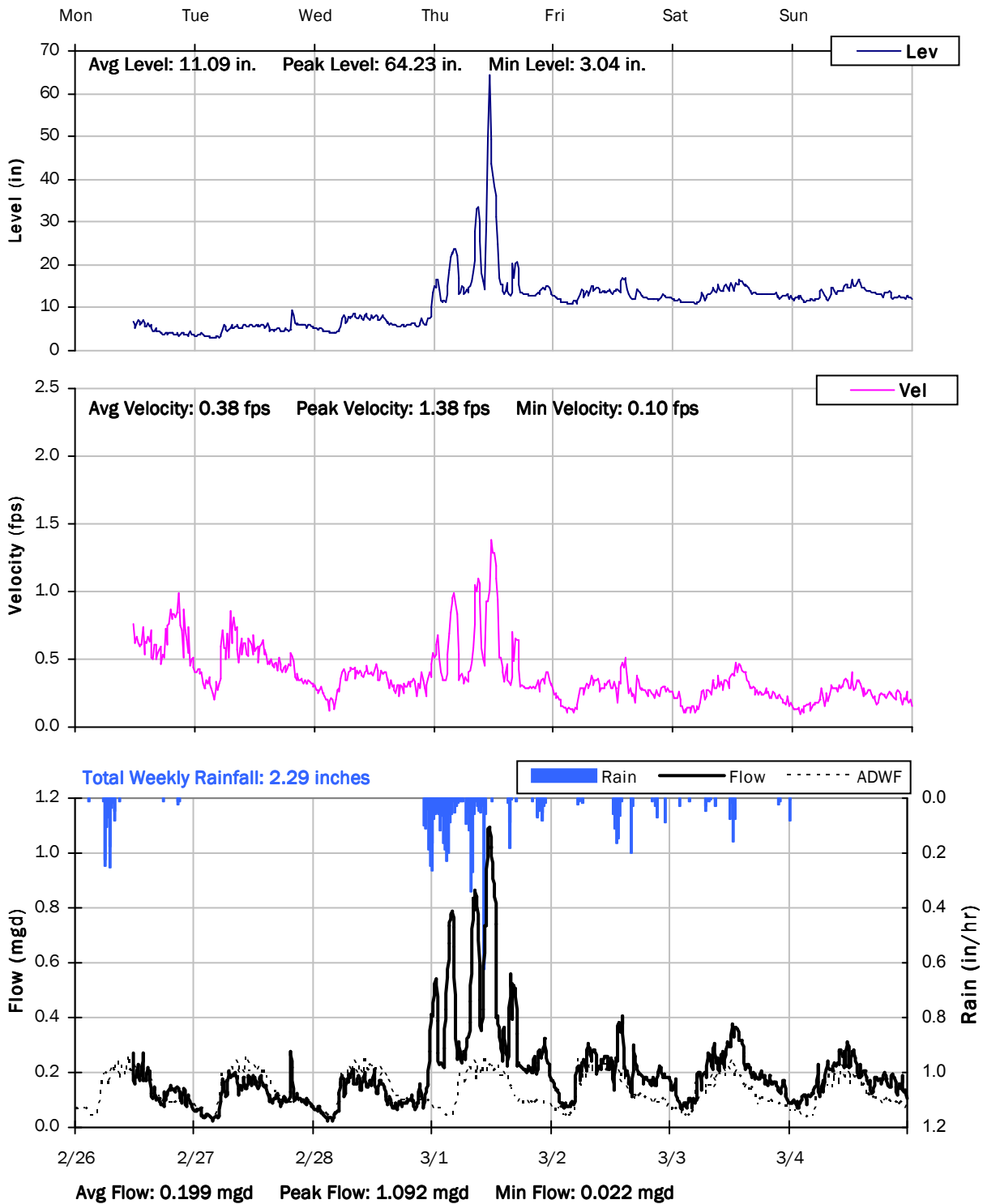
Event 3 Detail Graph



Storm Event I/I Analysis (Rain = 2.15 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	1.22 mgd	Peak I/I Rate:	1.13 mgd
PF:	9.25	Total I/I:	867,000 gallons
Peak Level:	58.82 in		
d/D Ratio:	3.92		

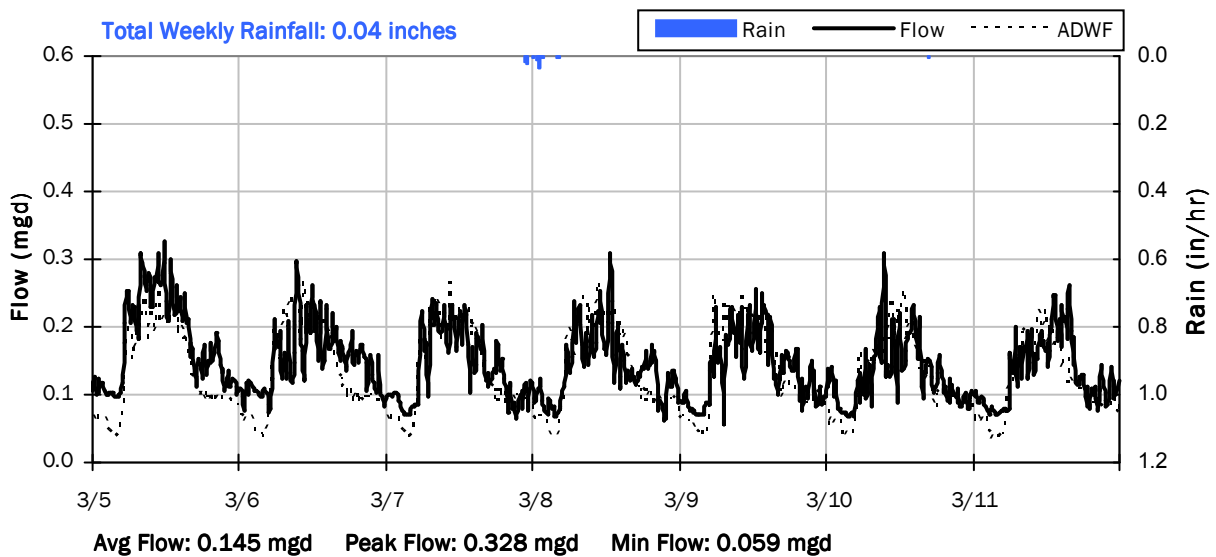
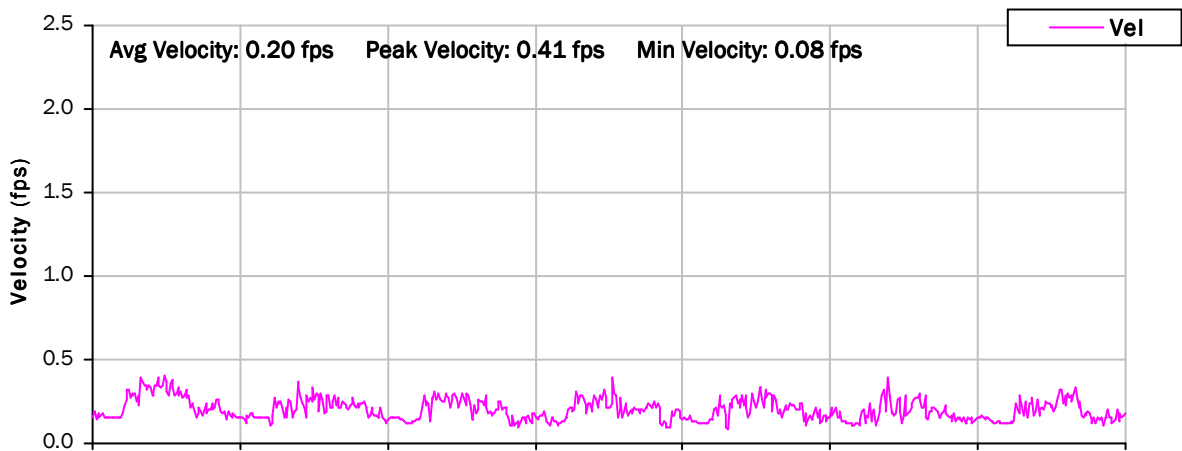
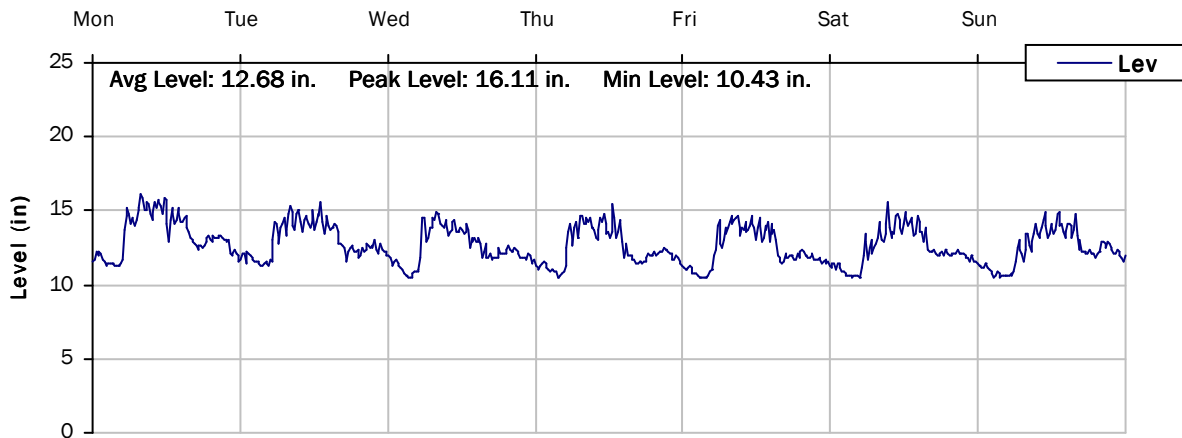
SITE 10
Weekly Level, Velocity and Flow Hydrographs
2/26/2018 to 3/5/2018



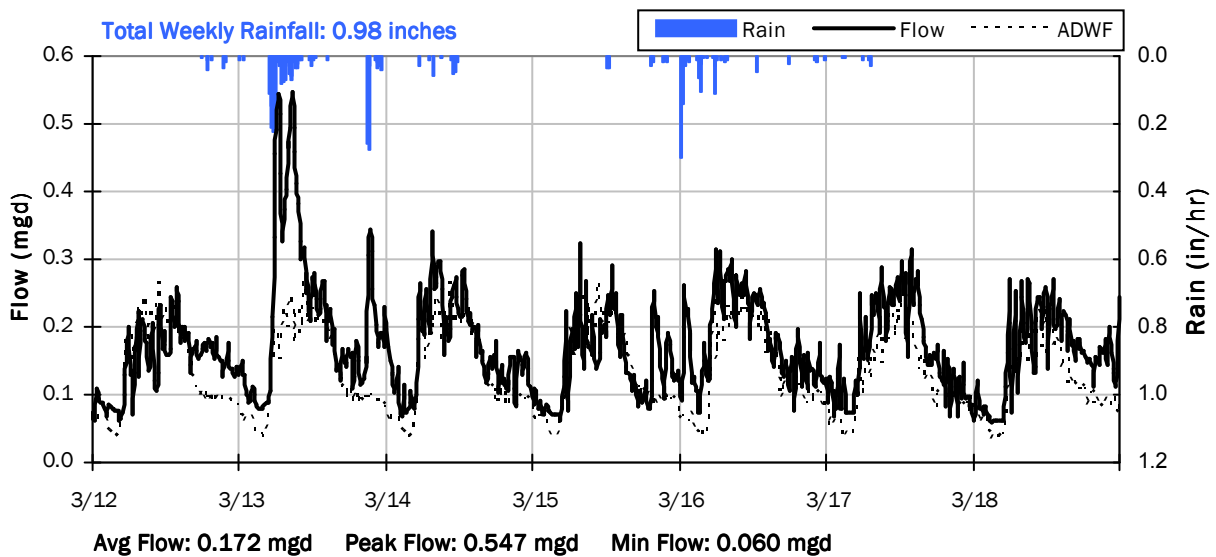
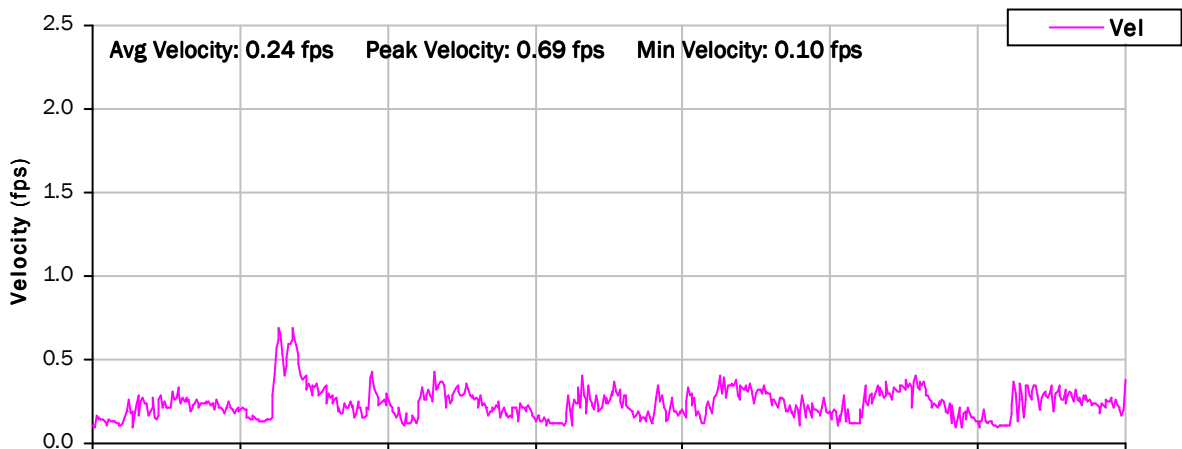
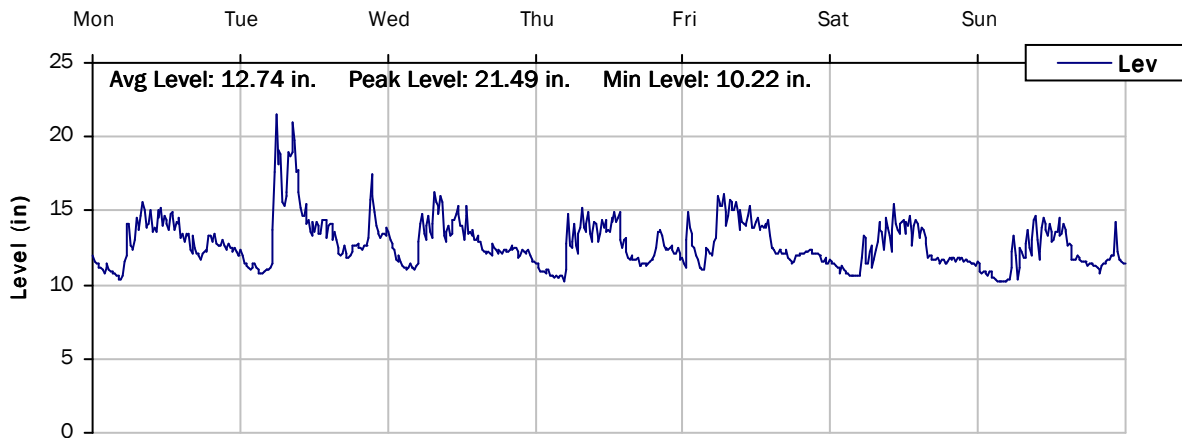
SITE 10

Weekly Level, Velocity and Flow Hydrographs

3/5/2018 to 3/12/2018



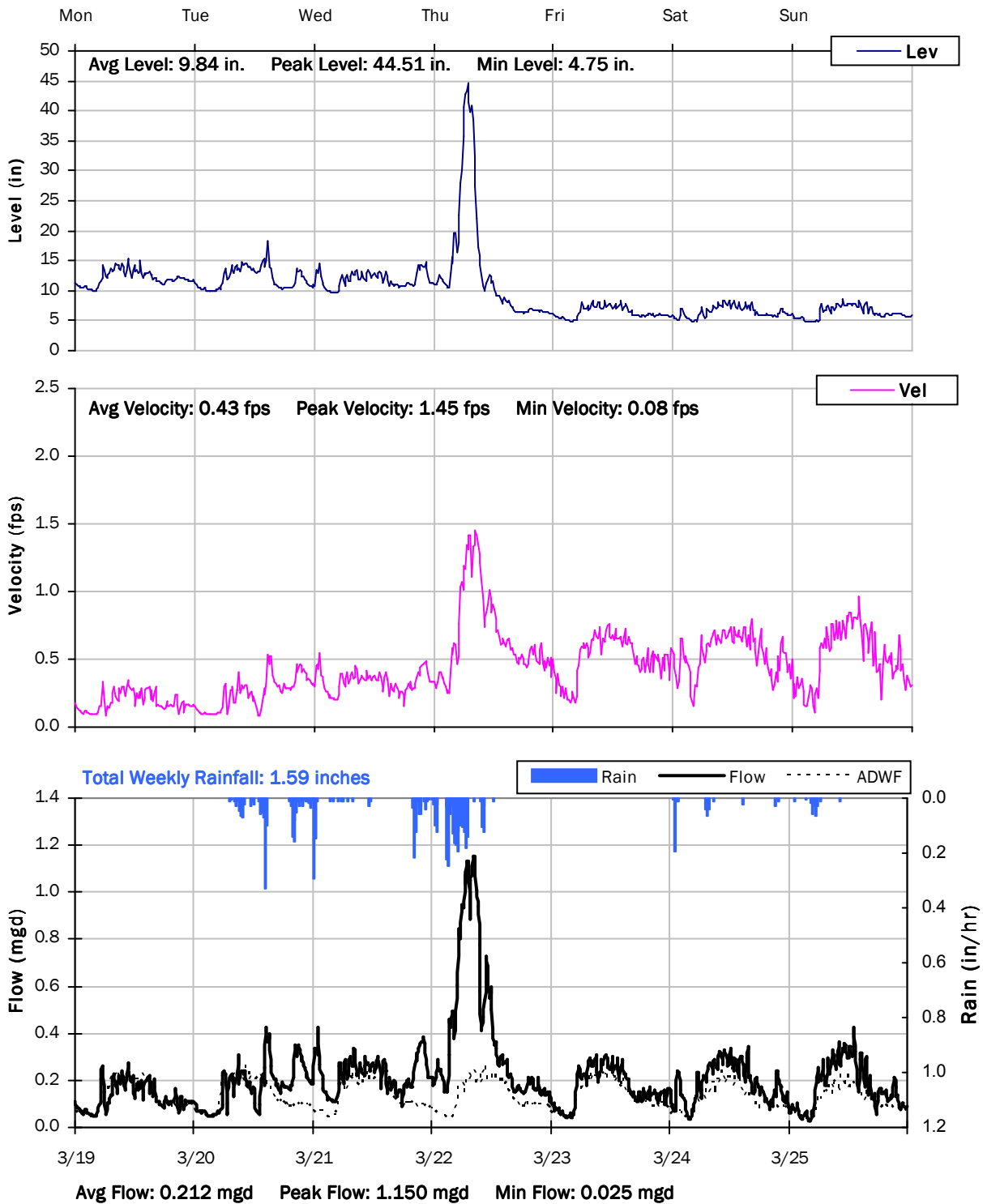
SITE 10
Weekly Level, Velocity and Flow Hydrographs
3/12/2018 to 3/19/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

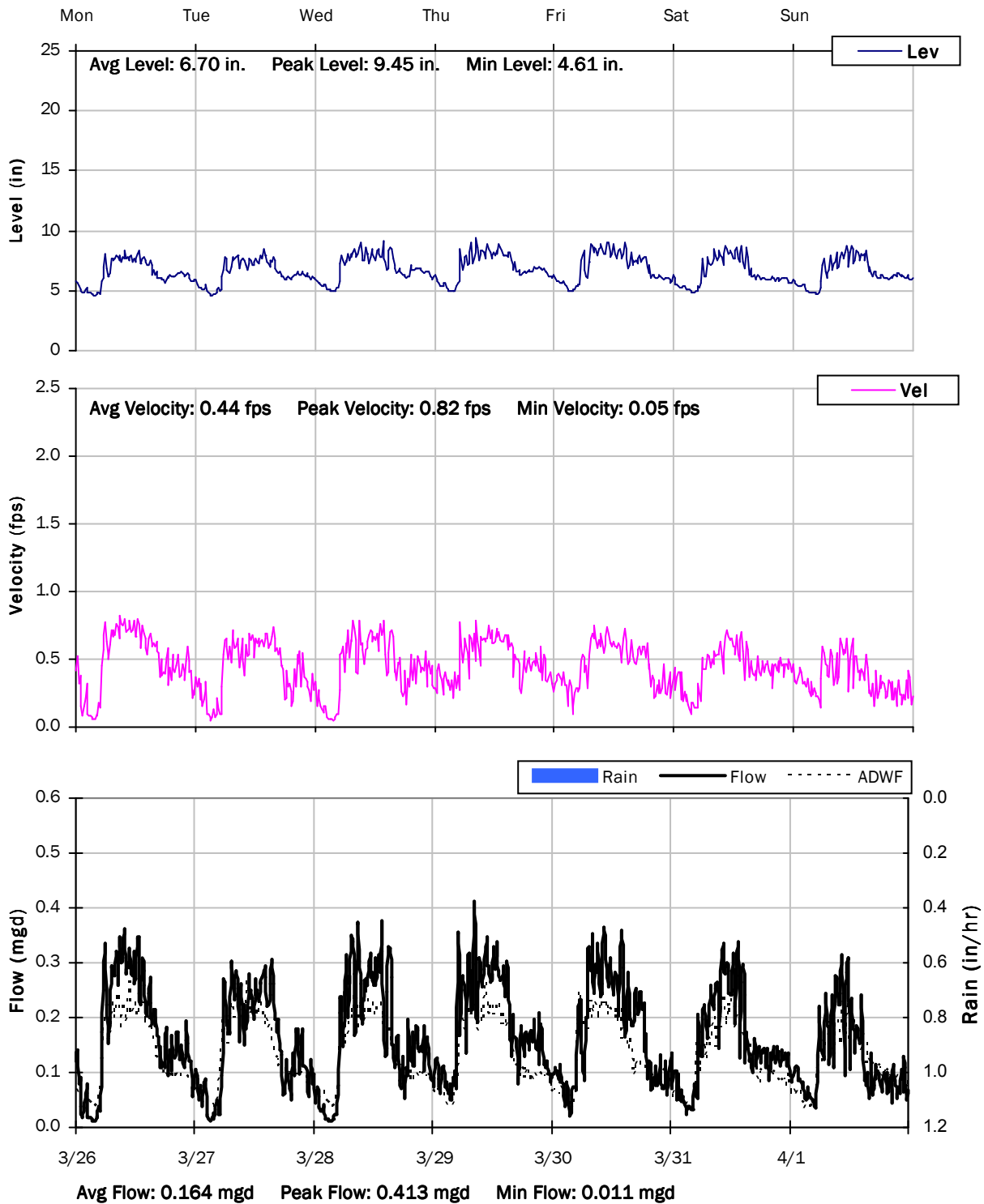
3/19/2018 to 3/26/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

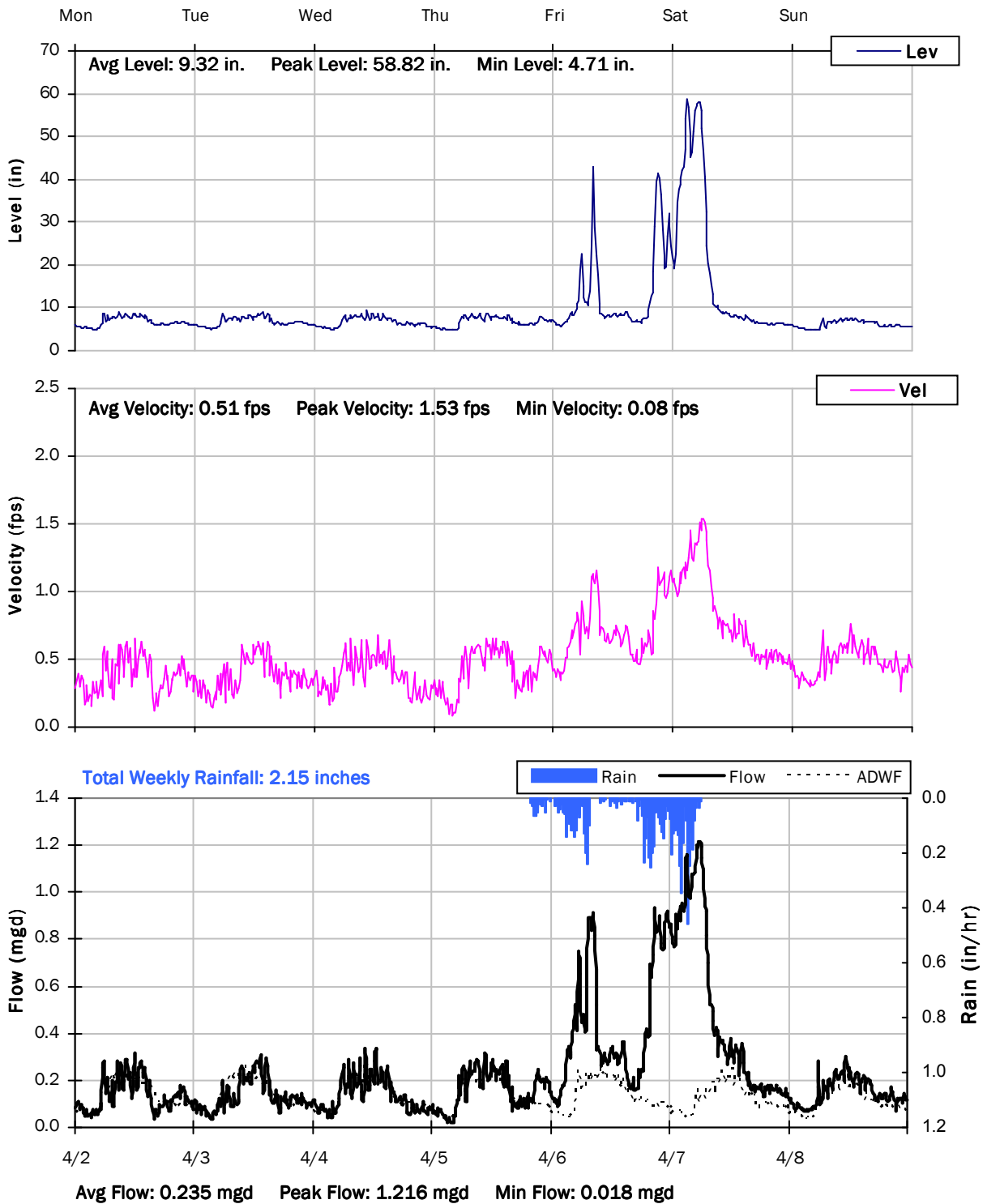
3/26/2018 to 4/2/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

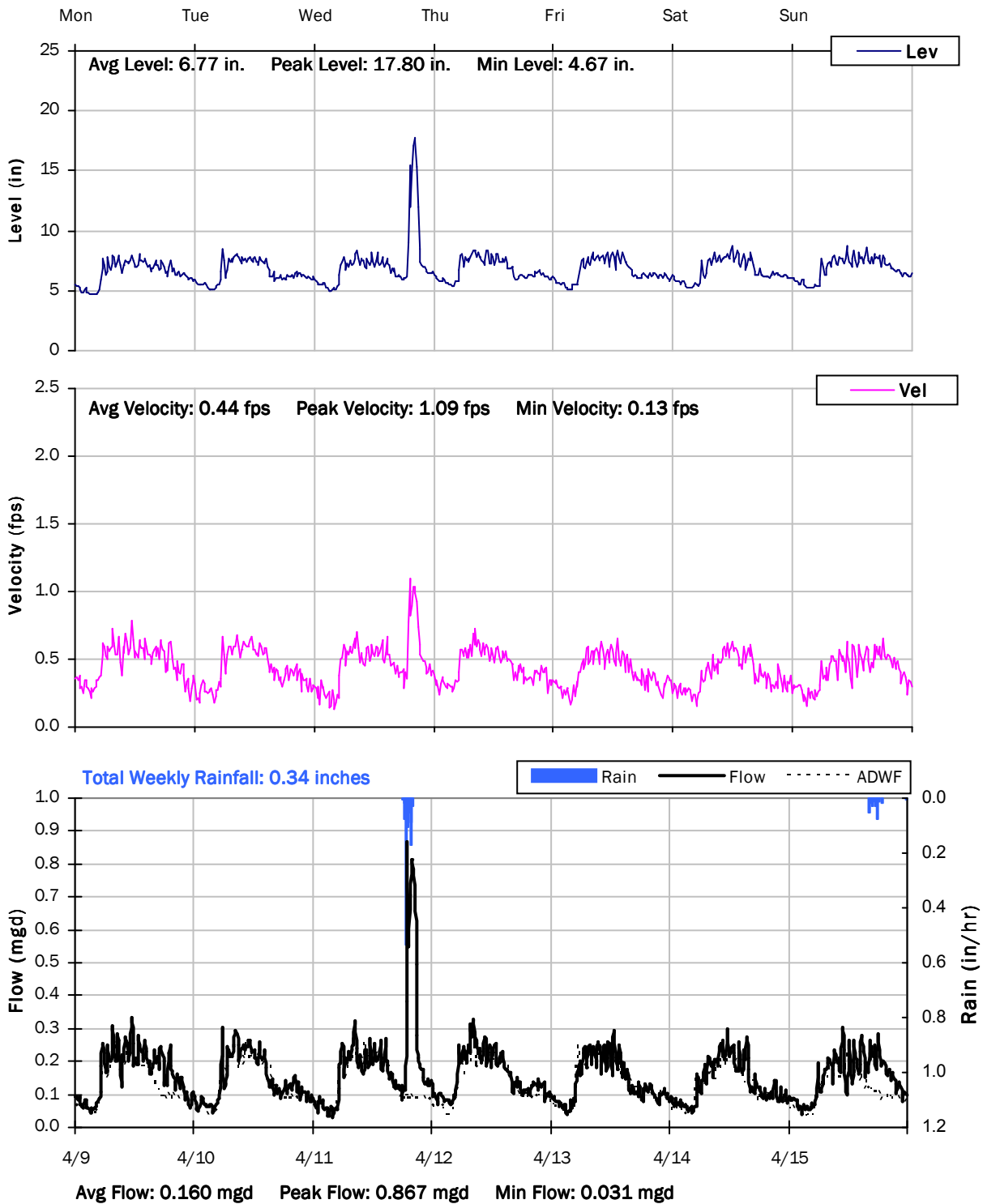
4/2/2018 to 4/9/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

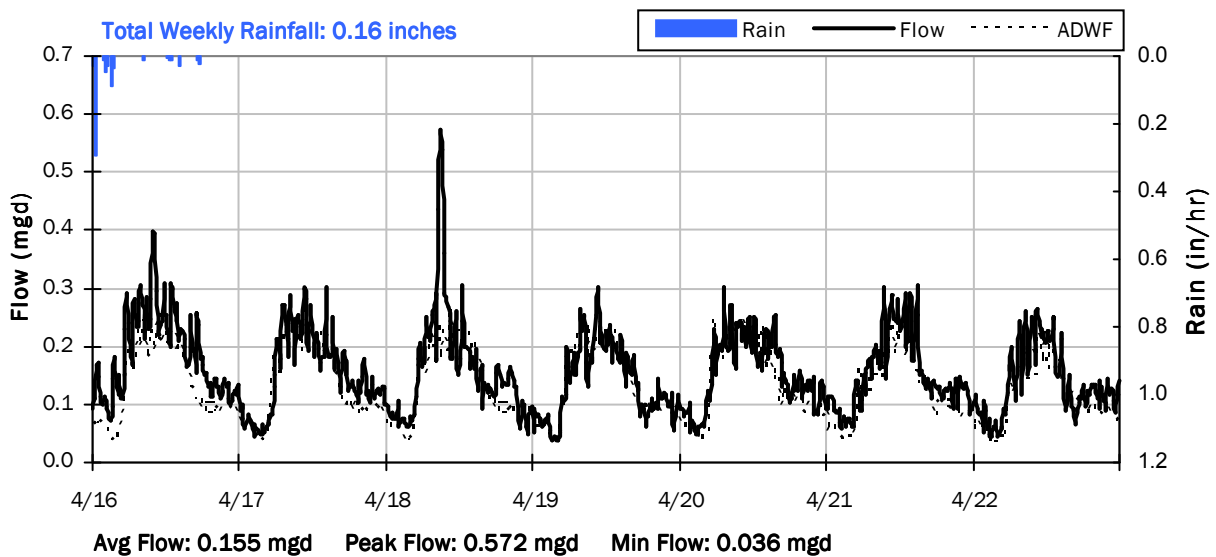
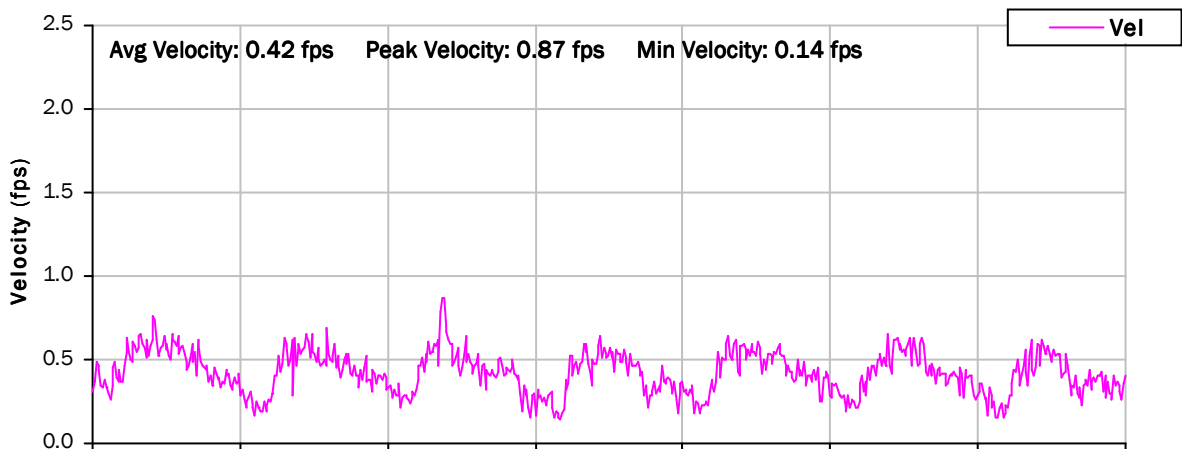
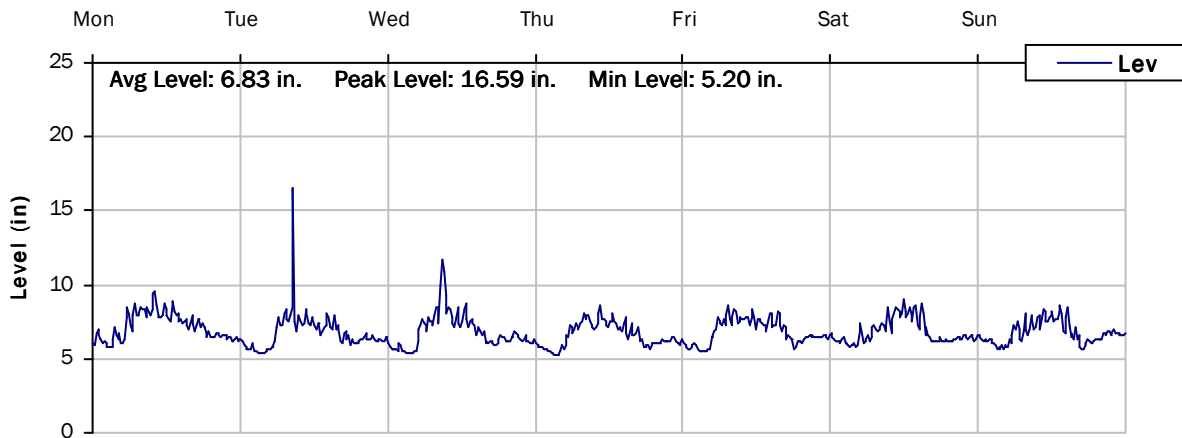
4/9/2018 to 4/16/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

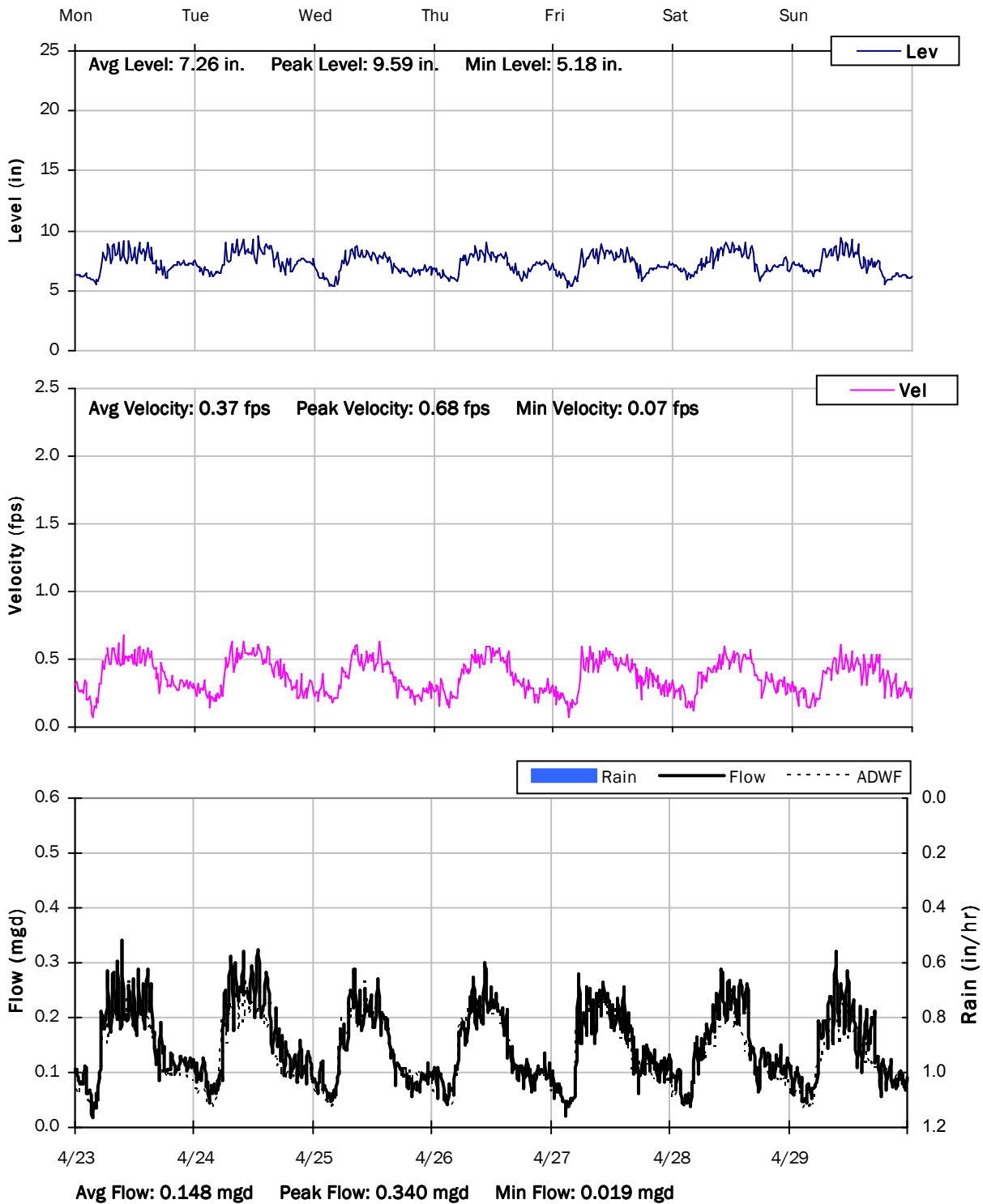
4/16/2018 to 4/23/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

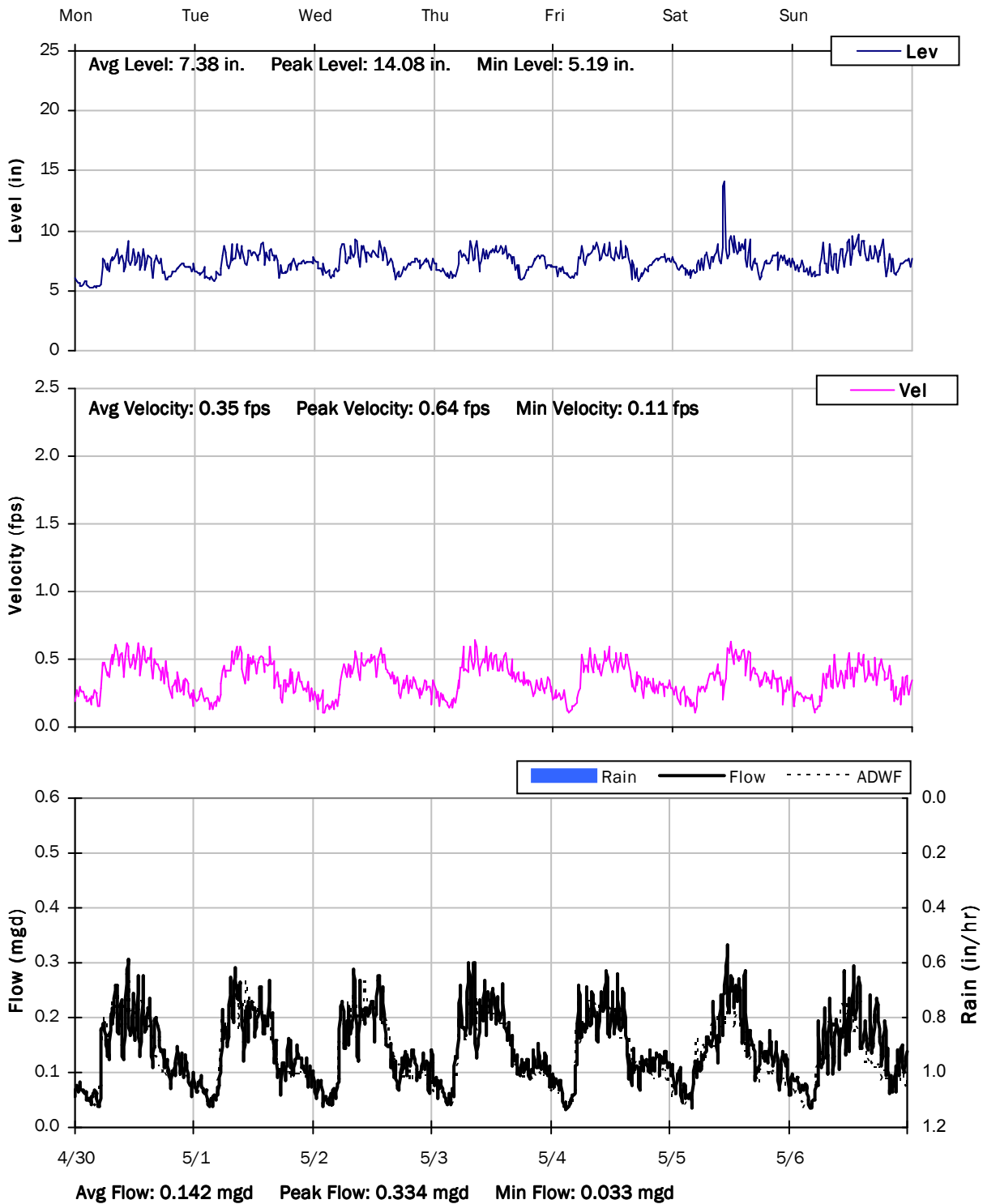
4/23/2018 to 4/30/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

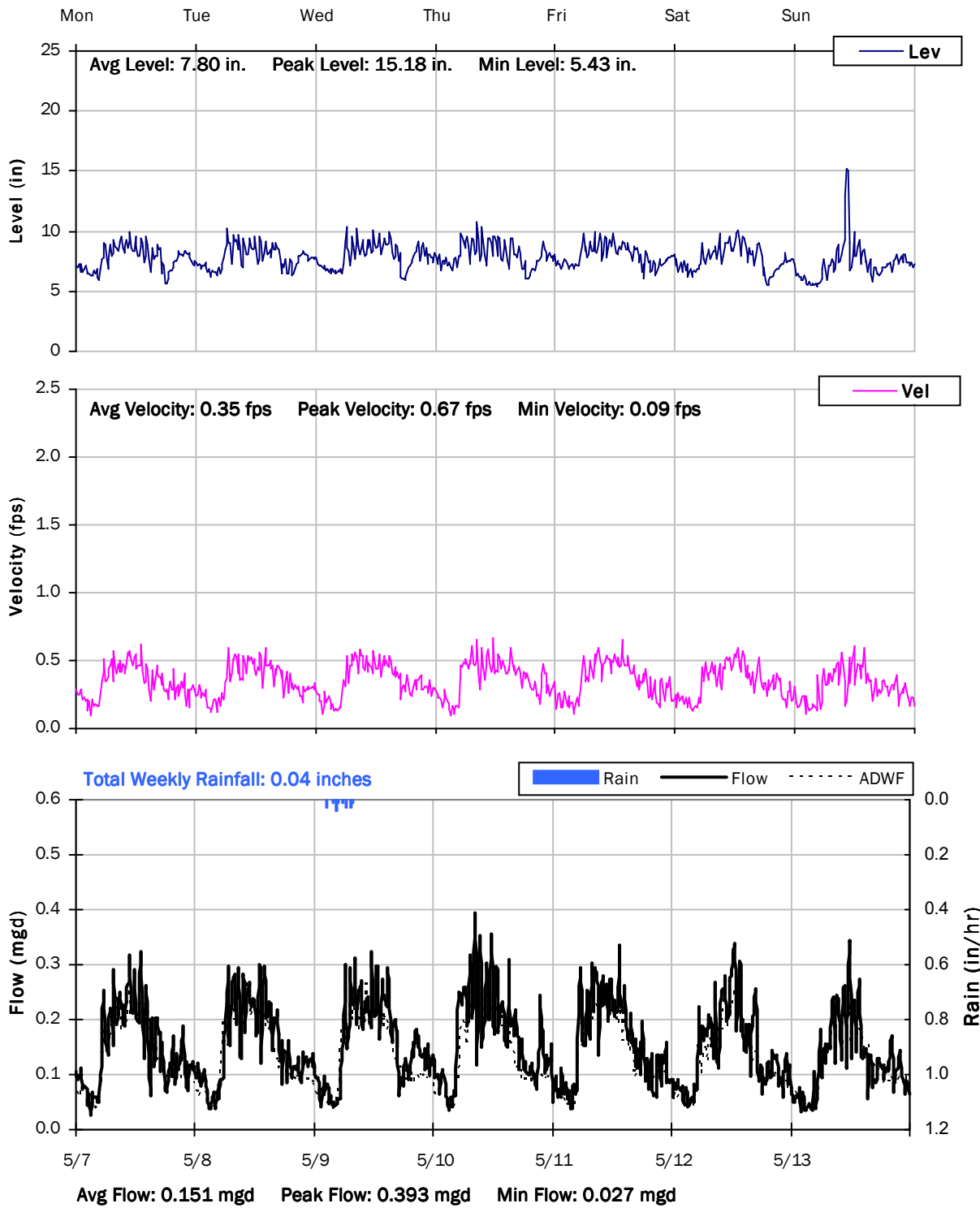
4/30/2018 to 5/7/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

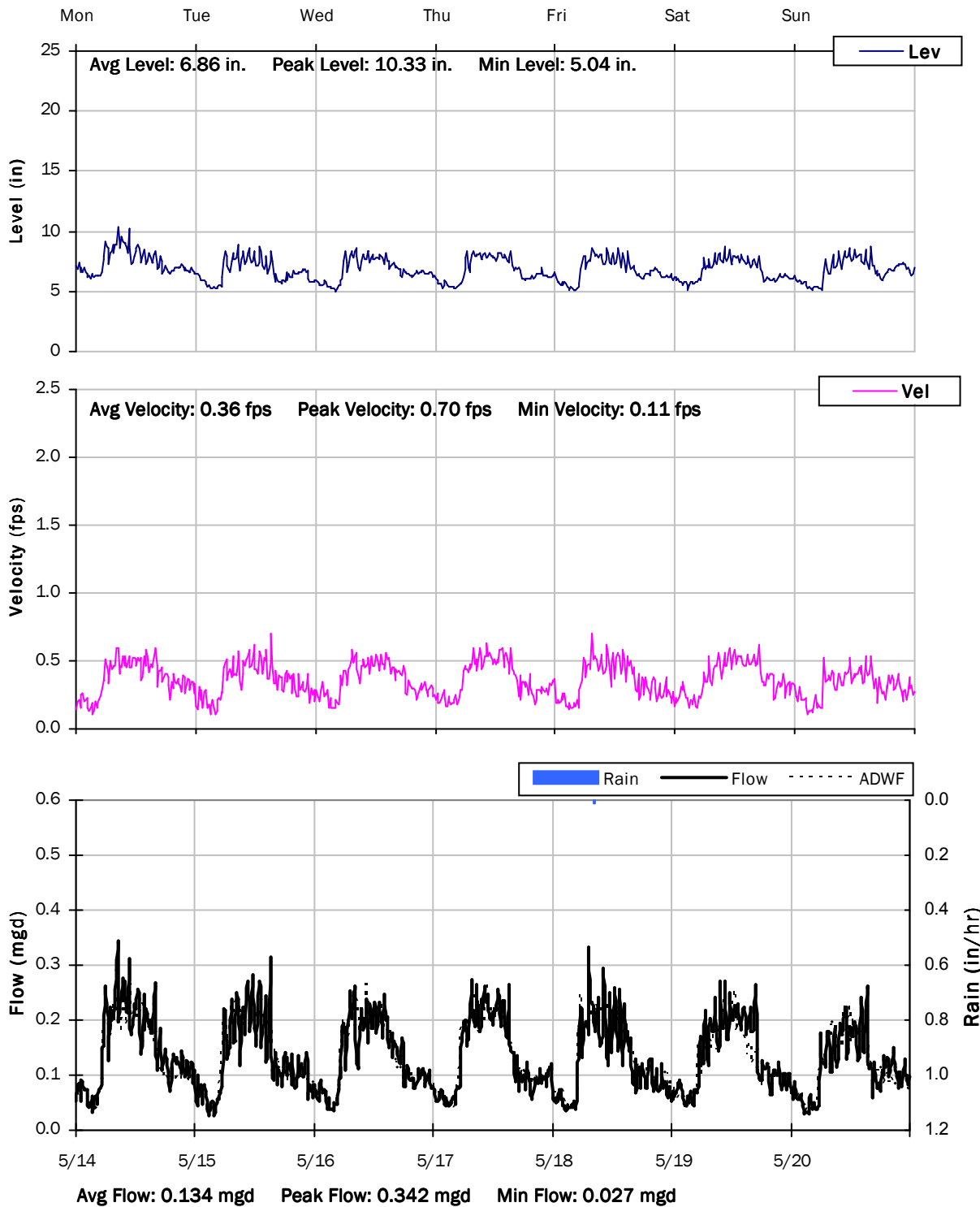
5/7/2018 to 5/14/2018



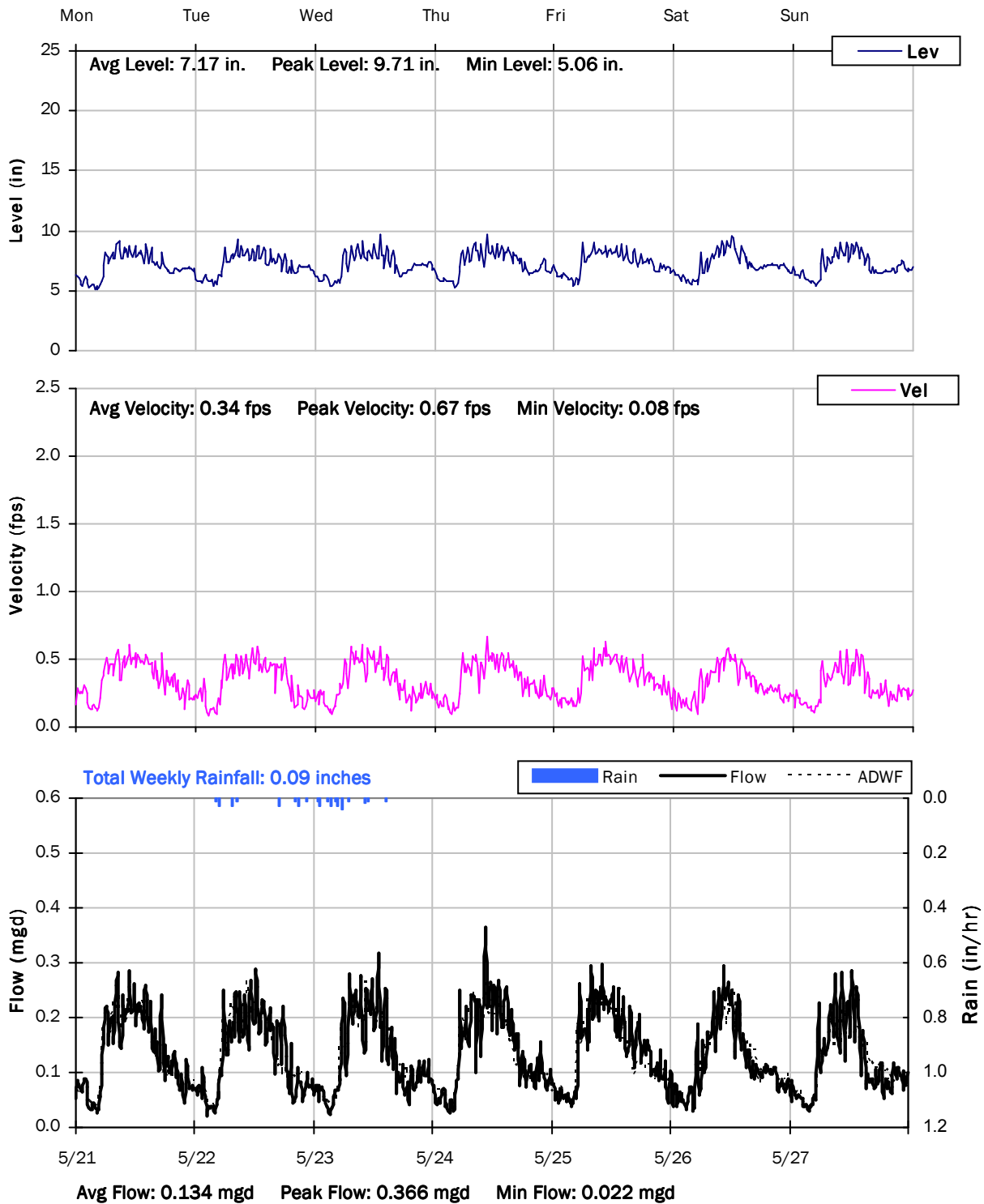
SITE 10

Weekly Level, Velocity and Flow Hydrographs

5/14/2018 to 5/21/2018



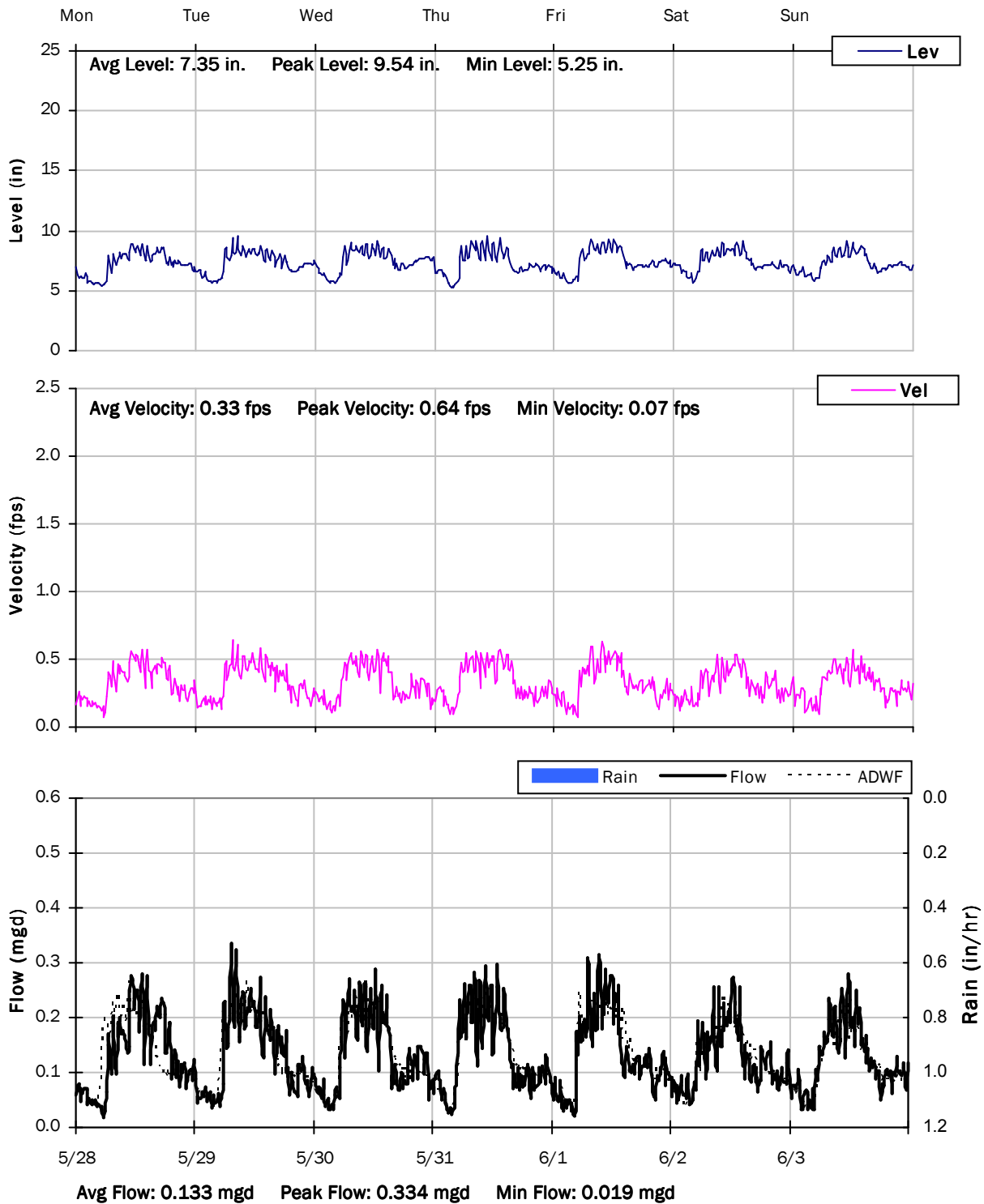
SITE 10
Weekly Level, Velocity and Flow Hydrographs
5/21/2018 to 5/28/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

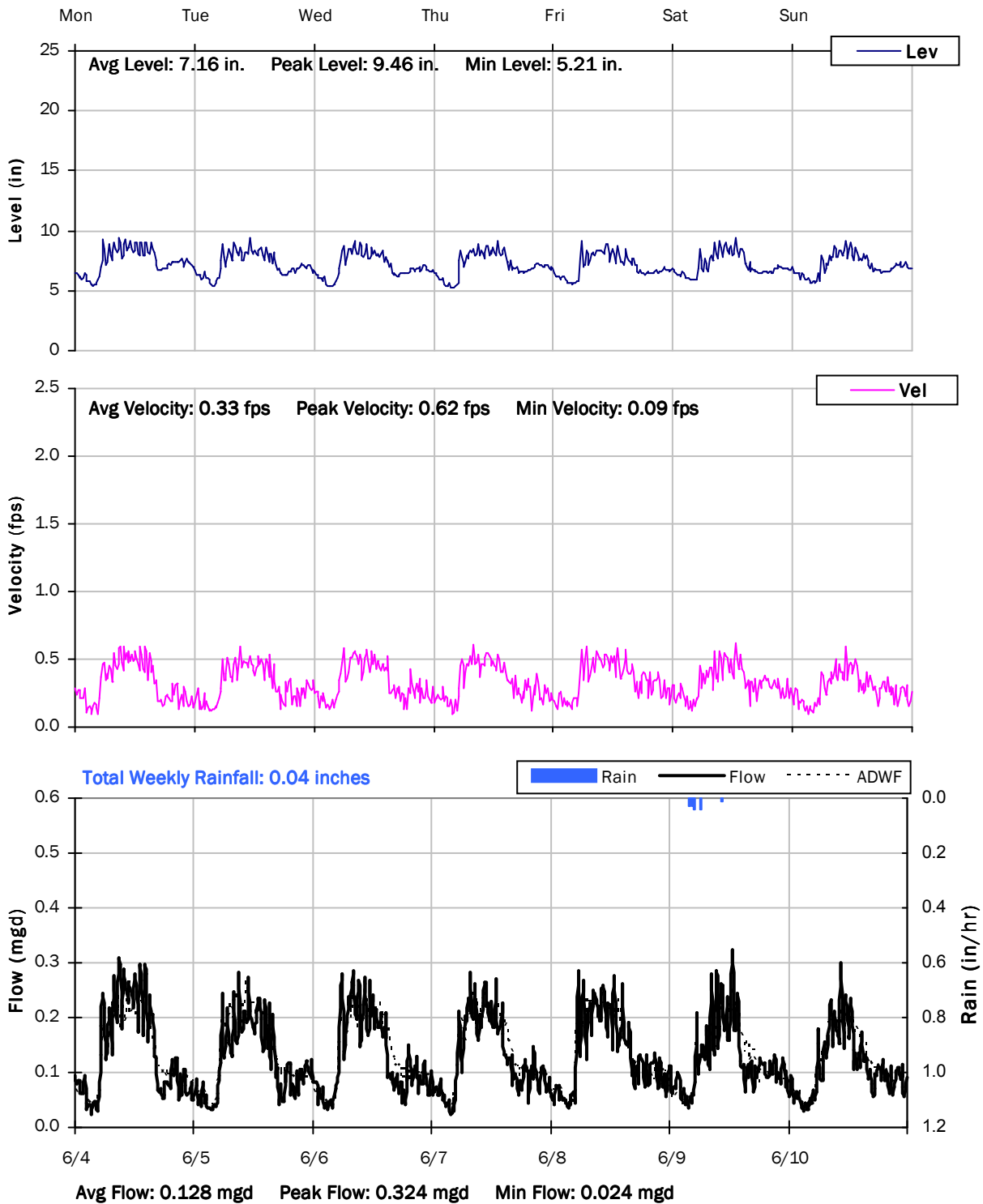
5/28/2018 to 6/4/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

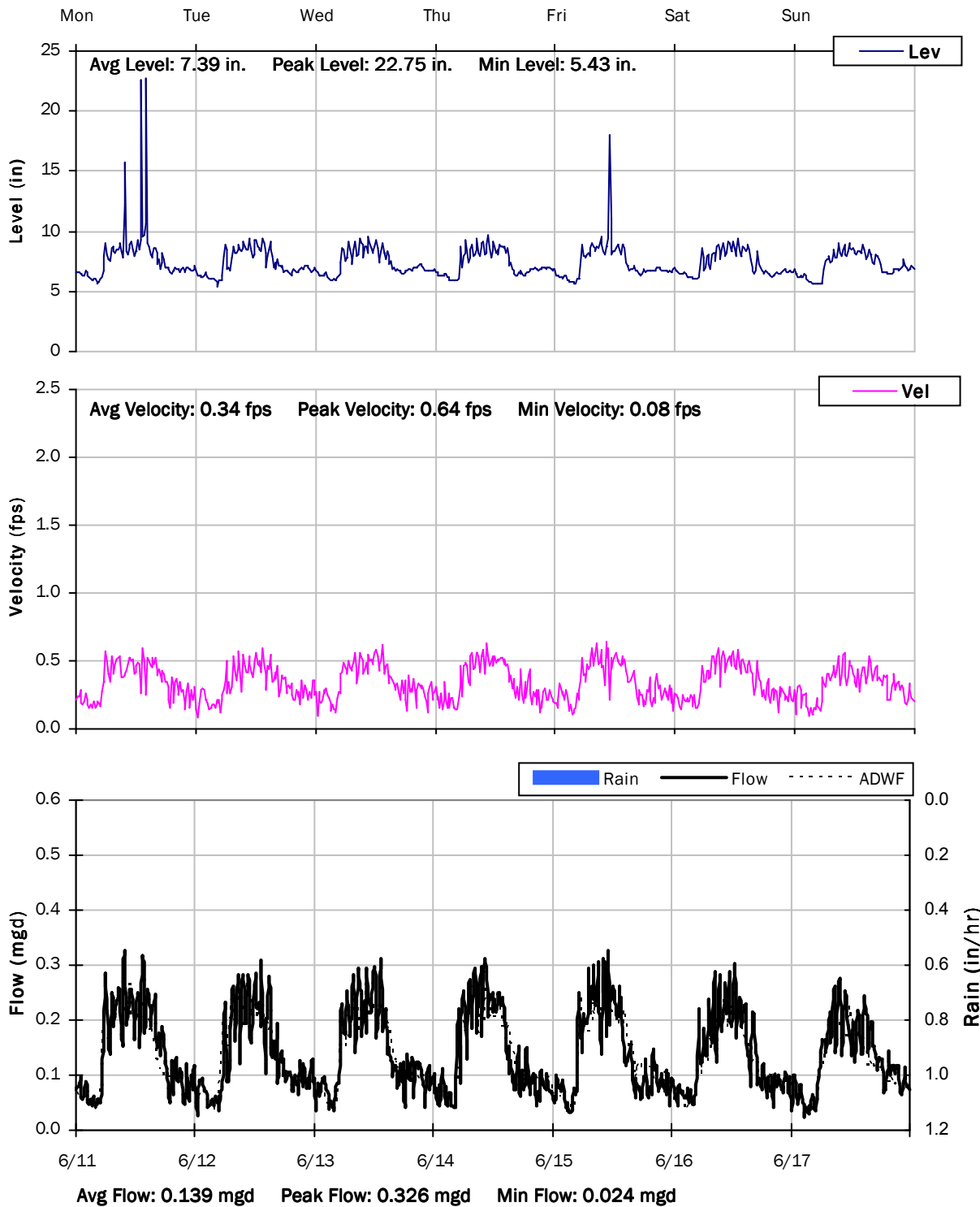
6/4/2018 to 6/11/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

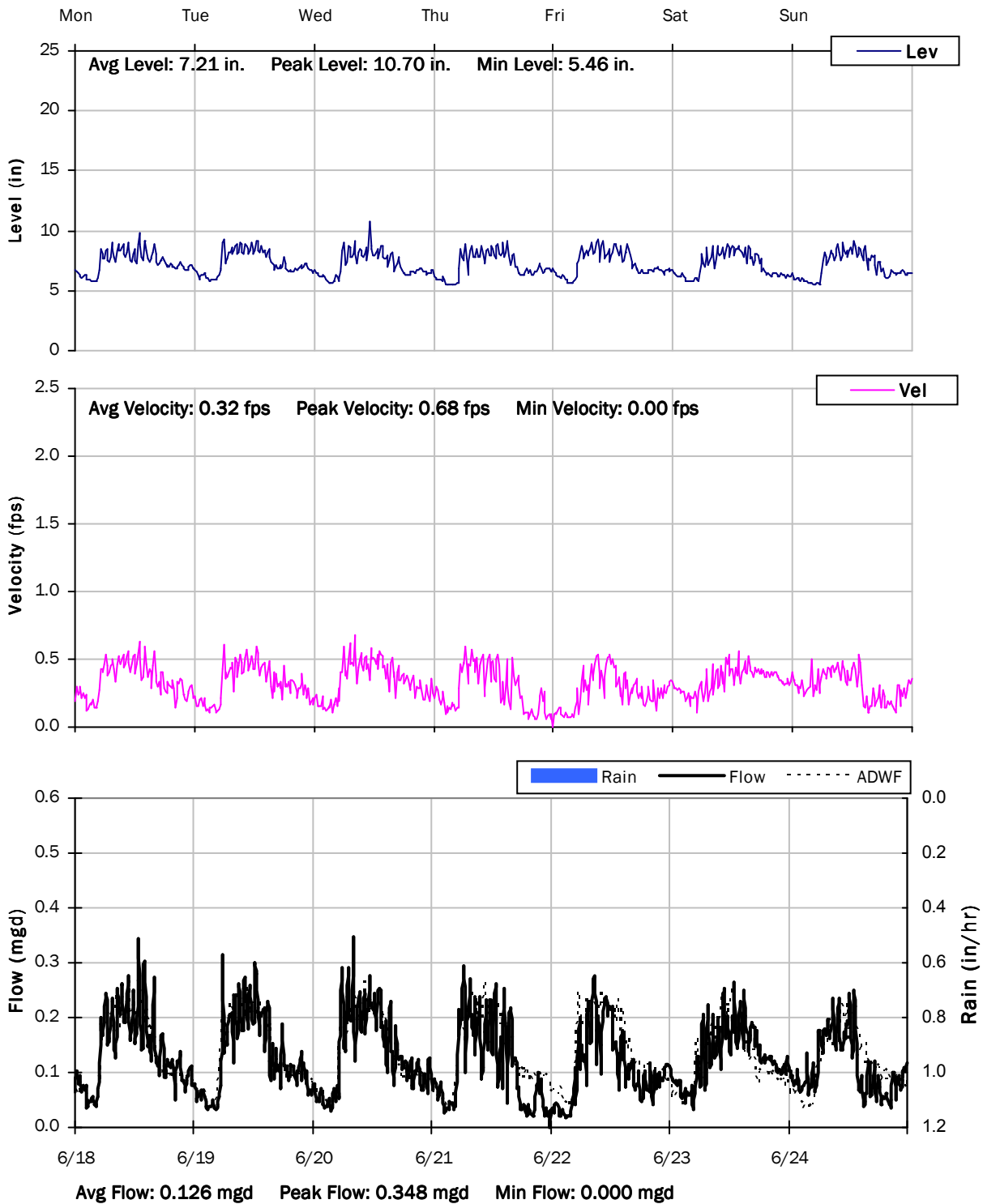
6/11/2018 to 6/18/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

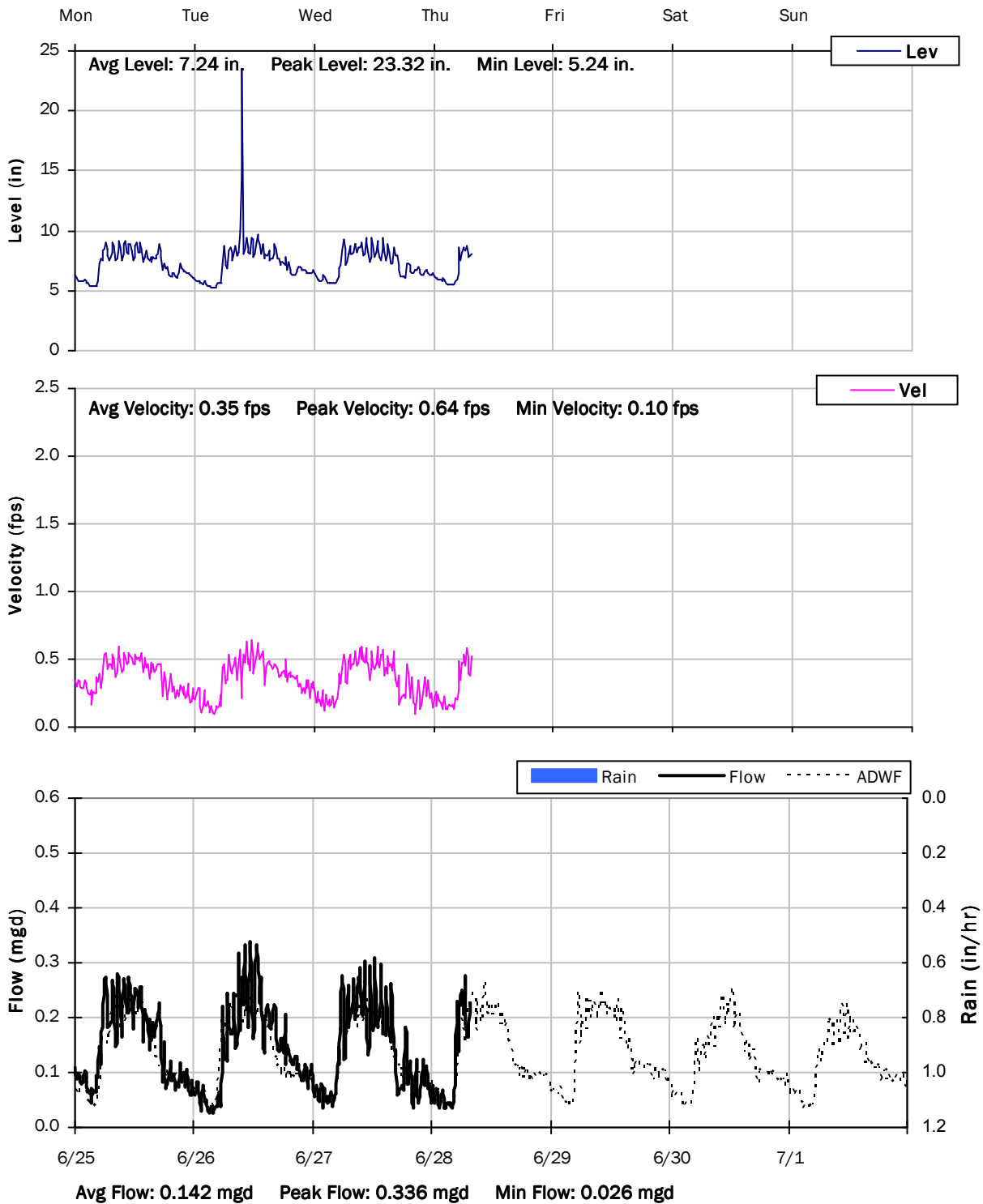
6/18/2018 to 6/25/2018



SITE 10

Weekly Level, Velocity and Flow Hydrographs

6/25/2018 to 7/2/2018

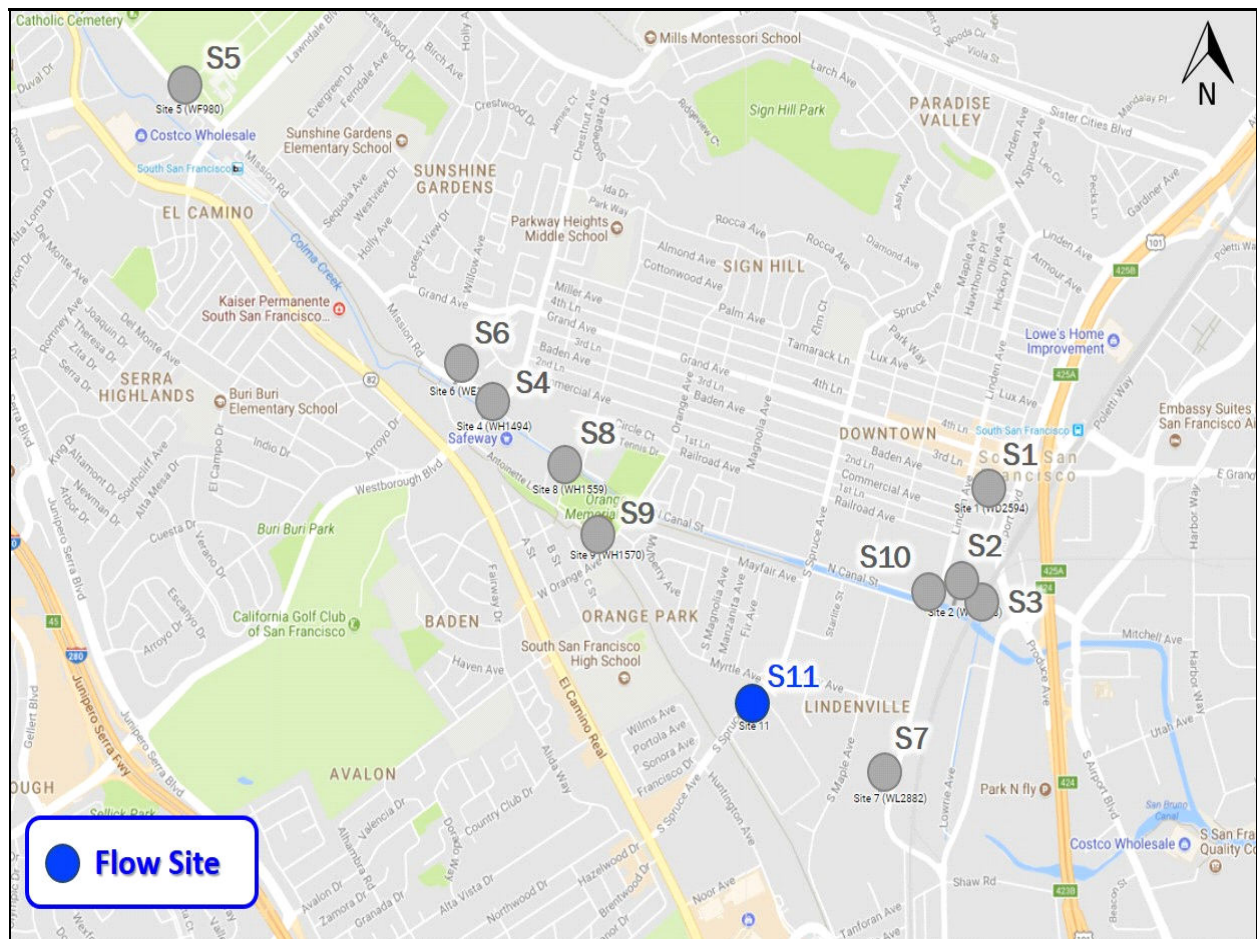


City of South San Francisco Sanitary Sewer Flow Monitoring February 26- June 28, 2018

Monitoring Site: Site 11

Location: 245 South Spruce Avenue, opposite of Aqua Handwash & Gas

Data Summary Report



Vicinity Map: Site 11

SITE 11

Site Information

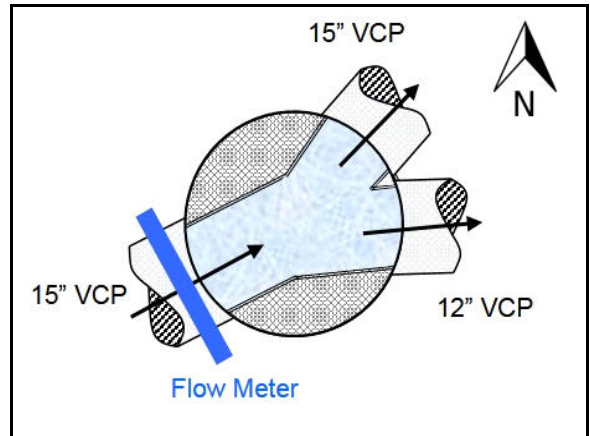
MH ID:	Not Given
Location:	245 South Spruce Avenue, opposite of Aqua Handwash & Gas
Coordinates:	122.4204° W, 37.6470° N
Rim Elevation (Earth):	19 feet
Pipe Diameter:	15 inches
Sediment:	0.75 inches
ADWF:	0.347 mgd
Peak Measured Flow:	3.059 mgd



Satellite Map



Sewer Map



Flow Sketch



Street View



Plan View

SITE 11

Additional Site Photos

Northeast Effluent Pipe



Influent Pipe



SITE 11

Additional Site Photos

North Effluent Pipe

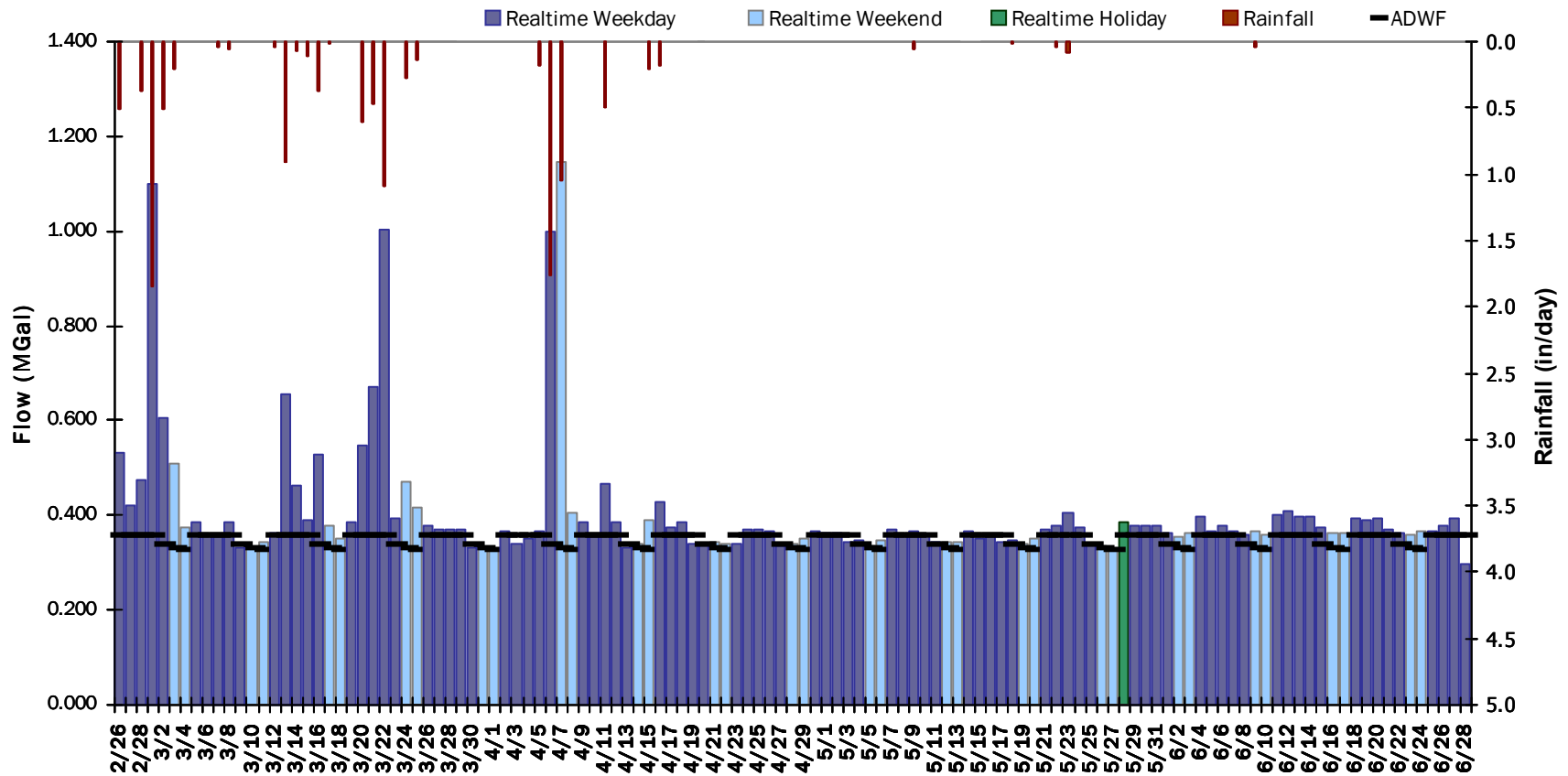


SITE 11

Period Flow Summary: Daily Flow Totals

Avg Period Flow: 0.403 MGal Peak Daily Flow: 1.145 MGal Min Daily Flow: 0.297 MGal

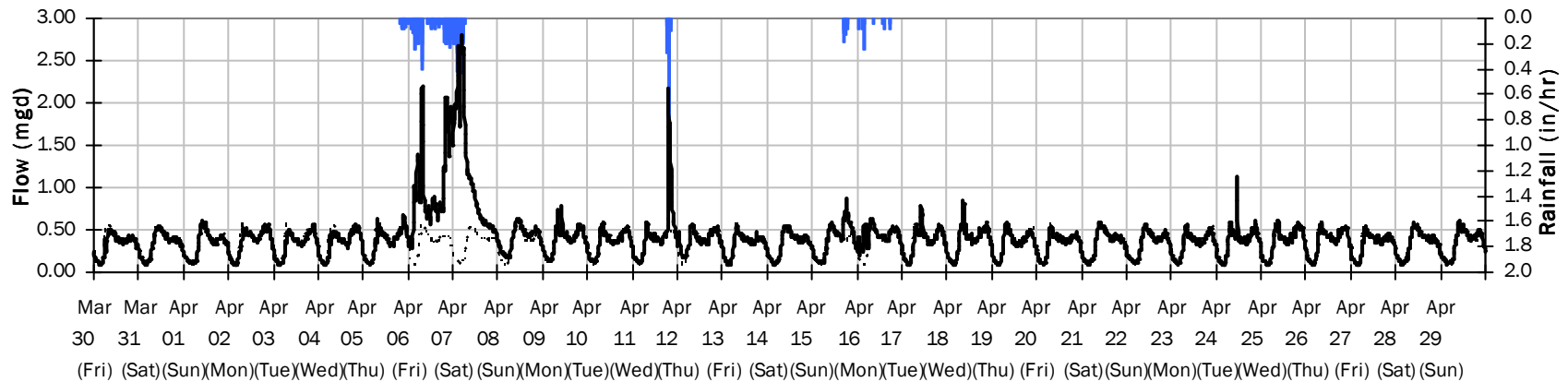
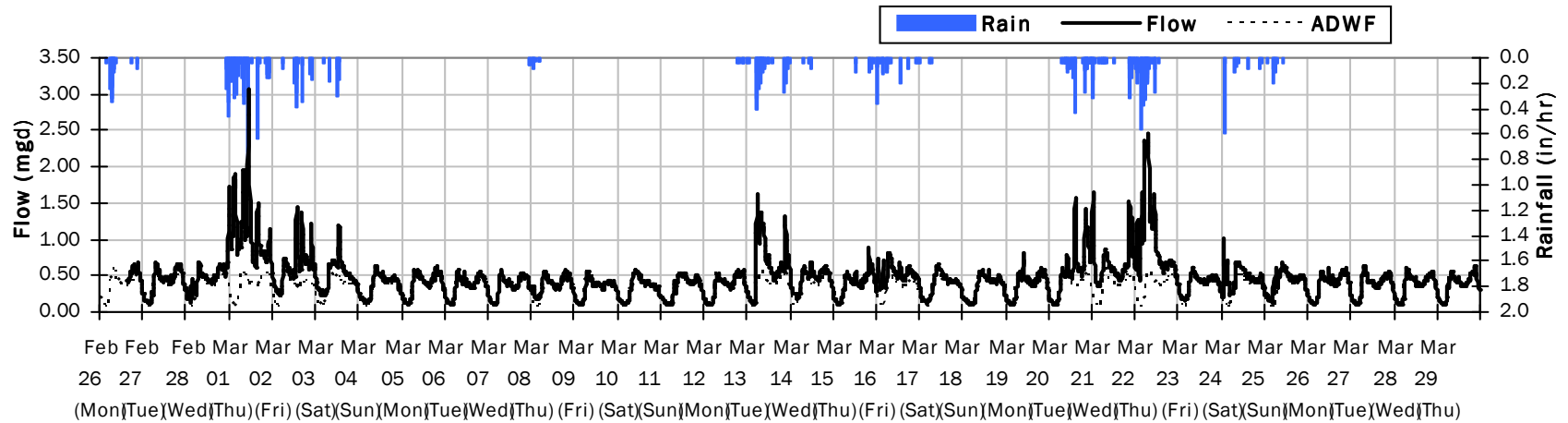
Total Period Rainfall: 11.25 inches



SITE 11

Flow Summary: 2/26/2018 to 4/29/2018

Total Period Rainfall: 11.50 inches Avg Flow: 0.438 mgd Peak Flow: 3.059 mgd Min Flow: 0.086 mgd



SITE 11

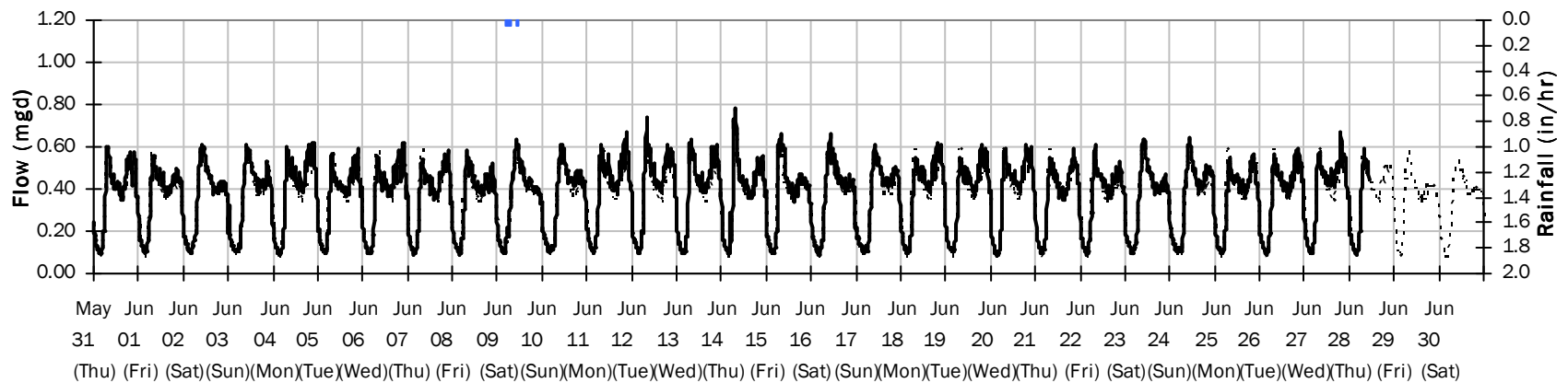
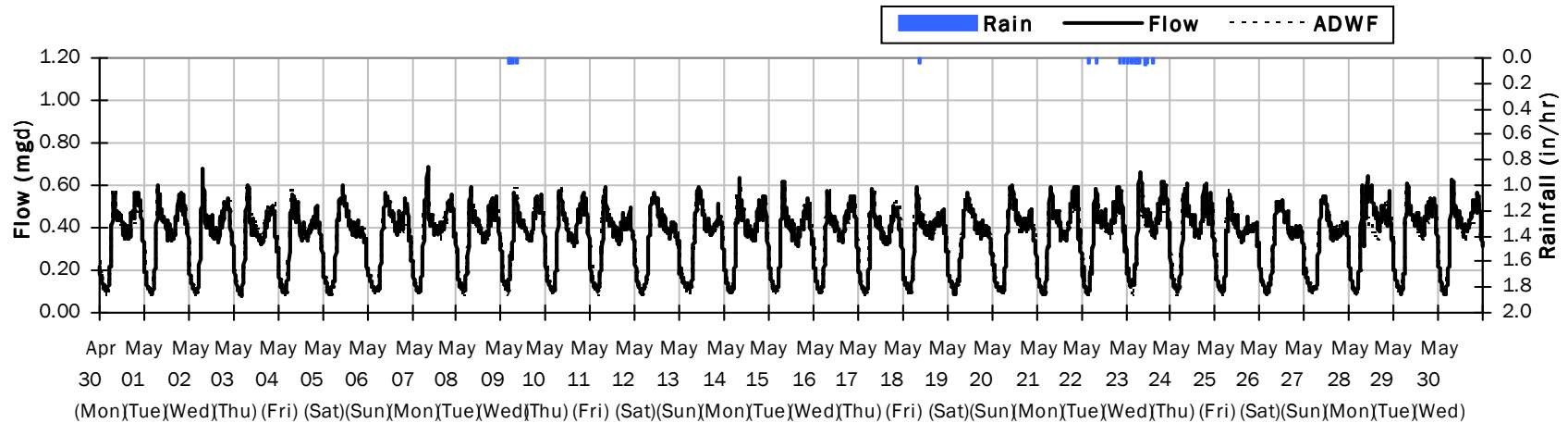
Flow Summary: 4/30/2018 to 6/30/2018

Total Period Rainfall: 0.23 inches

Avg Flow: 0.366 mgd

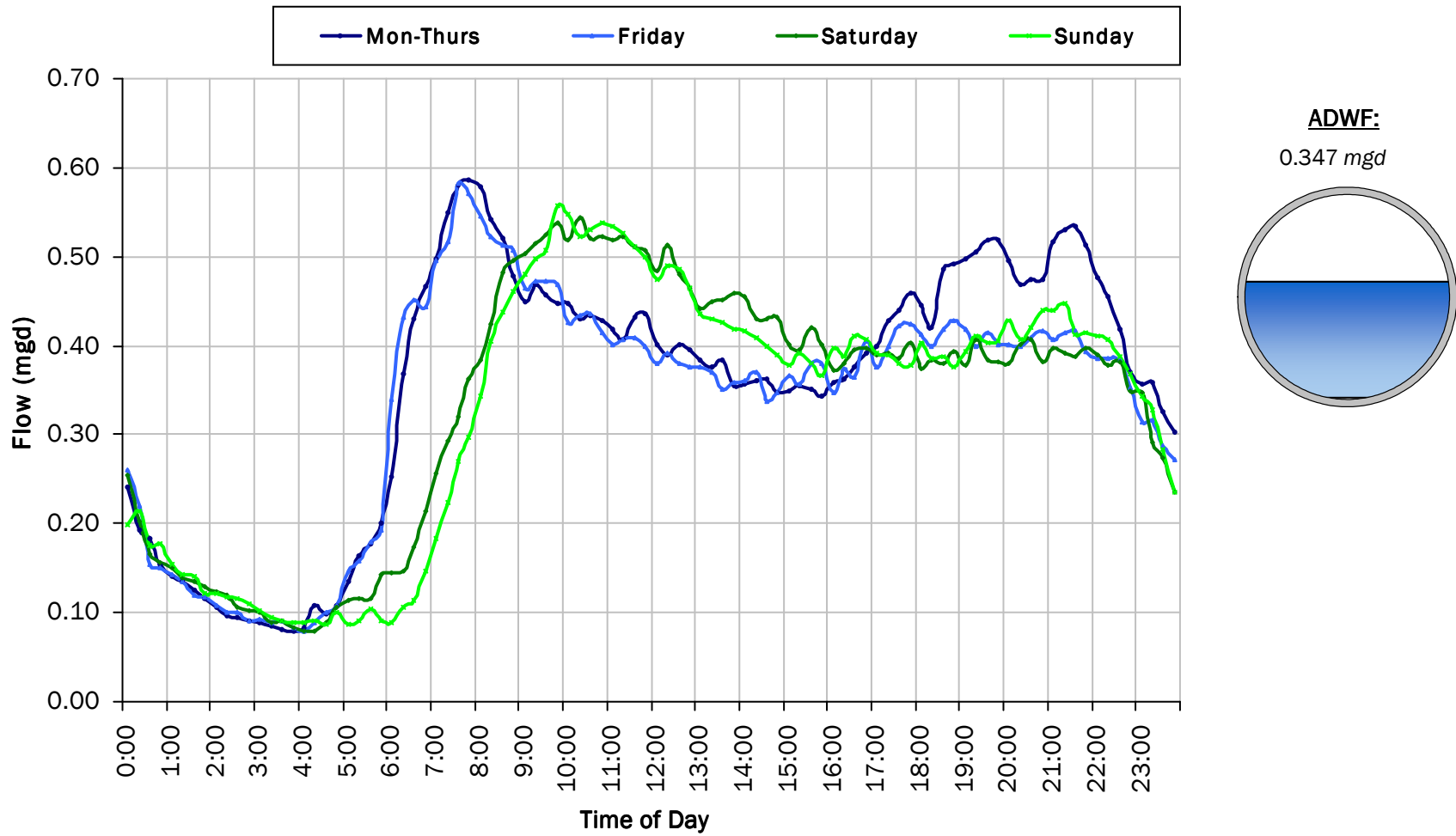
Peak Flow: 0.780 mgd

Min Flow: 0.081 mgd



SITE 11

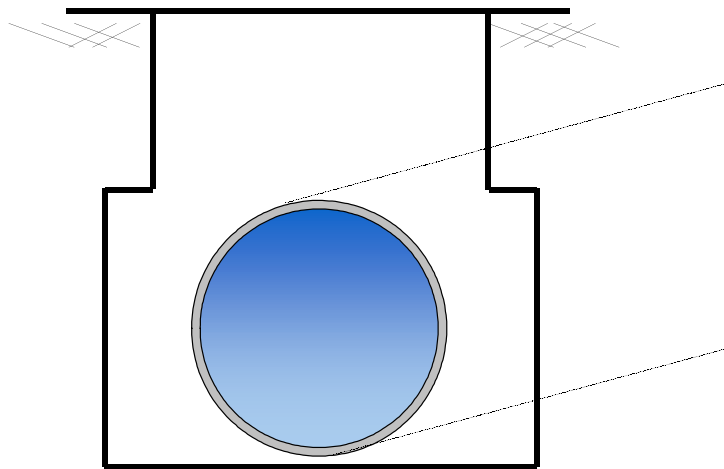
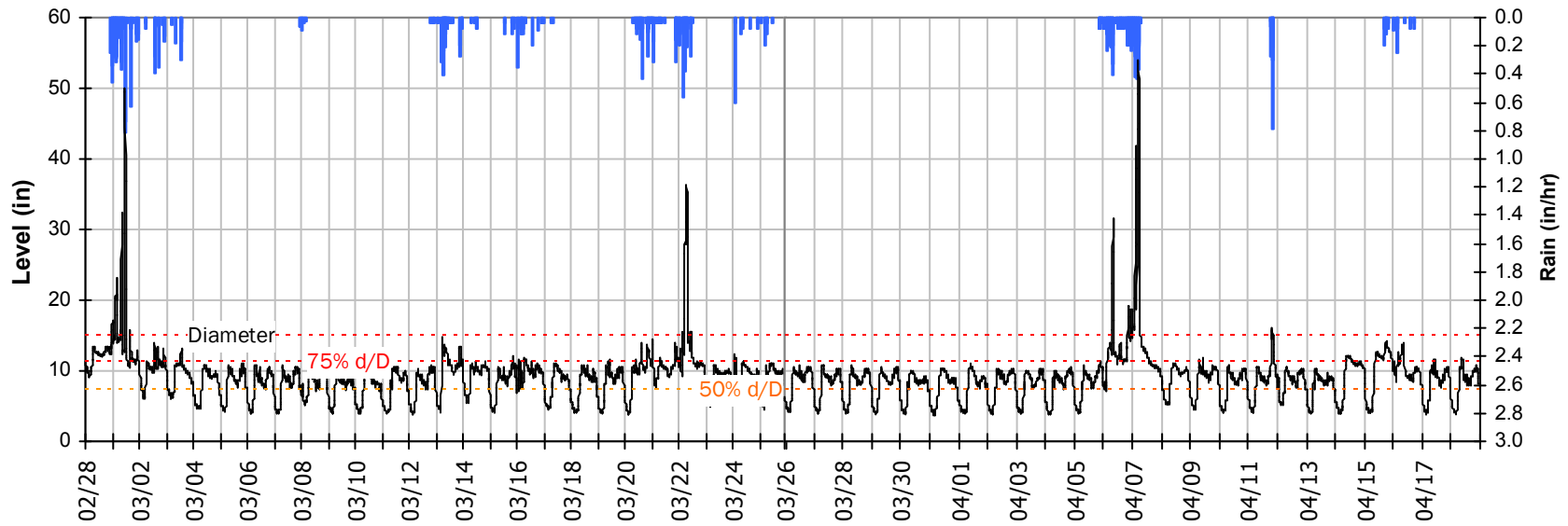
Average Dry Weather Flow Hydrographs



SITE 11

Site Capacity and Surge Summary

Realtime Flow Levels with Rainfall Data over Monitoring (High Capacity) Period



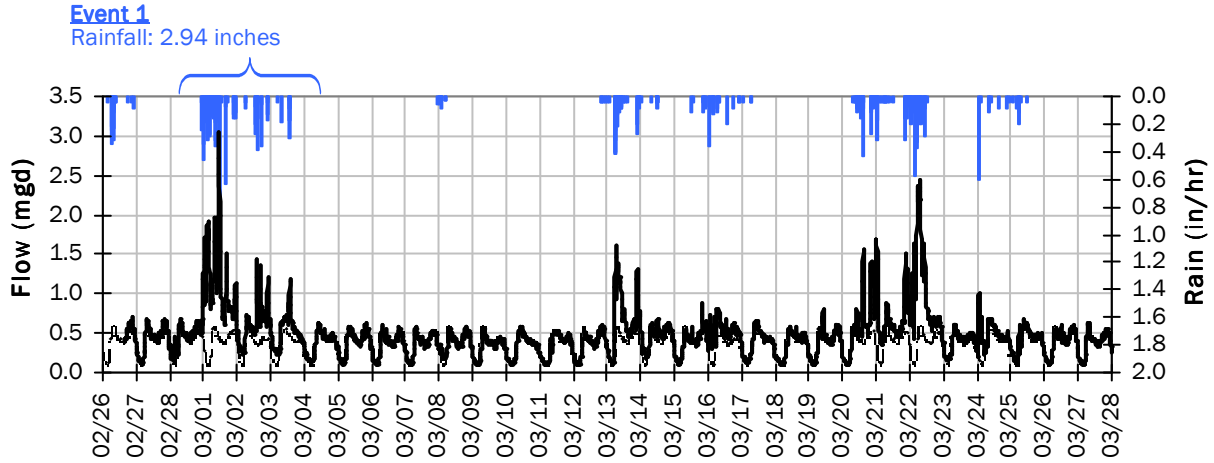
Pipe Diameter: 15 inches
Peak Measured Level: 54 inches
Peak d/D Ratio: 3.60

Surcharged 39.0 inches over crown

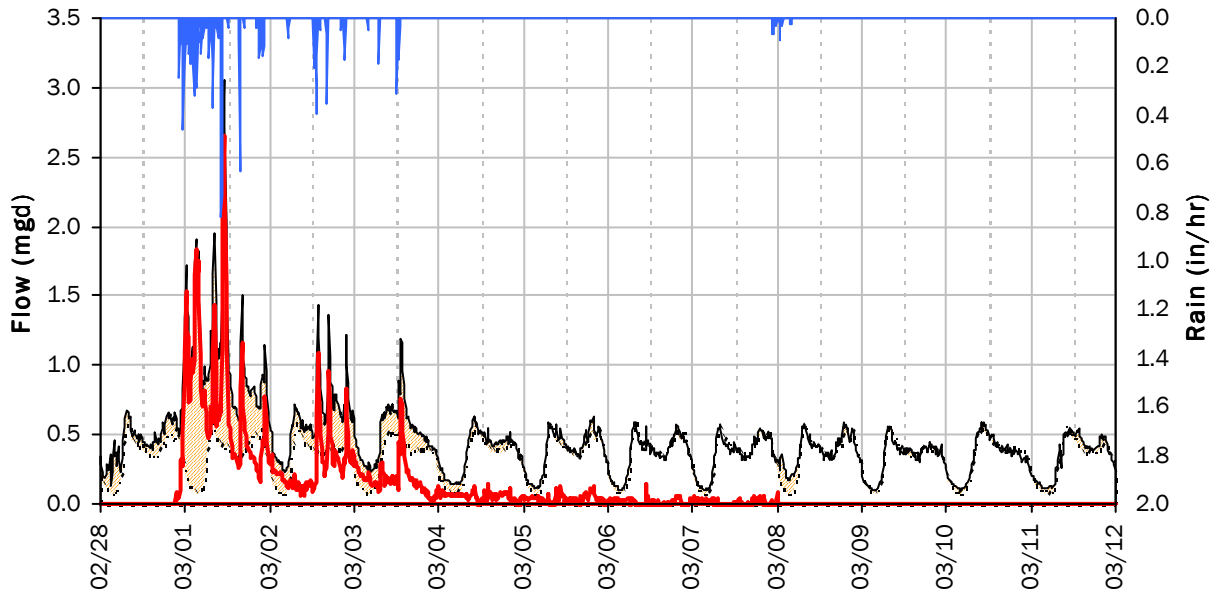
SITE 11

I/I Summary: Event 1

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 1 Detail Graph



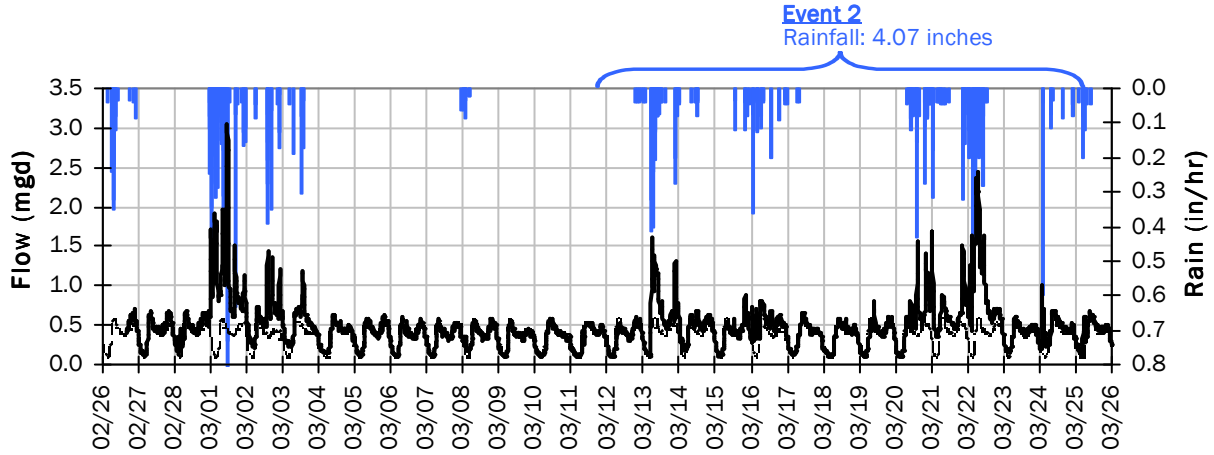
Storm Event I/I Analysis (Rain = 2.94 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	3.06 mgd	Peak I/I Rate:	2.65 mgd
PF:	8.82	Total I/I:	1,357,000 gallons
Peak Level:	49.97 in		
d/D Ratio:	3.33		

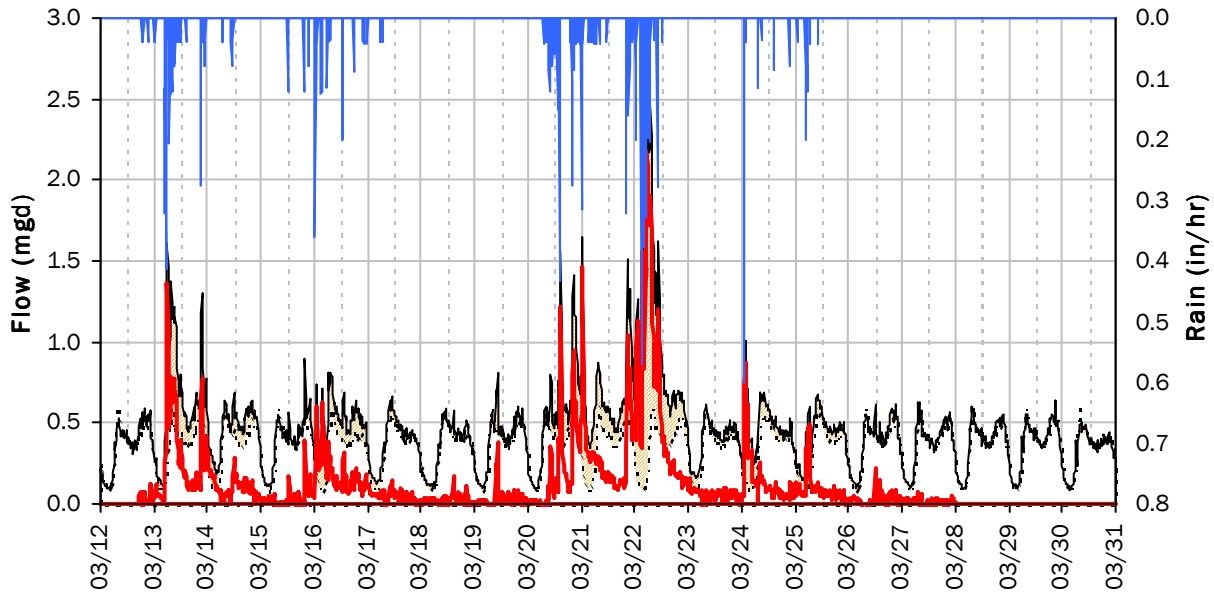
SITE 11

I/I Summary: Event 2

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 2 Detail Graph



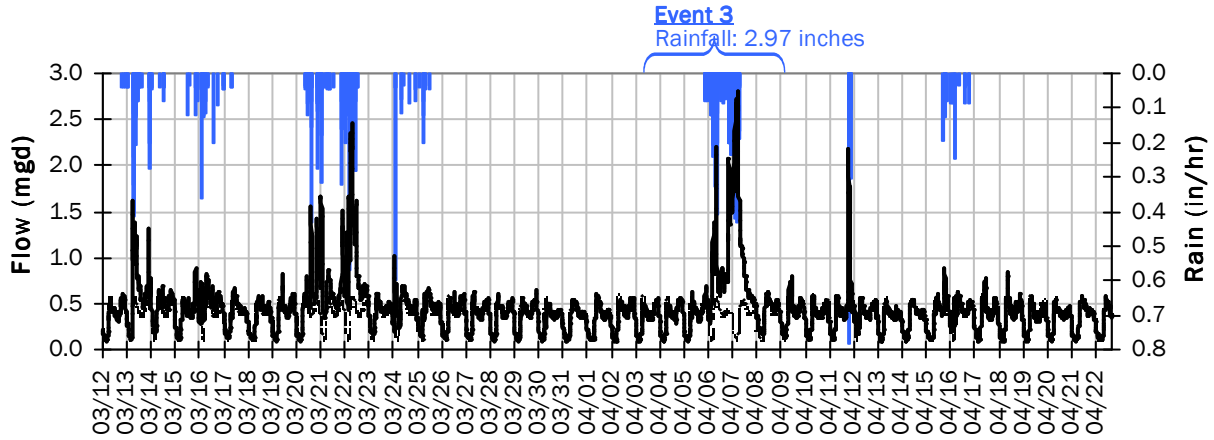
Storm Event I/I Analysis (Rain = 4.07 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	2.45 mgd	Peak I/I Rate:	2.18 mgd
PF:	7.08	Total I/I:	2,202,000 gallons
Peak Level:	36.28 in		
d/D Ratio:	2.42		

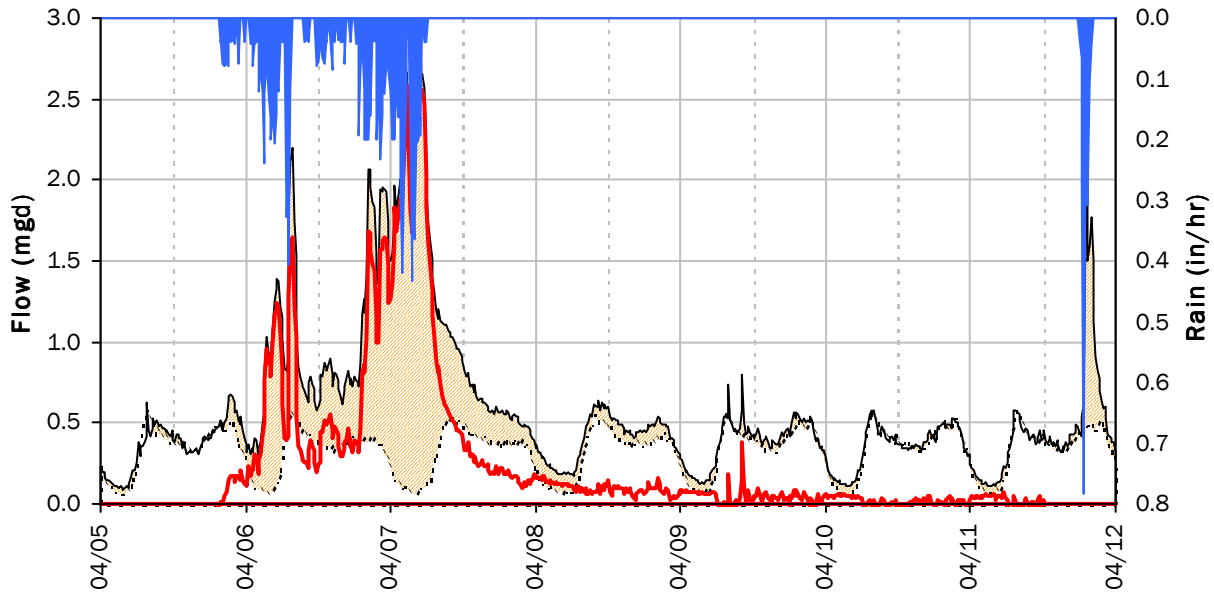
SITE 11

I/I Summary: Event 3

Baseline and Realtime Flows with Rainfall Data over Monitoring Period



Event 3 Detail Graph



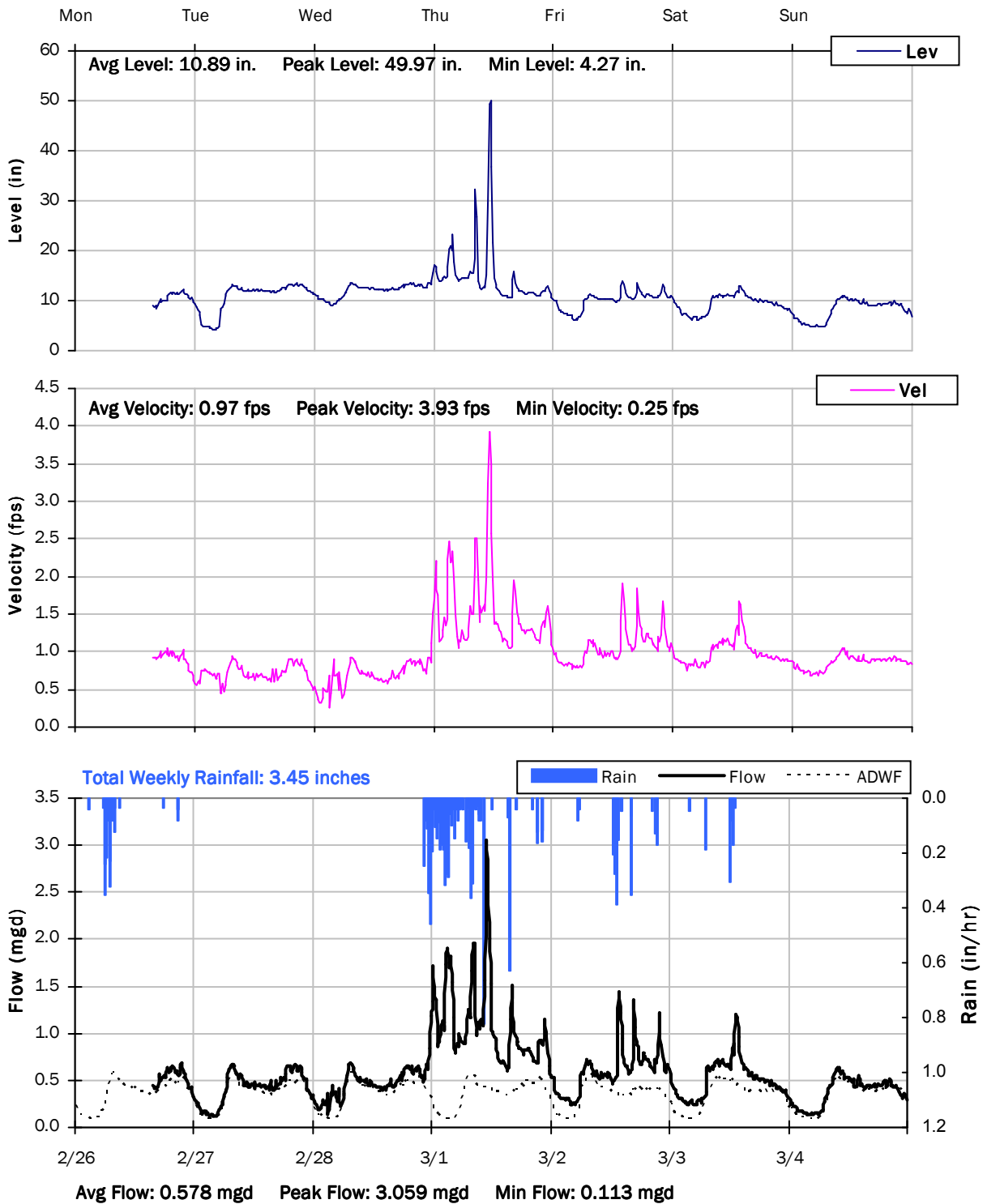
Storm Event I/I Analysis (Rain = 2.97 inches)

<u>Capacity</u>		<u>Inflow / Infiltration</u>	
Peak Flow:	2.80 mgd	Peak I/I Rate:	2.71 mgd
PF:	8.07	Total I/I:	1,705,000 gallons
Peak Level:	53.97 in		
d/D Ratio:	3.60		

SITE 11

Weekly Level, Velocity and Flow Hydrographs

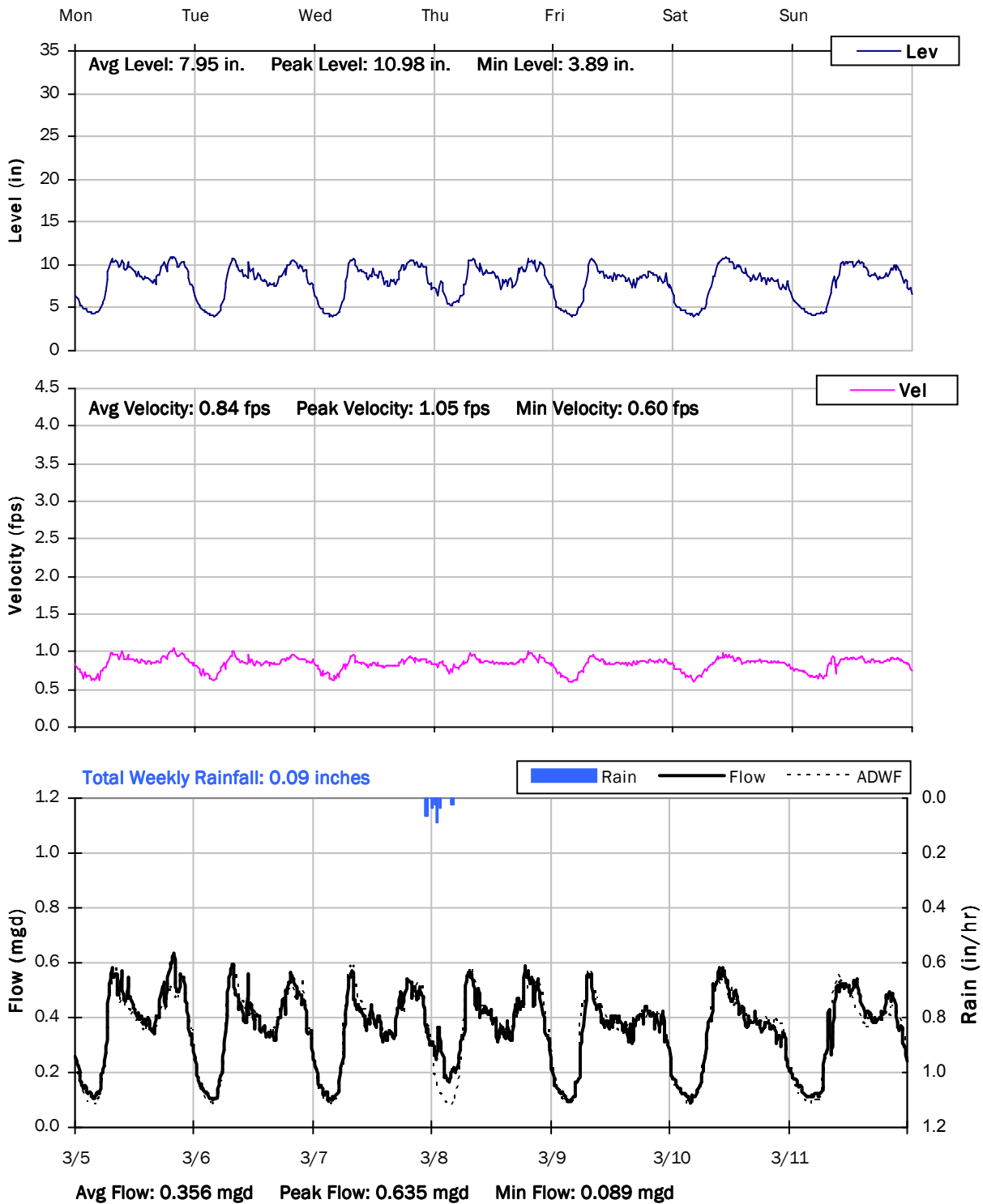
2/26/2018 to 3/5/2018



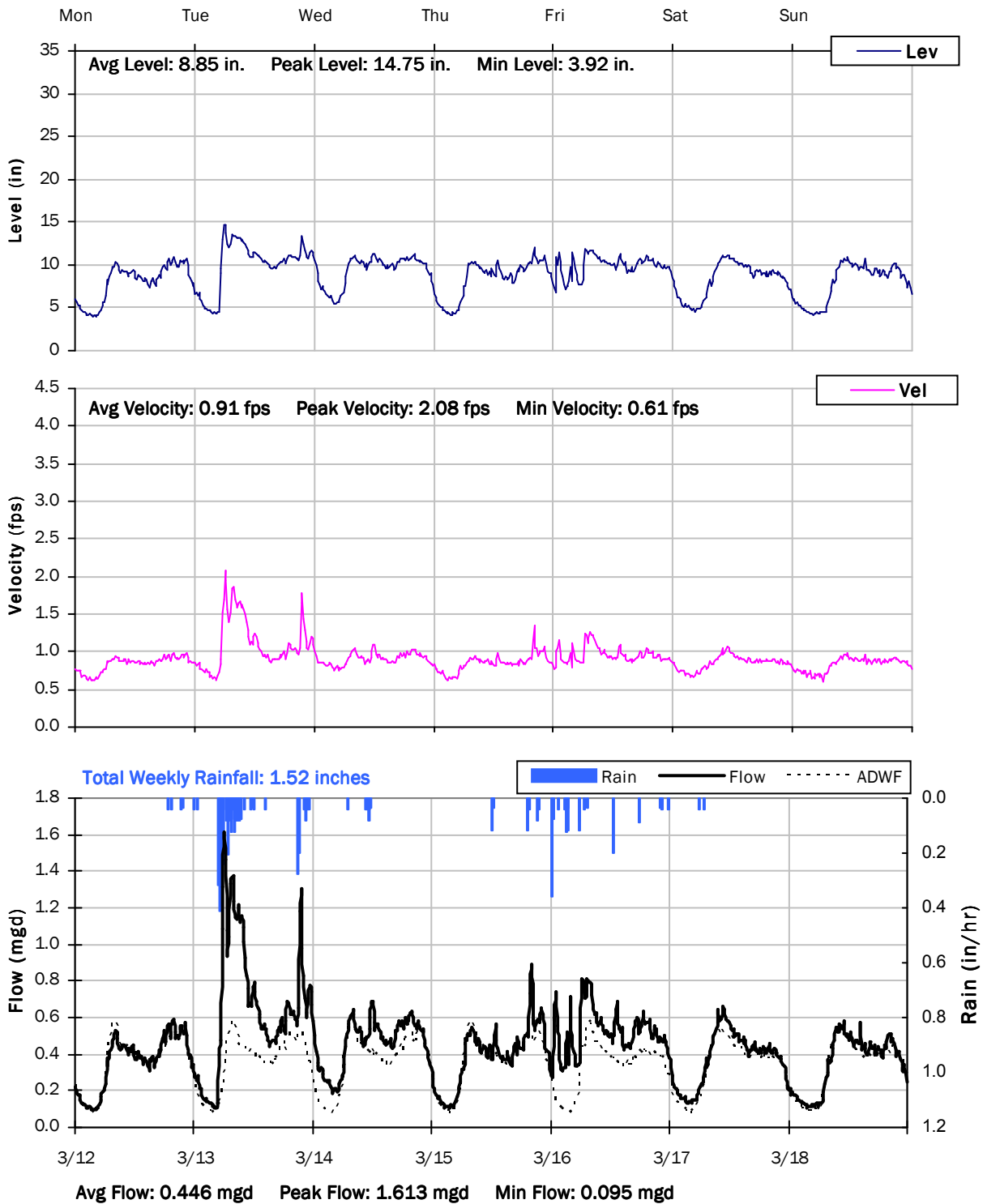
SITE 11

Weekly Level, Velocity and Flow Hydrographs

3/5/2018 to 3/12/2018



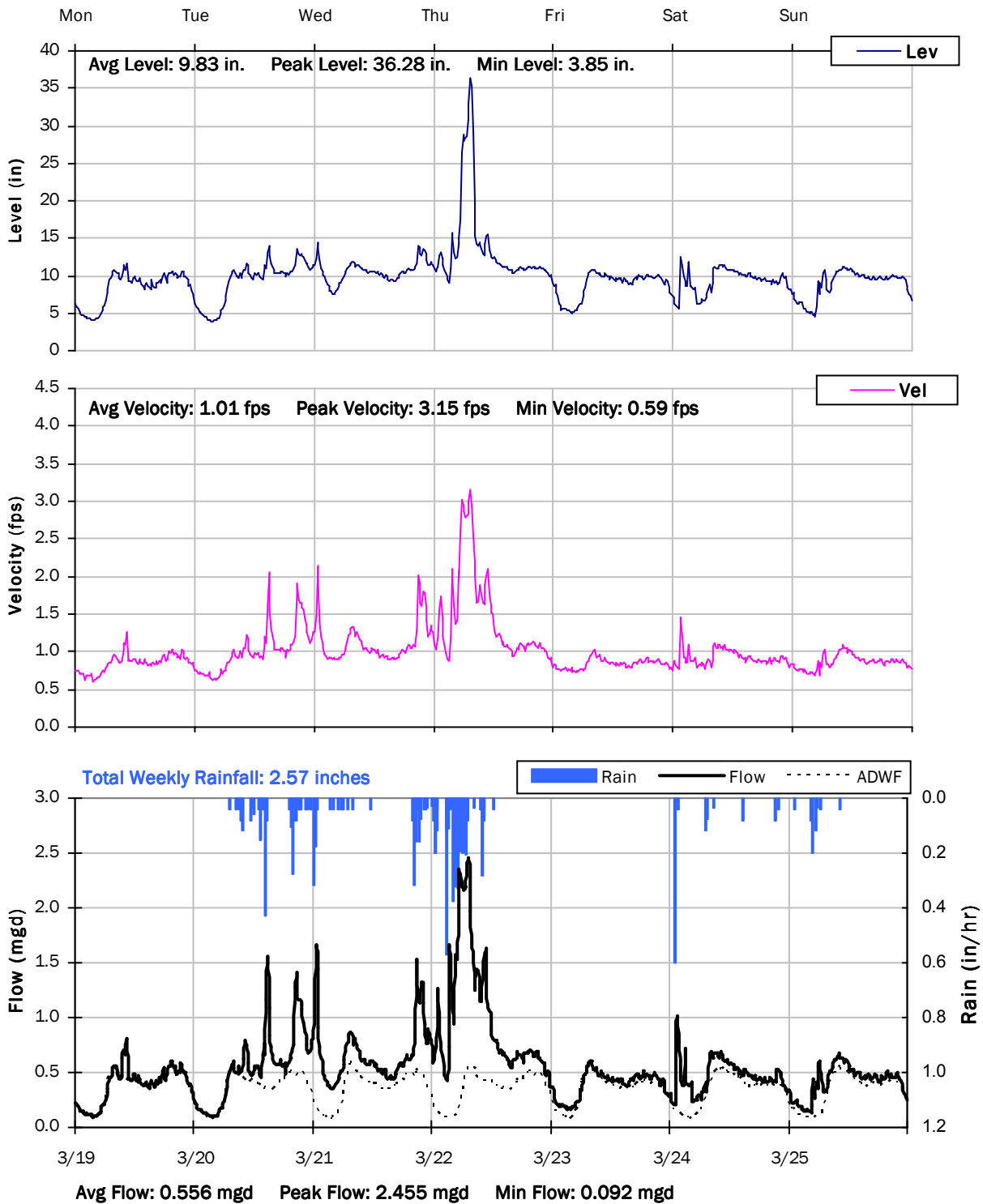
SITE 11
Weekly Level, Velocity and Flow Hydrographs
3/12/2018 to 3/19/2018



SITE 11

Weekly Level, Velocity and Flow Hydrographs

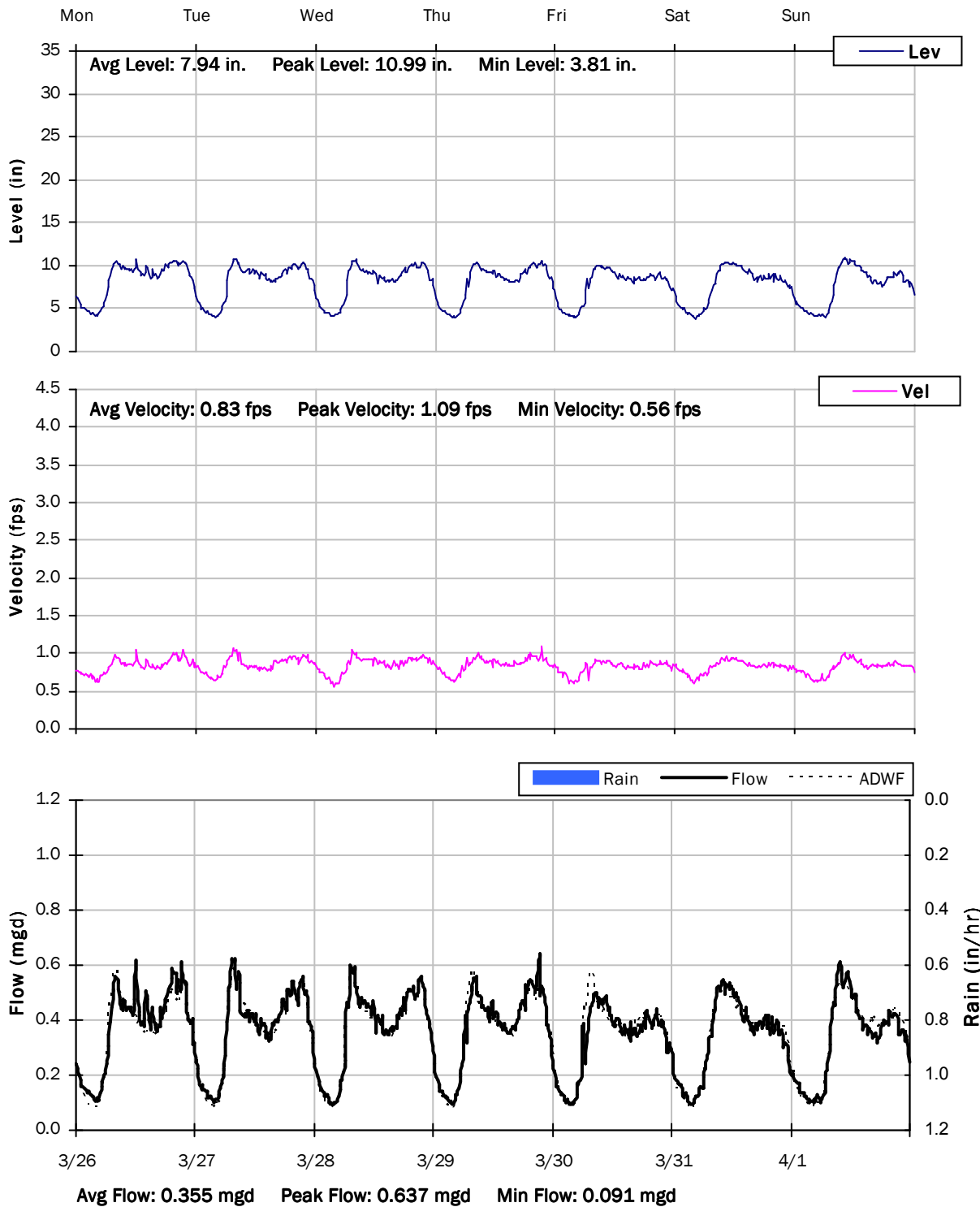
3/19/2018 to 3/26/2018



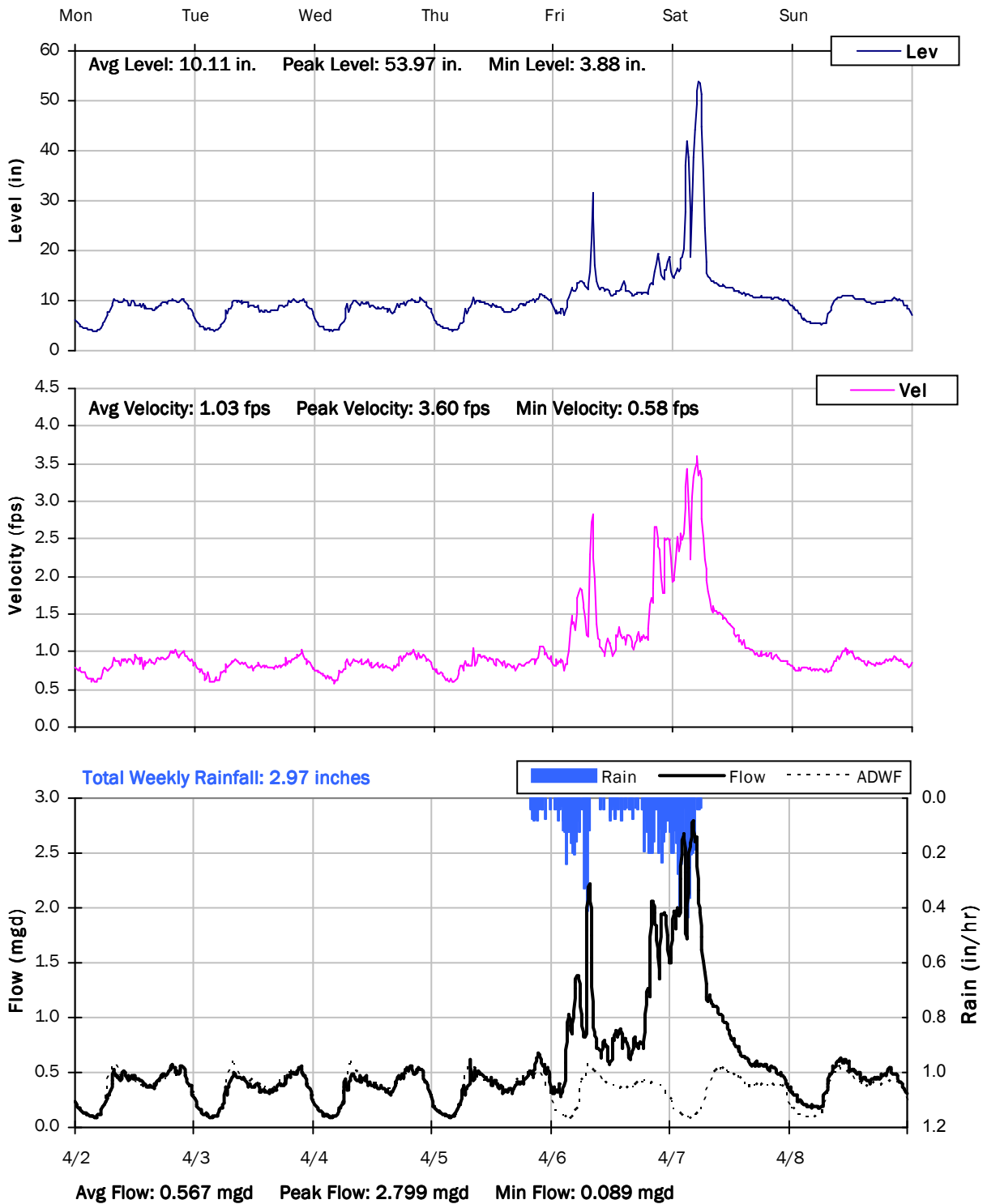
SITE 11

Weekly Level, Velocity and Flow Hydrographs

3/26/2018 to 4/2/2018



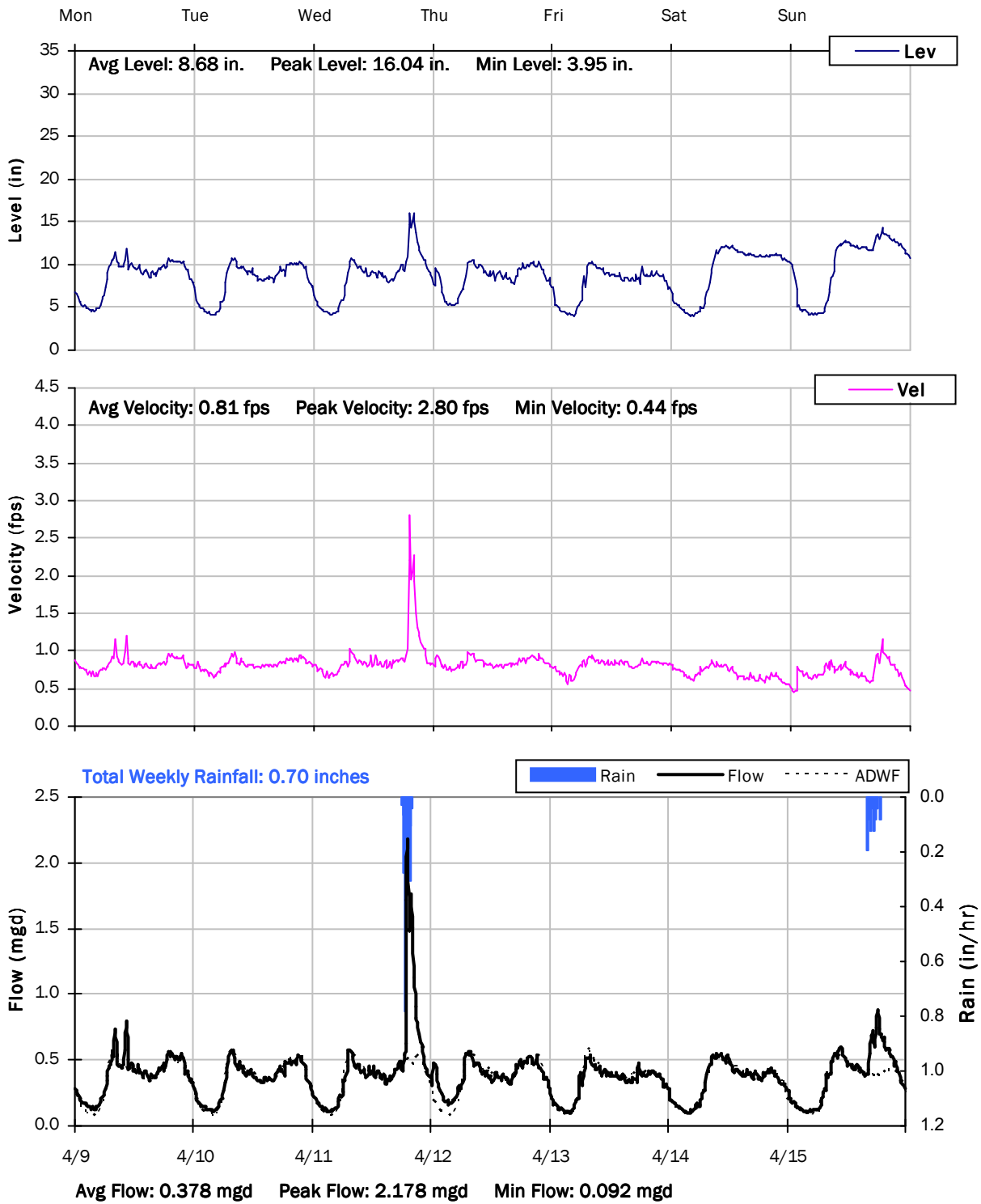
SITE 11
Weekly Level, Velocity and Flow Hydrographs
4/2/2018 to 4/9/2018



SITE 11

Weekly Level, Velocity and Flow Hydrographs

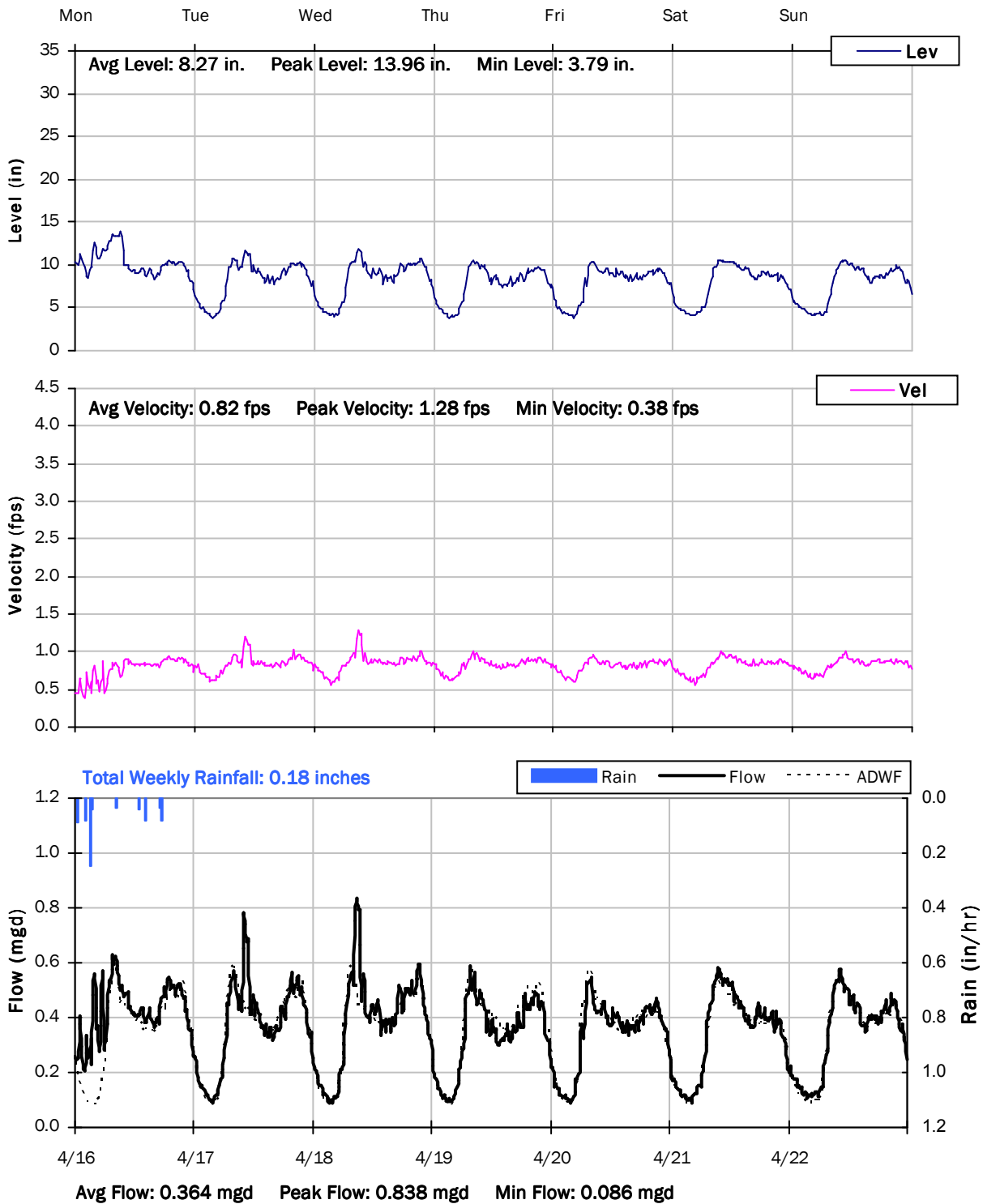
4/9/2018 to 4/16/2018



SITE 11

Weekly Level, Velocity and Flow Hydrographs

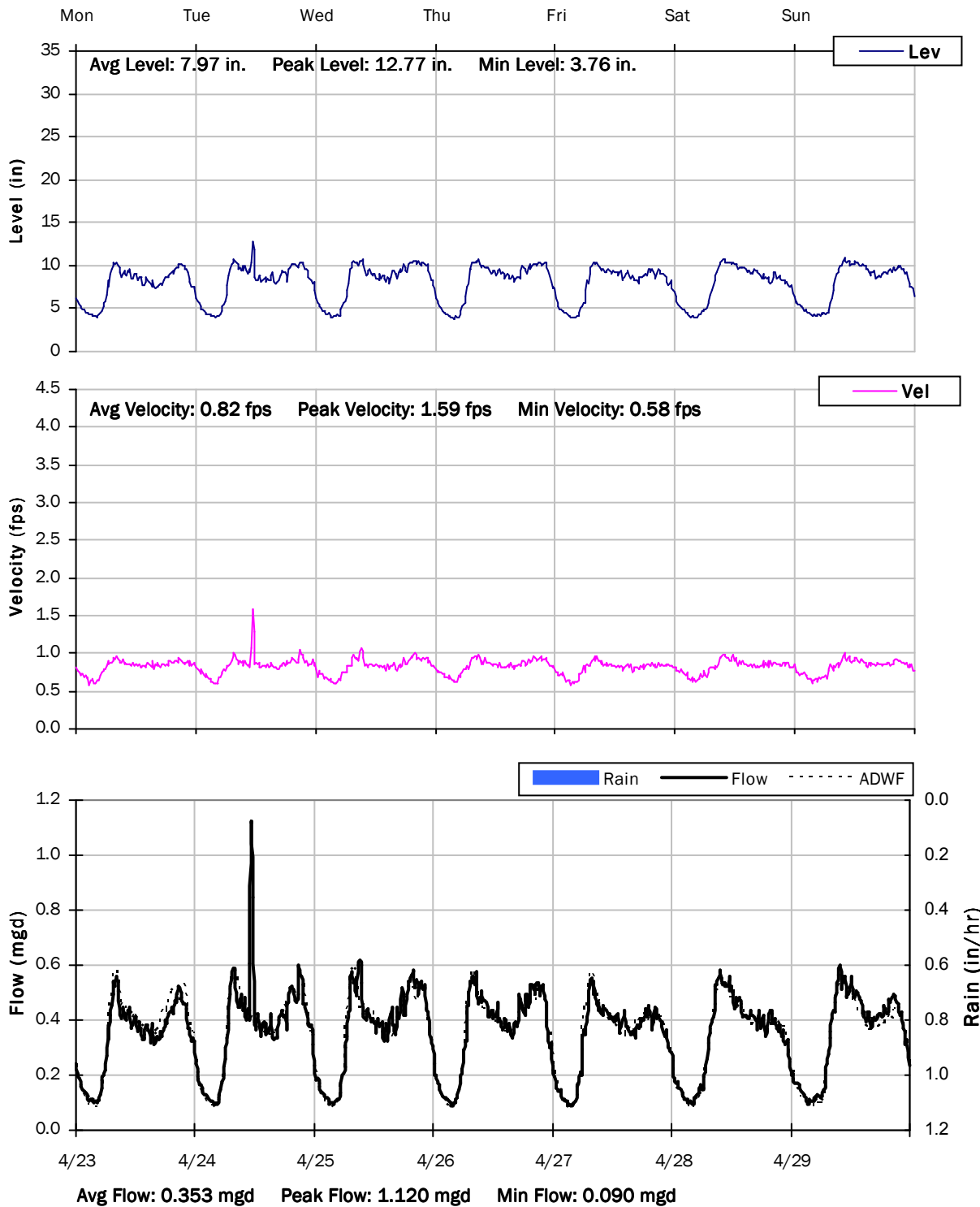
4/16/2018 to 4/23/2018



SITE 11

Weekly Level, Velocity and Flow Hydrographs

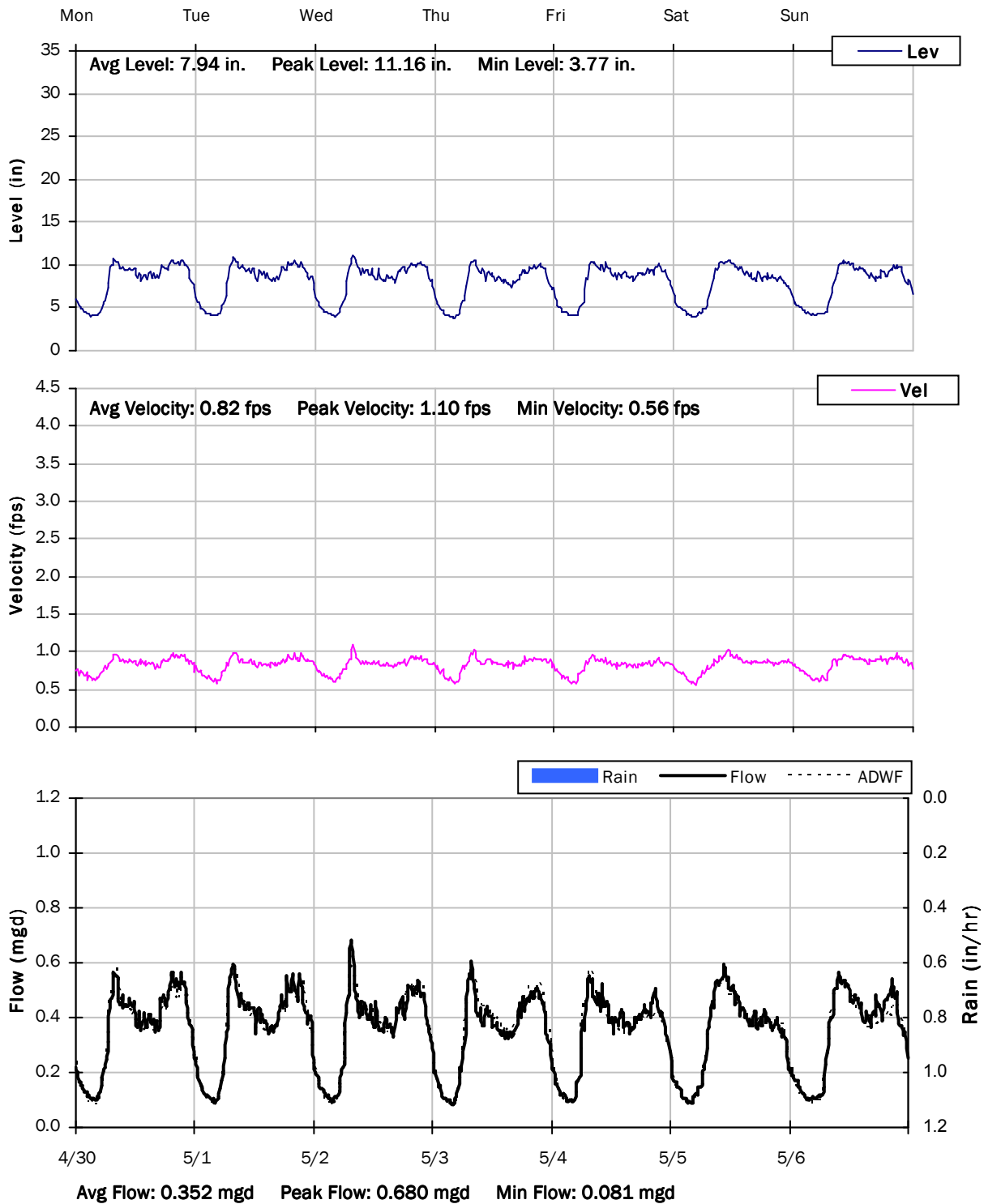
4/23/2018 to 4/30/2018



SITE 11

Weekly Level, Velocity and Flow Hydrographs

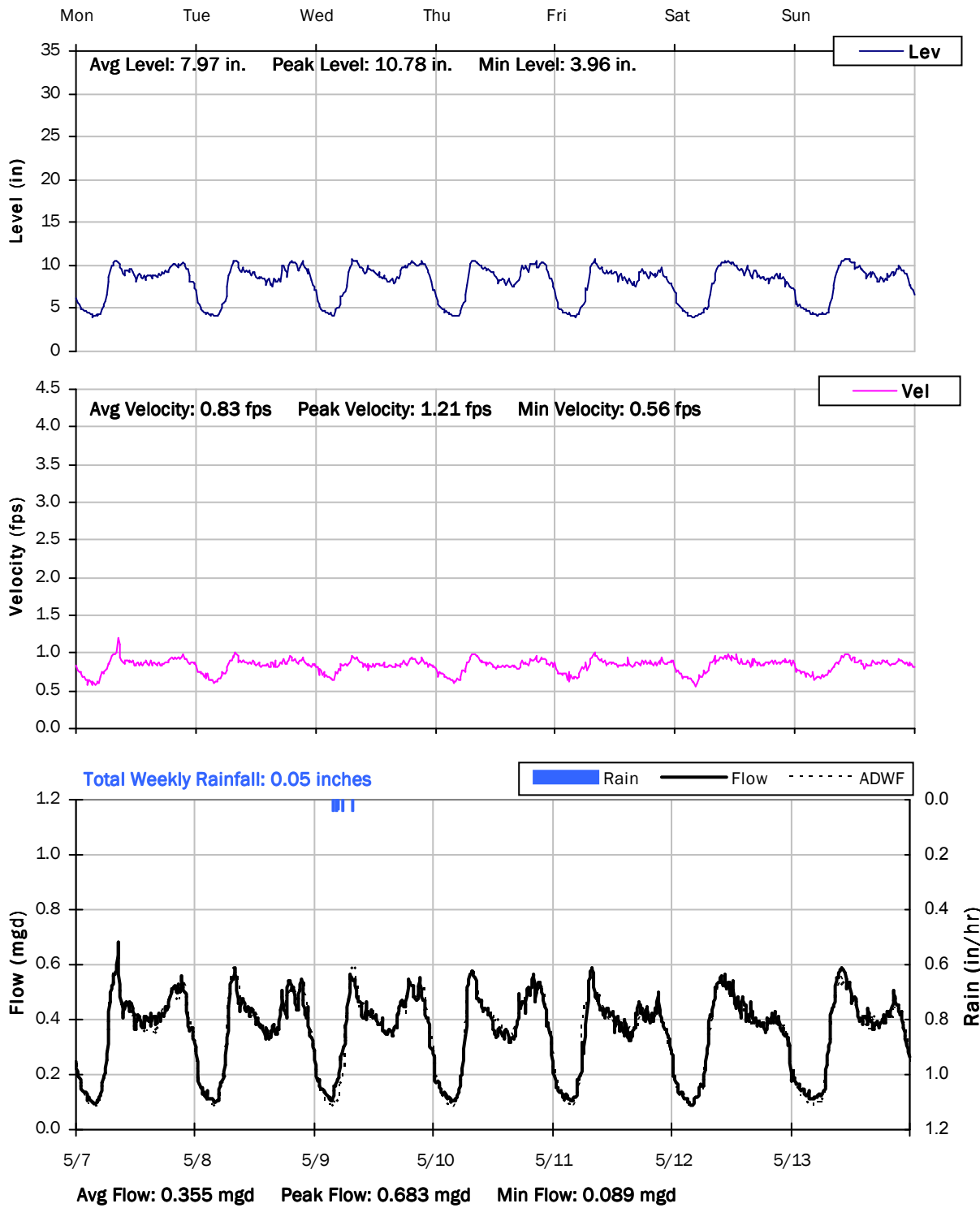
4/30/2018 to 5/7/2018



SITE 11

Weekly Level, Velocity and Flow Hydrographs

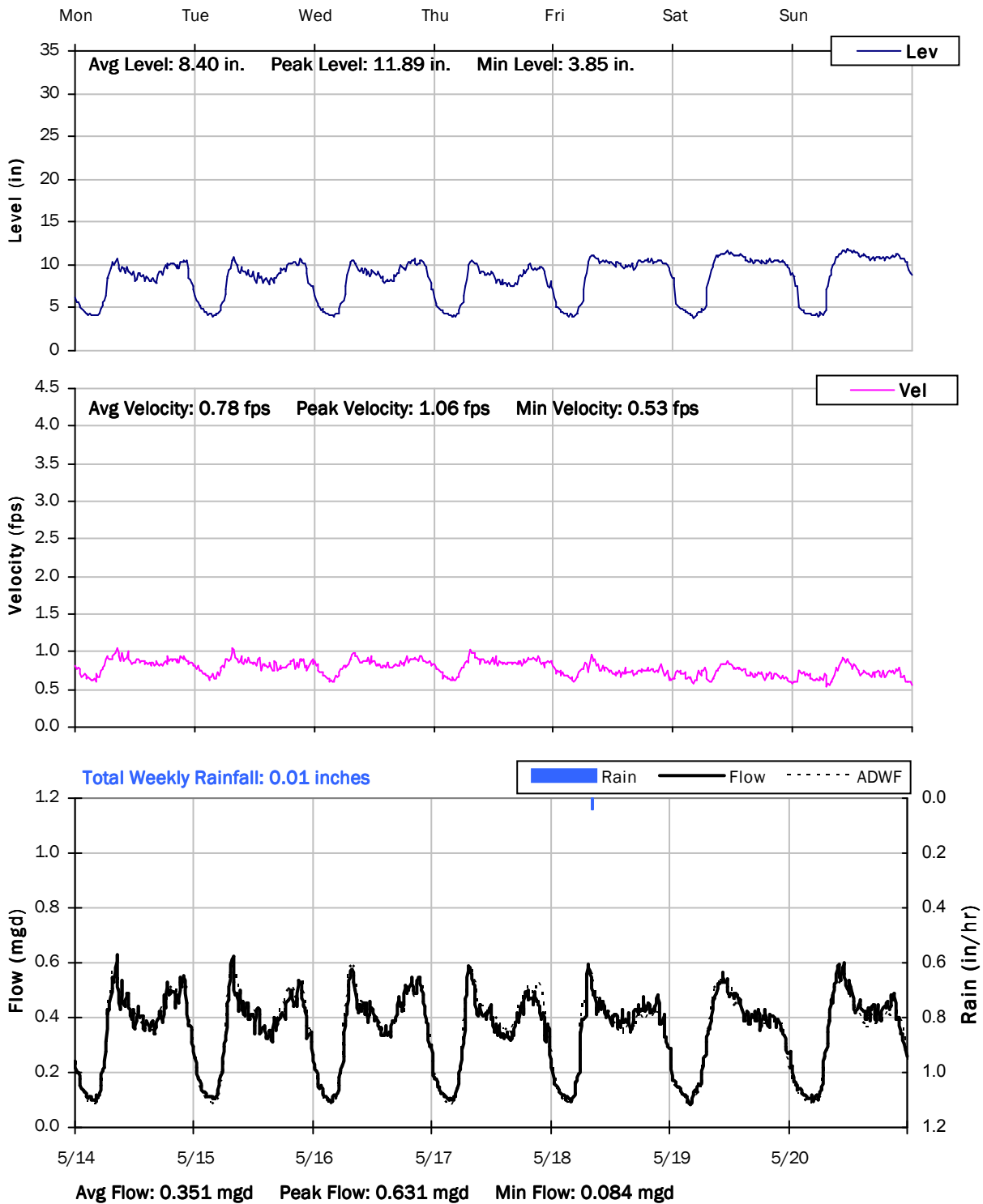
5/7/2018 to 5/14/2018



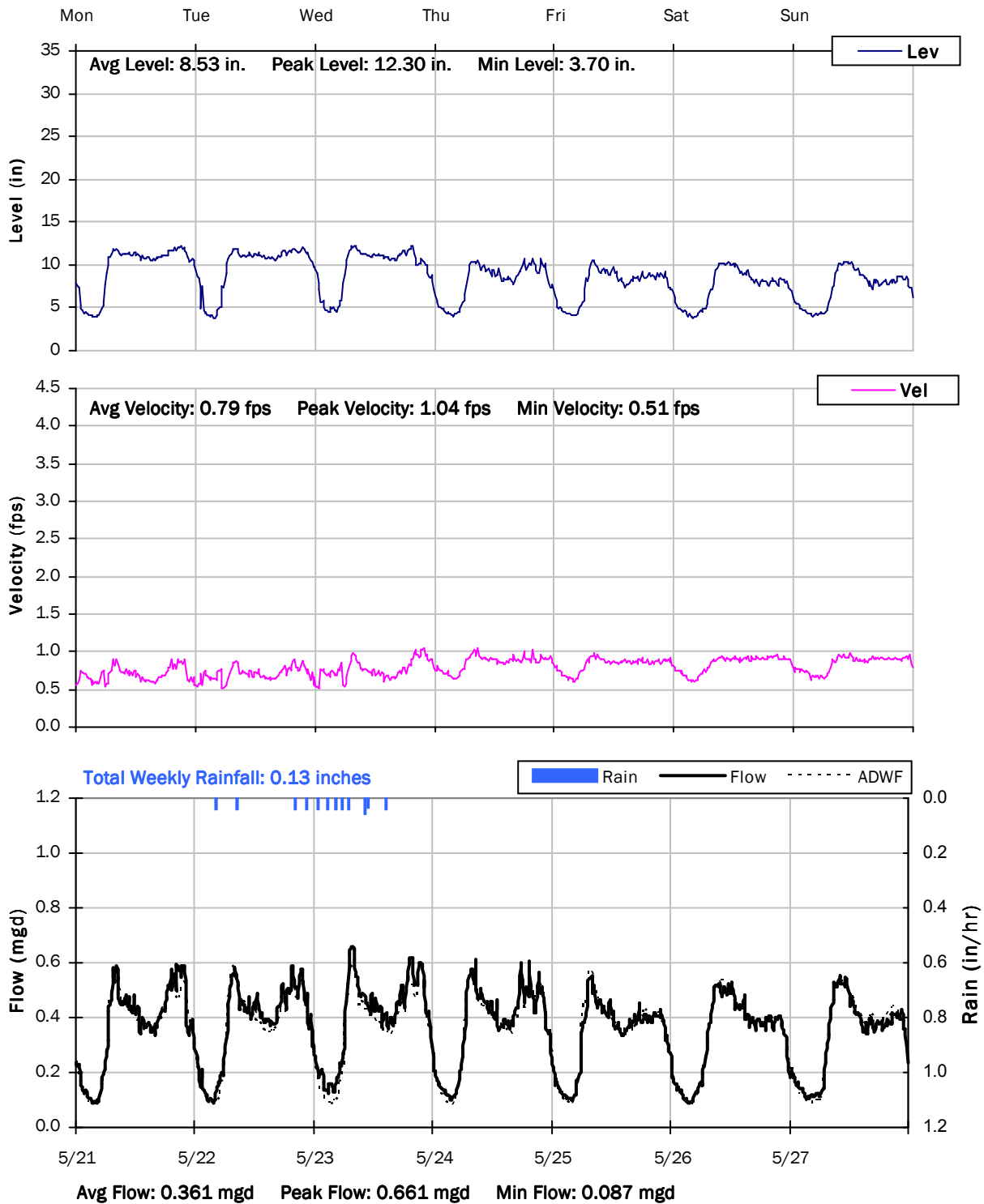
SITE 11

Weekly Level, Velocity and Flow Hydrographs

5/14/2018 to 5/21/2018



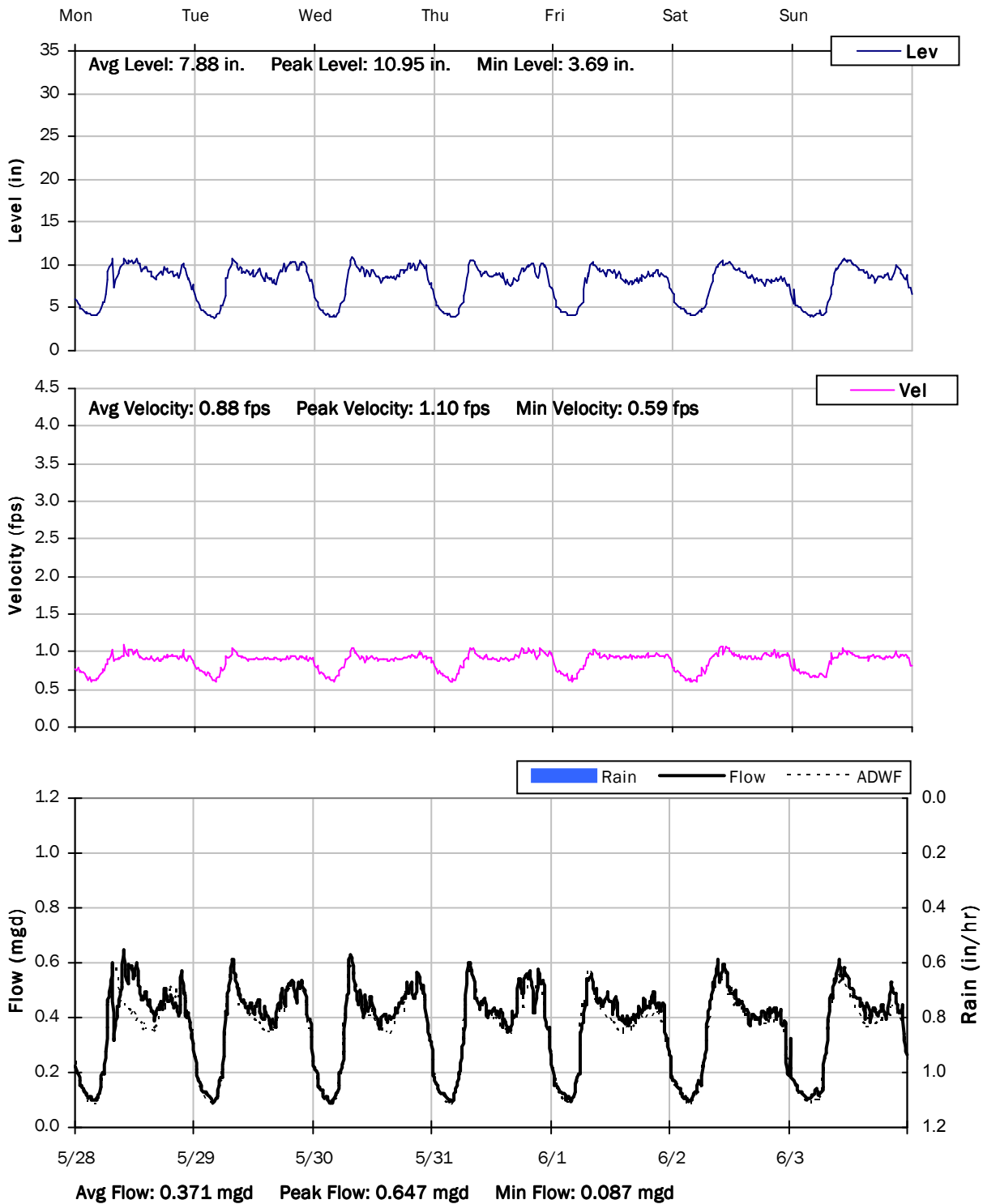
SITE 11
Weekly Level, Velocity and Flow Hydrographs
5/21/2018 to 5/28/2018



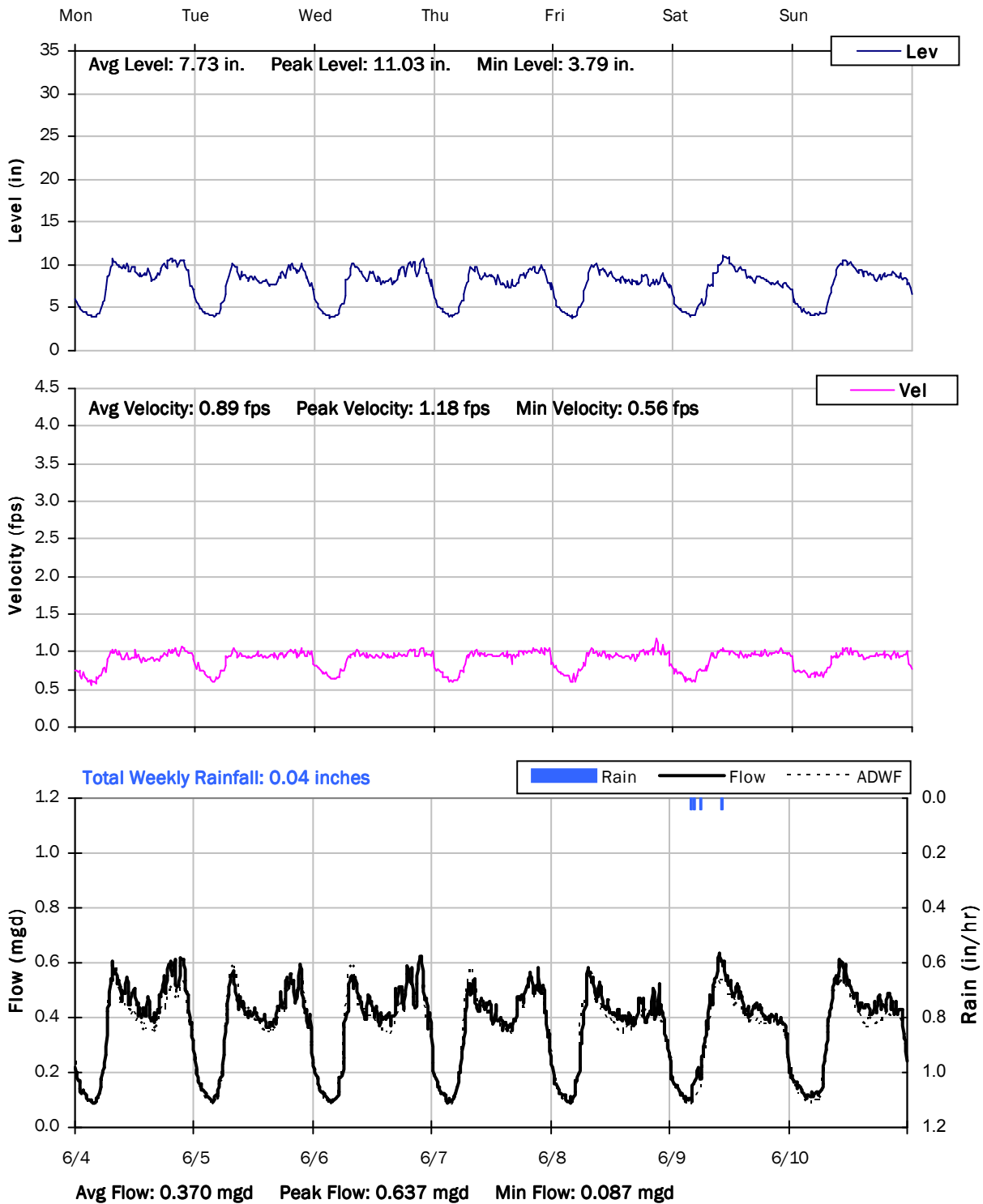
SITE 11

Weekly Level, Velocity and Flow Hydrographs

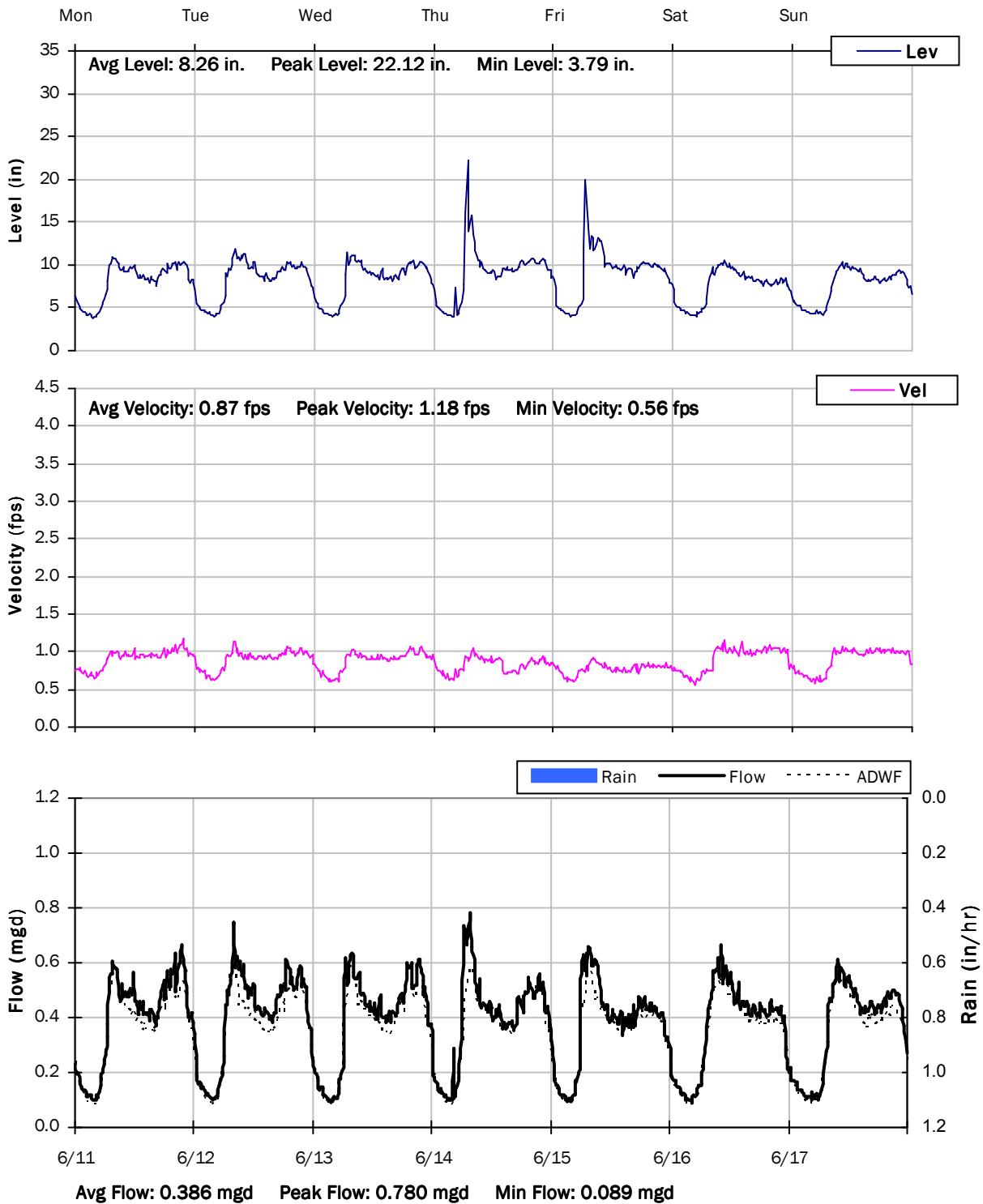
5/28/2018 to 6/4/2018



SITE 11
Weekly Level, Velocity and Flow Hydrographs
6/4/2018 to 6/11/2018



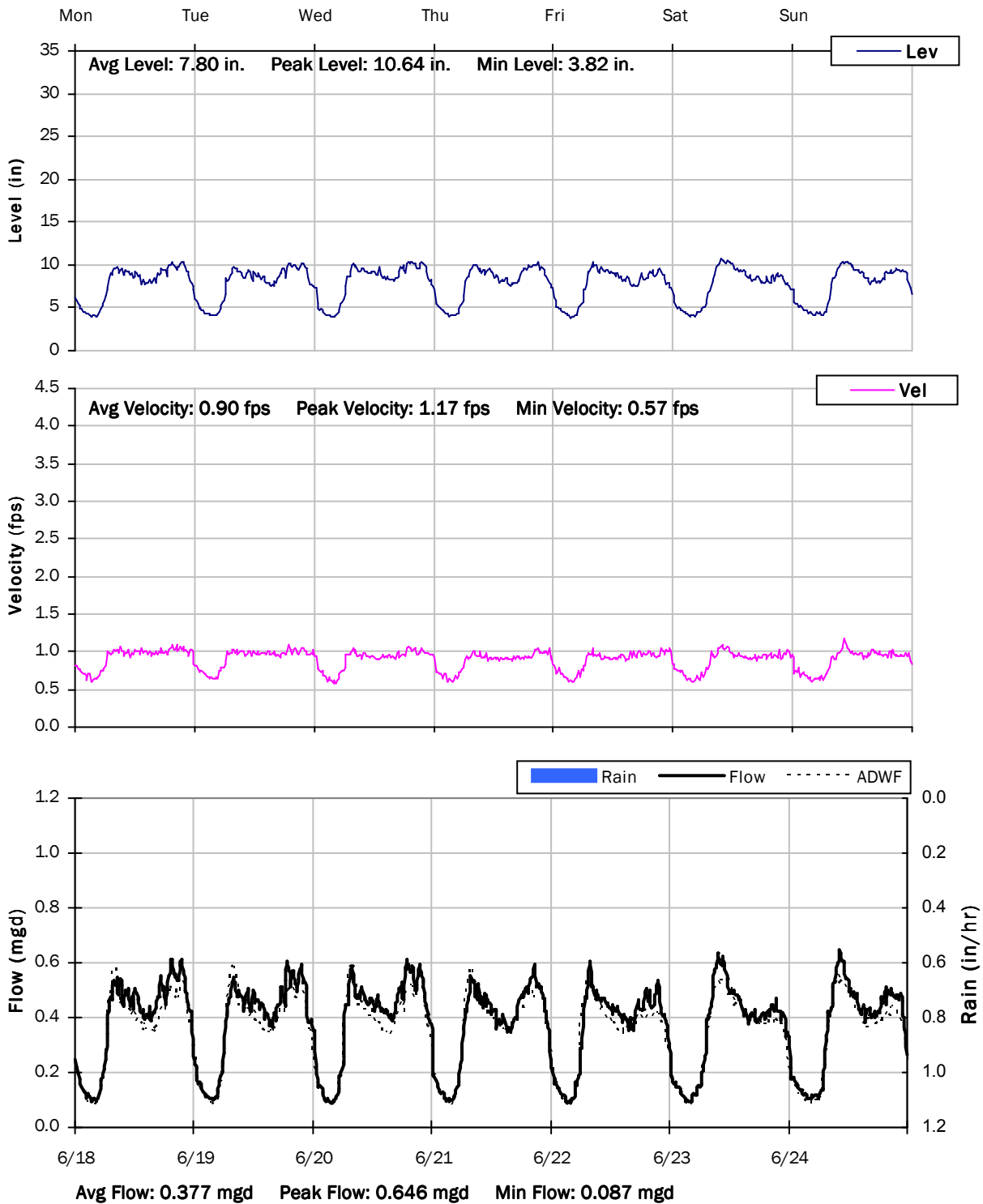
SITE 11
Weekly Level, Velocity and Flow Hydrographs
6/11/2018 to 6/18/2018



SITE 11

Weekly Level, Velocity and Flow Hydrographs

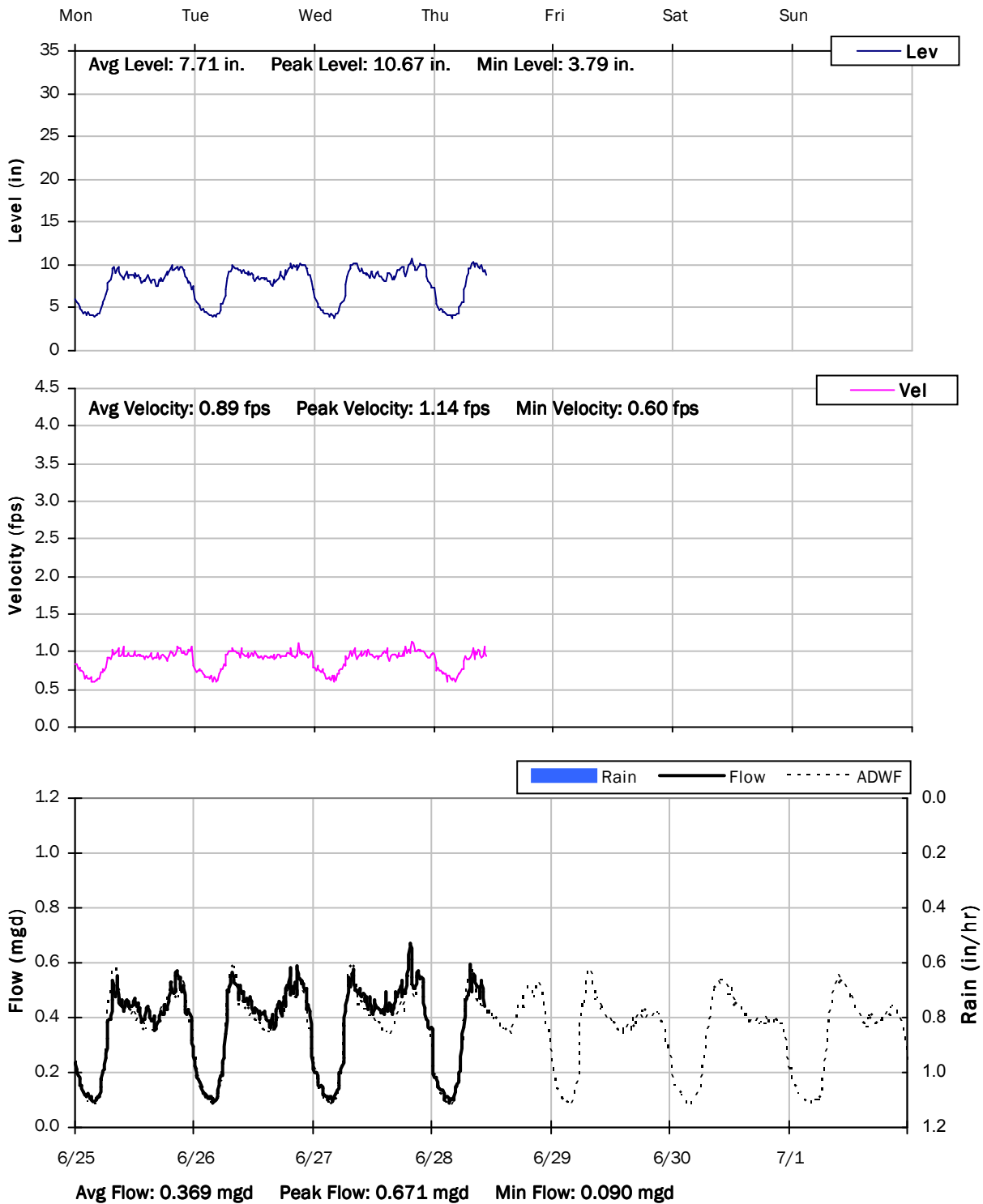
6/18/2018 to 6/25/2018



SITE 11

Weekly Level, Velocity and Flow Hydrographs

6/25/2018 to 7/2/2018



APPENDIX B

Manhole Survey Program

POINT I.D.: 0

MANHOLE No.: WL2683

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

STREET NAME(S): _____

NEAREST CROSS STREET: _____

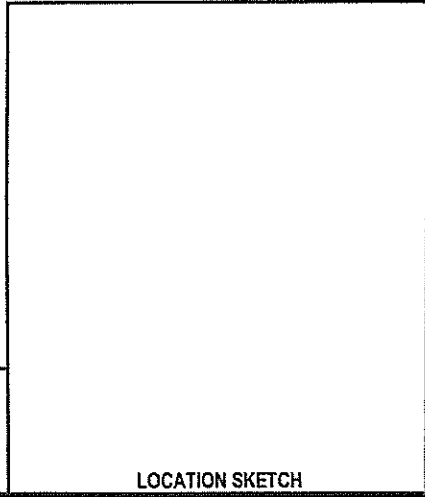
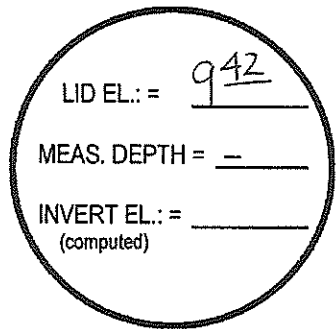
NEAREST ADDRESS No.: _____

SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS

No Need to
DIP.

SD



PICTURE FILENAMES: _____

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:**
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
 - 2) DRAW NORTH ARROW ABOVE.
 - 3) FILL IN LID ELEVATION.
 - 4) FILL IN MEASURED DEPTH.
 - 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
 - 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
 - 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
 - 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

SA SF, CA

PAGE NUMBER: 8

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: DA

MANHOLE No.: WL2683

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

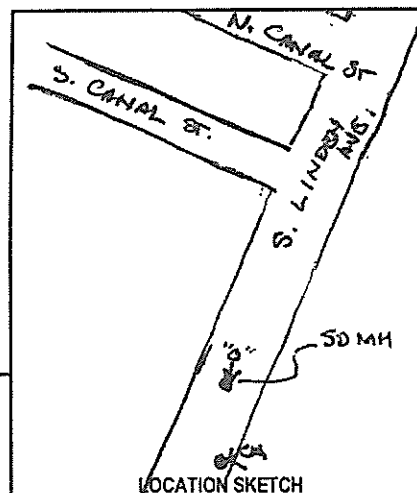
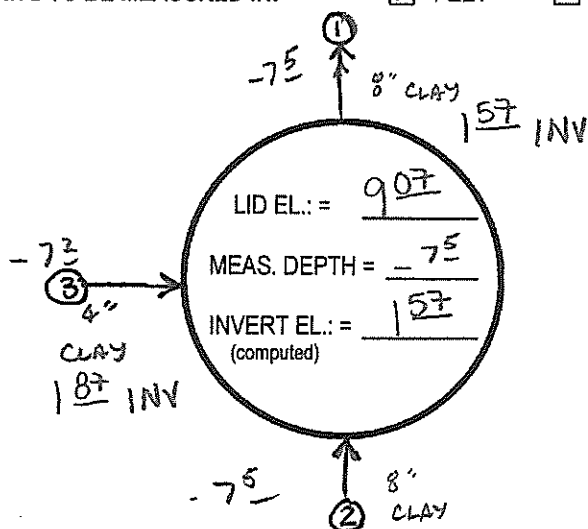
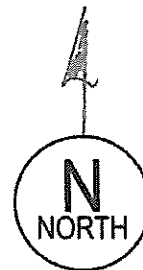
STREET NAME(S): S. LINDEN AVE

NEAREST CROSS STREET: S. CANAL ST.

NEAREST ADDRESS No.: 43 S. LINDEN AVE

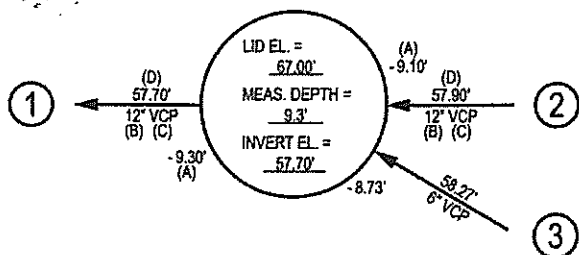
SPECIAL MARKINGS: "CITY OF SAN MATEO"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: 157 INV

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
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- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

CITY OF SA SF

JOB No.:

15695-101

CREW:

JM/CP

DATE:

2018-12-28

POINT I.D.: 1

MANHOLE No.: WL 2714

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

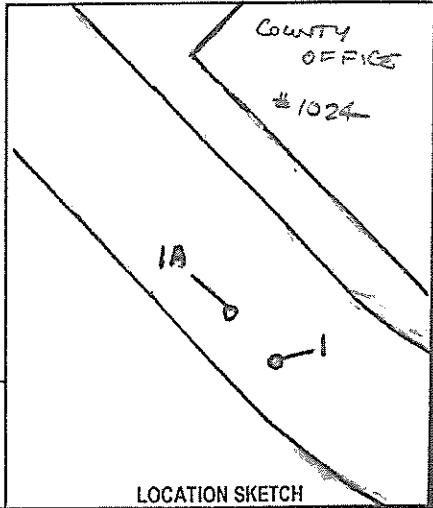
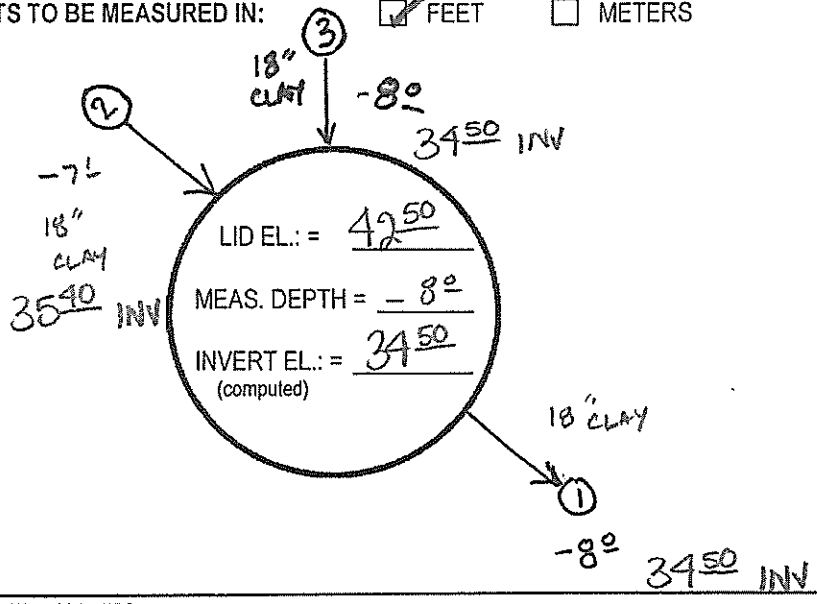
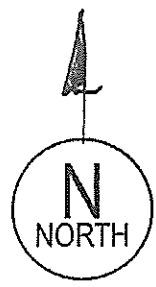
STREET NAME(S): MISSION RD.

NEAREST CROSS STREET: _____

NEAREST ADDRESS No.: 1024 MISSION RD

SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: _____

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:**
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
 - 2) DRAW NORTH ARROW ABOVE.
 - 3) FILL IN LID ELEVATION.
 - 4) FILL IN MEASURED DEPTH.
 - 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
 - 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
 - 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
 - 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: CITY OF So. SF

CREW: JM / CP

JOB No.: 15695-101

DATE: 2018 / 12 / 28

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

So. SF, CA

PAGE NUMBER: 44

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 1A

MANHOLE No.: WL2714

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

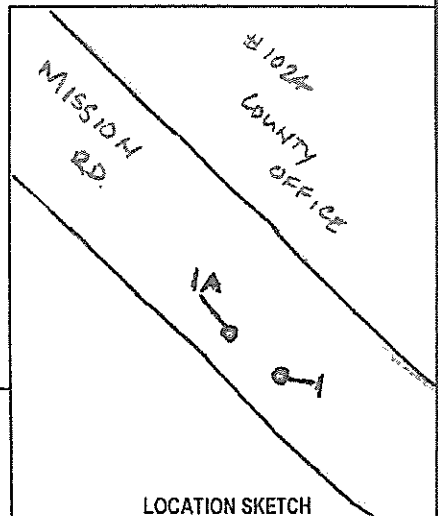
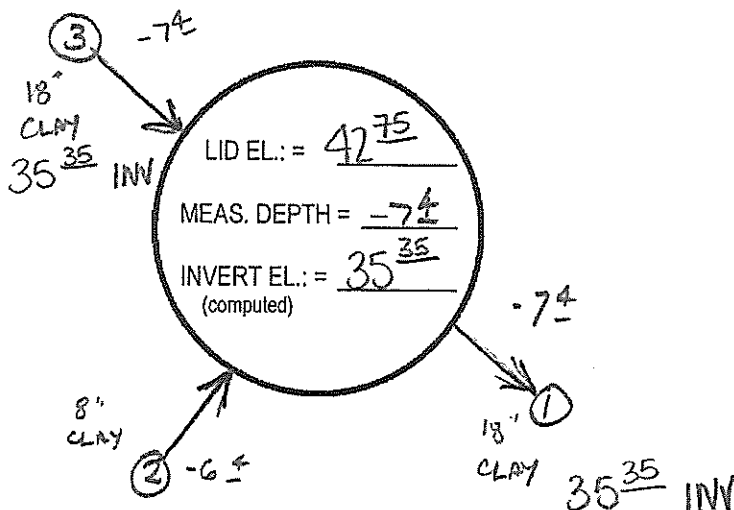
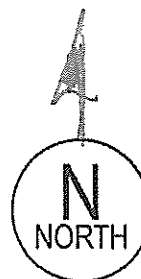
STREET NAME(S): MISSION RD.

NEAREST CROSS STREET: _____

NEAREST ADDRESS No.: 1024 MISSION RD.

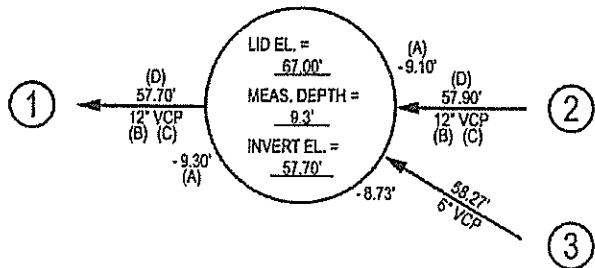
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: 36.35 INV

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

CITY OF SO. SF

CREW:

JM / CP

JOB No.:

15695-101

DATE:

2018/12/28

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

So. SF, CA

PAGE NUMBER: 9

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 2

MANHOLE No.: WL2699

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

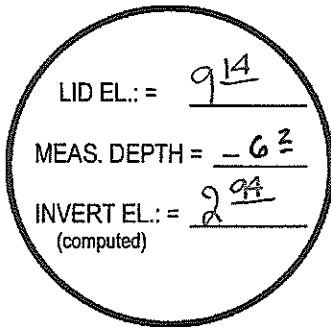
STREET NAME(S): S. LINDEN AVE

NEAREST CROSS STREET: S. CANAL ST.

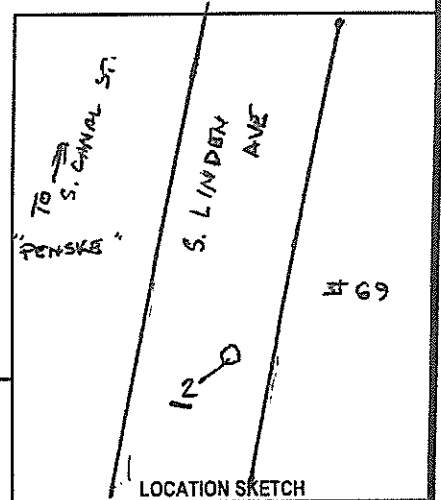
NEAREST ADDRESS No.: 69 S. LINDEN AVE

SPECIAL MARKINGS: "S"

UNITS TO BE MEASURED IN: FEET METERS

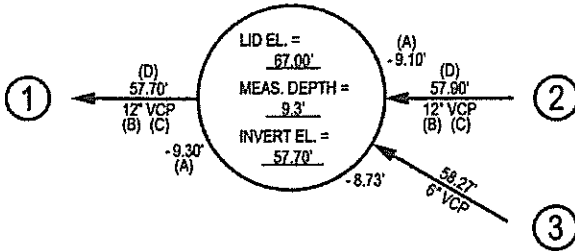


FULL OF WATER. PLUGGED?



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
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- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

CITY OF SO. SF

JOB No.:

15695-101

CREW:

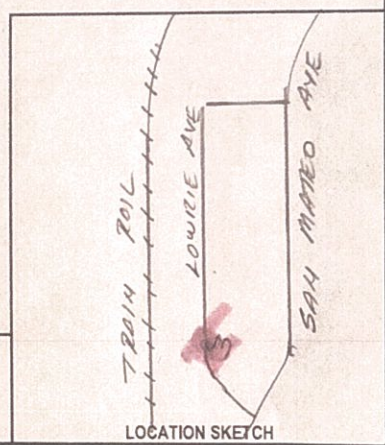
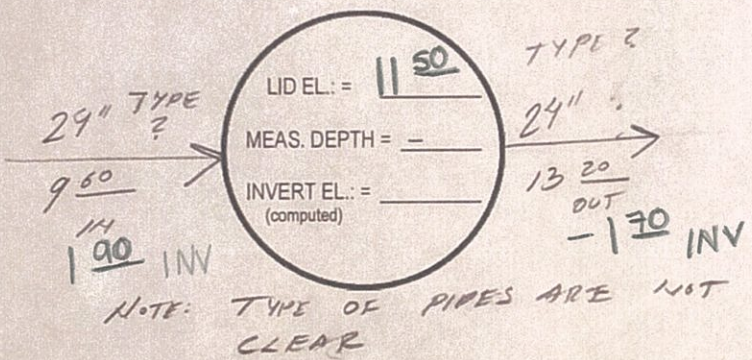
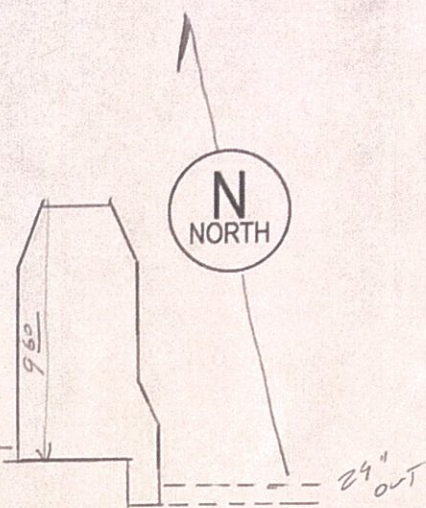
JM/CP

DATE:

2018-12-28

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: 3	FIELD BOOK:
	SSF-AKEL	SOUTH SAN FLO	OF 8 PAGES	PAGE:

POINT I.D.: 3
 MANHOLE No.: WL 2900
 MANHOLE TYPE: SS SD ELEC TEL OTHER: _____
 STREET NAME(S): LOWRIE AVE.
 NEAREST CROSS STREET: SAN MATEO AVE
 NEAREST ADDRESS No.: _____
 SPECIAL MARKINGS: _____
 UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
 - 2) DRAW NORTH ARROW ABOVE.
 - 3) FILL IN LID ELEVATION.
 - 4) FILL IN MEASURED DEPTH.
 - 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
 - 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
 - 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
 - 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

	CLIENT:	CREW:
	AKEL JOB No.: 15695-8101	EB / MY DATE: 2018-12-18

POINT I.D.: 5

MANHOLE No.: WL 811

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

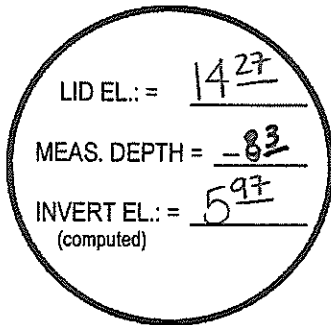
STREET NAME(S): S. MAPLE AVE

NEAREST CROSS STREET: VICTORY AVE.

NEAREST ADDRESS No.: 263 S. MAPLE AVE.

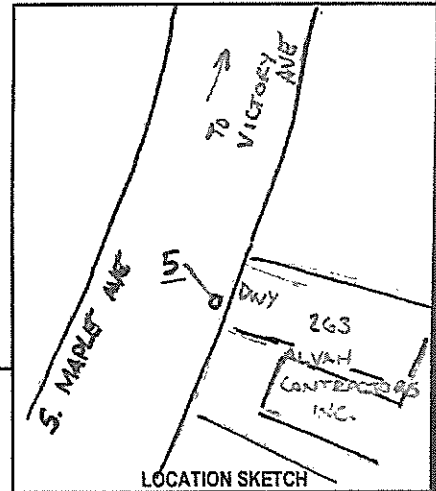
SPECIAL MARKINGS: "S"

UNITS TO BE MEASURED IN: FEET METERS



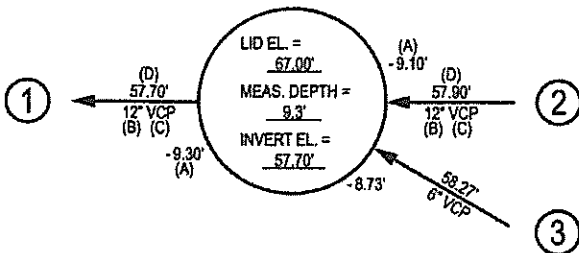
FULL OF WATER.

PLUGGED?
ABND?



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
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- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:
CITY OF So. SF

JOB No.:
16695-101

CREW:
JM / ep

DATE:
2018 / 12 / 28

POINT I.D.: 7

MANHOLE No.: WL795

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

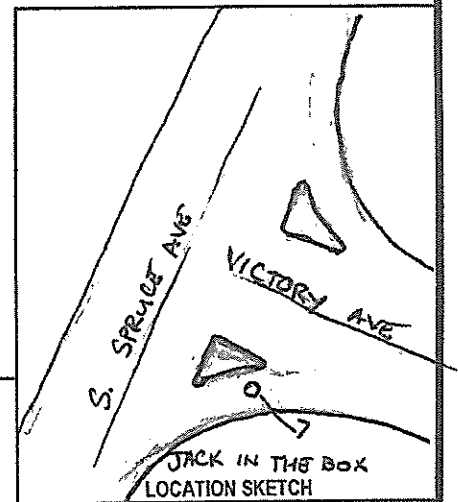
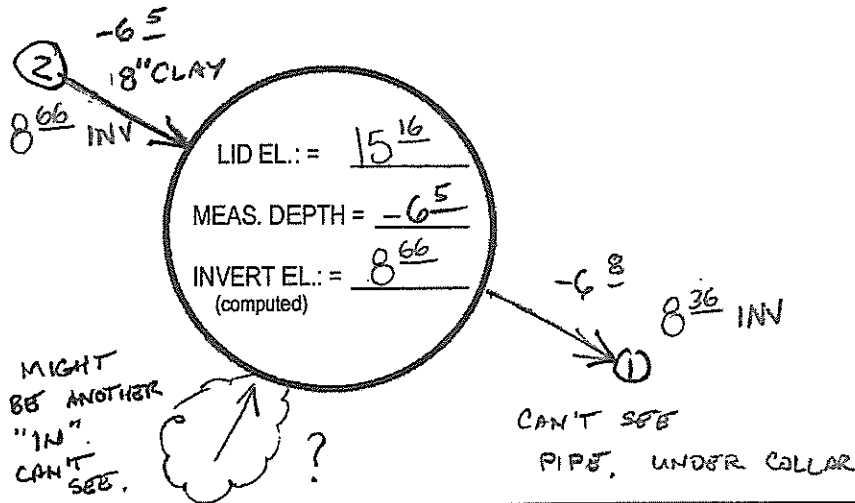
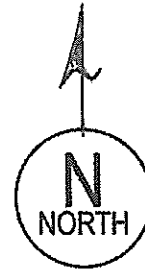
STREET NAME(S): VICTORY AVE

NEAREST CROSS STREET: S. SPRUCE AVE

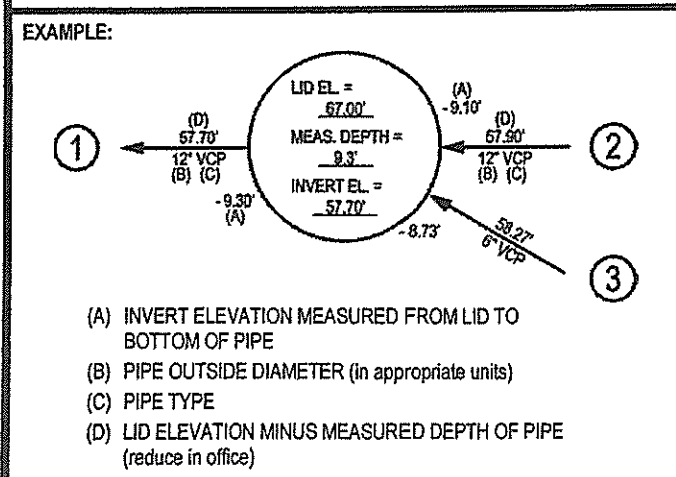
NEAREST ADDRESS No.: 201 S. SPRUCE AVE

SPECIAL MARKINGS: N/A

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:



- GENERAL FIELD INSTRUCTIONS:
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
 - 2) DRAW NORTH ARROW ABOVE.
 - 3) FILL IN LID ELEVATION.
 - 4) FILL IN MEASURED DEPTH.
 - 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
 - 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
 - 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
 - 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

<p>TOWILL Surveying, Mapping and GIS Services</p>	CLIENT: CITY OF So. SF	CREW: JM / CP
	JOB No.: 15695-101	DATE: 2018/12/28

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:
S. SAN FRANCISCO,
CA

PAGE NUMBER: 17
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 8

MANHOLE No.: WH794

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

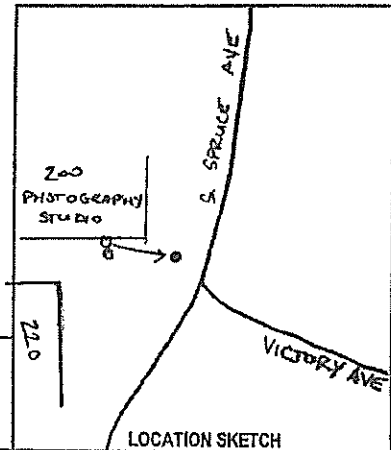
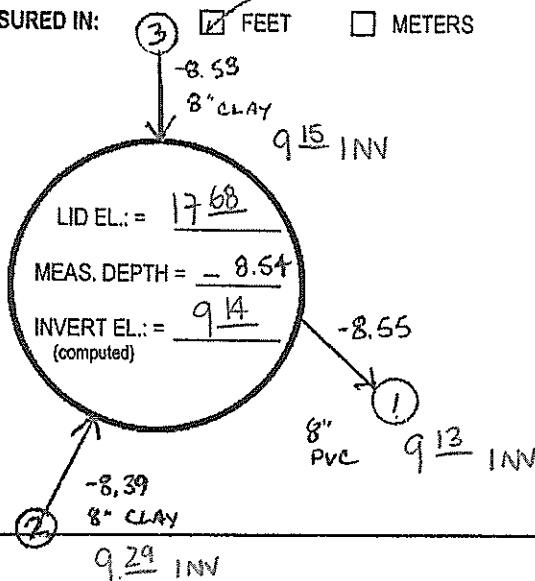
STREET NAME(S): S. SPRUCE AVE.

NEAREST CROSS STREET: VICTORY AVE.

NEAREST ADDRESS No.: 200 S. SPRUCE AVE

SPECIAL MARKINGS: "CITY OF SAN MATEO"

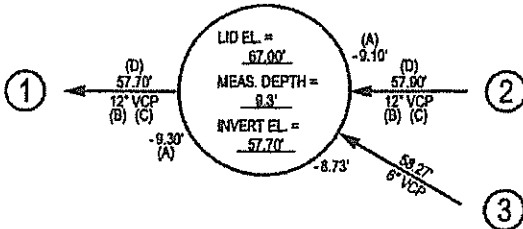
UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

9.29 INN

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

JOB No.:

15695

CREW:

JM / OS

DATE:

2018/12/15

MANHOLE DIPSHEET

PROJECT NAME:

PROJECT LOCATION:

PAGE NUMBER: 28

FIELD BOOK:

OF PAGES

PAGE:

POINT I.D.: 9

MANHOLE No.: WL790

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

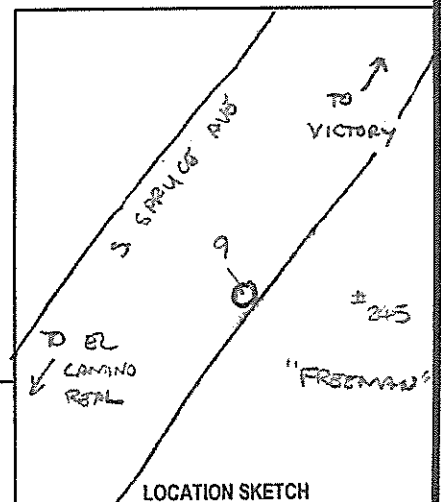
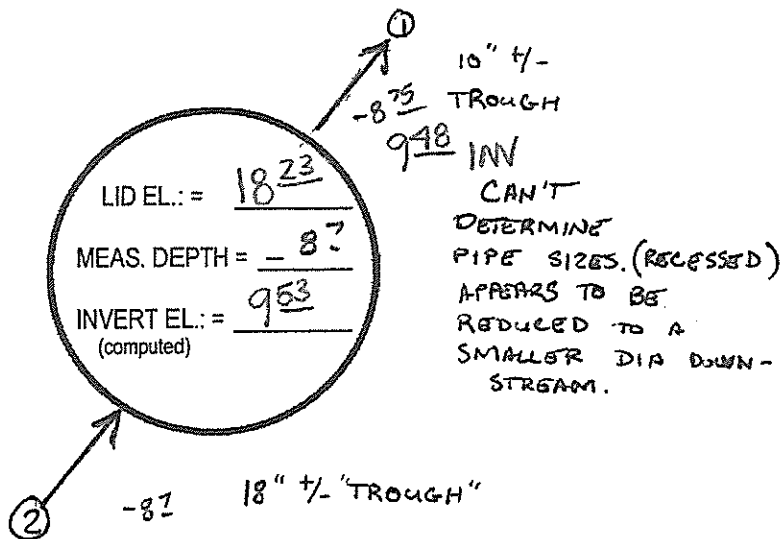
STREET NAME(S): S. SPRUCE

NEAREST CROSS STREET: VICTORY AVE

NEAREST ADDRESS No.: 245 S. SPRUCE AVE

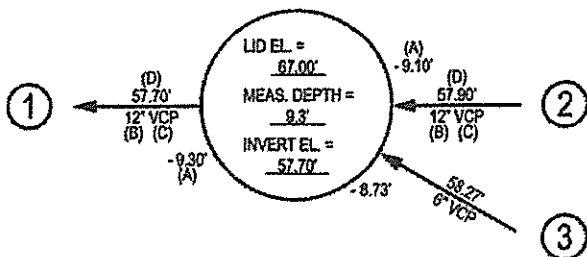
SPECIAL MARKINGS: "S"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: 9.53 INV

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
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- 4) FILL IN MEASURED DEPTH.
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- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
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CLIENT: CITY OF SO. SF

CREW: JM / CD

JOB No.: 15695-101

DATE: 2018 / 12 / 28

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

S. SAN FRANCISCO

PAGE NUMBER: 1
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 10

MANHOLE No.: WH 778

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

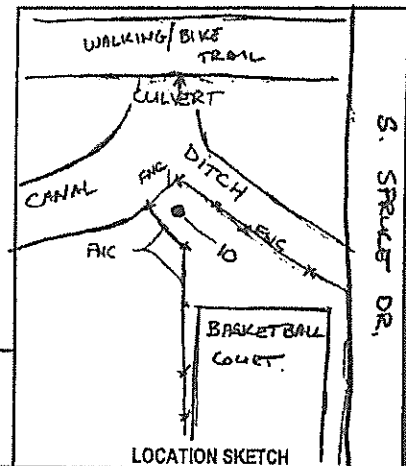
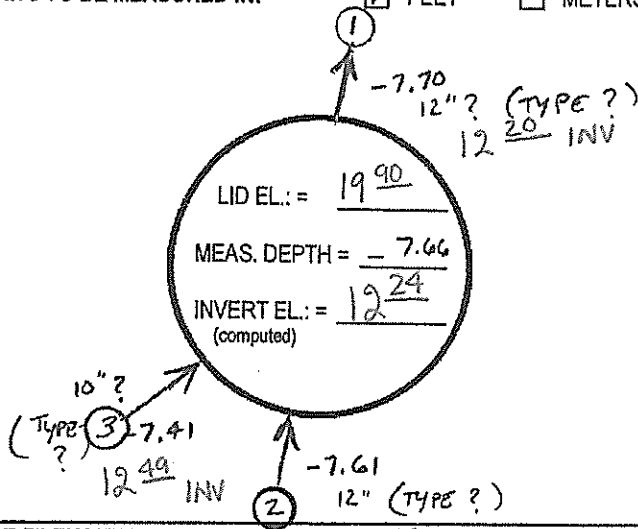
STREET NAME(S): S. SPRUCE ST

NEAREST CROSS STREET: HUNTINGTON AVE

NEAREST ADDRESS No.: 121 FRANCISCO DR.

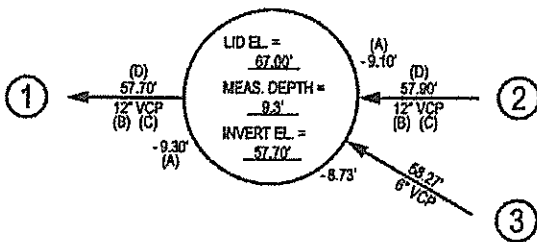
SPECIAL MARKINGS: "ASAX FOUNDRY"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: 12 29 INV

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
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CLIENT:

JOB No.:

15695

CREW:

JM / DS

DATE:

2018 / 12 / 15

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: 28	FIELD BOOK:
	AKEL	So. SF, CA	OF PAGES	PAGE:

POINT I.D.: 11

MANHOLE No.: WH670

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

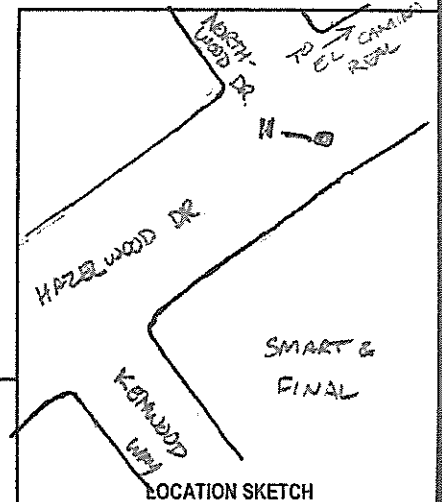
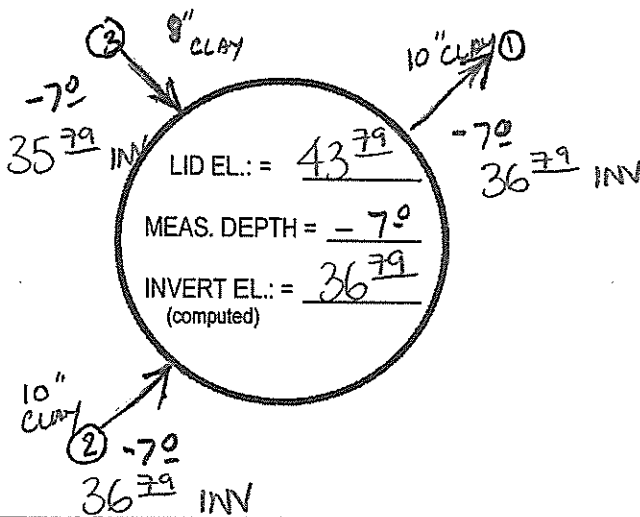
STREET NAME(S): HAZELWOOD DR.

NEAREST CROSS STREET: NORTHWOOD DR.

NEAREST ADDRESS No.: 249 KENWOOD WAY

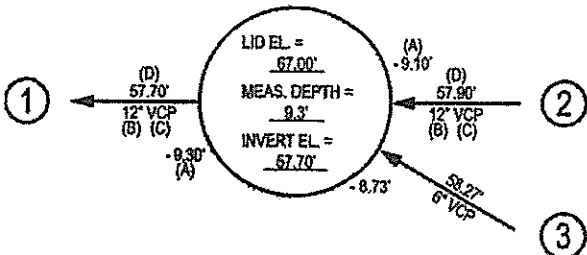
SPECIAL MARKINGS: N/A

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
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- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
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- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
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CLIENT:
CITY OF SO. SF

JOB No.:
15695-101

CREW:
JM / CP

DATE:
2018 / 12 / 28

MANHOLE DIPSHEET

PROJECT NAME:
AKEL

PROJECT LOCATION:
**S. SAN FRANCISCO,
CA**

PAGE NUMBER: **6**
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 12

MANHOLE No.: WH 753

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

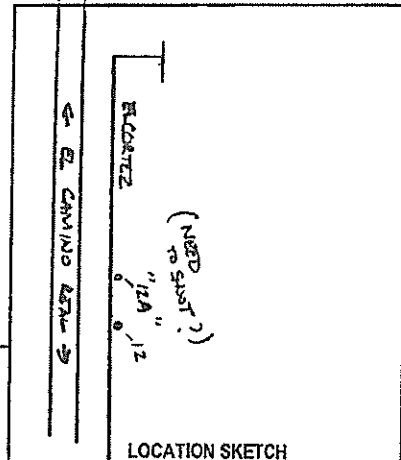
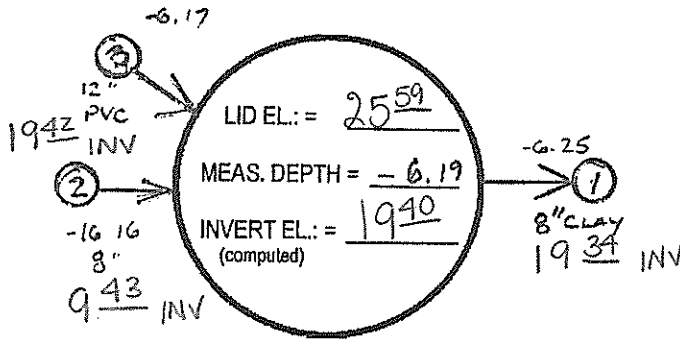
STREET NAME(S): EL CORTEZ

NEAREST CROSS STREET: FRANCISCO DR

NEAREST ADDRESS No.: 348 EL CORTEZ AVE

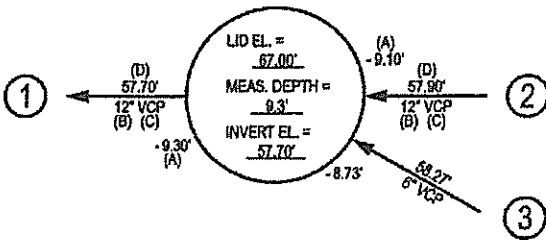
SPECIAL MARKINGS: "S"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

JOB No.:

15695

CREW:

JM/DS

DATE:

2018/12/15

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

PAGE NUMBER: 7

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 12 A ~~(NEED TO SHOOT?)~~ SHOT ✓

MANHOLE No.: WH753

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

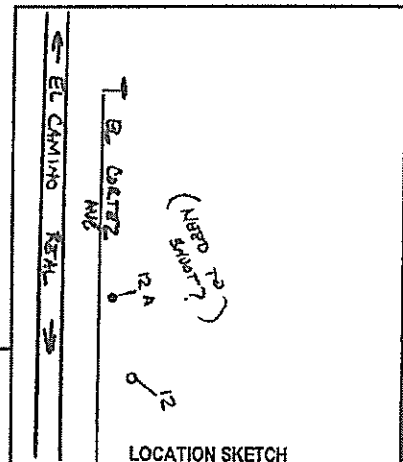
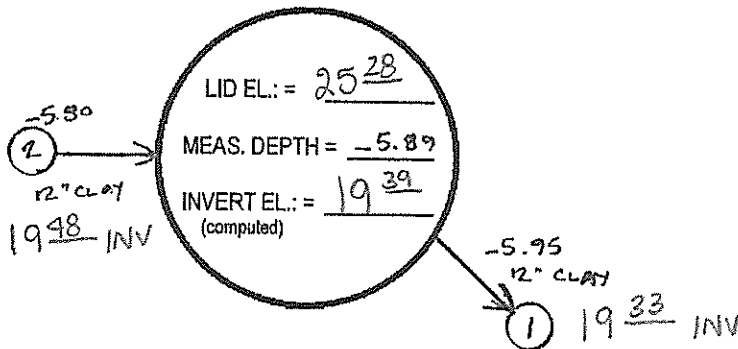
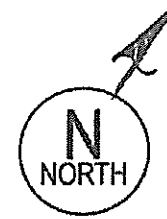
STREET NAME(S): EL CORTEZ AVE

NEAREST CROSS STREET: FRANCISCO DR.

NEAREST ADDRESS No.: 348 EL CORTEZ AVE

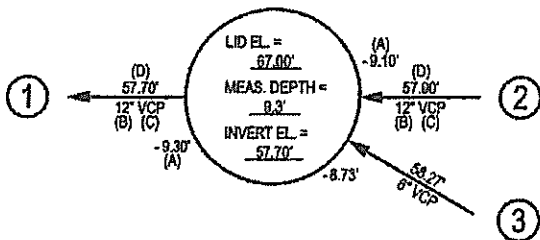
SPECIAL MARKINGS: N/A

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

JOB No.:

15695

CREW:

JM/DS

DATE:

2018-12-15

POINT I.D.: 13

MANHOLE No.: WH1833

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

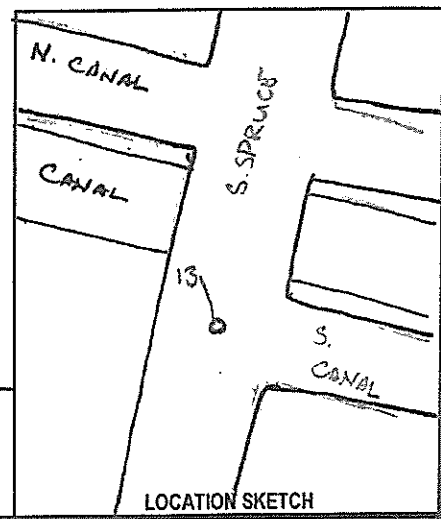
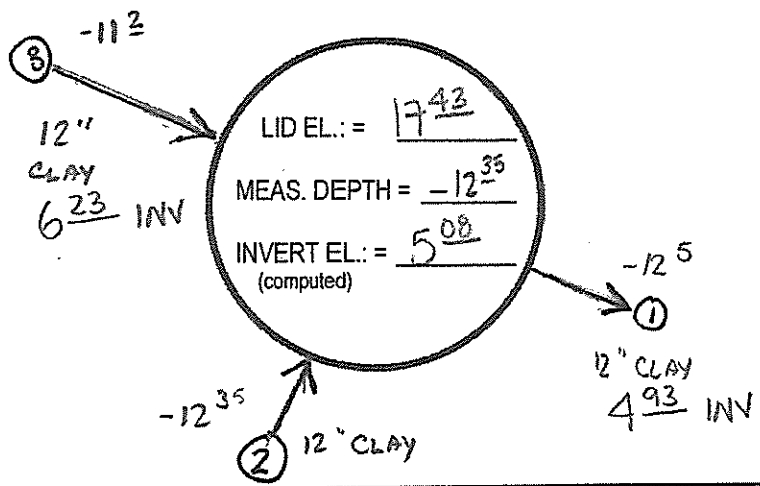
STREET NAME(S): S. SPRUCE AVE

NEAREST CROSS STREET: S. CANAL ST.

NEAREST ADDRESS No.: 106 S. SPRUCE AVE

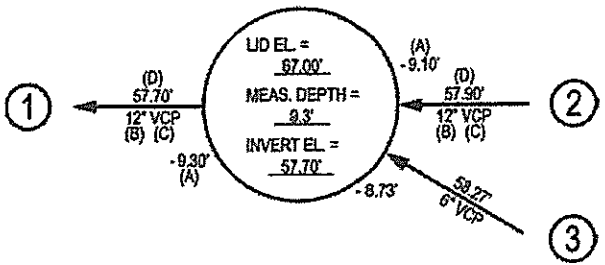
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: 508 INV

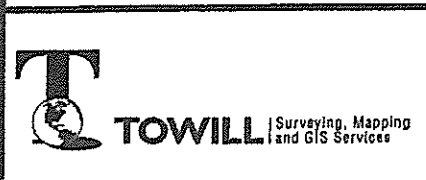
EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
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- 3) FILL IN LID ELEVATION.
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- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
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- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: CITY OF So. SF

JOB No.: 15695-101

CREW: JM/CP

DATE: 2018/12/28

MANHOLE DIPSHEET

PROJECT NAME:
AKEL

PROJECT LOCATION:
So. SF, CA

PAGE NUMBER: **4**
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 14

MANHOLE No.: WL2651

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

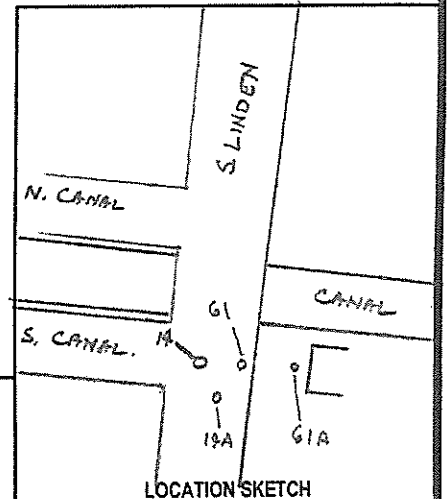
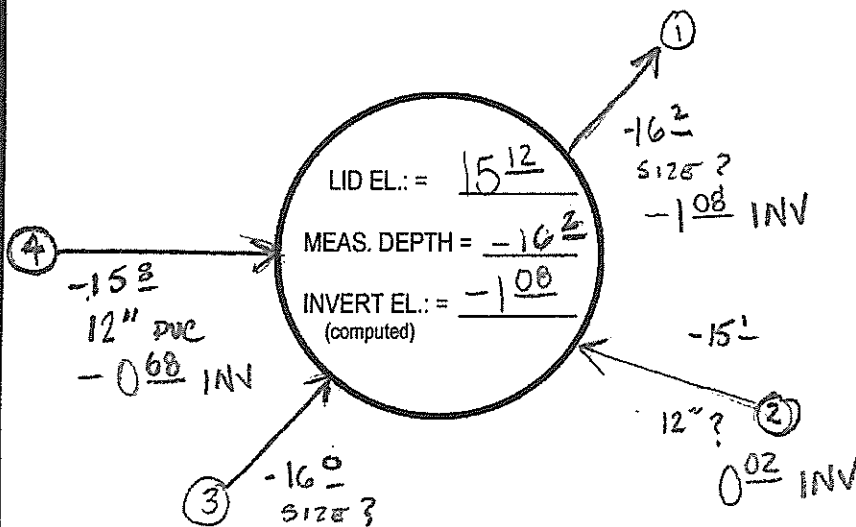
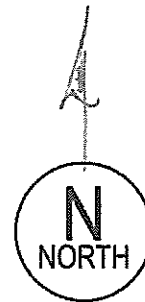
STREET NAME(S): S. LINDEN AVE

NEAREST CROSS STREET: S. CANAL ST,

NEAREST ADDRESS No.: 35 S. LINDEN

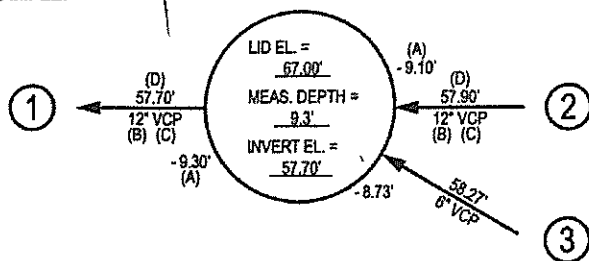
SPECIAL MARKINGS: "CITY OF S. SAN FRANCISCO

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: -0.88 INV

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
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CLIENT:
CITY OF So. SF

CREW:
JM/ep

JOB No.:
15695-101

DATE:
2018/12/28

MANHOLE DIPSHEET

PROJECT NAME:

AK5L

PROJECT LOCATION:

S. SAN FRANCISCO,
CA

PAGE NUMBER: 3

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 14A

MANHOLE No.: WL2651

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

STREET NAME(S): S. LINDEN AVE

NEAREST CROSS STREET: S. CANAL ST

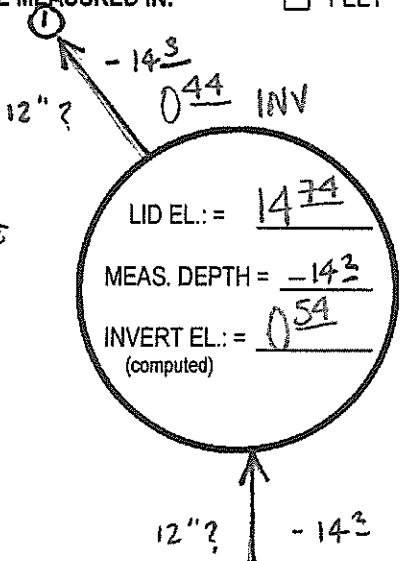
NEAREST ADDRESS No.: 35 S. LINDEN AVE.

SPECIAL MARKINGS: 118"

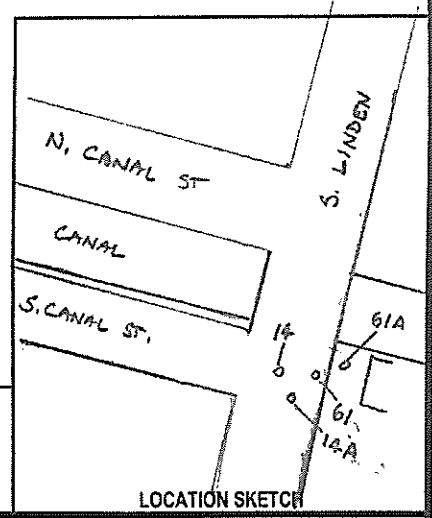
UNITS TO BE MEASURED IN: FEET METERS



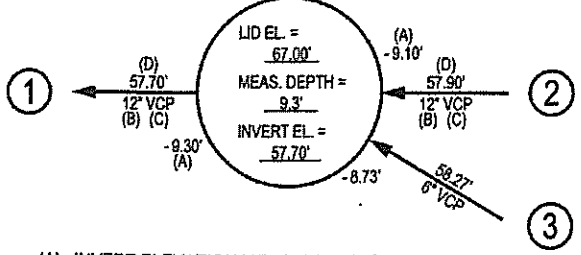
CAN'T
DETERMINE
PIPE SIZES



PICTURE FILENAMES: ② 054 INV



EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
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CLIENT:
CITY OF S. SF

JOB No.:
15695-101

CREW:
JM/CP

DATE:
2018/12/28

POINT I.D.: 15

MANHOLE No.: WD2638

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

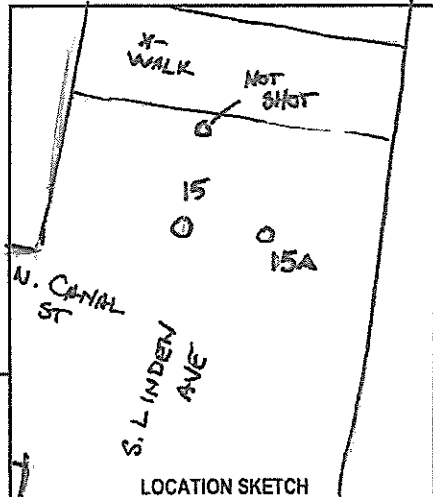
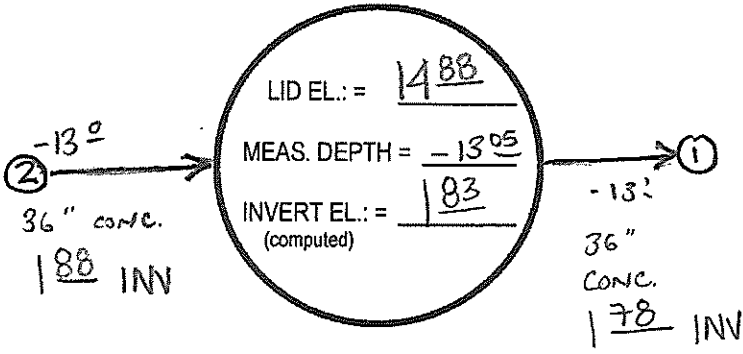
STREET NAME(S): S. LINDEN AVE

NEAREST CROSS STREET: N. CANAL ST.

NEAREST ADDRESS No.: 26 S. LINDEN AVE

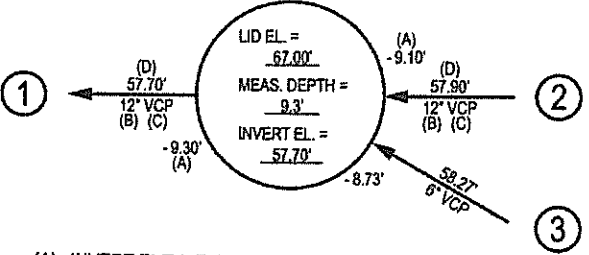
SPECIAL MARKINGS: "S"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
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- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:
CITY OF So. SF

JOB No.:
15695

CREW:
JM / CP

DATE:
2018/12/28

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

So. SF, CA

PAGE NUMBER: 19

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 15A

MANHOLE No.: WD2638

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

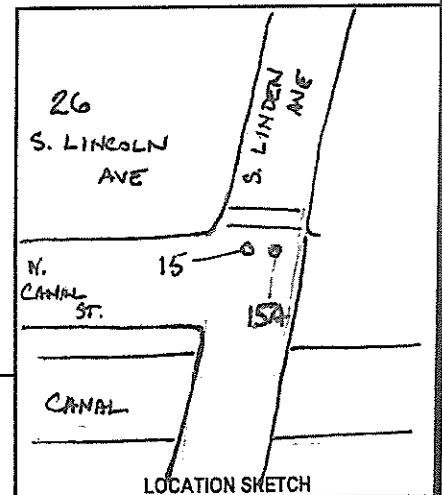
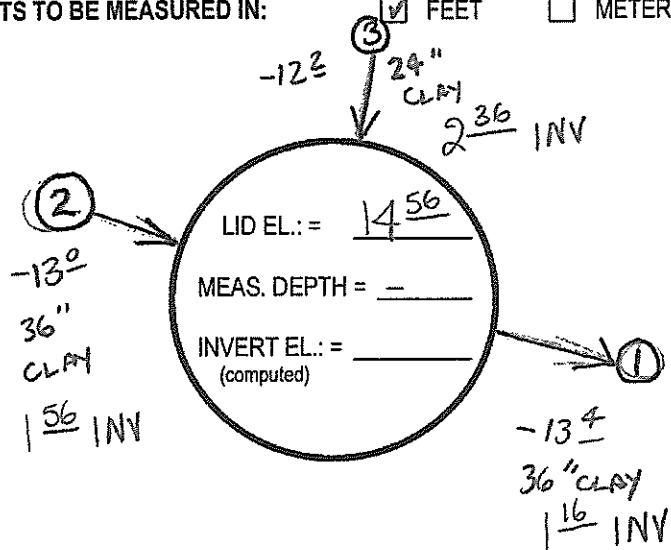
STREET NAME(S): S. LINDEN AVE

NEAREST CROSS STREET: N. CANAL ST

NEAREST ADDRESS No.: 26 S. LINDEN AVE

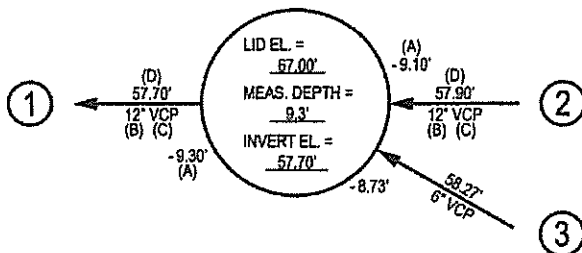
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

CITY OF So. SF

JOB No.:

15695-101

CREW:

JM / CP

DATE:

2/18 / 12 / 28

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: 23	FIELD BOOK:
	AKEL	SO. SF, CA	OF PAGES	PAGE:

POINT I.D.: 16

MANHOLE No.: WE1828

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

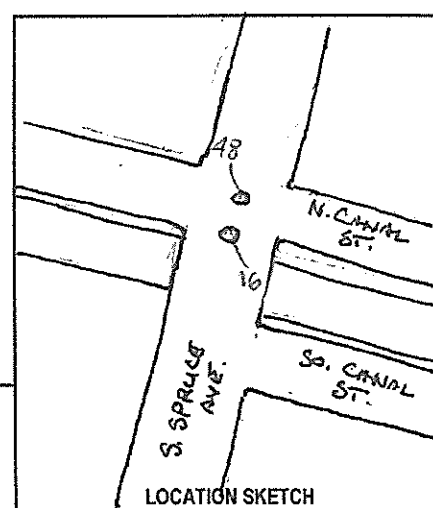
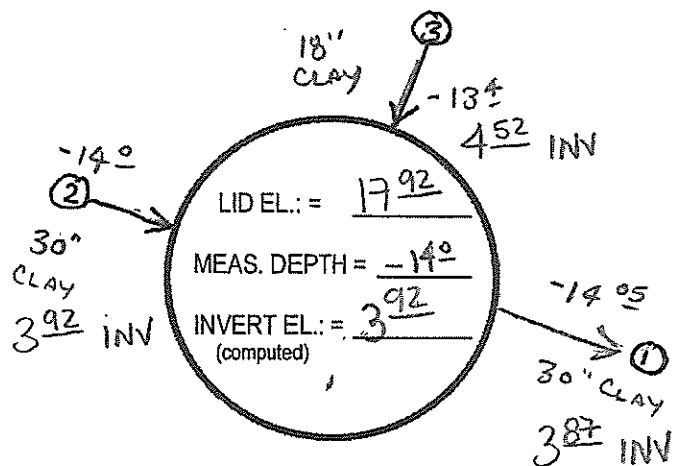
STREET NAME(S): S. SPRUCE

NEAREST CROSS STREET: N. CANAL ST.

NEAREST ADDRESS No.: 90 S. SPRUCE ST

SPECIAL MARKINGS: N/A

UNITS TO BE MEASURED IN: FEET METERS

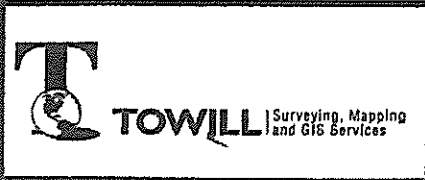


PICTURE FILENAMES:

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:**
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
 - 2) DRAW NORTH ARROW ABOVE.
 - 3) FILL IN LID ELEVATION.
 - 4) FILL IN MEASURED DEPTH.
 - 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
 - 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
 - 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
 - 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: CITY OF SO. SF

JOB No.: 15695-101

CREW: JM / CD

DATE: 2018 / 12 / 28

POINT I.D.: 17

MANHOLE No.: WD2586

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

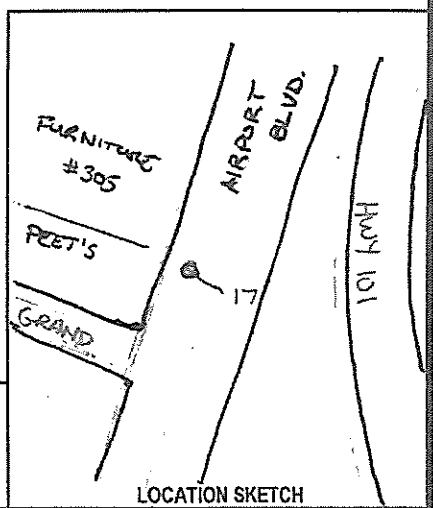
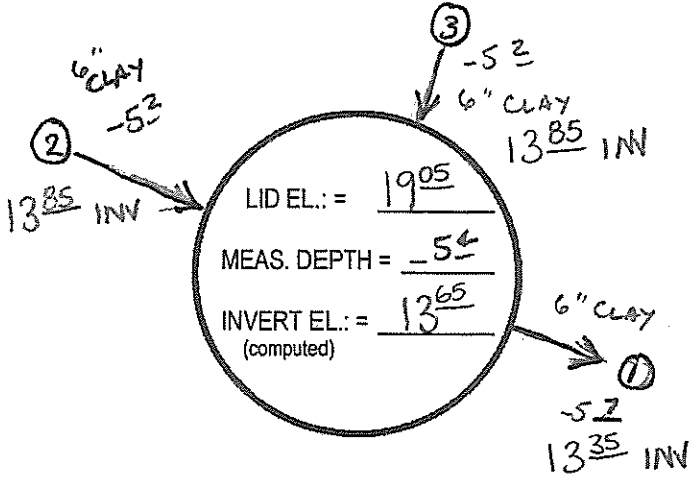
STREET NAME(S): AIRPORT BLVD.

NEAREST CROSS STREET: GRAND AVE

NEAREST ADDRESS No.: 305 AIRPORT BLVD.

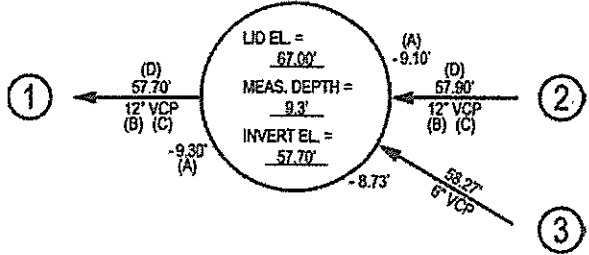
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



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CLIENT:
CITY OF So. SF

JOB No.:
15695-101

CREW:
JM / CP

DATE:
2018/12/28

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: 8	FIELD BOOK:
	SSF SEWER	SOUTH SAN FID	OF 20 PAGES	PAGE:

POINT I.D.: 18

MANHOLE No.: WC 2913

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

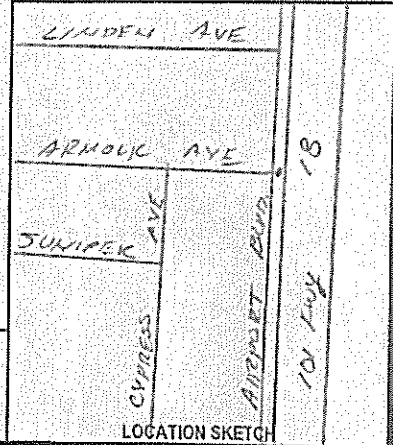
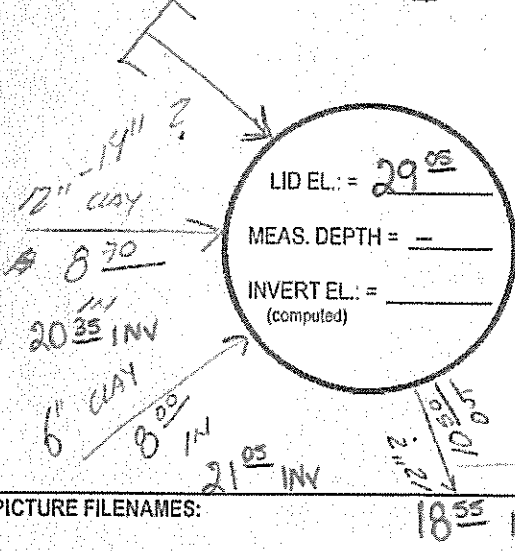
STREET NAME(S): ARMOUR AVE

NEAREST CROSS STREET: AIRPORT BLVD

NEAREST ADDRESS No.: 751 AIRPORT BLVD

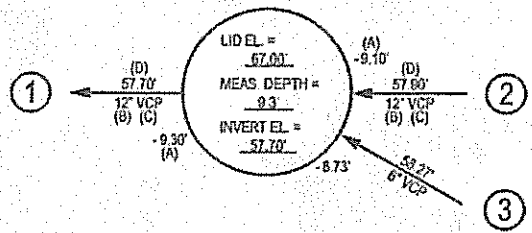
SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE; FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

	CLIENT:	CREW:
	SSF - AKEL	EB / MY
JOB No.:	DATE:	
15695	2018-12-15	

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER:	FIELD BOOK:
	SSF SEWER	SOUTH SAN FLA.	12 OF 20 PAGES	PAGE:

POINT I.D.: 19

MANHOLE No.: WD 7554

MANHOLE TYPE: SS SD ELEC TEL OTHER: POSSIBLE 315"

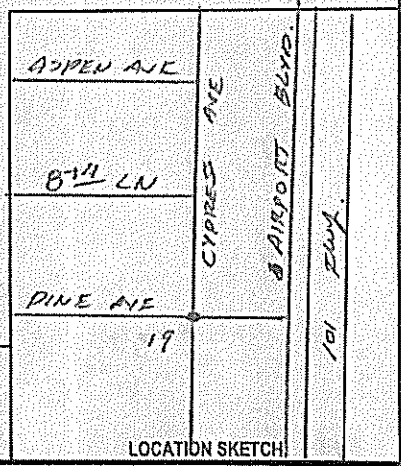
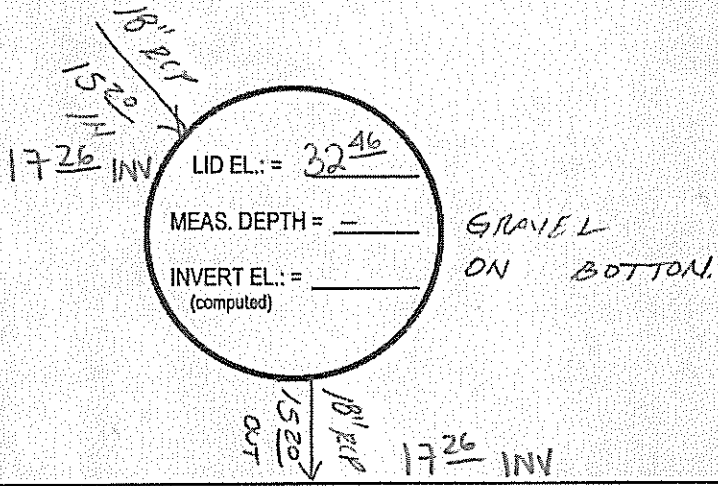
STREET NAME(S): CYPRESS AVE

NEAREST CROSS STREET: PINE AVE

NEAREST ADDRESS No.: _____

SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: _____

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
 - 2) DRAW NORTH ARROW ABOVE.
 - 3) FILL IN LID ELEVATION.
 - 4) FILL IN MEASURED DEPTH.
 - 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
 - 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
 - 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
 - 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

	CLIENT:	CREW:
	SSF - AKEL	EB / MY
JOB No.:	DATE:	
15695	2018-12-15	

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: //	FIELD BOOK:
	SSF SEWER	SOUTH 34th AVE	OF 20 PAGES	PAGE:

POINT I.D.: 19A

MANHOLE No.: WD 2994

MANHOLE TYPE: SS SD ELEC TEL OTHER: POSSIBLE SD*

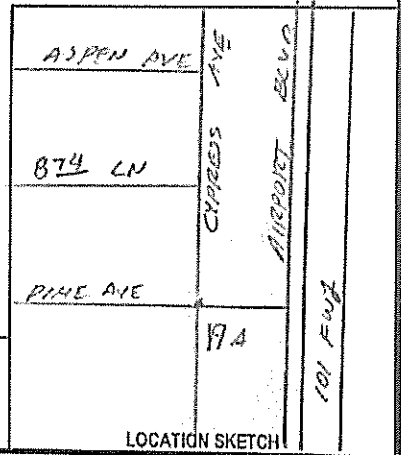
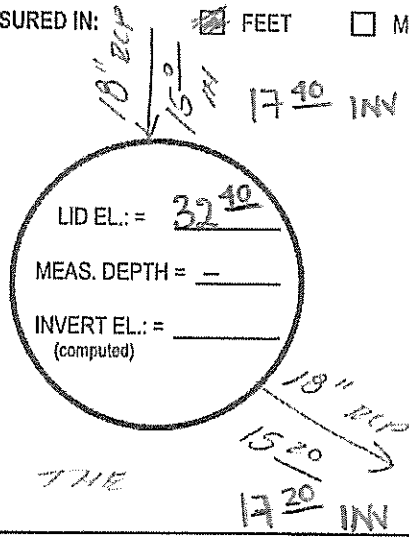
STREET NAME(S): CYPRESS AVE

NEAREST CROSS STREET: PIKE AVE

NEAREST ADDRESS No.: _____

SPECIAL MARKINGS: _____

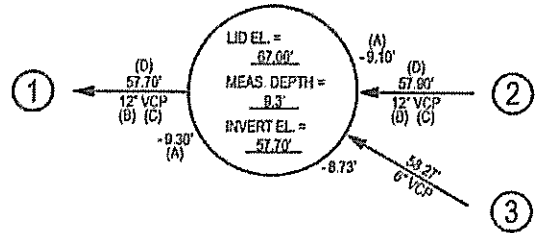
UNITS TO BE MEASURED IN: FEET METERS



GRAVEL IN THE BOTTOM

PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

	CLIENT:	CREW:
	SSF - AKEL	FB / MV
JOB No.:	DATE:	
15695	2018-12-15	

MANHOLE DIPSHEET	PROJECT NAME: SSF SEWER	PROJECT LOCATION: SOUTH SAN FCO.	PAGE NUMBER: 10 OF 20 PAGES	FIELD BOOK: PAGE:
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POINT I.D.: 19 B

MANHOLE No.: WD 2554

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

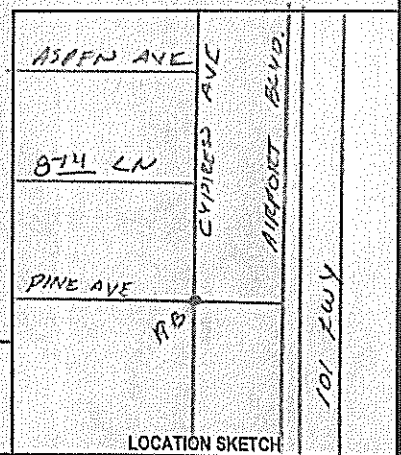
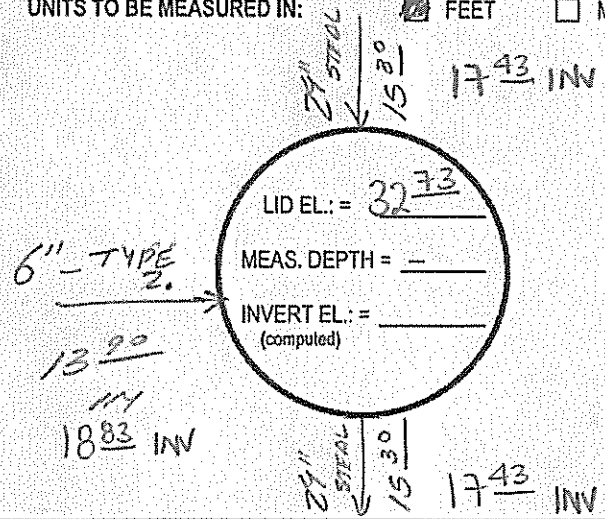
STREET NAME(S): CYPRESS AVE

NEAREST CROSS STREET: PINE AVE

NEAREST ADDRESS No.: _____

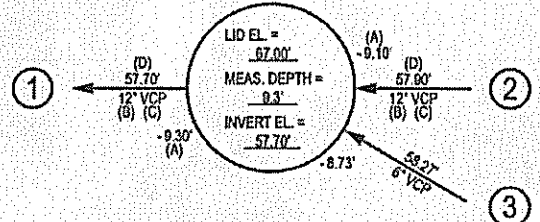
SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: SSF - AKEL

JOB No.: 15695

CREW: EB/ MV

DATE: 2018-12-15

POINT I.D.: 20

MANHOLE No.: WC2408

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

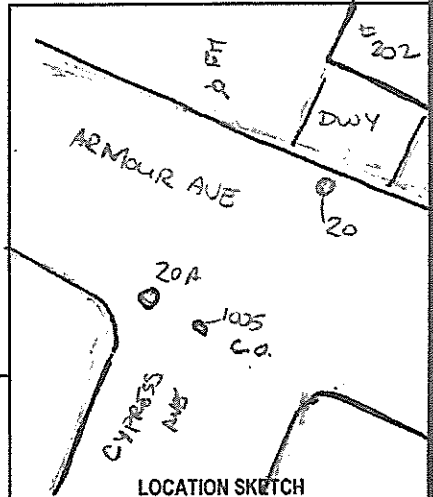
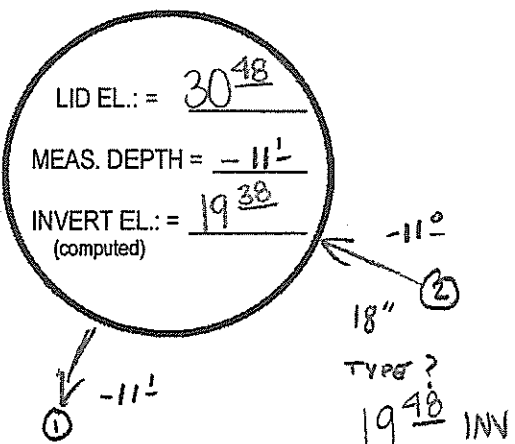
STREET NAME(S): ARMOUR AVE

NEAREST CROSS STREET: CYPRESS AVE

NEAREST ADDRESS No.: 202 ARMOUR

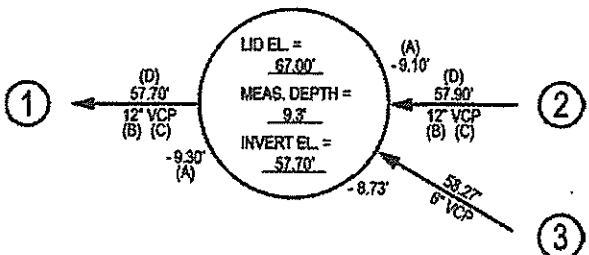
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: 19.38 INV

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



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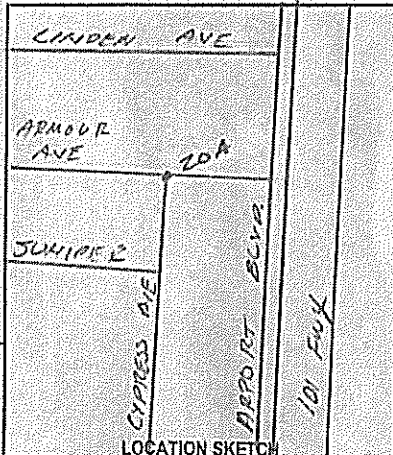
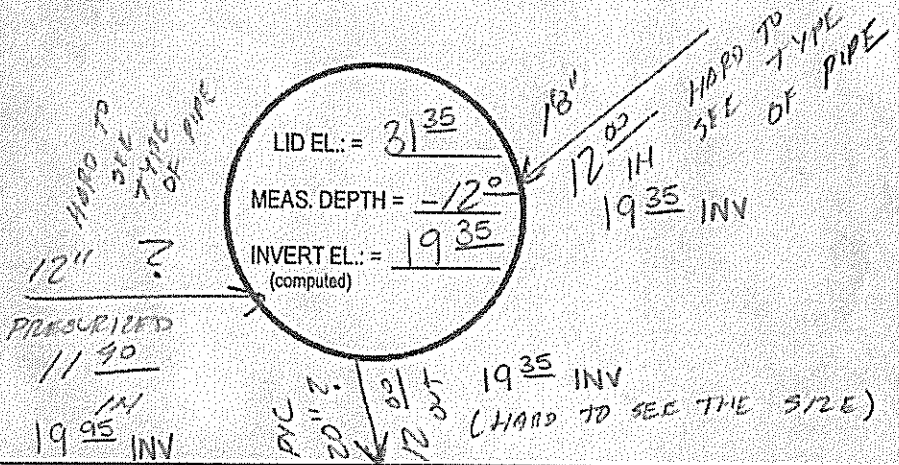
CLIENT: CITY OF SO. SF

JOB No.: 15695-101

CREW: JM / CP

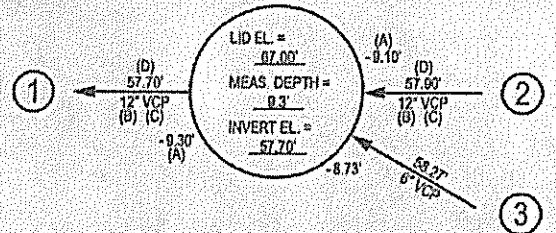
DATE: 2018 / 12 / 28

POINT I.D.: 20A
 MANHOLE No.: WC 2408
 MANHOLE TYPE: SS SD ELEC TEL OTHER: _____
 STREET NAME(S): ARMOUR AVE
 NEAREST CROSS STREET: CYPRESS AVE
 NEAREST ADDRESS No.: _____
 SPECIAL MARKINGS: _____
 UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: _____

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: SSF - AKEL
 JOB No.: 15695

CREW: FBI/MY
 DATE: 2018-12-15

POINT I.D.: 21

MANHOLE No.: WD2555

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

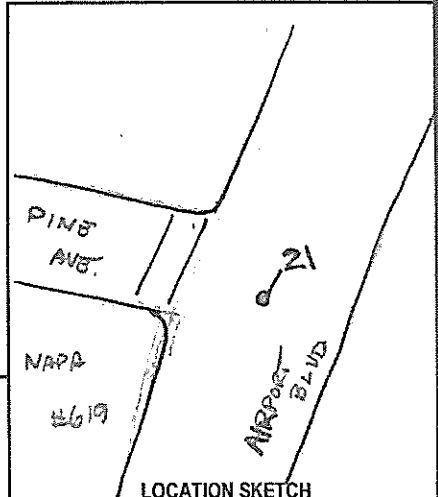
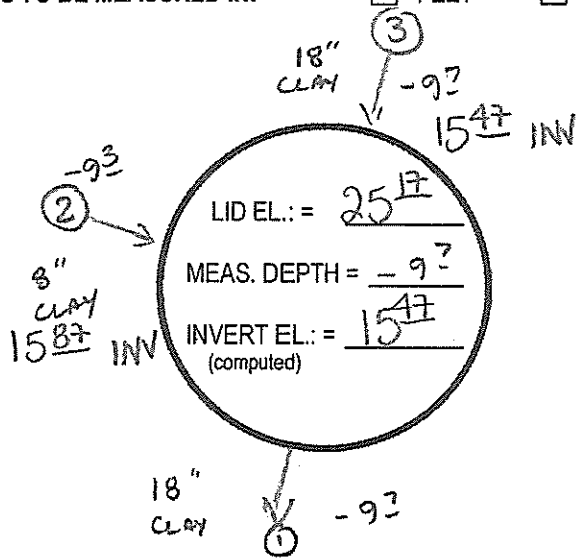
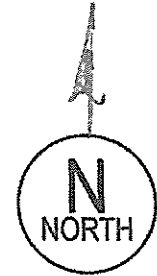
STREET NAME(S): AIRPORT BLVD.

NEAREST CROSS STREET: PINE AVE

NEAREST ADDRESS No.: 619 AIRPORT BLVD.

SPECIAL MARKINGS: N/A

UNITS TO BE MEASURED IN: FEET METERS

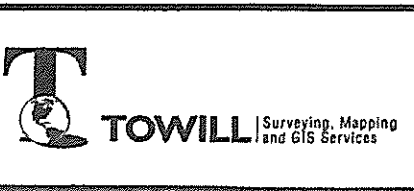


PICTURE FILENAMES: 15.47 INV

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:**
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
 - 2) DRAW NORTH ARROW ABOVE.
 - 3) FILL IN LID ELEVATION.
 - 4) FILL IN MEASURED DEPTH.
 - 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
 - 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
 - 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
 - 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: CITY OF SO. SF

JOB No.: 15695-101

CREW: JM / CP

DATE: 2018 / 12 / 28

MANHOLE DIPSHEET

PROJECT NAME:

SSF SEWER

PROJECT LOCATION:

SOUTH SAN FIB

PAGE NUMBER: 15

OF 20 PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 22

MANHOLE No.: WD 2563

MANHOLE TYPE: SS SD ELEC TEL OTHER

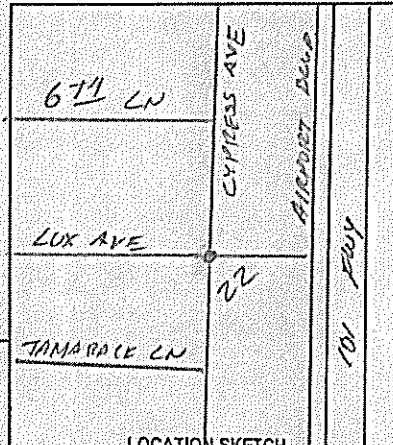
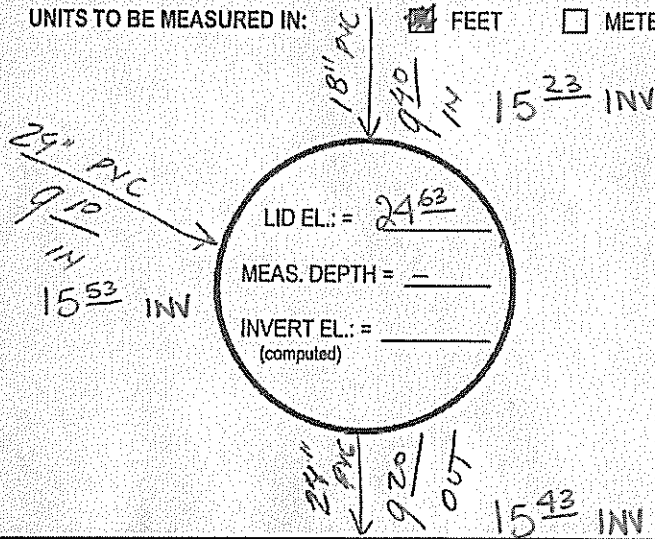
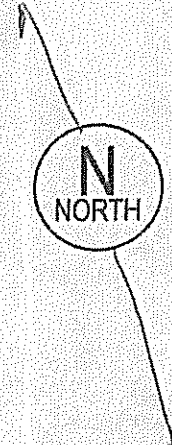
STREET NAME(S): LUX AVE

NEAREST CROSS STREET: CYPRESS AVE

NEAREST ADDRESS No.:

SPECIAL MARKINGS:

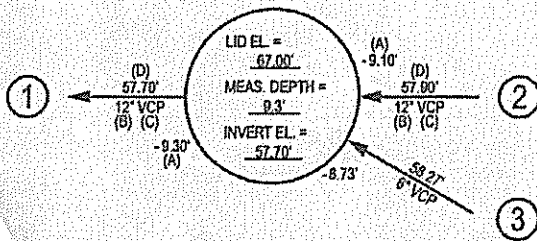
UNITS TO BE MEASURED IN: FEET METERS



LOCATION SKETCH

PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

SSF - AKEL

CREW:

EBI MY

JOB No.:

15695

DATE:

2018-12-15

MANHOLE DIPSHEET

PROJECT NAME: SSF SEWER

PROJECT LOCATION: SOUTH SAN FCO.

PAGE NUMBER: 14
OF 20 PAGES

FIELD BOOK: _____
PAGE: _____

POINT I.D.: 23

MANHOLE No.: WD 2561

MANHOLE TYPE: SS SD ELEC TEL OTHER _____

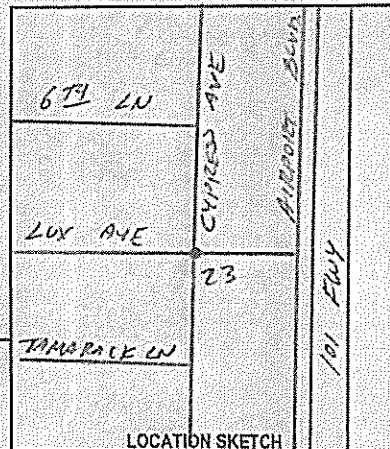
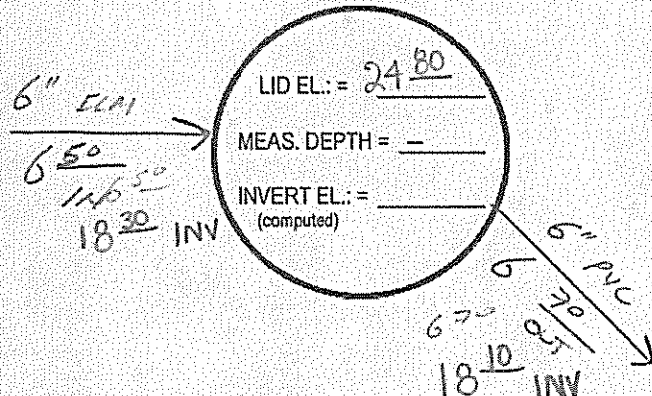
STREET NAME(S): LUX AVE

NEAREST CROSS STREET: CYPRESS AVE

NEAREST ADDRESS No.: _____

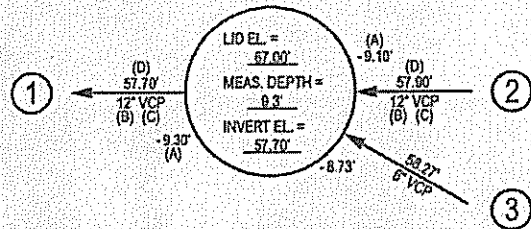
SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: _____

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: SSF - AKEL

CREW: EB / MY

JOB No.: 15695

DATE: 2018-12-15

POINT I.D.: 24

MANHOLE No.: WD 2564

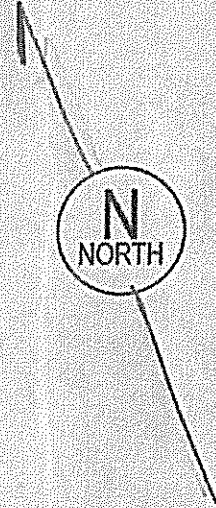
MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

STREET NAME(S): CYPRESS AVE

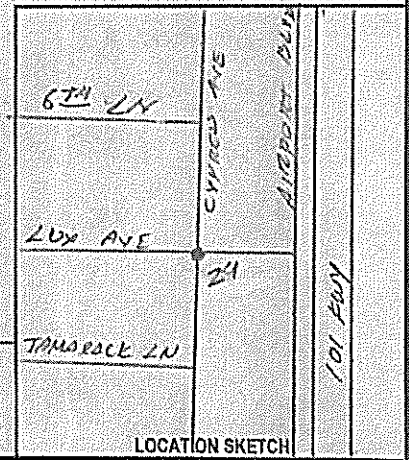
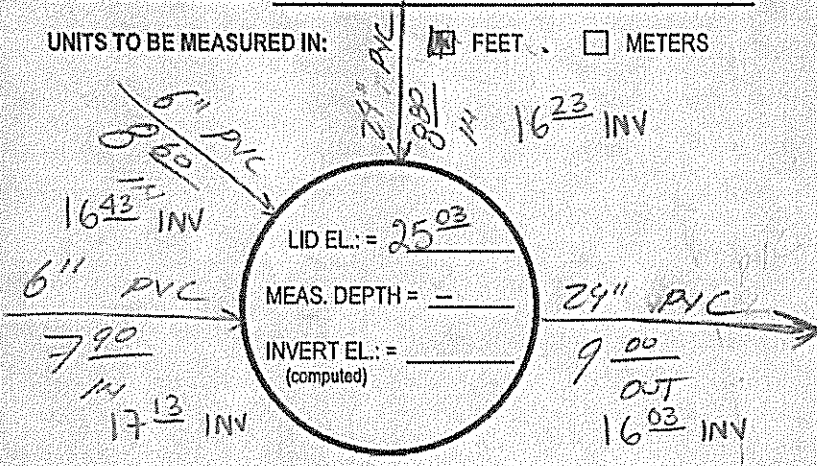
NEAREST CROSS STREET: LUX AVE

NEAREST ADDRESS No.: _____

SPECIAL MARKINGS: _____

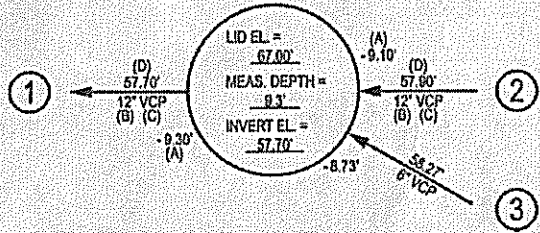


UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: SSF - AKEL

JOB No.: 15695

CREW: ED/MN

DATE: 2018-12-15

MANHOLE DIPSHEET

PROJECT NAME:

SSF SEWER

PROJECT LOCATION:

SOUTH SAN FWO.

PAGE NUMBER: 17
OF 20 PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 25

MANHOLE No.: WD 2573

MANHOLE TYPE: SS SD ELEC TEL OTHER

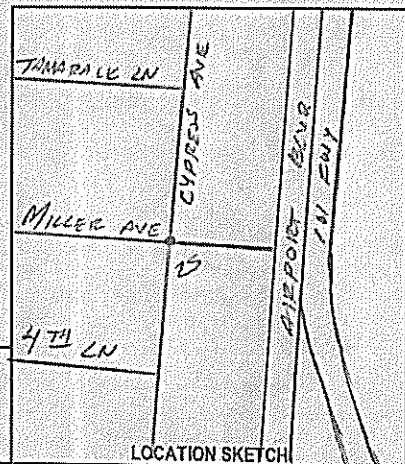
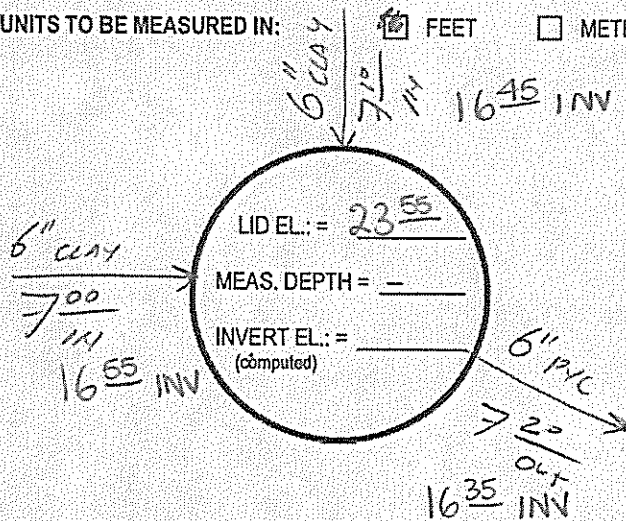
STREET NAME(S): MILLER AVE

NEAREST CROSS STREET: CYPRESS AVE

NEAREST ADDRESS No.:

SPECIAL MARKINGS:

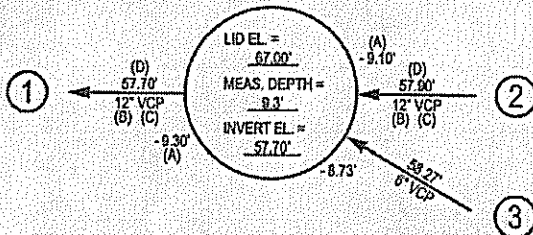
UNITS TO BE MEASURED IN: FEET METERS



LOCATION SKETCH

PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

SSF - AKEL

CREW:

EB / MV

JOB No.:

15695

DATE:

2018-12-15

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: 16	FIELD BOOK:
	SSF SEWER	SOUTH SAN FERNANDO	OF 20 PAGES	PAGE:

POINT I.D.: 25A

MANHOLE No.: WD 2573

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

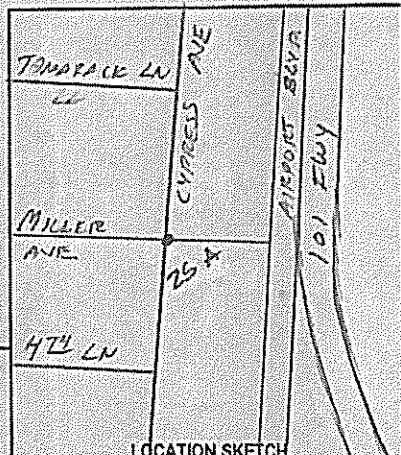
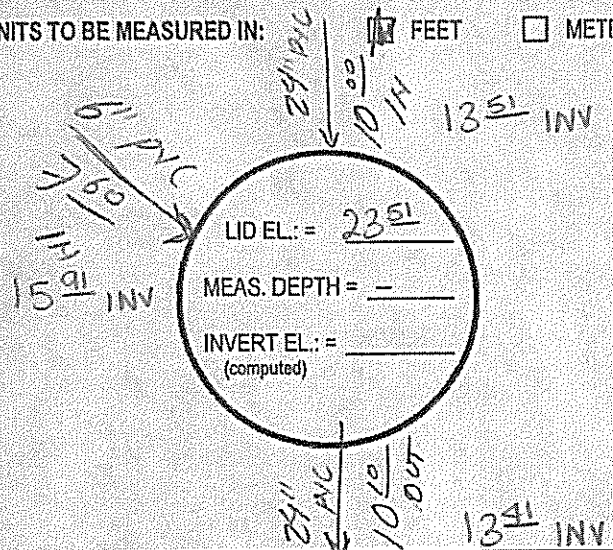
STREET NAME(S): MILLER AVE

NEAREST CROSS STREET: CYPRESS

NEAREST ADDRESS No.: _____

SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
 - 2) DRAW NORTH ARROW ABOVE.
 - 3) FILL IN LID ELEVATION.
 - 4) FILL IN MEASURED DEPTH.
 - 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
 - 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
 - 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
 - 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: SSF - AKEL

JOB No.: 15695

CREW: EB / MV

DATE: 2018-12-15

POINT I.D.: 28

MANHOLE No.: WL 2658

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

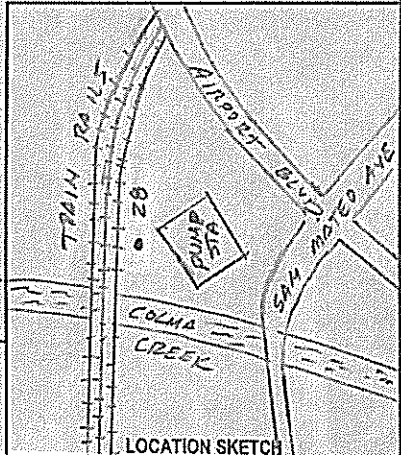
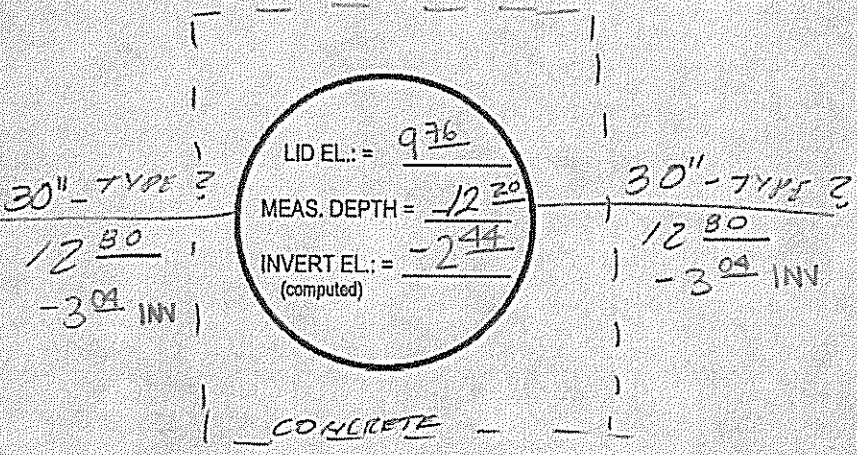
STREET NAME(S): NA

NEAREST CROSS STREET: AIRPORT BLVD.

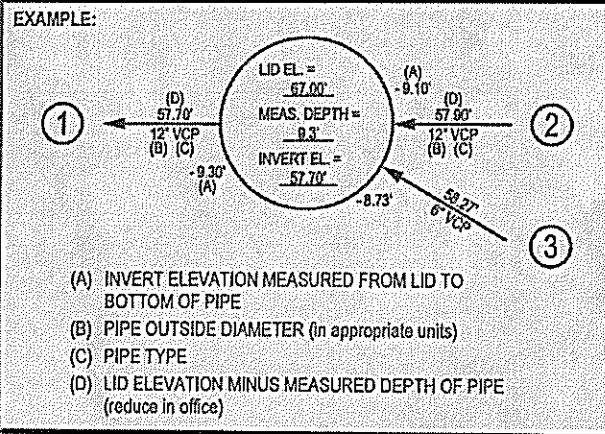
NEAREST ADDRESS No.: _____

SPECIAL MARKINGS: NEED P68E KEY TO ACCESS GATE

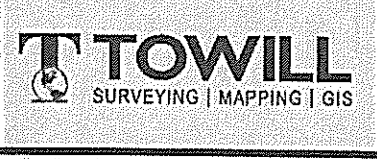
UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:



- GENERAL FIELD INSTRUCTIONS:
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
 - 2) DRAW NORTH ARROW ABOVE.
 - 3) FILL IN LID ELEVATION.
 - 4) FILL IN MEASURED DEPTH.
 - 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
 - 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
 - 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
 - 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: SSF - AXEL

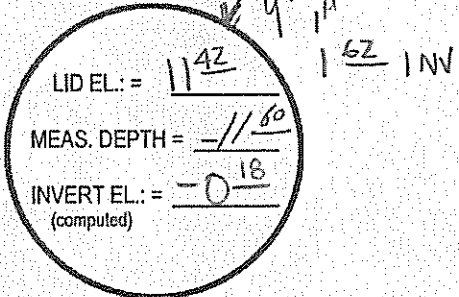
JOB No.: 15695

CREW: FBI / MY

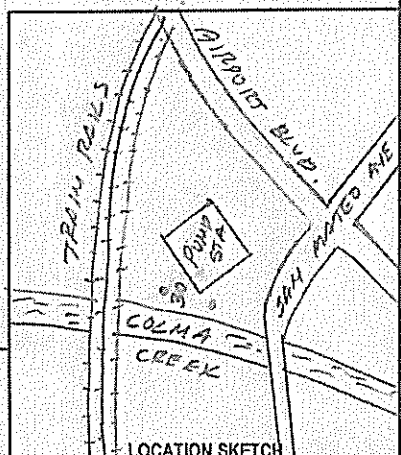
DATE: 2018-12-15

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: 20	FIELD BOOK:
	SSF SEWER	SOUTH SAN FCO.	OF 20 PAGES	PAGE:

POINT I.D.: 30
 MANHOLE No.: WL 2660
 MANHOLE TYPE: SS SD ELEC TEL OTHER: _____
 STREET NAME(S): N/A
 NEAREST CROSS STREET: AIRPORT BLVD
 NEAREST ADDRESS No.: _____
 SPECIAL MARKINGS: NEED POLE KEY TO ACCESS GATE
 UNITS TO BE MEASURED IN: FEET METERS

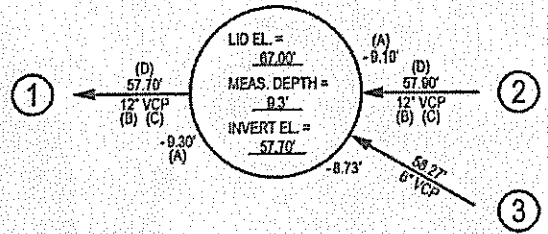


NOTE: SEEMS LIKE IS CLOGGED (SEE PICTURES)



PICTURE FILENAMES:

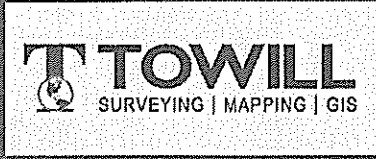
EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

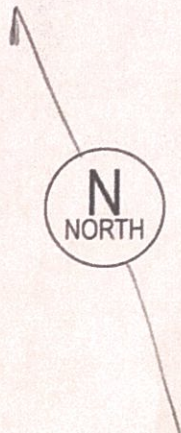


CLIENT: SSF - ADEL
 JOB No.: 15695

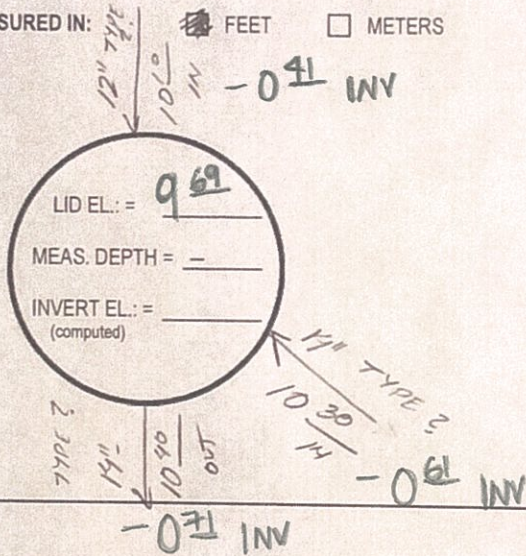
CREW: EB / MJ
 DATE: 2018-12-15

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER:	FIELD BOOK:
	SSF - AXEL	SOUTH SAN FCO	1 OF 8 PAGES	PAGE:

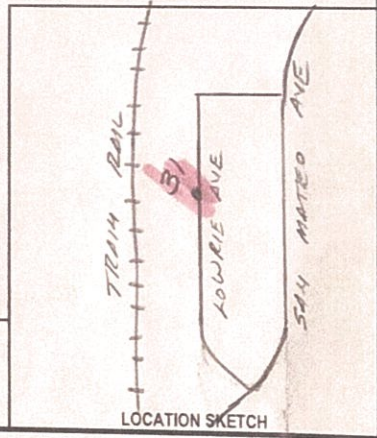
POINT I.D.: 31
 MANHOLE No.: WL2891
 MANHOLE TYPE: SS SD ELEC TEL OTHER: _____
 STREET NAME(S): LOWRIE AVE
 NEAREST CROSS STREET: SAN MATEO AVE
 NEAREST ADDRESS No.: _____
 SPECIAL MARKINGS: _____



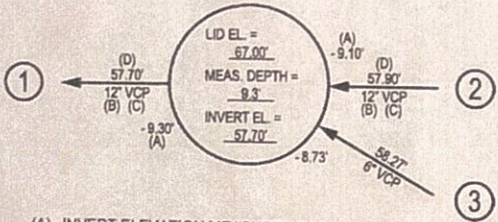
UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:



EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
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- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:	SSF - AXEL	CREW:	EB / MN
JOB No.:	15695 -101	DATE:	2018 - 12 - 18

MANHOLE DIPSHEET	PROJECT NAME: <i>SSF - AKEL</i>	PROJECT LOCATION: <i>SOUTH SAN FLO</i>	PAGE NUMBER: <i>2</i> OF <i>8</i> PAGES	FIELD BOOK: PAGE:
POINT I.D.: <u>32</u>				
MANHOLE No.: <u>WL 2890</u>				
MANHOLE TYPE: <input checked="" type="checkbox"/> SS <input type="checkbox"/> SD <input type="checkbox"/> ELEC <input type="checkbox"/> TEL <input type="checkbox"/> OTHER: _____				
STREET NAME(S): <u>LOWRIE AVE</u>				
NEAREST CROSS STREET: <u>SAN MATEO AVE</u>				
NEAREST ADDRESS No.: <u>1353 LOWRIE AVE</u>				
SPECIAL MARKINGS: _____				
UNITS TO BE MEASURED IN: <input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS				
PICTURE FILENAMES:				
EXAMPLE: 		GENERAL FIELD INSTRUCTIONS: 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE. 2) DRAW NORTH ARROW ABOVE. 3) FILL IN LID ELEVATION. 4) FILL IN MEASURED DEPTH. 5) DETERMINE THE FIRST <u>OUT FLOW</u> PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1. 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example). 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION. 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2. 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES. 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.		
		CLIENT: <i>SSF - AKEL</i>	CREW: <i>EB / MY</i>	
		JOB No.: <i>15695 - 101</i>	DATE: <i>2018 - 12 - 18</i>	

POINT I.D.: 34

MANHOLE No.: N/A MH-1

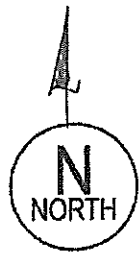
MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

STREET NAME(S): EUCALYPTUS AVE

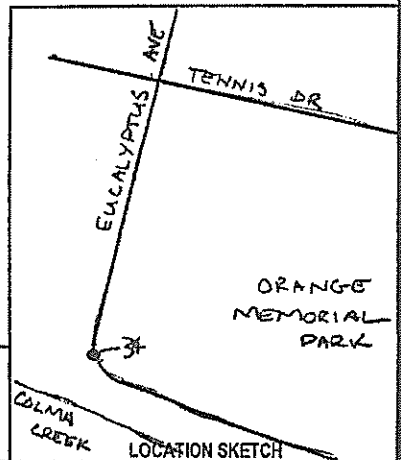
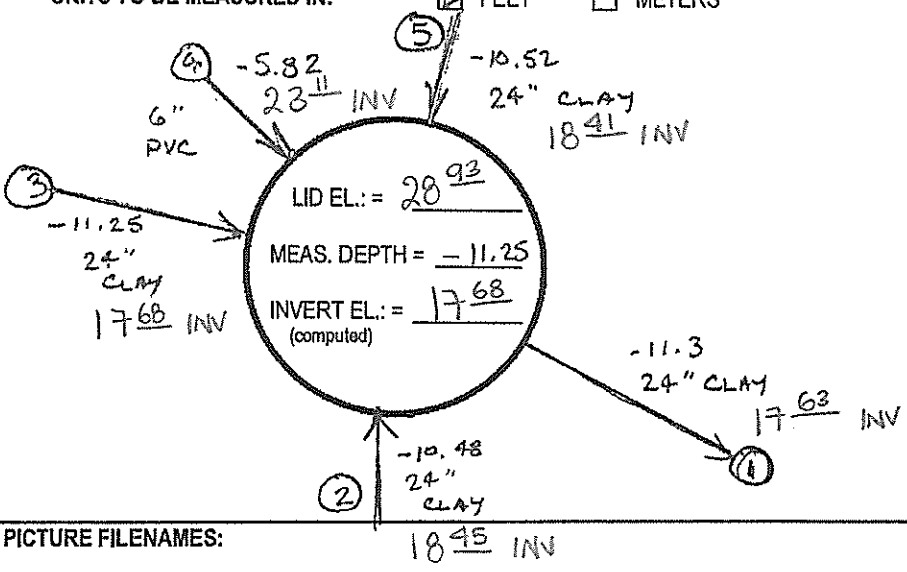
NEAREST CROSS STREET: TENNIS DR.

NEAREST ADDRESS No.: 781 TENNIS DR (PARK)

SPECIAL MARKINGS: N/A

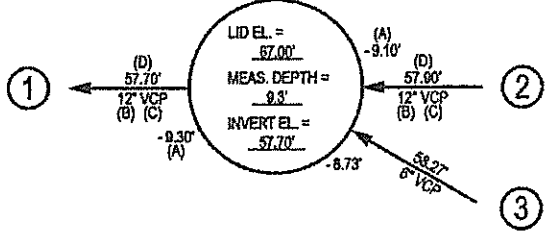


UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:
AKEL

JOB No.:
15695

CREW:
JM/DS

DATE:
2018-12-15

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

So. SF, CA

PAGE NUMBER: 40

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 35

MANHOLE No.: WE1493

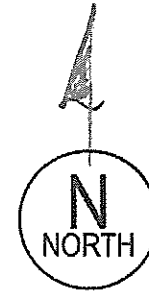
MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

STREET NAME(S): CHESTNUT AVE

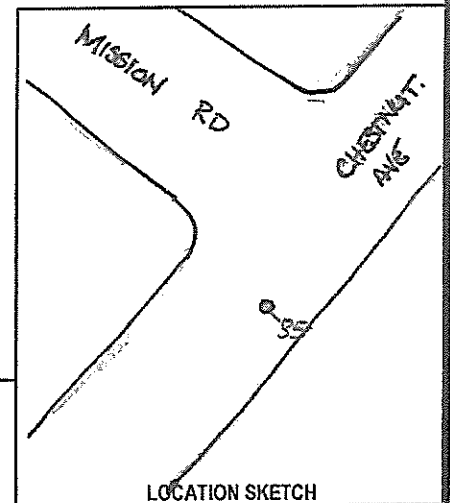
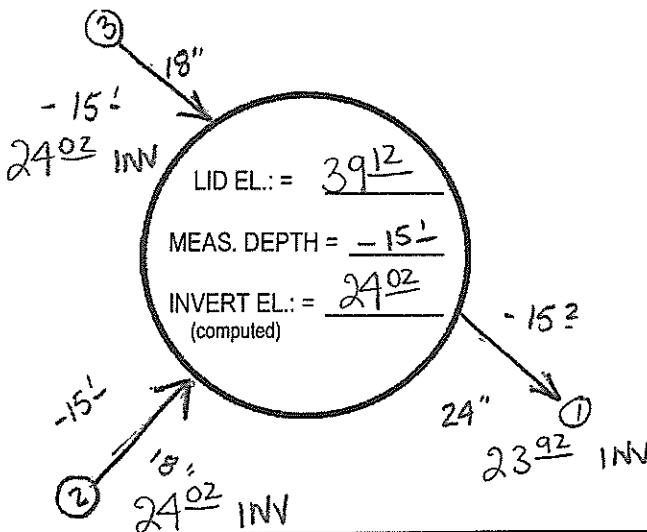
NEAREST CROSS STREET: MISSION RD.

NEAREST ADDRESS No.: 80 CHESTNUT AVE.

SPECIAL MARKINGS: "SANITARY SEWER"

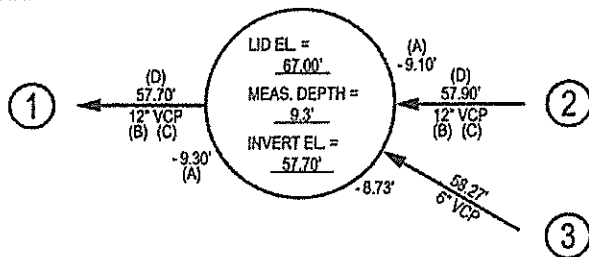


UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

CITY OF So. SF

CREW:

JM / CP

JOB No.:

15695-101

DATE:

2018 / 12 / 28

MANHOLE DIPSHEET

PROJECT NAME:

SSF-AKEL

PROJECT LOCATION:

SOUTH SAN FCO

PAGE NUMBER: /

OF 6 PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 36

MANHOLE No.: WG 1325

MANHOLE TYPE: SS SD ELEC TEL OTHER

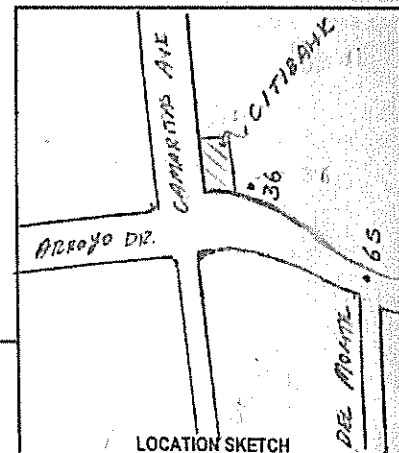
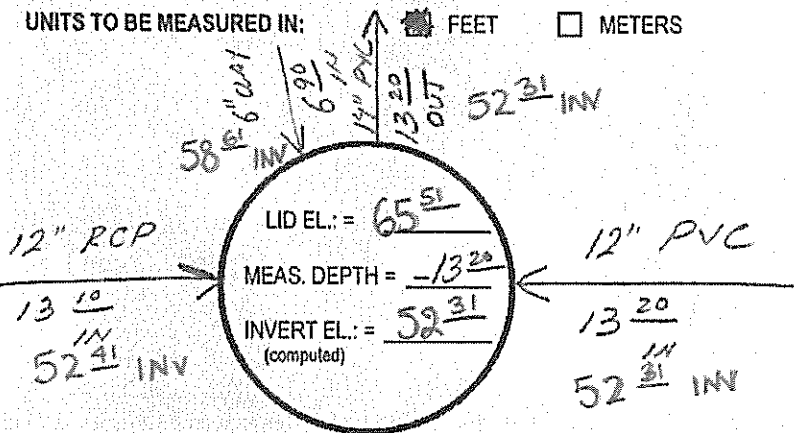
STREET NAME(S): Arroyo Dr

NEAREST CROSS STREET: 101 Arroyo Dr

NEAREST ADDRESS No.: OTY BANK

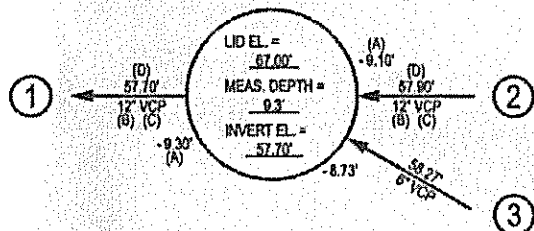
SPECIAL MARKINGS: BETWEEN SIDEWALK AND PARKING LOT

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

AKEL

JOB No.:

15695-101

CREW:

EB/JL/SS

DATE:

2018-12-06

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

So. SF, CA

PAGE NUMBER: 41

OF

PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 37

MANHOLE No.: WE1480

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

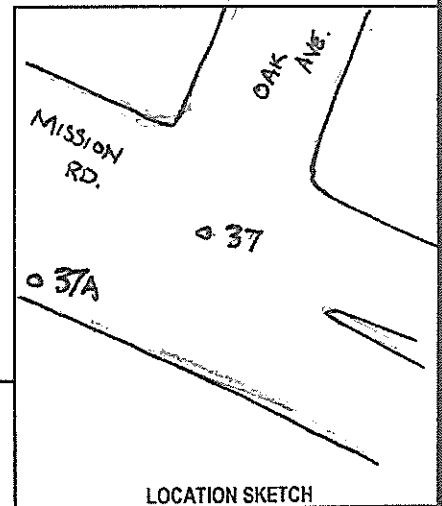
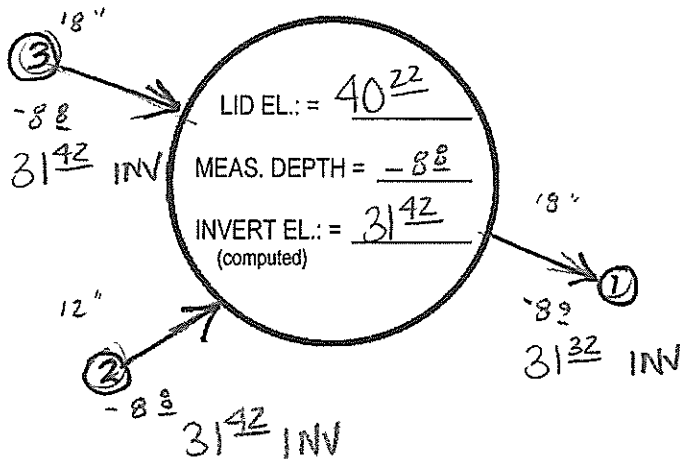
STREET NAME(S): MISSION RD.

NEAREST CROSS STREET: OAK AVE.

NEAREST ADDRESS No.: 956 MISSION RD.

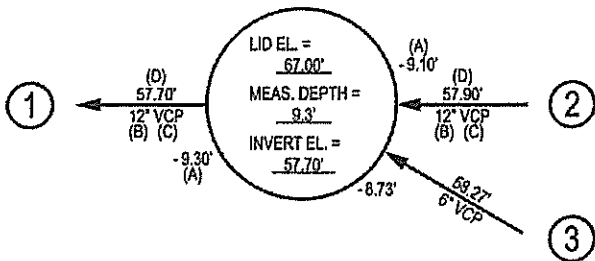
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 3) FILL IN LID ELEVATION.
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CLIENT:

CITY OF So. SF

JOB No.:

15695-101

CREW:

JM / CP

DATE:

2018/12/28

POINT I.D.: 37A

MANHOLE No.: WE 1488

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

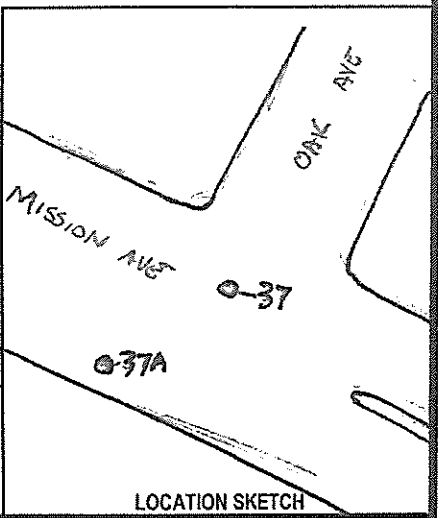
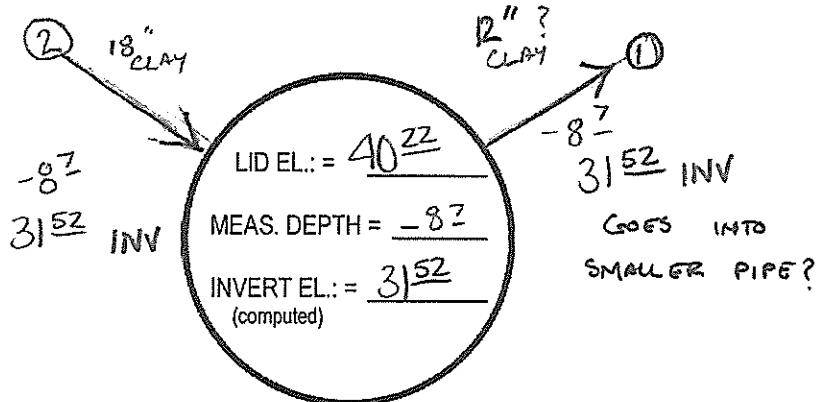
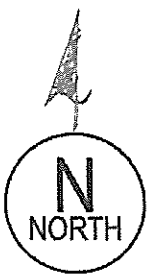
STREET NAME(S): MISSION RD

NEAREST CROSS STREET: oak ave

NEAREST ADDRESS No.: 956 MISSION RD.

SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:**
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
 - 2) DRAW NORTH ARROW ABOVE.
 - 3) FILL IN LID ELEVATION.
 - 4) FILL IN MEASURED DEPTH.
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 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:
CITY OF So. SF

JOB No.:
15695-101

CREW:
JM / CP

DATE:
2018/12/28

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

PAGE NUMBER: 10
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 38

MANHOLE No.: N/A WL2677

MANHOLE TYPE: SS SD ELEC TEL OTHER:

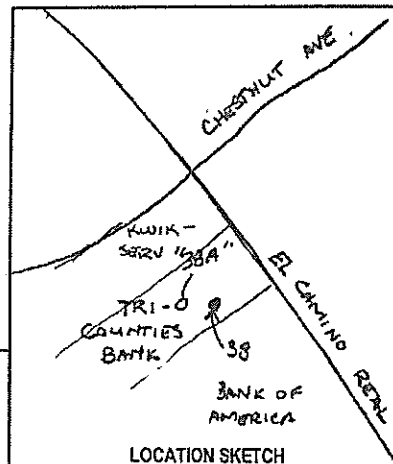
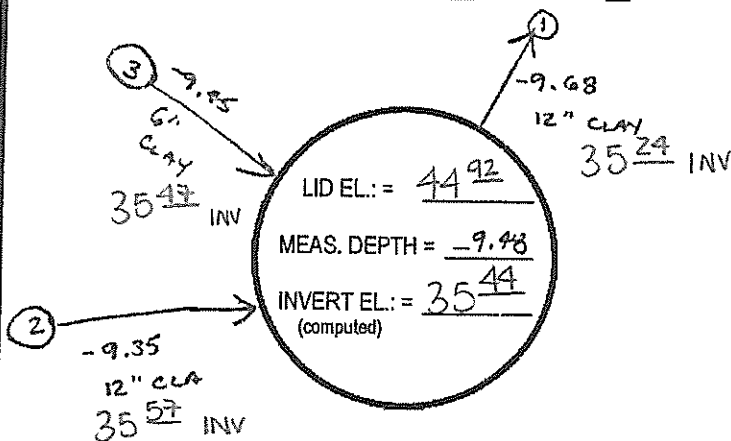
STREET NAME(S): CHESTNUT AVE

NEAREST CROSS STREET: EL CAMINO REAL

NEAREST ADDRESS No.: 975 EL CAMINO REAL

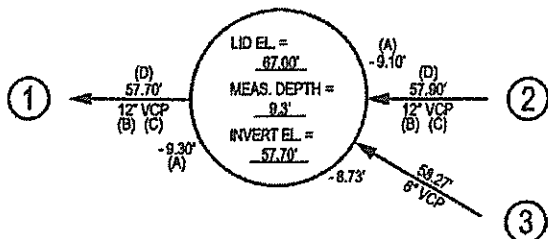
SPECIAL MARKINGS: "S"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

JOB No.:

15695

CREW:

JM / DS

DATE:

2018/12/15

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

S. SAN FRANCISCO, CA

PAGE NUMBER: 5

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 38 A NEEDS TO BE SHOT (UNDER AWNING)
SET (2) WORK PTS. FOR CONV.

MANHOLE No.: _____

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

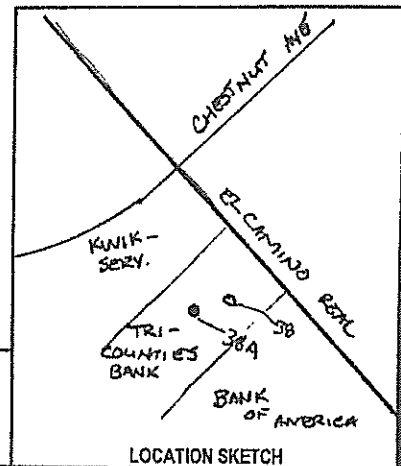
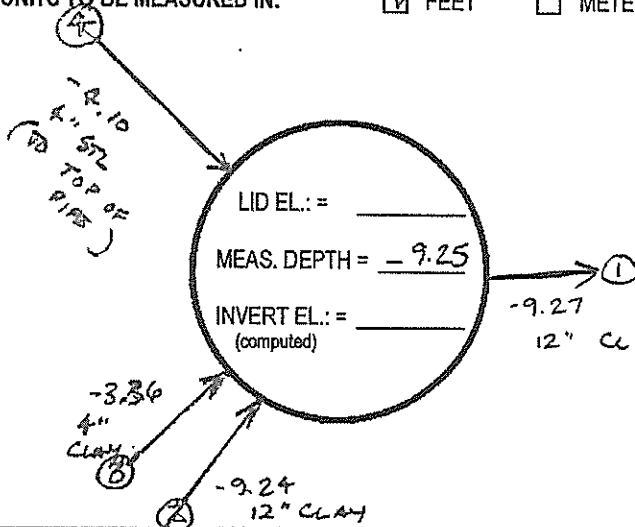
STREET NAME(S): EL CAMINO REAL

NEAREST CROSS STREET: CHESTNUT AVE

NEAREST ADDRESS No.: 975 EL CAMINO REAL

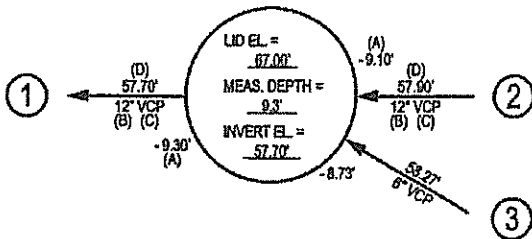
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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- 3) FILL IN LID ELEVATION.
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- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

JOB No.:

15695

CREW:

JM / OS

DATE:

2018/12/15

POINT I.D.: 39

MANHOLE No.: WD2583

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

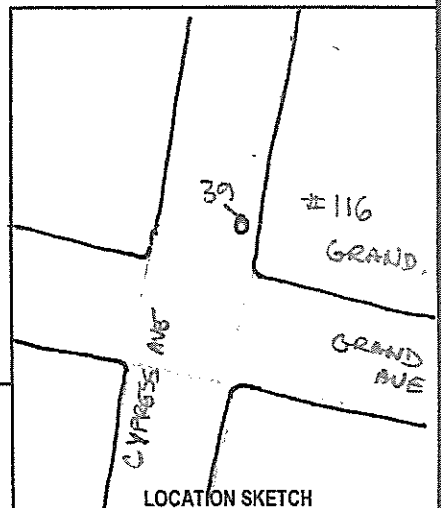
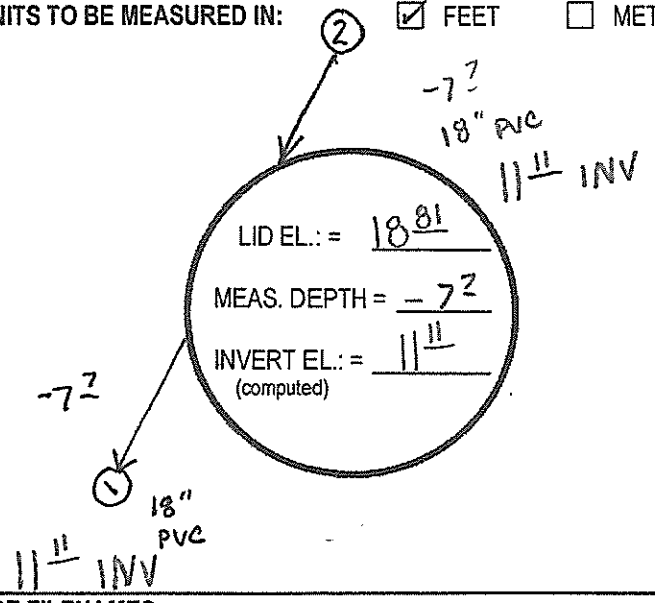
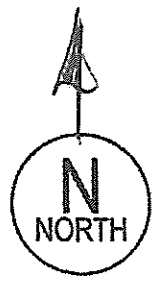
STREET NAME(S): CYPRESS AVE.

NEAREST CROSS STREET: GRAND AVE.

NEAREST ADDRESS No.: 116 GRAND AVE

SPECIAL MARKINGS: " SANITARY SEWER "

UNITS TO BE MEASURED IN: FEET METERS

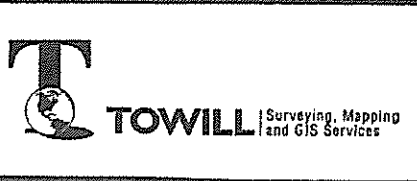


PICTURE FILENAMES:

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:**
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
 - 2) DRAW NORTH ARROW ABOVE.
 - 3) FILL IN LID ELEVATION.
 - 4) FILL IN MEASURED DEPTH.
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 - 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: CITY OF So. SF

CREW: JM/CP

JOB No.: 15695-101

DATE: 2018 / 12 / 28

POINT I.D.: 40

MANHOLE No.: ~~#~~ WD2578

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

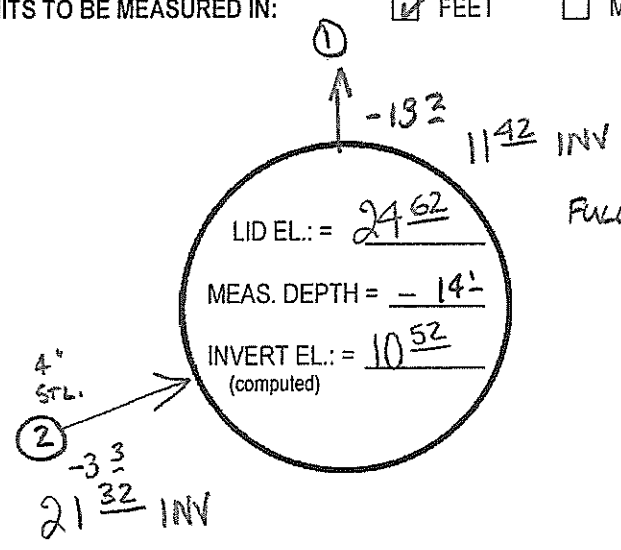
STREET NAME(S): AIRPORT BLVD.

NEAREST CROSS STREET: MILLER AVE.

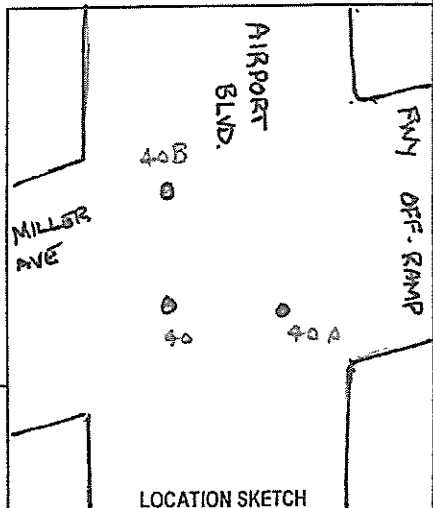
NEAREST ADDRESS No.: 1 MILLER AVE.

SPECIAL MARKINGS: "CITY OF SO. SAN FRANCISCO"

UNITS TO BE MEASURED IN: FEET METERS



FULL OF WATER.



PICTURE FILENAMES:

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:**
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
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 - 3) FILL IN LID ELEVATION.
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 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:
CITY OF SO. SF

JOB No.:
15695-101

CREW:
JM / CP

DATE:
2018 / 12 / 28

POINT I.D.: 40 A

MANHOLE No.: WD2578

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

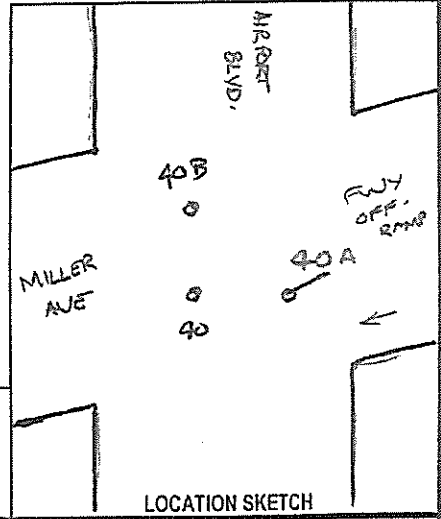
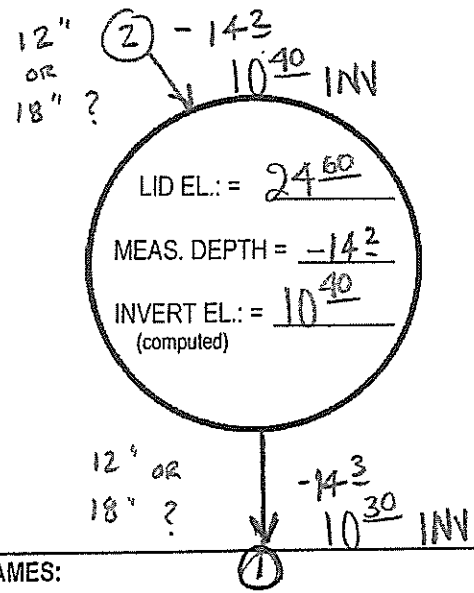
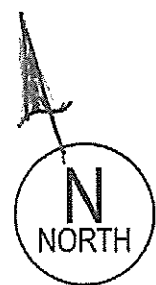
STREET NAME(S): AIRPORT BLVD

NEAREST CROSS STREET: MILLER AVE

NEAREST ADDRESS No.: 1 MILLER AVE

SPECIAL MARKINGS: "CITY OF SO. SAN FRANCISCO"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: _____

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE

(B) PIPE OUTSIDE DIAMETER (in appropriate units)

(C) PIPE TYPE

(D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

So. SAN FRANCISCO, CA

PAGE NUMBER: 36

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 40 B

MANHOLE No.: WD2578

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

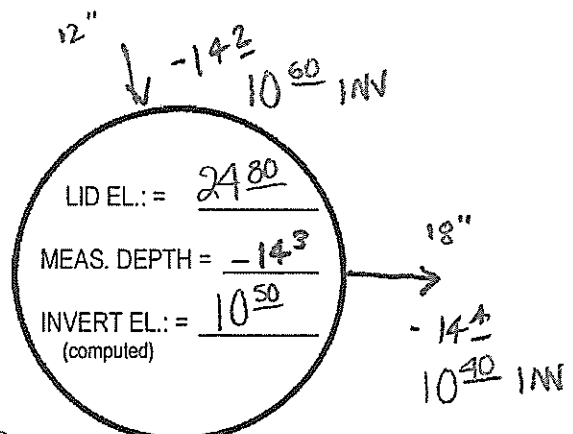
STREET NAME(S): AIRPORT BLVD.

NEAREST CROSS STREET: MILLER AVE

NEAREST ADDRESS No.: 1 MILLER AVE

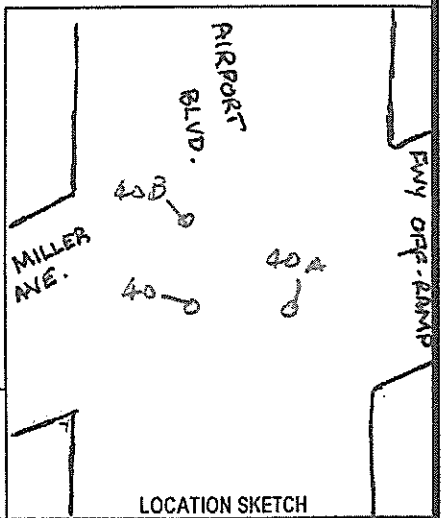
SPECIAL MARKINGS: "CITY OF SO. SAN FRANCISCO"

UNITS TO BE MEASURED IN: FEET METERS



COVERED: CAN'T SEE PIPE
 POSSIBLY FILLED IN W/ CONC. (PLUGGED)

PICTURE FILENAMES: 1250 INV



EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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 - 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
 - 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
 - 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: CITY OF So. SF

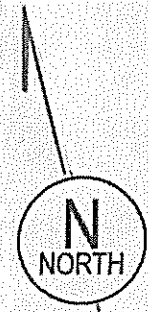
JOB No.: 15695-101

CREW: JM / CP

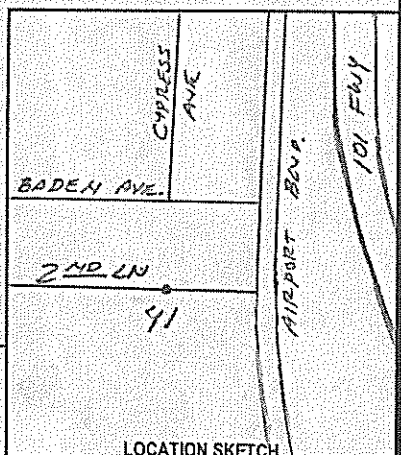
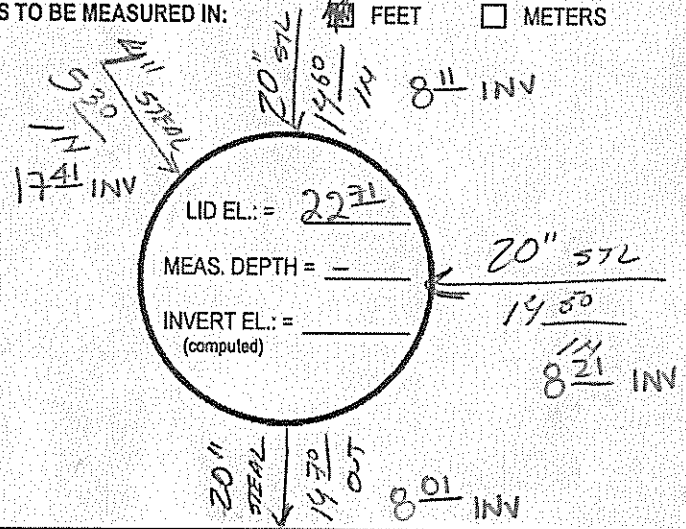
DATE: 2018/12/28

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: 18	FIELD BOOK:
	SSF SEWER	SOUTH SAN FID.	OF 20 PAGES	PAGE:

POINT I.D.: 41
 MANHOLE No.: WD2604
 MANHOLE TYPE: SS SD ELEC TEL OTHER
 STREET NAME(S): SECOND LN
 NEAREST CROSS STREET: AIRPORT BLVD
 NEAREST ADDRESS No.: _____
 SPECIAL MARKINGS: _____

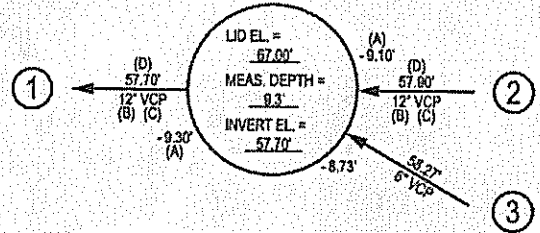


UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

	CLIENT:	CREW:
	SSF - AKEL	EB / MY
JOB No.:	DATE:	
15695	2018-12-15	

MANHOLE DIPSHEET

PROJECT NAME:
AKEL

PROJECT LOCATION:
SO. SF, CA

PAGE NUMBER: 14
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 42

MANHOLE No.: WD2643

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

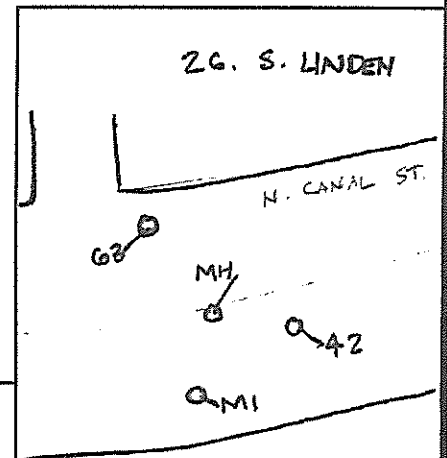
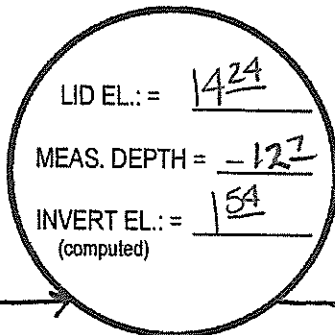
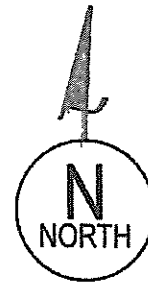
STREET NAME(S): N. CANAL ST.

NEAREST CROSS STREET: S. LINDEN AVE

NEAREST ADDRESS No.: 26 S. LINDEN AVE

SPECIAL MARKINGS: "SANITARY SEWER"

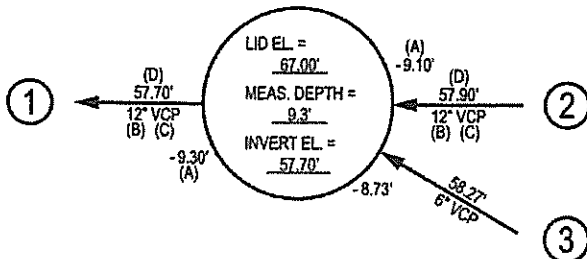
UNITS TO BE MEASURED IN: FEET METERS



LOCATION SKETCH

PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: CITY OF SO SF

CREW: JM / CP

JOB No.: 15696-101

DATE: 2018 / 12 / 28

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: <u>7</u>	FIELD BOOK:
	<u>SSF-AVEL</u>	<u>SOUTH SAN JO.</u>	OF <u>8</u> PAGES	PAGE:

POINT I.D.: 44

MANHOLE No.: WL2371

MANHOLE TYPE: SS SD ELEC TEL OTHER

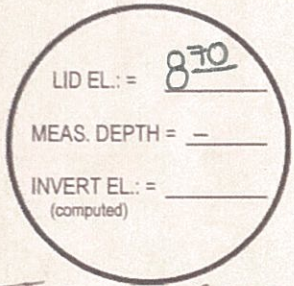
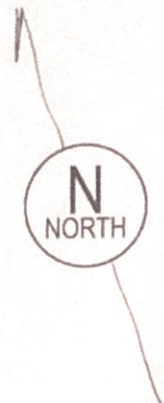
STREET NAME(S): VICTORY AVE

NEAREST CROSS STREET: S LINDEN AVE

NEAREST ADDRESS No.: 320 VICTORY AVE

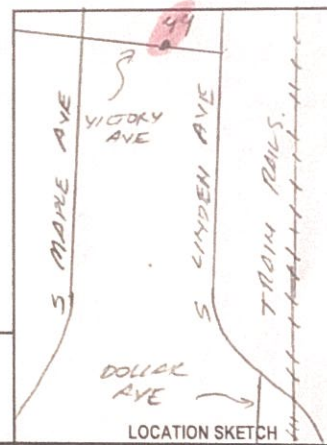
SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS

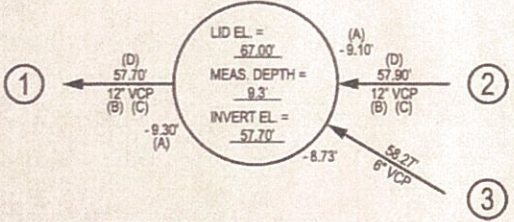


NOTE: CLOGGED, SEE PHOTOS.

PICTURE FILENAMES:



EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
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- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: AVEL

JOB No.: 15695-101

CREW: EB/ MY

DATE: 2018-12-18

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: <u>8</u>	FIELD BOOK:
	<u>SSF - AXEL</u>	<u>SOUTH SAN FID</u>	OF <u>8</u> PAGES	PAGE:

POINT I.D.: 45

MANHOLE No.: WL 2870

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

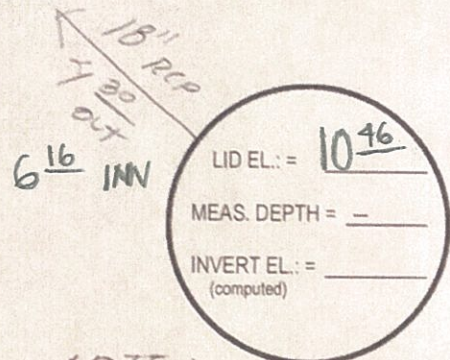
STREET NAME(S): VICTORY AVE

NEAREST CROSS STREET: S LINDEN AVE

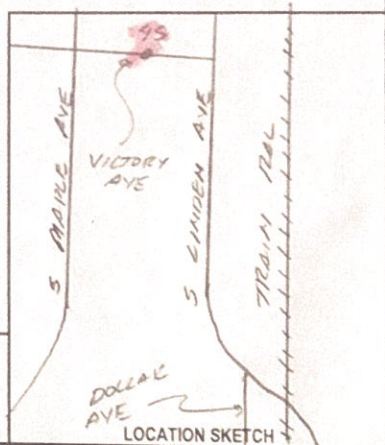
NEAREST ADDRESS No.: 325 VICTORY AVE

SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS

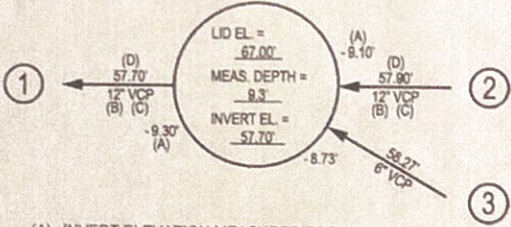


NOTE: CLOGGED, SEE PHOTOS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
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CLIENT: AXEL

JOB No.: 15695 - 101

CREW: ED / MY

DATE: 2018 - 12 - 18

MANHOLE DIPSHEET

PROJECT NAME:
AKEL

PROJECT LOCATION:
S. SAN FRANCISCO,
CA

PAGE NUMBER: 16
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 46

MANHOLE No.: WE1738

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

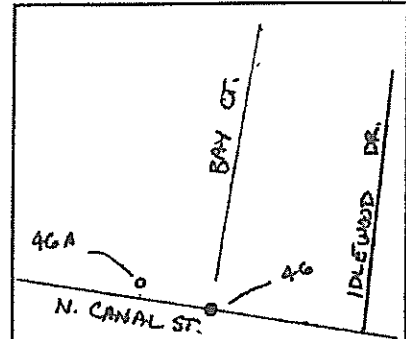
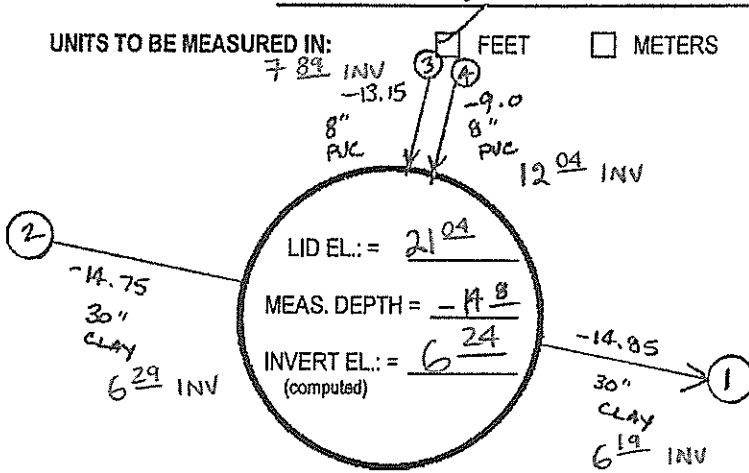
STREET NAME(S): N. CANAL ST.

NEAREST CROSS STREET: IDLEWOOD DR.

NEAREST ADDRESS No.: 89 IDLEWOOD DR.

SPECIAL MARKINGS: 'SANITARY SEWER'

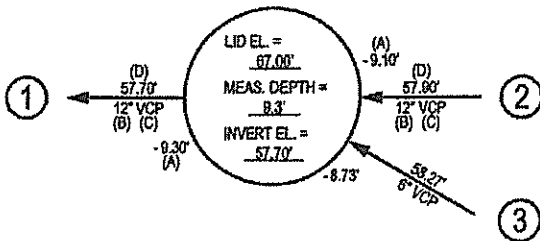
UNITS TO BE MEASURED IN: FEET METERS



LOCATION SKETCH

PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
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CLIENT:

JOB No.:

15695

CREW:

JM / DS

DATE:

2018/12/15

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

S. SAN FRANCISCO, CA

PAGE NUMBER:

4

OF

PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 46 A ~~NEED TO SHOOT ?~~ SHOT

MANHOLE No.: WE1738

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

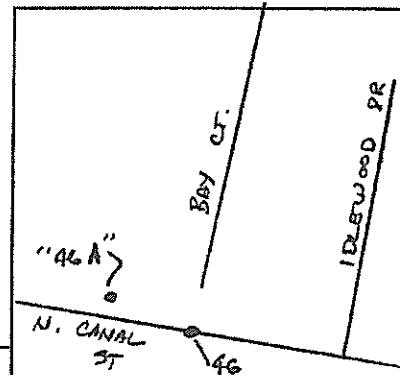
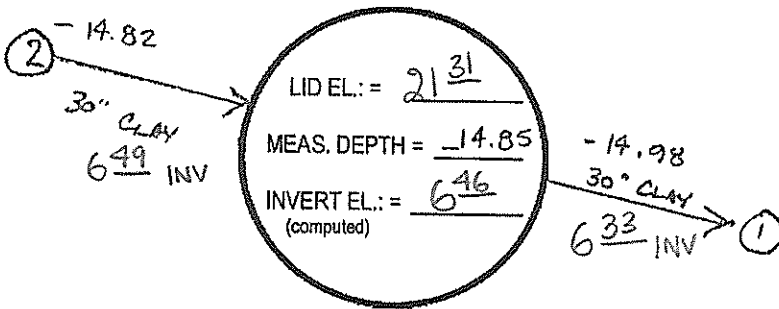
STREET NAME(S): N. CANAL ST.

NEAREST CROSS STREET: IDLEWOOD DR.

NEAREST ADDRESS No.: 89 IDLEWOOD DR.

SPECIAL MARKINGS: "SANITARY SEWER"

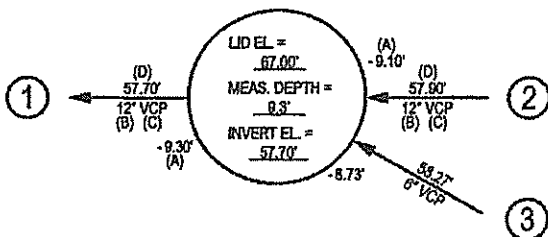
UNITS TO BE MEASURED IN: FEET METERS



LOCATION SKETCH

PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
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CLIENT:

JOB No.:

15495

CREW:

JM / OS

DATE:

2018/12/15

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

So. SF, CA

PAGE NUMBER: 20

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 47

MANHOLE No.: WE 1831

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

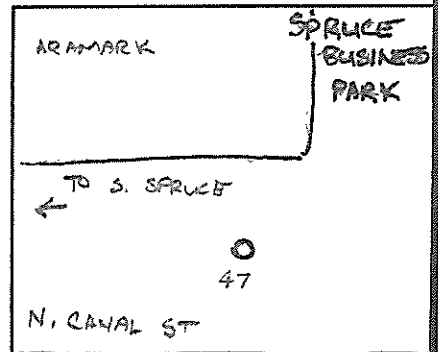
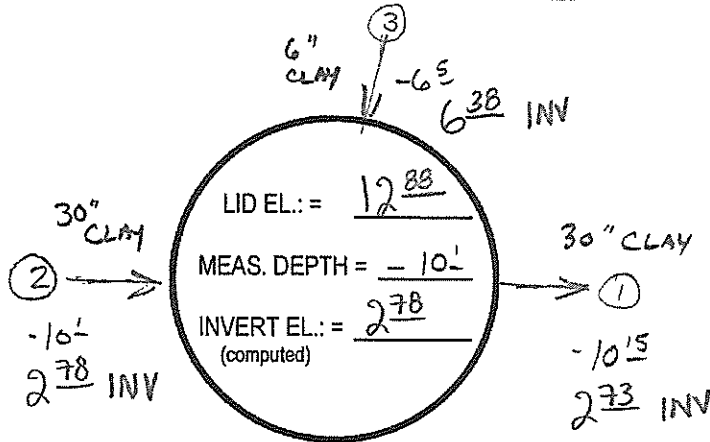
STREET NAME(S): N. CANAL ST

NEAREST CROSS STREET: S. SPRUCE

NEAREST ADDRESS No.: 440 N. CANAL ST

SPECIAL MARKINGS: N/A

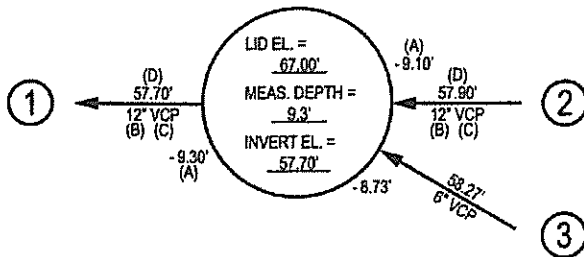
UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

LOCATION SKETCH

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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- 4) FILL IN MEASURED DEPTH.
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- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
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CLIENT:

CITY OF SO. SF

CREW:

JM / CP

JOB No.:

15695-101

DATE:

2018 / 12 / 28

POINT I.D.: 48

MANHOLE No.: WE1822

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

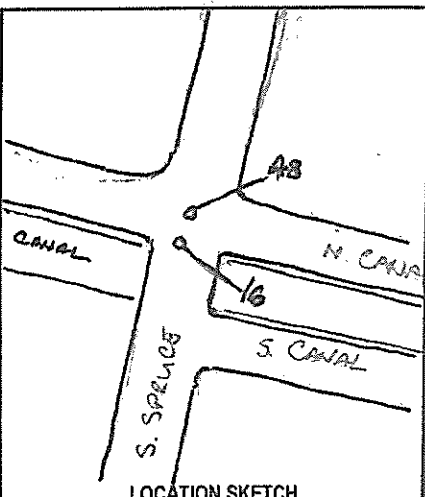
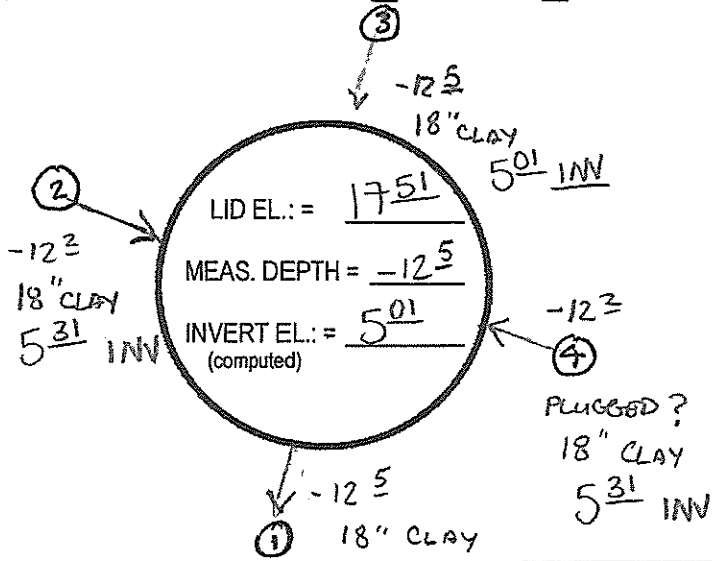
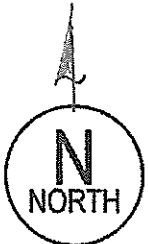
STREET NAME(S): S. SPRUCE

NEAREST CROSS STREET: N. CANAL ST.

NEAREST ADDRESS No.: 90 S. SPRUCE

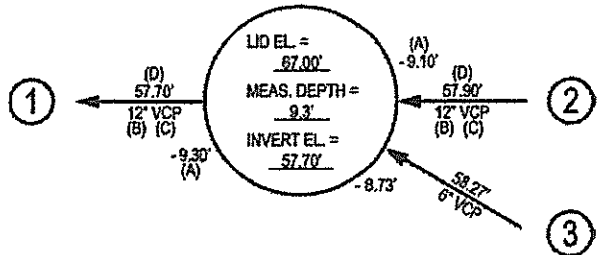
SPECIAL MARKINGS: "CITY OF SO. SAN FRANCISCO"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: 501 INV

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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- 2) DRAW NORTH ARROW ABOVE.
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- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



TOWILL | Surveying, Mapping and GIS Services

CLIENT:
CITY OF So. SF.

JOB No.:
15095-101

CREW:
JM / CP

DATE:
2013/12/28

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

SO. SF, CA

PAGE NUMBER: 26

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 49

MANHOLE No.: WH792

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

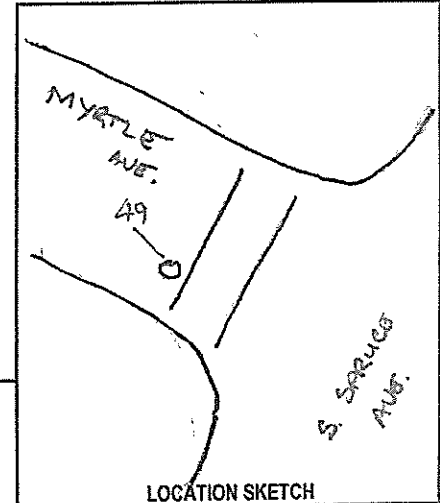
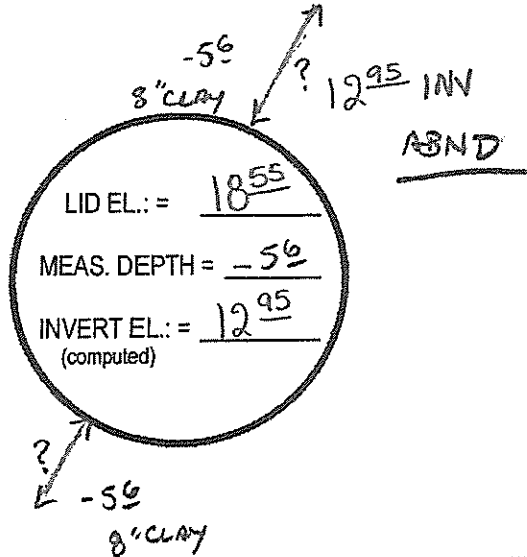
STREET NAME(S): MYRTLE

NEAREST CROSS STREET: SO. SPRUCE

NEAREST ADDRESS No.: 230 S. SPRUCE AVE

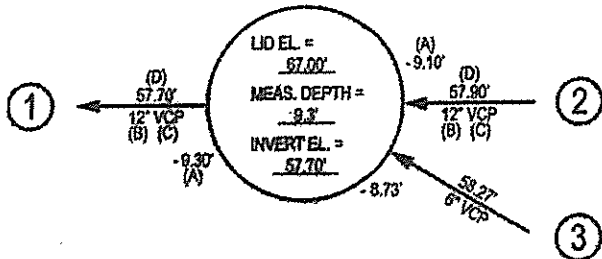
SPECIAL MARKINGS: "CITY OF SAN MATEO"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: 12.95 INV

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

CLIENT: CITY OF SO. SF

CREW: JM / CP

JOB No.: 15695-101

DATE: 2018/12/23



MANHOLE DIPSHEET

PROJECT NAME:

AKGL

PROJECT LOCATION:

So. SF, CA

PAGE NUMBER: 21

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 50

MANHOLE No.: WE 1825

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

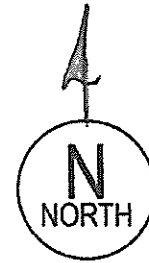
STREET NAME(S): N. CANAL ST

NEAREST CROSS STREET: S. SPRUCE ST.

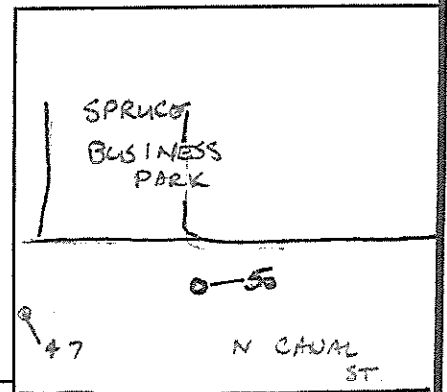
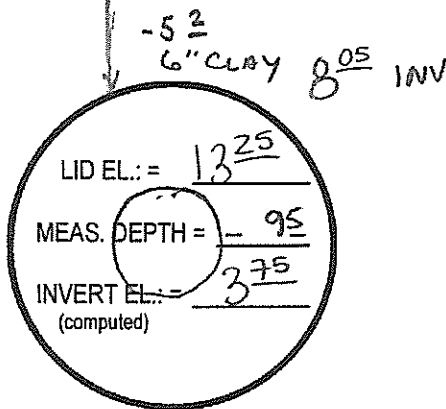
NEAREST ADDRESS No.: 428 N. CANAL ST.

SPECIAL MARKINGS: N/A

UNITS TO BE MEASURED IN: FEET METERS



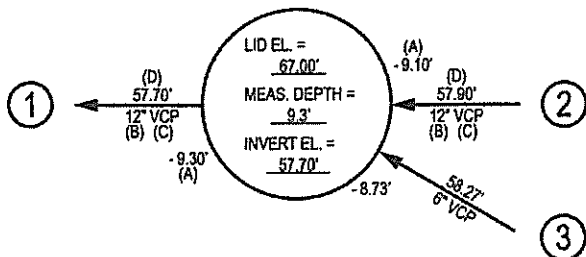
MEAS. BOTTOM,
COVER W/SMALL
OPENING.



PICTURE FILENAMES:

LOCATION SKETCH

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: CITY OF
15695-101 SOUTH SF

CREW: JM / CP

JOB No.: 15695-101

DATE: 2018 / 12 / 28

POINT I.D.: 51

MANHOLE No.: WG990

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

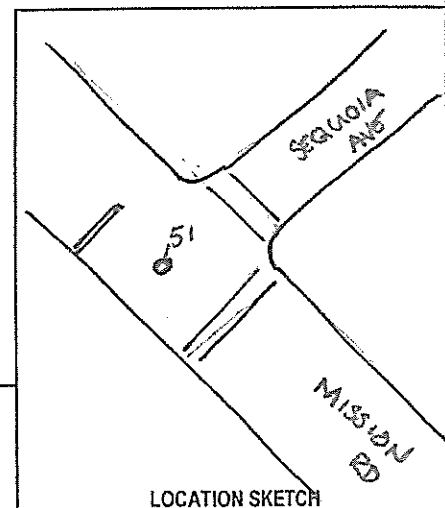
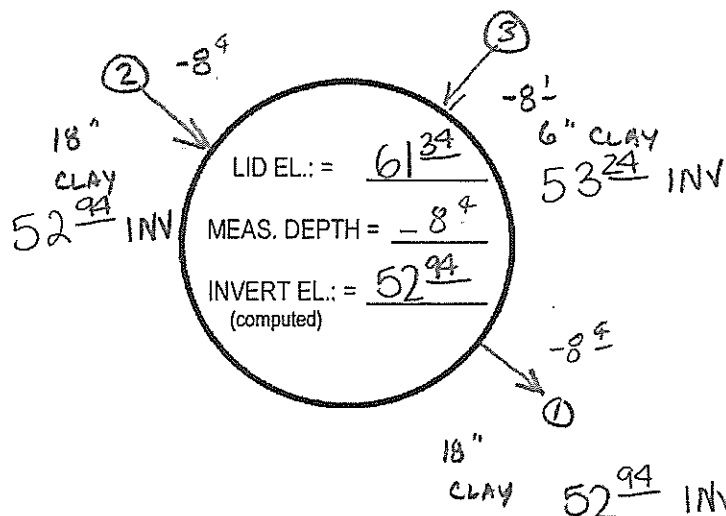
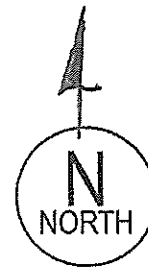
STREET NAME(S): MISSION RD.

NEAREST CROSS STREET: SEQUOIA AVE

NEAREST ADDRESS No.: 1200 MISSION RD

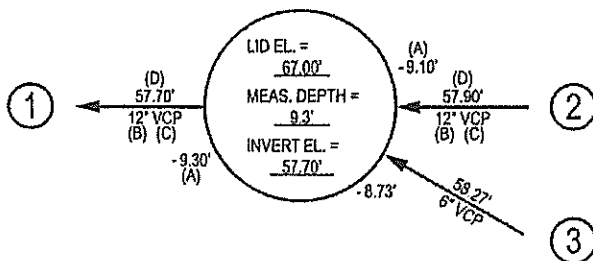
SPECIAL MARKINGS: 45"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:
CITY OF So. SF

JOB No.:
15695-101

CREW:
JM / CP

DATE:
2018 / 12 / 28

MANHOLE DIPSHEET

PROJECT NAME:

SSF - AXEL

PROJECT LOCATION:

SOUTH 30th FID

PAGE NUMBER: 3

OF 6 PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 52

MANHOLE No.: WH 1420

MANHOLE TYPE: SS SD ELEC TEL OTHER

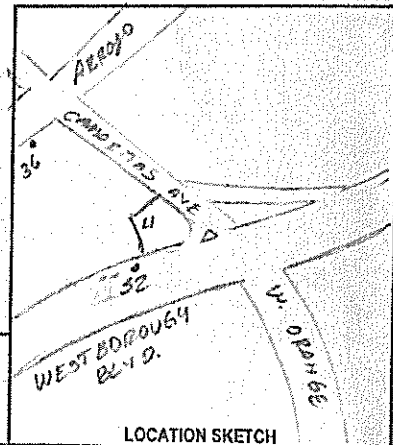
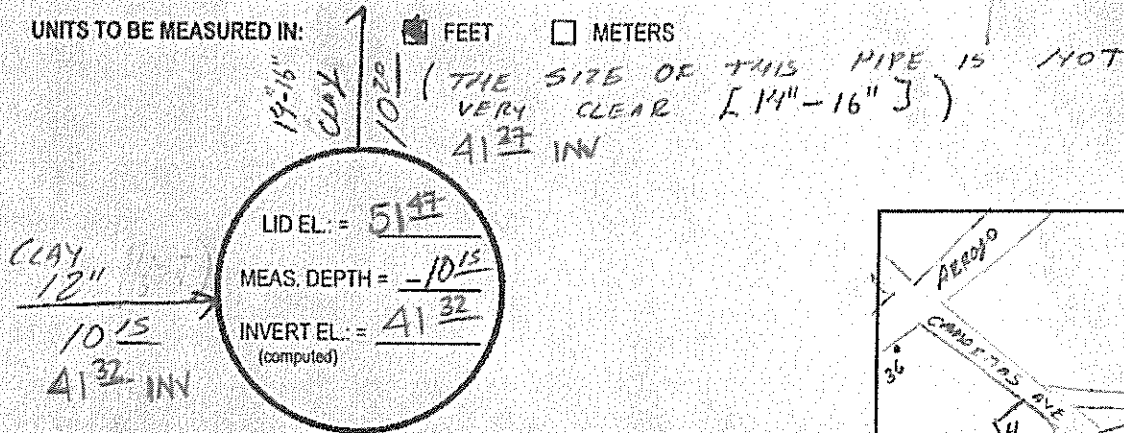
STREET NAME(S): WESTBOROUGH BLVD

NEAREST CROSS STREET: CANDRITAS AVE

NEAREST ADDRESS No.: BURI BURI LIQUOR STORE

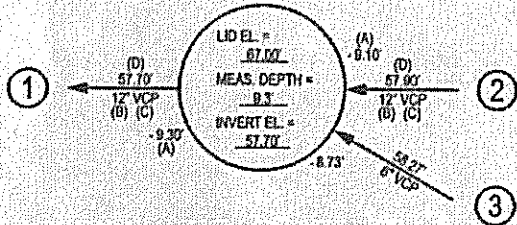
SPECIAL MARKINGS:

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

T TOWILL
SURVEYING | MAPPING | GIS

CLIENT:

AXEL

JOB No.:

15695-101

CREW:

EB/52/55

DATE:

2018-12-06

MANHOLE DIPSHEET

PROJECT NAME:
AKEL

PROJECT LOCATION:

PAGE NUMBER: 13
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 53

MANHOLE No.: WG1289

MANHOLE TYPE: SS SD ELEC TEL OTHER:

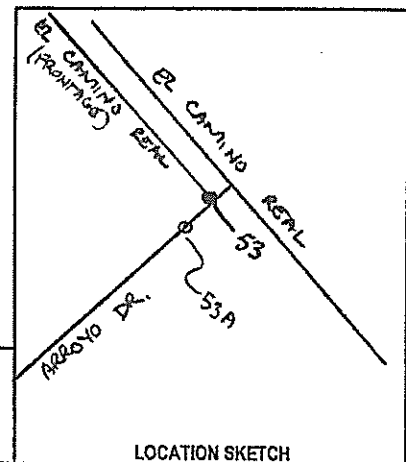
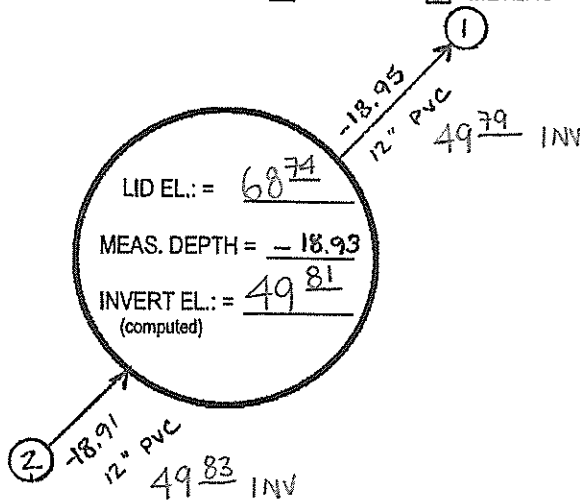
STREET NAME(S): ARROYO DR.

NEAREST CROSS STREET: EL CAMINO REAL

NEAREST ADDRESS No.: 1103 EL CAMINO REAL

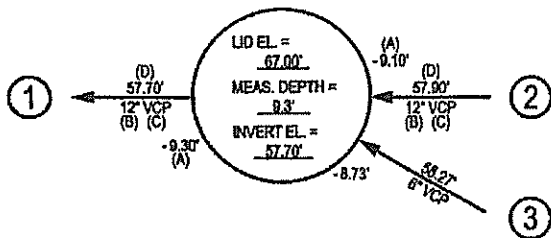
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
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CLIENT:

JOB No.:

15695

CREW:

JM / DS

DATE:

2018 / 12 / 15

MANHOLE DIPSHEET

PROJECT NAME: AKEL

PROJECT LOCATION: S SAN FRANCISCO, CA

PAGE NUMBER: 14
OF PAGES

FIELD BOOK: _____
PAGE: _____

POINT I.D.: 53 A

MANHOLE No.: WG1289

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

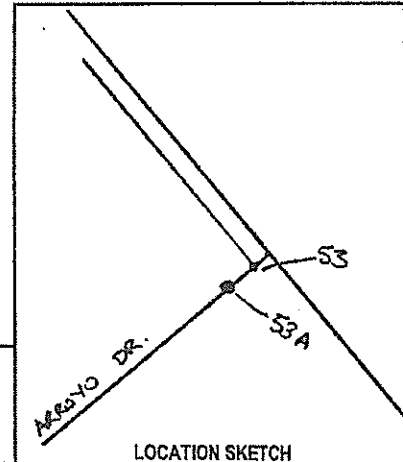
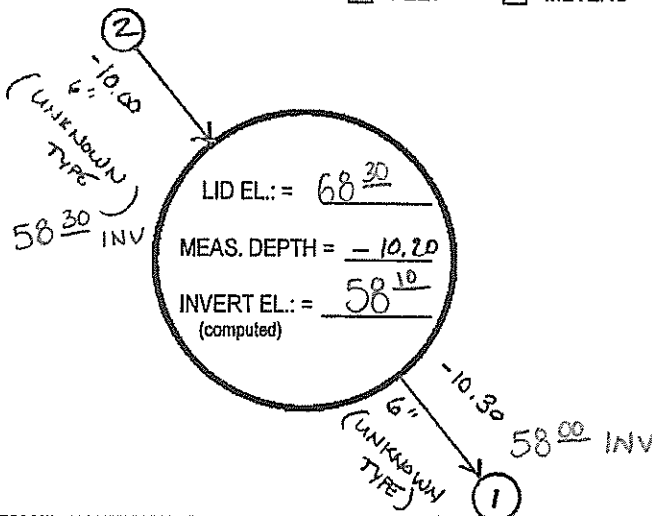
STREET NAME(S): ARROYO DR.

NEAREST CROSS STREET: EL CAMINO REAL

NEAREST ADDRESS No.: 1103 EL CAMINO REAL

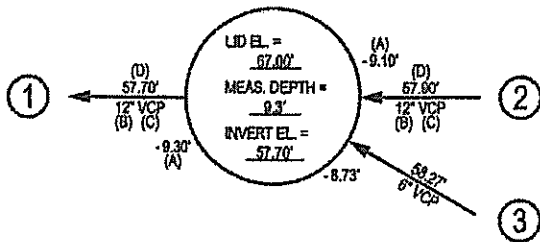
SPECIAL MARKINGS: "SF DPW SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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CLIENT:

JOB No.:

15695

CREW:

JM / DS

DATE:

2018/12/15

MANHOLE DIPSHEET

PROJECT NAME:

SSF - AXEL

PROJECT LOCATION:

SOUTH SAN FLO

PAGE NUMBER:

4

OF 6

PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 54

MANHOLE No.: WE 1716

MANHOLE TYPE: SS SD ELEC TEL OTHER

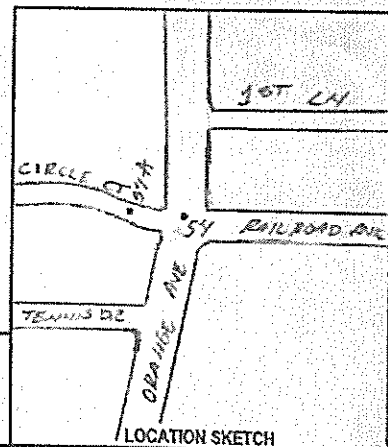
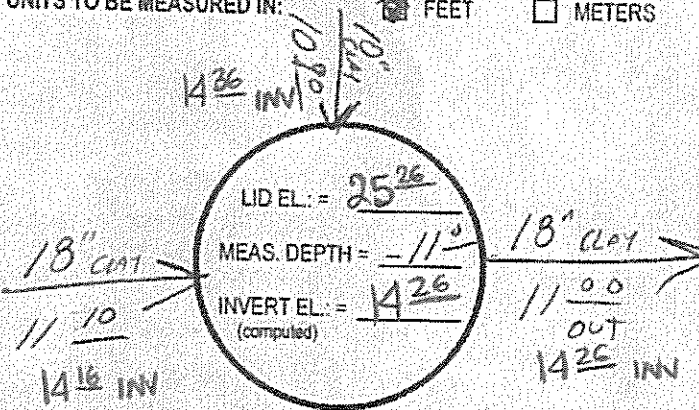
STREET NAME(S): ORANGE AVE

NEAREST CROSS STREET: CIRCLE CT

NEAREST ADDRESS No.: _____

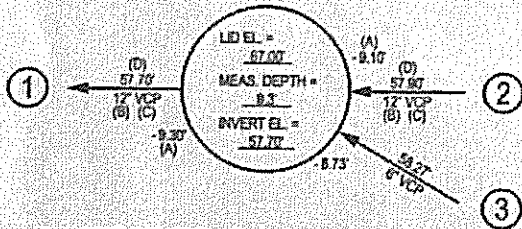
SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

AXEL

CREW:

EB / SC / SS

JOB No.:

15695 - 101

DATE:

2018-12-06

MANHOLE DIPSHEET

PROJECT NAME:
AKEL

PROJECT LOCATION:
S. SAN FRANCISCO, CA

PAGE NUMBER: **8**
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: **54 A**

MANHOLE No.: **N/A WE1716**

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

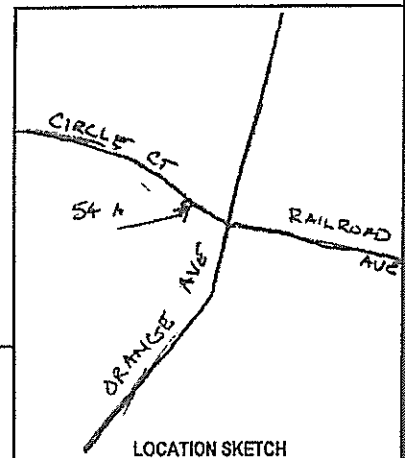
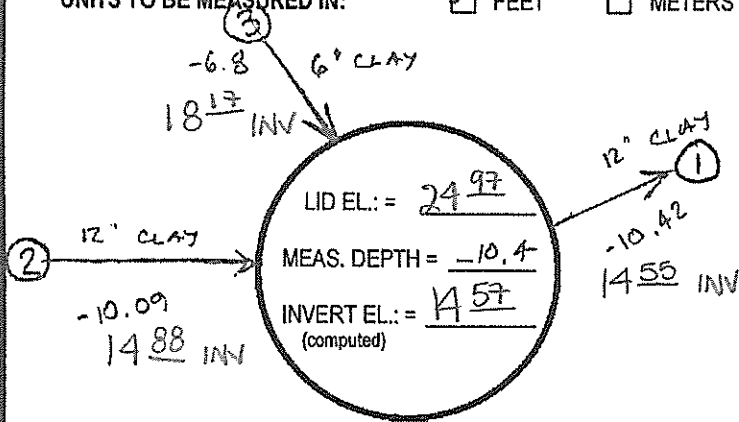
STREET NAME(S): **CIRCLE CT**

NEAREST CROSS STREET: **ORANGE AVE**

NEAREST ADDRESS No.: **709**

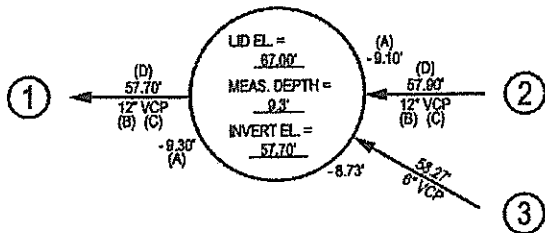
SPECIAL MARKINGS: **SANITARY SEWER**

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

JOB No.: **15695**

CREW:

JM / DS

DATE:

2018/12/15

MANHOLE DIPSHEET

PROJECT NAME:

SSF - ADEL

PROJECT LOCATION:

South San Francisco

PAGE NUMBER: 6

OF 6 PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 55

MANHOLE No.: WE 1528

MANHOLE TYPE: SS SD ELEC TEL OTHER

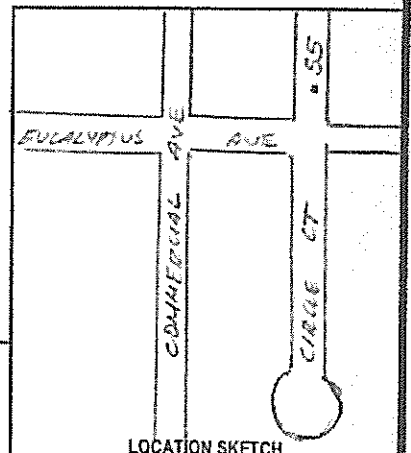
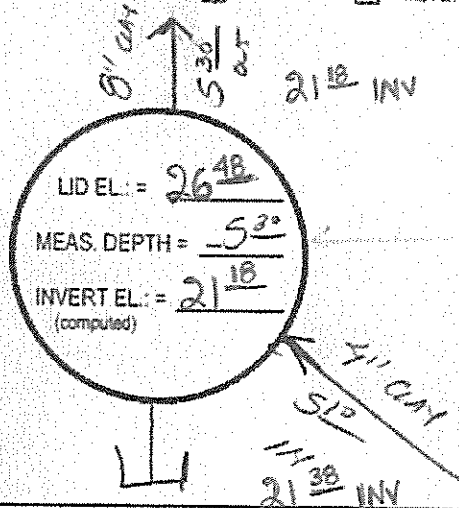
STREET NAME(S): CIRCLE CT

NEAREST CROSS STREET: EUCALYPTUS AVE

NEAREST ADDRESS No.: ---

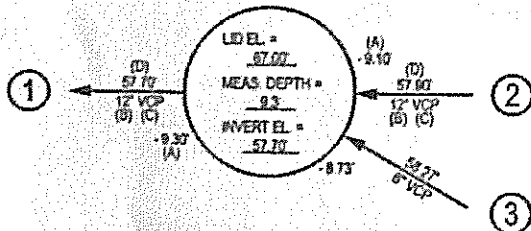
SPECIAL MARKINGS: ---

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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- 4) FILL IN MEASURED DEPTH.
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- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

ADEL

CREW:

EB / SL / SS

JOB No.:

15695-101

DATE:

2018-12-06

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

PAGE NUMBER: 18

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 56

MANHOLE No.: WD2645

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

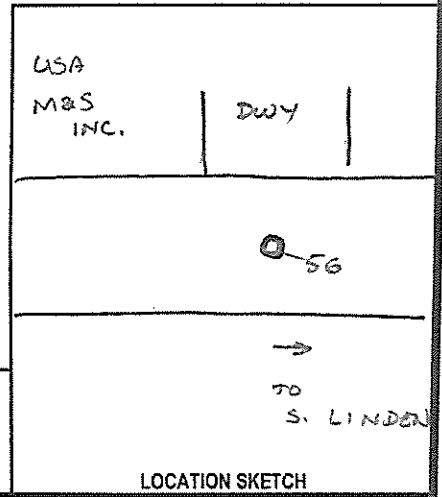
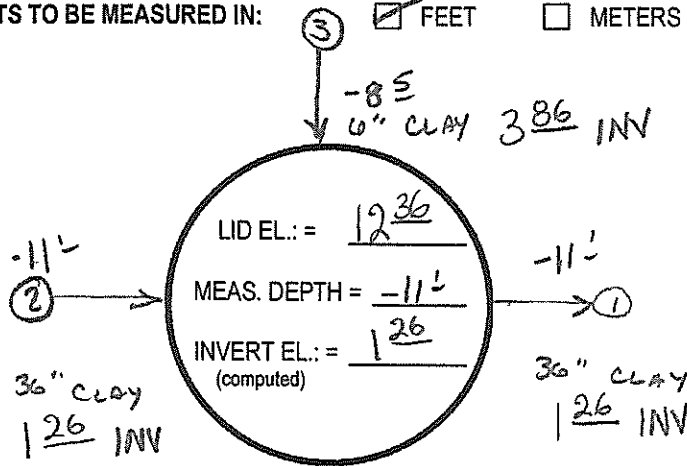
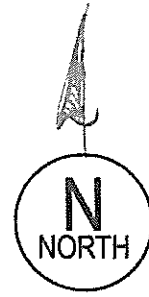
STREET NAME(S): N. CANAL ST.

NEAREST CROSS STREET: S. LINDEN

NEAREST ADDRESS No.: 338 N. CANAL ST.

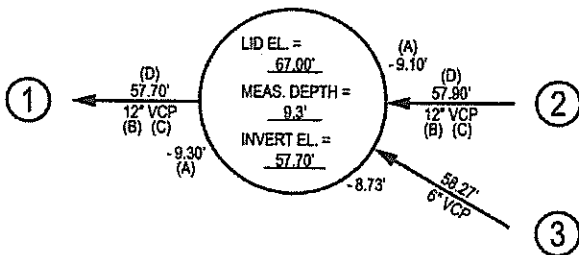
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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CLIENT:

CITY OF SO. SF

CREW:

JM / CP

JOB No.:

15695-101

DATE:

2018/12/28

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

So. SF, CA

PAGE NUMBER: 25

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 57

MANHOLE No.: WL1882

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

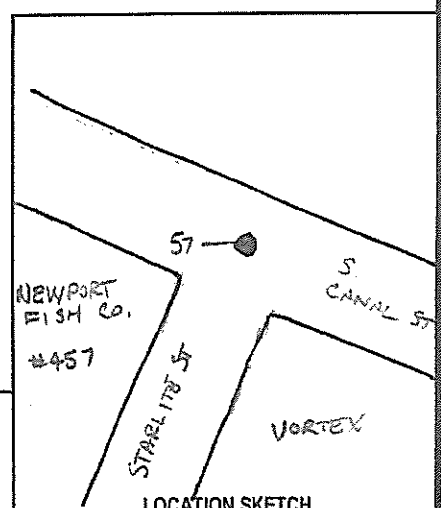
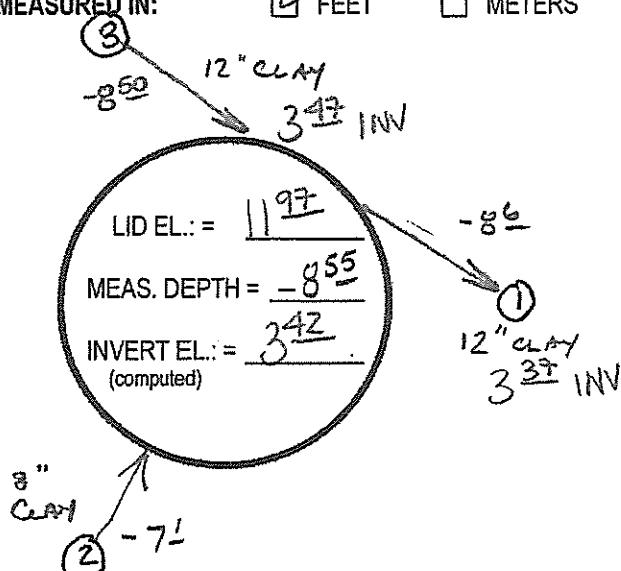
STREET NAME(S): S. CANAL ST.

NEAREST CROSS STREET: STARLITE ST.

NEAREST ADDRESS No.: 457 S. CANAL ST.

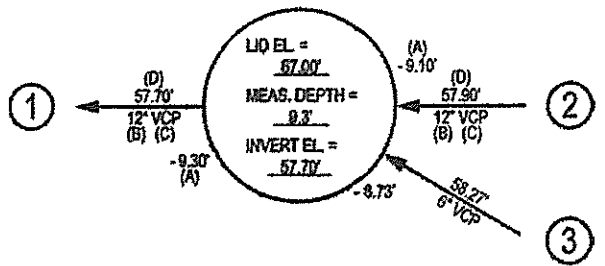
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: 4 8.7 INV

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
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CLIENT: CITY OF SO. SAN FRANCISCO.

CREW: JM / CP

JOB No.: 15695-1a

DATE: 2018 / 12 / 28

MANHOLE DIPSHEET

PROJECT NAME:

AK62

PROJECT LOCATION:

So. SF, CA

PAGE NUMBER: 12

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 58

MANHOLE No.: WL2874

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

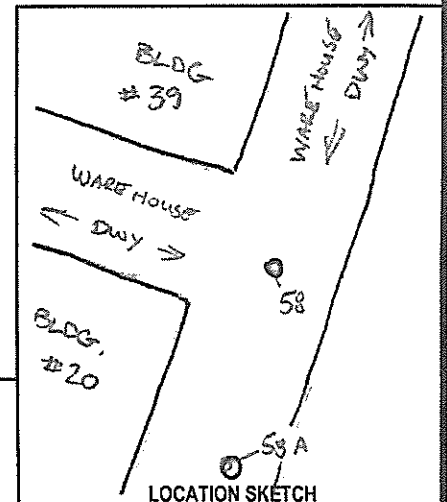
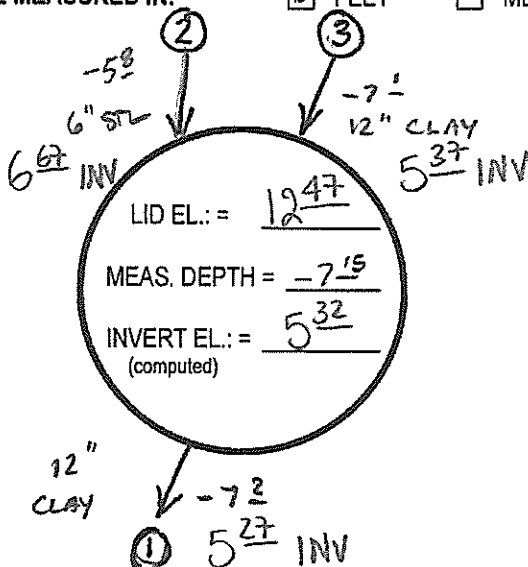
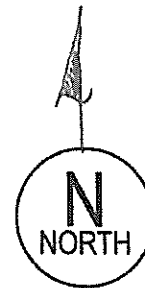
STREET NAME(S): BETWEEN S. MAPLE / S. LINDEN; S. OF VICTORY

NEAREST CROSS STREET: S. MAPLE

NEAREST ADDRESS No.: 233 S. MAPLE AVE.

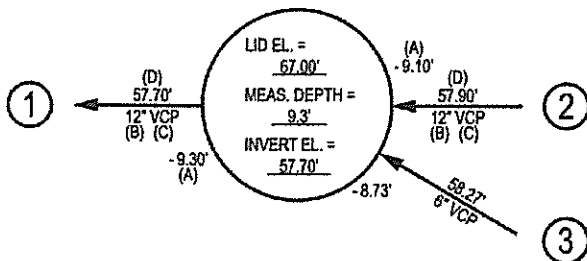
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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CLIENT:

CITY OF So. SF

CREW:

JM / CP

JOB No.:

15695-101

DATE:

2018 / 12 / 28

POINT I.D.: 58 A

MANHOLE No.: WL2874

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

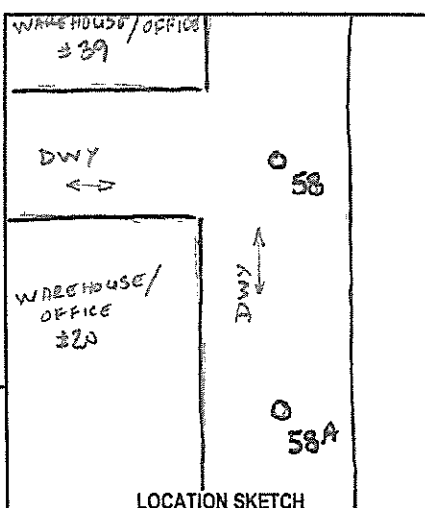
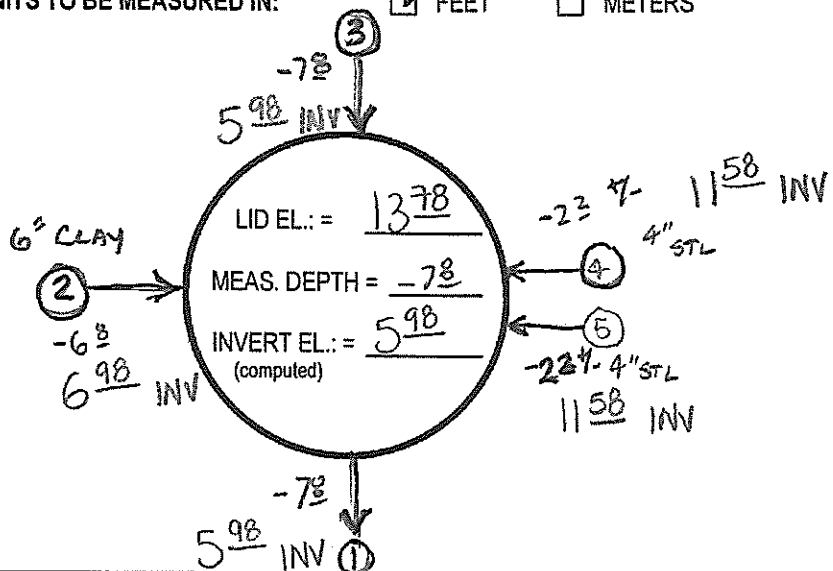
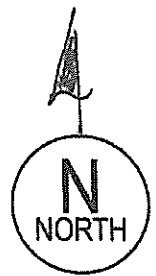
STREET NAME(S): BTWN S. MAPLE / S. LINDEN ; S. OF VICTORY

NEAREST CROSS STREET: S. MAPLE AVE

NEAREST ADDRESS No.: 233 S, MAPLE AVE.

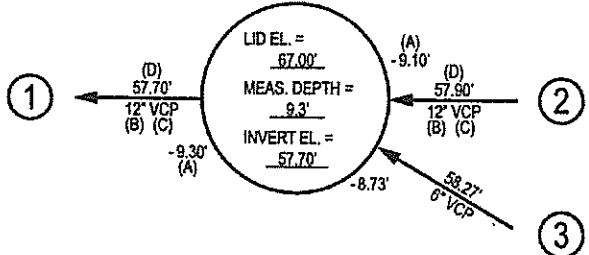
SPECIAL MARKINGS: " STORM

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

	CLIENT: CITY OF So. SF	CREW: JM / CP
	JOB No.: 15695-101	DATE: 2018/12/28

MANHOLE DIPSHEET

PROJECT NAME:

SSF - AKEL

PROJECT LOCATION:

SOUTH SAN FID.

PAGE NUMBER: 4

OF 8 PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 60

MANHOLE No.: WL288Z

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

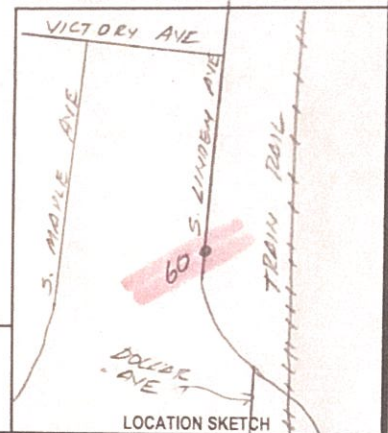
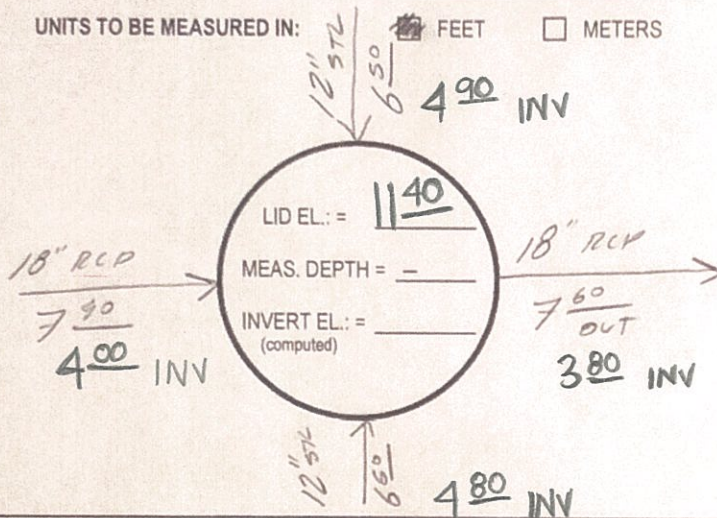
STREET NAME(S): S LINDEN AVE

NEAREST CROSS STREET: DOCLAR AVE

NEAREST ADDRESS No.: 3 S LINDEN AVE

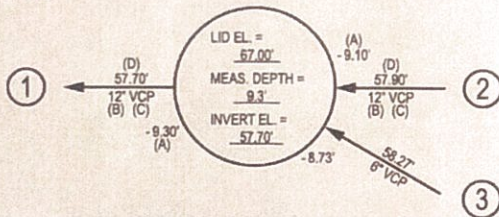
SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

AKEL

CREW:

EB / MY

JOB No.:

15695-101

DATE:

2013-12-18

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

S. SAN FRANCISCO, CA

PAGE NUMBER: 1

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 61

MANHOLE No.: WL 2650

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

STREET NAME(S): S. LINDEN

NEAREST CROSS STREET: S. CANAL ST

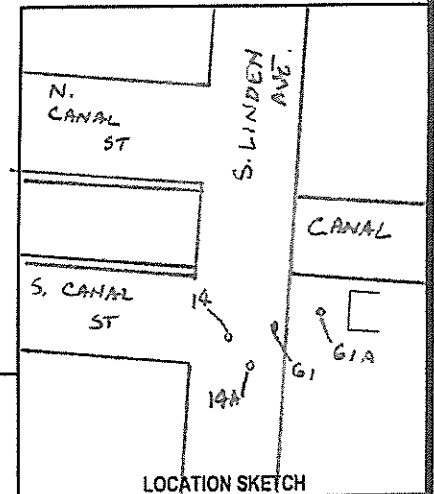
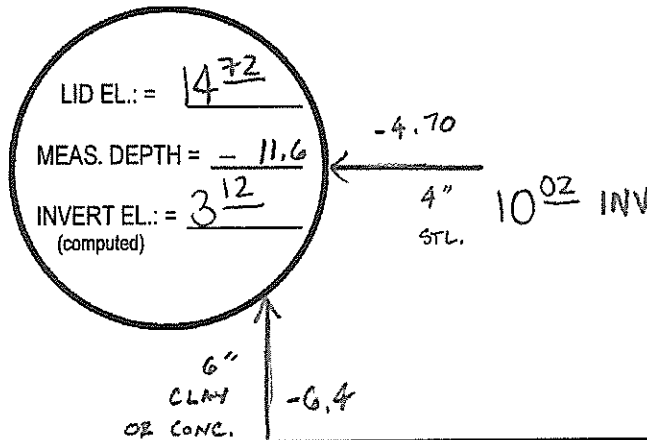
NEAREST ADDRESS No.: 35. S. LINDEN AVE

SPECIAL MARKINGS: N/A

UNITS TO BE MEASURED IN: FEET METERS



CAN'T DETERMINE PIPE INV'S @ BOTTOM

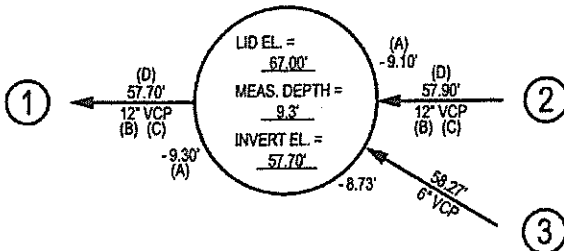


PICTURE FILENAMES:

832 INV

LOCATION SKETCH

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

CITY OF SO. SF

CREW:

JM/CP

JOB No.:

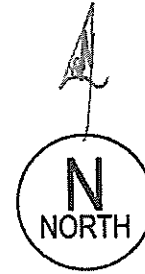
15695-101

DATE:

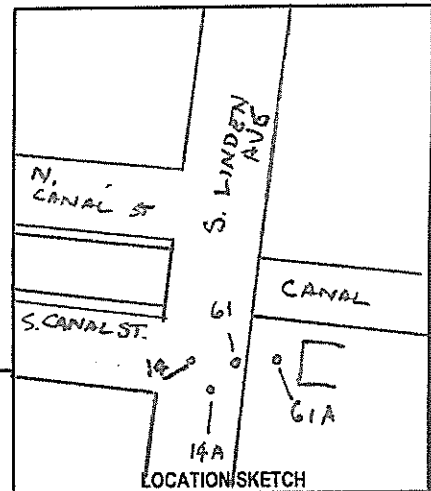
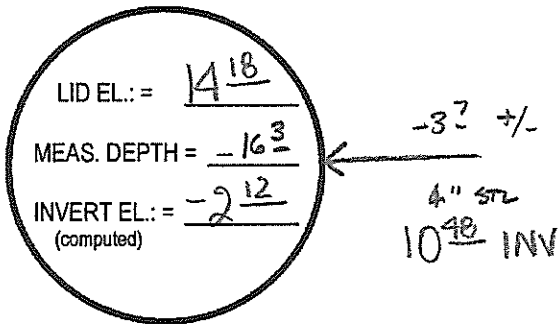
2018/12/28

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: <u>2</u>	FIELD BOOK:
	<u>AVEL</u>	<u>So. SF, CA</u>	OF PAGES	PAGE:

POINT I.D.: 61A
 MANHOLE No.: WL2650
 MANHOLE TYPE: SS SD ELEC TEL OTHER: _____
 STREET NAME(S): S. LINDEN AVE.
 NEAREST CROSS STREET: S. CANAL ST.
 NEAREST ADDRESS No.: 35. S. LINDEN AVE
 SPECIAL MARKINGS: N/A
 UNITS TO BE MEASURED IN: FEET METERS

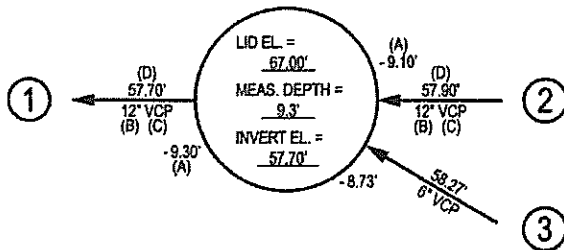


CAN'T
 DETERMINE
 PIPE INVS
 @ BOTTOM



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
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- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:
CITY OF S. SF
 JOB No.:
15695-101

CREW:
JM/CP
 DATE:
2018/12/28

POINT I.D.: 62

MANHOLE No.: WD 2649

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

STREET NAME(S): S. LINDEN AVE

NEAREST CROSS STREET: N. CANAL ST.

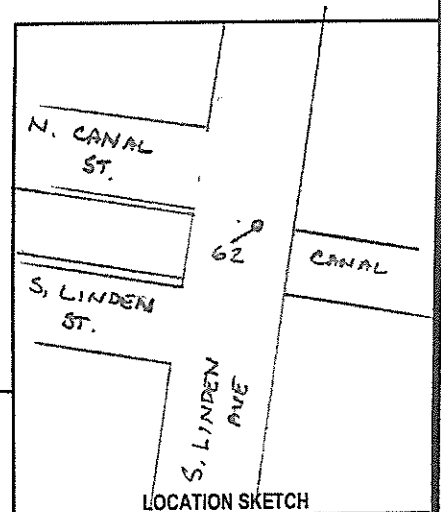
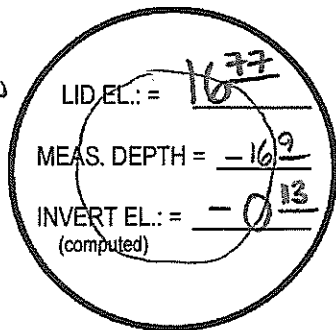
NEAREST ADDRESS No.: 7, S. LINDEN AVE

SPECIAL MARKINGS: "S"

UNITS TO BE MEASURED IN: FEET METERS

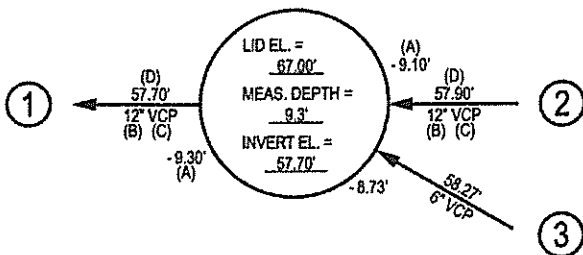


CAN'T SEE
INV'S DUE TO
"COLLAR"
OBSTRUCTING VIEW



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

SO. SF, CA

PAGE NUMBER: 15

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 63

MANHOLE No.: WD2641

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

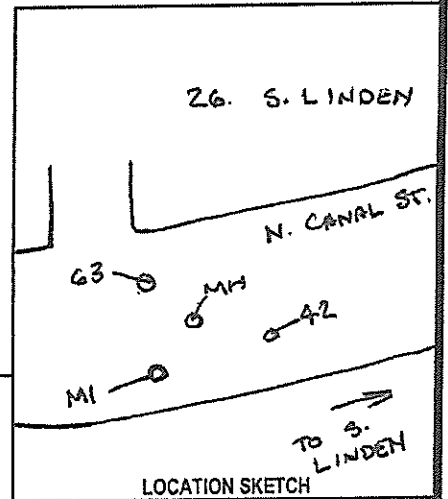
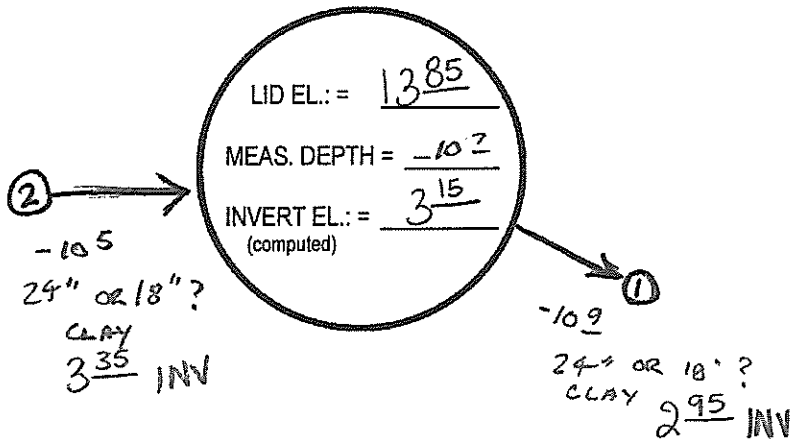
STREET NAME(S): N. CANAL ST.

NEAREST CROSS STREET: S. LINDEN

NEAREST ADDRESS No.: 2

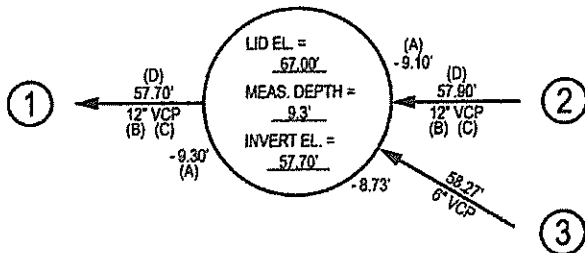
SPECIAL MARKINGS: N/A

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

CITY OF SO. SF

CREW:

JM / CP

JOB No.:

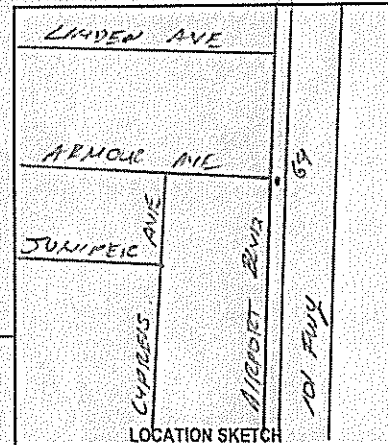
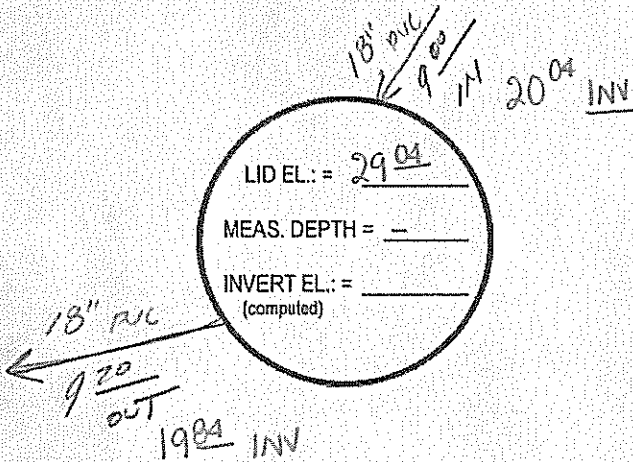
15695-101

DATE:

2018-12-28

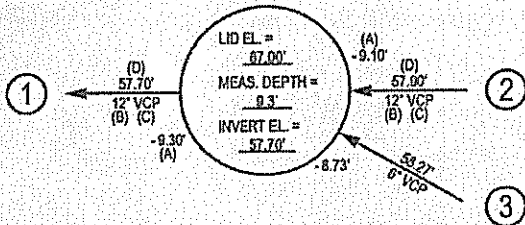
MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: <u>7</u>	FIELD BOOK:
	<u>SSF SEWER</u>	<u>SOUTH 30th FID</u>	OF <u>20</u> PAGES	PAGE:

POINT I.D.: 64
 MANHOLE No.: WC 2914
 MANHOLE TYPE: SS SD ELEC TEL OTHER: _____
 STREET NAME(S): ARMOUR AVE
 NEAREST CROSS STREET: AIRPORT BLVD
 NEAREST ADDRESS No.: _____
 SPECIAL MARKINGS: _____
 UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: SSF - AKEL
 JOB No.: 15695

CREW: EB / MV
 DATE: 2018-12-15

MANHOLE DIPSHEET

PROJECT NAME:

SSF SEWER

PROJECT LOCATION:

SOUTH 3RD FLD.

PAGE NUMBER: 6

OF 20 PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 69 A ~~69~~

MANHOLE No.: WC 2914

MANHOLE TYPE: SS SD ELEC TEL OTHER

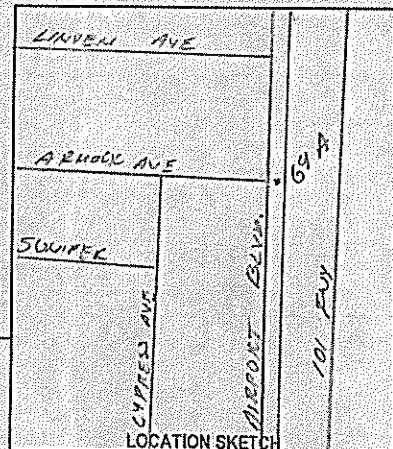
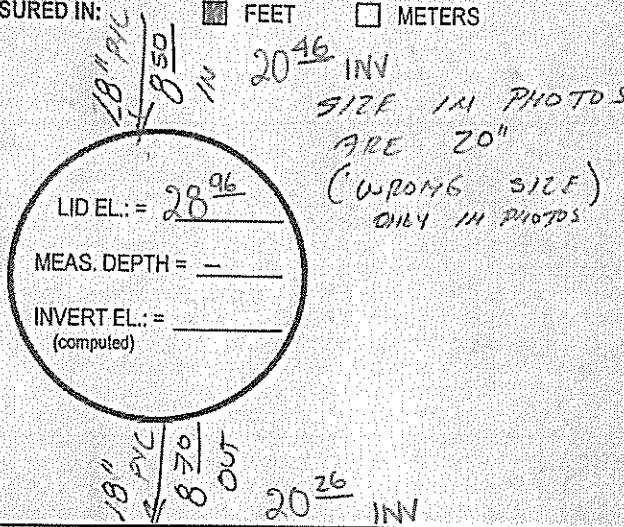
STREET NAME(S): ARMOUR AVE

NEAREST CROSS STREET: AIRPORT BLVD

NEAREST ADDRESS No.: _____

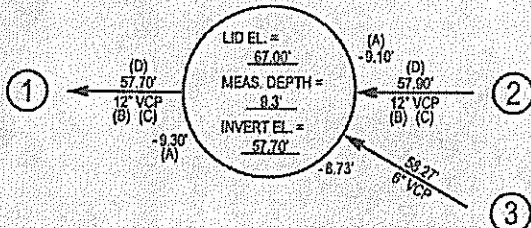
SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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CLIENT:

SSF - AKEL

CREW:

EB / MY

JOB No.:

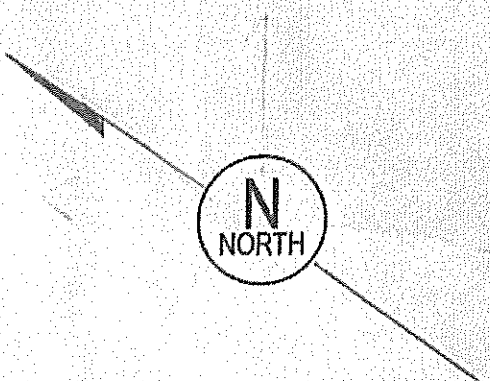
15695

DATE:

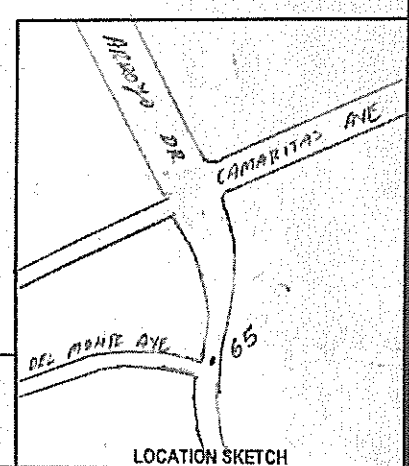
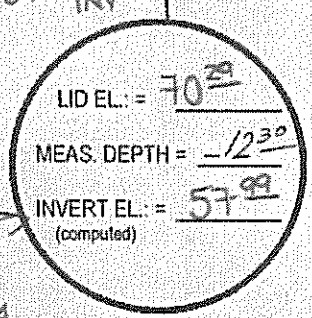
2018-12-15

MANHOLE DIPSHEET	PROJECT NAME: SSF-AVEL	PROJECT LOCATION: SOUTH SAN SFO	PAGE NUMBER: 2 OF 6 PAGES	FIELD BOOK: PAGE:
------------------	---------------------------	------------------------------------	------------------------------	----------------------

POINT I.D.: 65
 MANHOLE No.: WG 1323
 MANHOLE TYPE: SS SD ELEC TEL OTHER _____
 STREET NAME(S): Arroyo Dr
 NEAREST CROSS STREET: DEL MONTE AVE
 NEAREST ADDRESS No.: 113 Arroyo Dr
 SPECIAL MARKINGS: _____
 UNITS TO BE MEASURED IN: FEET METERS



120" INVERT (NOTE: TYPE OF PIPE IS NOT CLEAR)
 57.49 INVERT
 18" INVERT



PICTURE FILENAMES:

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduces in office)

- GENERAL FIELD INSTRUCTIONS:
- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
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	CLIENT: <u>AVEL</u>	CREW: <u>EB/SL/JS</u>
	JOB No.: <u>15695-101</u>	DATE: <u>2018-12-06</u>

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: 34	FIELD BOOK:
	AKEL	So. SF, CA	OF PAGES	PAGE:

POINT I.D.: 66

MANHOLE No.: WD2585

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

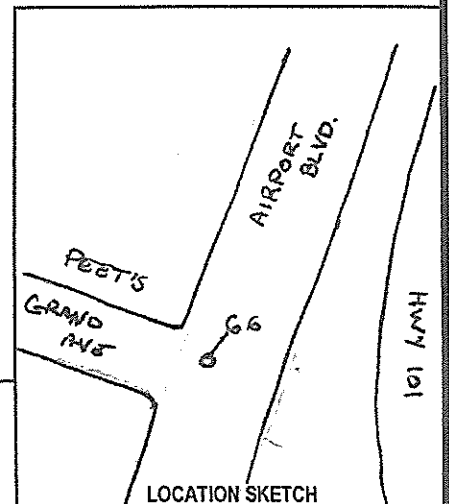
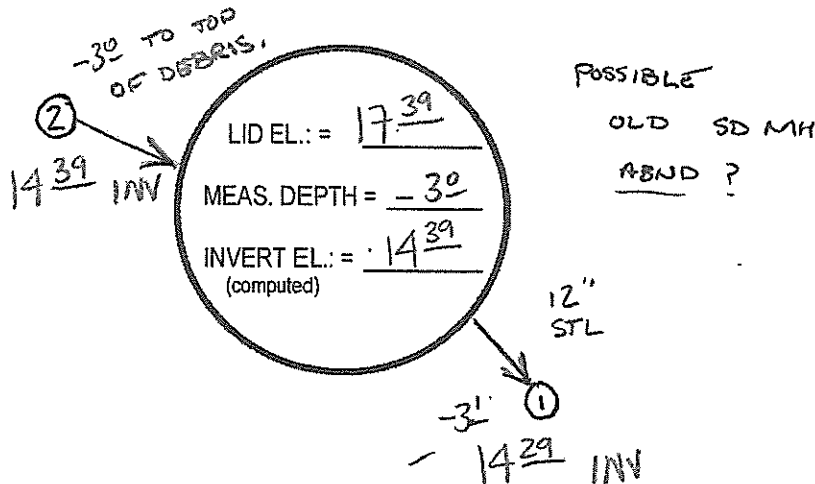
STREET NAME(S): AIRPORT BLVD.

NEAREST CROSS STREET: GRAND AVE

NEAREST ADDRESS No.: 102 GRAND

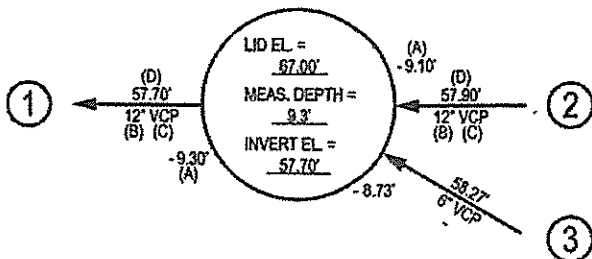
SPECIAL MARKINGS: N/A

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

	CLIENT:	CREW:
	CITY OF So. SF	JM / CP
JOB No.:	DATE:	
15695-101	2018 / 12 / 28	

MANHOLE DIPSHEET

PROJECT NAME:

A-KEL

PROJECT LOCATION:

S. SAN FRANCISCO, CA

PAGE NUMBER: 2

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 67 A

MANHOLE No.: WH1836

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

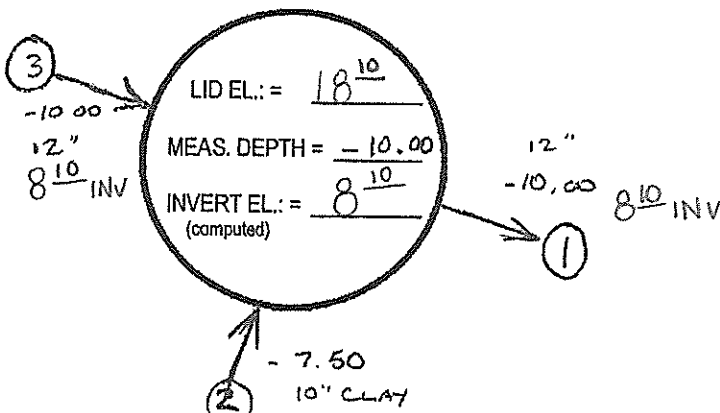
STREET NAME(S): S. MAGNOLIA AVE

NEAREST CROSS STREET: MAYFAIR AVE.

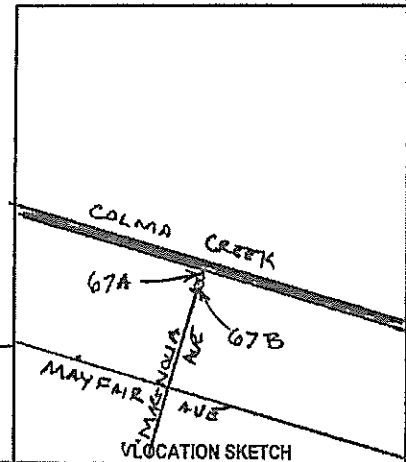
NEAREST ADDRESS No.: 600 MAYFAIR AVE

SPECIAL MARKINGS: 'SANITARY SEWER'

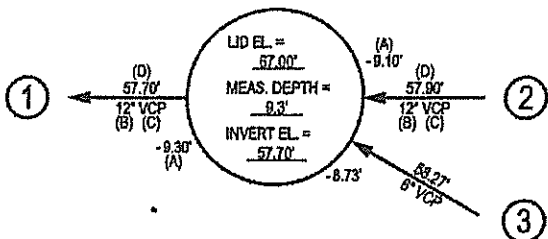
UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: 10 60 INV



EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
- 7) PIPE #2 IS THE NEXT PIPE CONTINUING IN THE CLOCKWISE DIRECTION.
- 8) FILL IN APPLICABLE INFORMATION FOR PIPE #2.
- 9) CONTINUING CLOCKWISE, FILL IN APPLICABLE INFORMATION FOR THE REST OF THE PIPES.
- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:

JOB No.:

15695

CREW:

JM/DS

DATE:

2018 / 12 / 15

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:
S. SAN FRANCISCO,
CA

PAGE NUMBER: 3
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 67 B

MANHOLE No.: WH1836

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

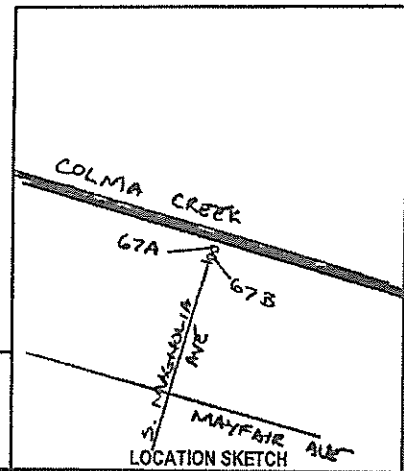
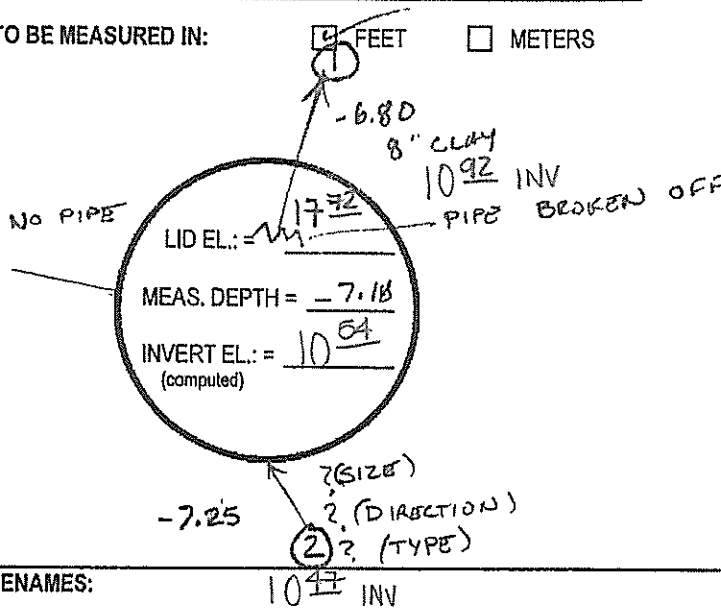
STREET NAME(S): S. MAGNOLIA AVE

NEAREST CROSS STREET: MAYFAIR AVE

NEAREST ADDRESS No.: 600 MAYFAIR AVE

SPECIAL MARKINGS: _____

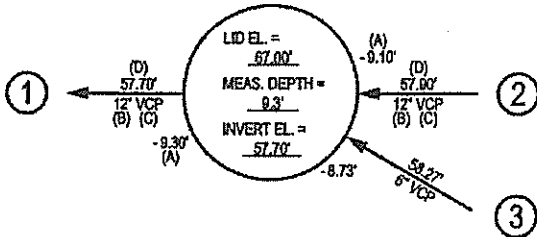
UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

10¹¹ INV

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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CLIENT:

JOB No.:

15695

CREW:

JM/DS

DATE:

2018/12/15

MANHOLE DIPSHEET

PROJECT NAME:

AVEL

PROJECT LOCATION:

S SAN FRANCISCO, CA

PAGE NUMBER: 15
OF PAGES

FIELD BOOK: PAGE:

POINT I.D.: 68

MANHOLE No.: MH-3

MANHOLE TYPE: SS SD ELEC TEL OTHER:

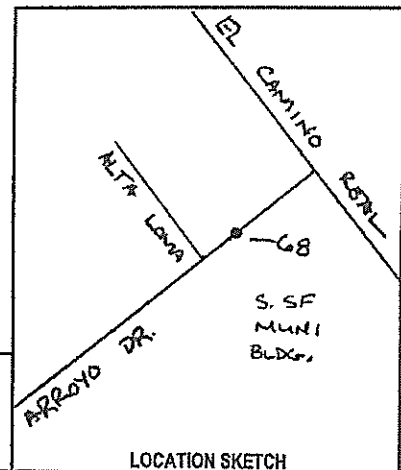
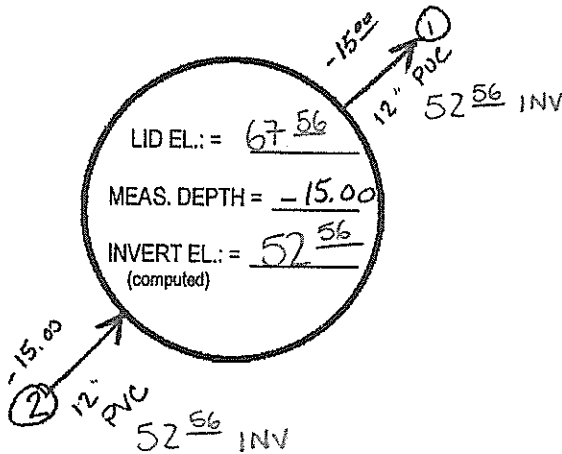
STREET NAME(S): ARROYO DR.

NEAREST CROSS STREET: ALTA LOMA

NEAREST ADDRESS No.: 33 ARROYO DR

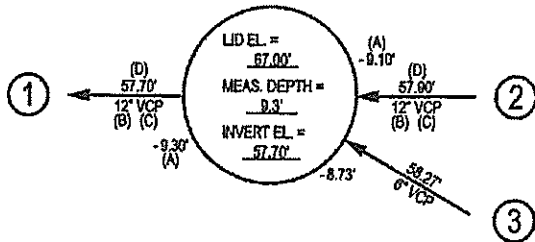
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

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CLIENT:

JOB No.:

15695

CREW:

JM / DS

DATE:

2018/12/15

MANHOLE DIPSHEET

PROJECT NAME:
AKEL

PROJECT LOCATION:
S. SAN FRANCISCO
CA

PAGE NUMBER: 11
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 69

MANHOLE No.: MH-2

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

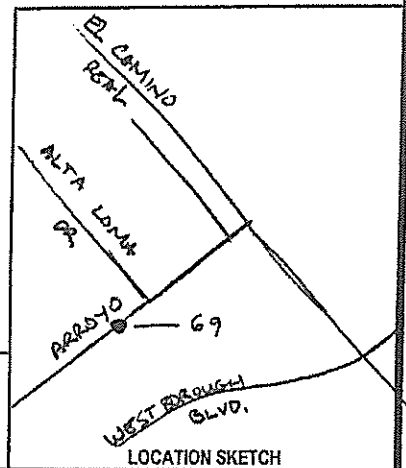
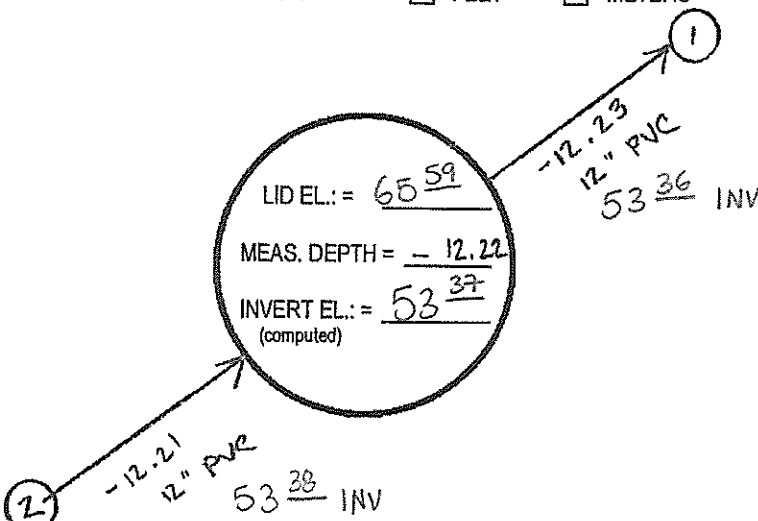
STREET NAME(S): ARROYO DR.

NEAREST CROSS STREET: ALTA LOMA DR.

NEAREST ADDRESS No.: 58 ARROYO DR

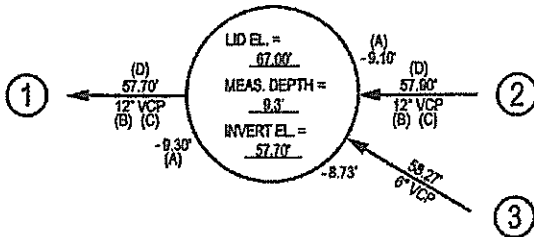
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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CLIENT:

JOB No.: 15695

CREW:

JM/DS

DATE:

2018/12/15

MANHOLE DIPSHEET

PROJECT NAME:

SSF SEWER

PROJECT LOCATION:

SOUTH SAN JOE

PAGE NUMBER: 2

OF 20 PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 70

MANHOLE No.: WC 2427

MANHOLE TYPE: SS SD ELEC TEL OTHER

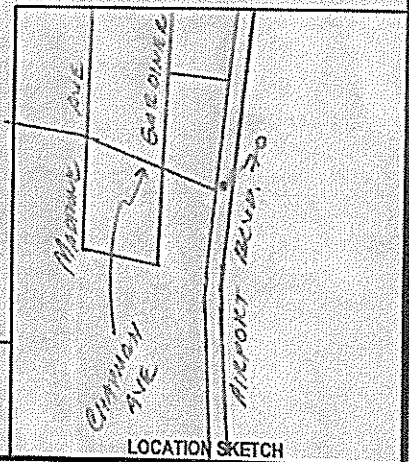
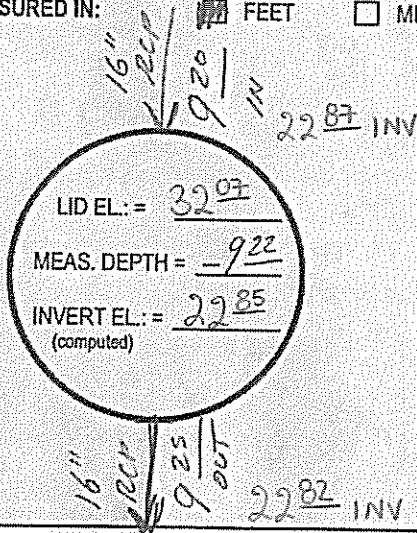
STREET NAME(S): AIRPORT BLVD

NEAREST CROSS STREET: CHAPMAN AVE

NEAREST ADDRESS No.: 995 AIRPORT BLVD

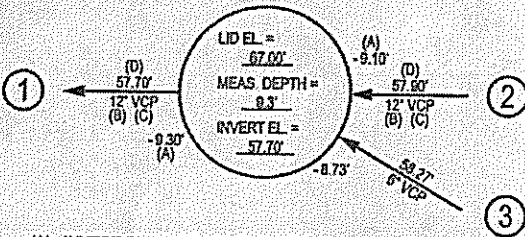
SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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CLIENT:

SSF - AKEL

JOB No.:

15695

CREW:

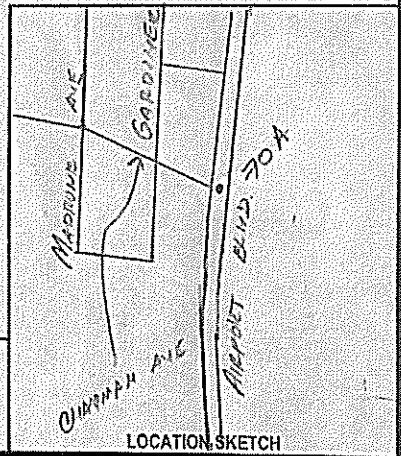
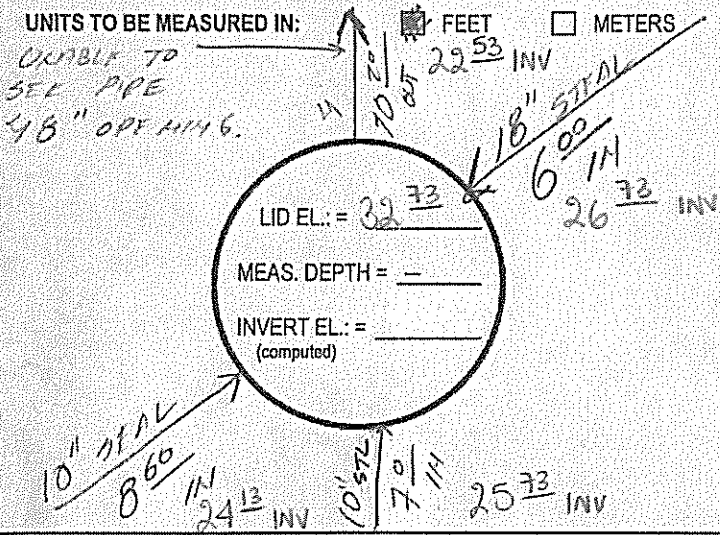
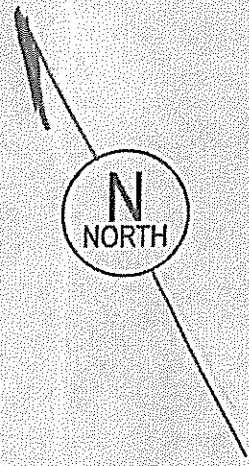
EB / MY

DATE:

2018-12-15

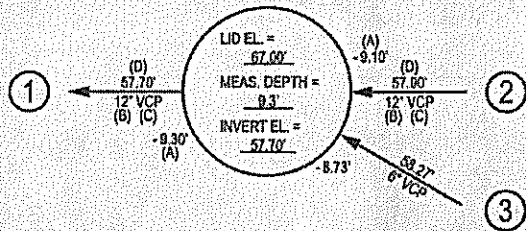
MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: /	FIELD BOOK:
	SSF SEWER	SOUTH SAN JO	OF 20 PAGES	PAGE:

POINT I.D.: 70 A
 MANHOLE No.: WC 2427
 MANHOLE TYPE: SS SD ELEC TEL OTHER: _____
 STREET NAME(S): AIRPORT BLVD
 NEAREST CROSS STREET: CHAPMAN AVE
 NEAREST ADDRESS No.: _____
 SPECIAL MARKINGS: _____



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: SSF - AXEL
 JOB No.: 15695

CREW: EB / MY
 DATE: 2018-12-15

MANHOLE DIPSHEET

PROJECT NAME:

SSF SEWER

PROJECT LOCATION:

SOUTH SAN JOSE

PAGE NUMBER: 3

OF 20 PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 71

MANHOLE No.: WC 2429

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

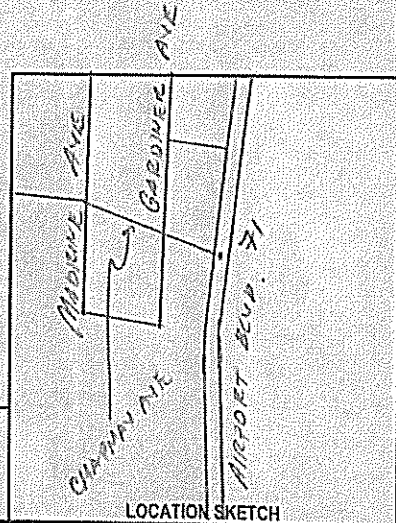
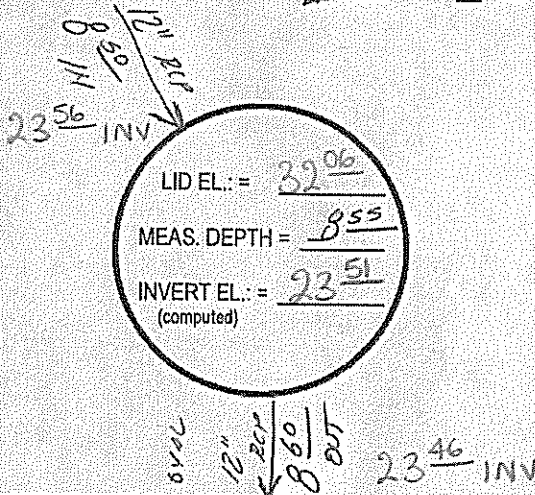
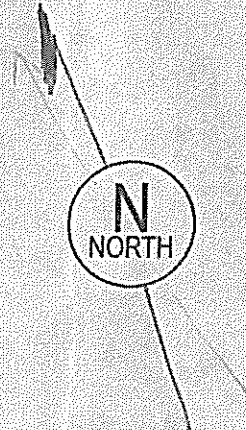
STREET NAME(S): CHAPMAN AVE

NEAREST CROSS STREET: AIRPORT BLVD

NEAREST ADDRESS No.: _____

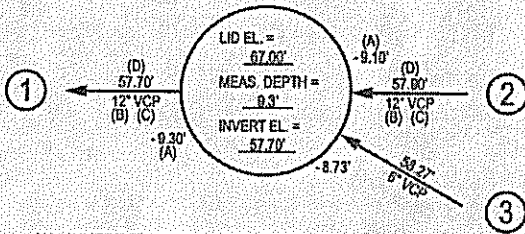
SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.

T TOWILL
SURVEYING | MAPPING | GIS

CLIENT:

SSF - AKEL

CREW:

EBI / MY

JOB No.:

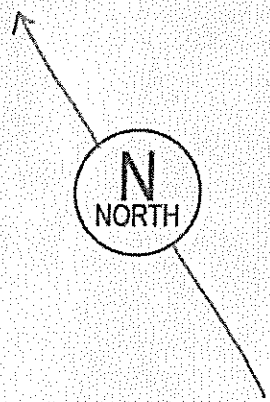
15695

DATE:

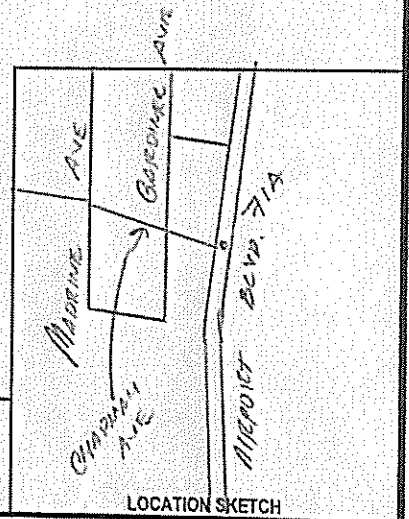
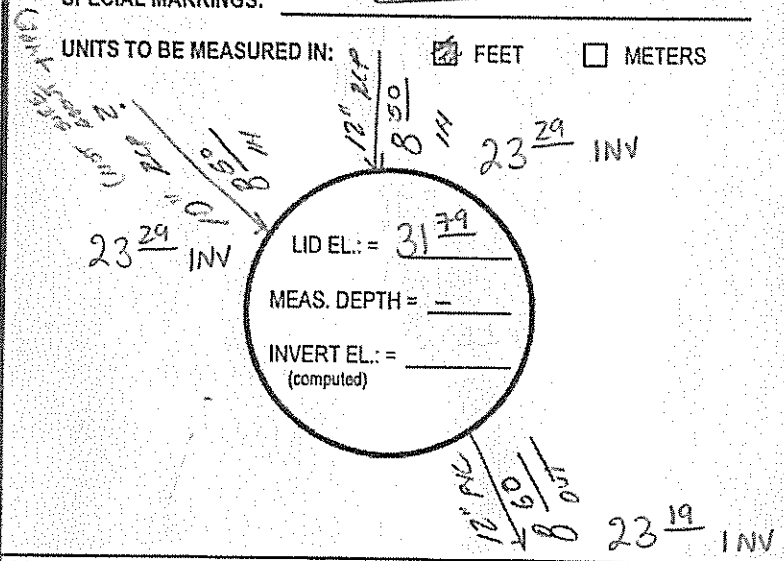
2018-12-15

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: 4	FIELD BOOK:
	SSF SEWER	SOUTH SAN FLO.	OF 20 PAGES	PAGE:

POINT I.D.: 71 A
 MANHOLE No.: WC 2429
 MANHOLE TYPE: SS SD ELEC TEL OTHER _____
 STREET NAME(S): CHAPMAN AVE
 NEAREST CROSS STREET: AIRPORT BLVD
 NEAREST ADDRESS No.: _____
 SPECIAL MARKINGS: _____

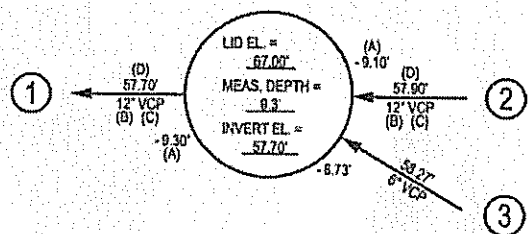


UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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CLIENT: SSF - AKEL
 JOB No.: 15695

CREW: EB / MV
 DATE: 2018-12-15

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: <u>S</u>	FIELD BOOK:
	<u>SSF SEWER</u>	<u>South San Fld.</u>	OF <u>20</u> PAGES	PAGE:

POINT I.D.: 71 B

MANHOLE No.: WC 2429

MANHOLE TYPE: SS SD ELEC TEL OTHER

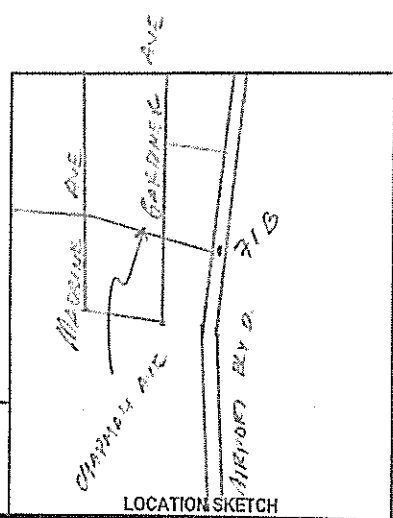
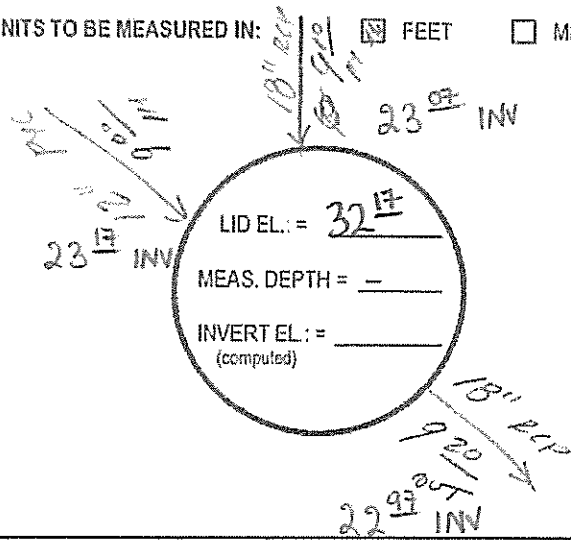
STREET NAME(S): AIRPORT BLVD

NEAREST CROSS STREET: CHAMBERLAIN AVE

NEAREST ADDRESS No.: _____

SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES: _____

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:
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T TOWILL
 SURVEYING | MAPPING | GIS

CLIENT: SSF - AKEL
 JOB No.: 15695

CREW: EB / MY
 DATE: 2018-12-15

POINT I.D.: 72

MANHOLE No.: WG 1008

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

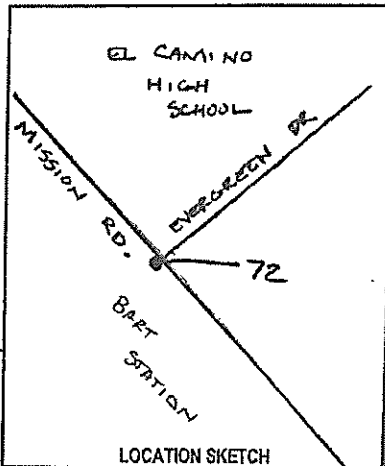
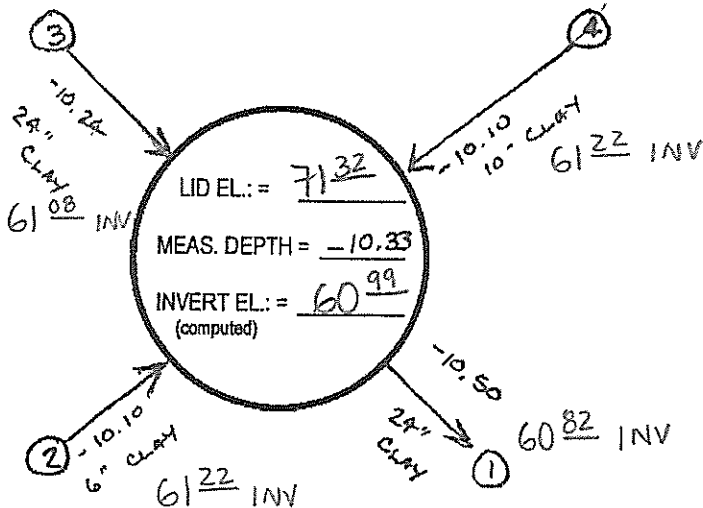
STREET NAME(S): MISSION RD.

NEAREST CROSS STREET: EVERGREEN DR.

NEAREST ADDRESS No.: 1289 MISSION RD.

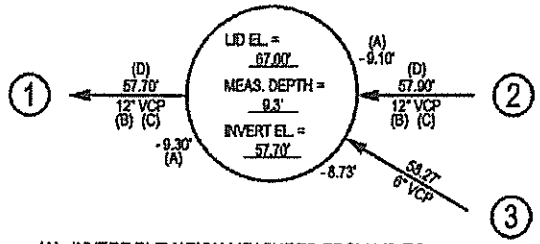
SPECIAL MARKINGS: "CITY OF S. SAN FRANCISCO"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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- 3) FILL IN LID ELEVATION.
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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT: _____

JOB No.: 15695

CREW: JM / DS

DATE: 2018/12/15

MANHOLE DIPSHEET

PROJECT NAME:
AKEL

PROJECT LOCATION:
So. SF, CA

PAGE NUMBER: **42**
OF PAGES

FIELD BOOK:
PAGE:

POINT I.D.: 73

MANHOLE No.: WG999

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

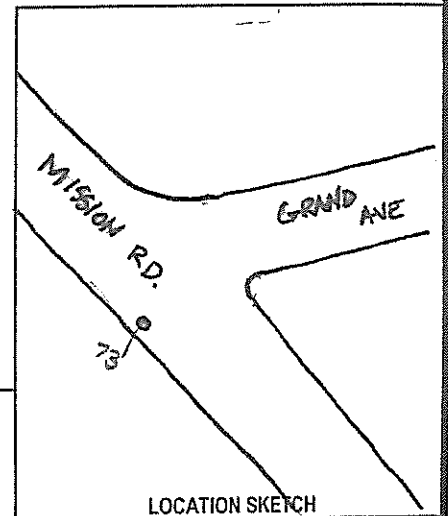
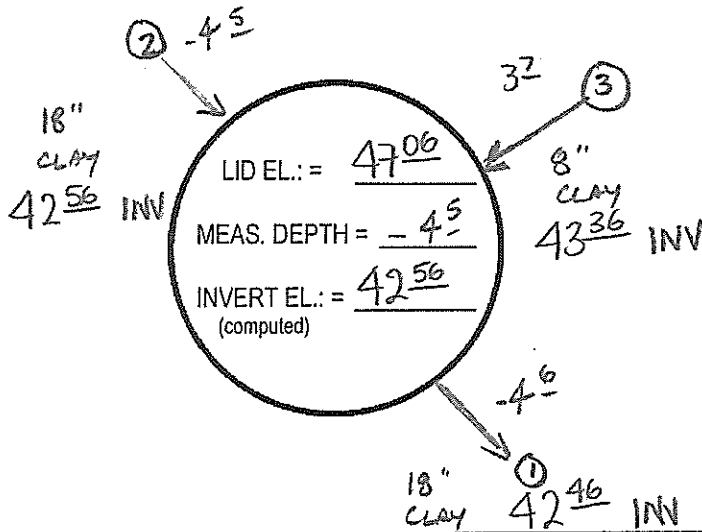
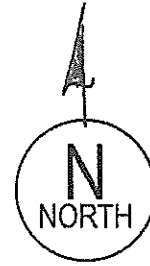
STREET NAME(S): MISSION RD

NEAREST CROSS STREET: GRAND AVE

NEAREST ADDRESS No.: 1107 MISSION RD

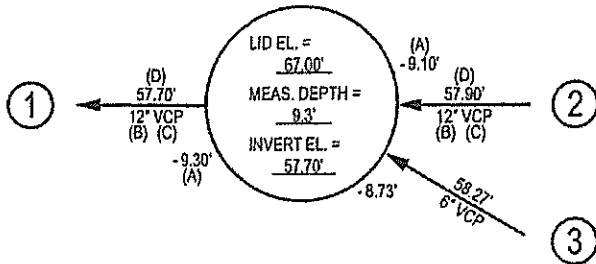
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

GENERAL FIELD INSTRUCTIONS:

- 1) FILL IN APPLICABLE BLANKS ON TOP OF PAGE.
- 2) DRAW NORTH ARROW ABOVE.
- 3) FILL IN LID ELEVATION.
- 4) FILL IN MEASURED DEPTH.
- 5) DETERMINE THE FIRST OUT FLOW PIPE CLOCKWISE FROM NORTH. THIS IS PIPE #1.
- 6) FILL IN APPLICABLE INFORMATION FOR PIPE #1 (see example).
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- 10) DRAW A MAP IN THE LOCATION SKETCH BOX SHOWING STREETS, STREET NAME(S), AND LOCATION OF UTILITY.



CLIENT:
CITY OF So. SF

CREW:
JM / CP

JOB No.:
15695-101

DATE:
2018 / 12 / 28

POINT I.D.: 74

MANHOLE No.: WG1028

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

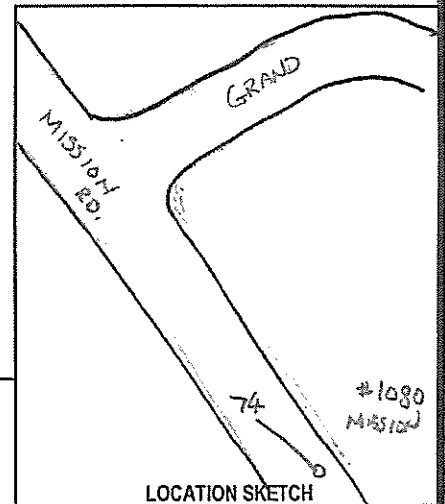
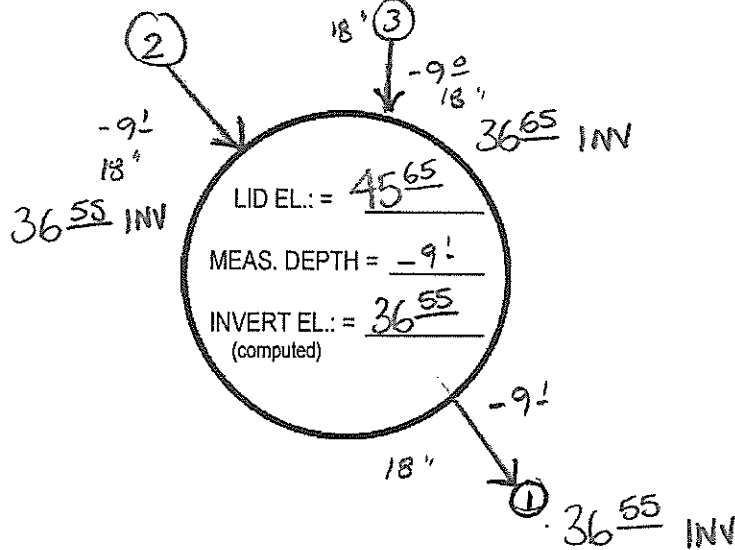
STREET NAME(S): MISSION RD.

NEAREST CROSS STREET: GRAND AVE

NEAREST ADDRESS No.: 1080 MISSION RD

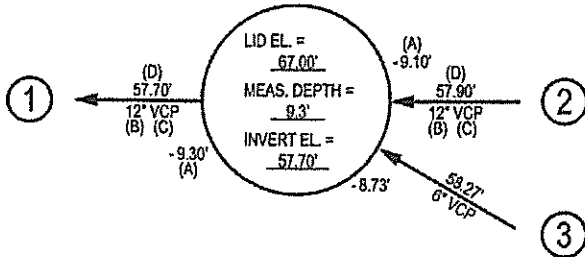
SPECIAL MARKINGS: "SANITARY SEWER"

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
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CLIENT: CITY OF So. SF

JOB No.: 15695-101

CREW: JM / CP

DATE: 2018/12/28

MANHOLE DIPSHEET

PROJECT NAME:

AKEL

PROJECT LOCATION:

So. SF, CA

PAGE NUMBER: 17

OF PAGES

FIELD BOOK:

PAGE:

POINT I.D.: 1000

MANHOLE No.: MH

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

STREET NAME(S): N. CANAL ST.

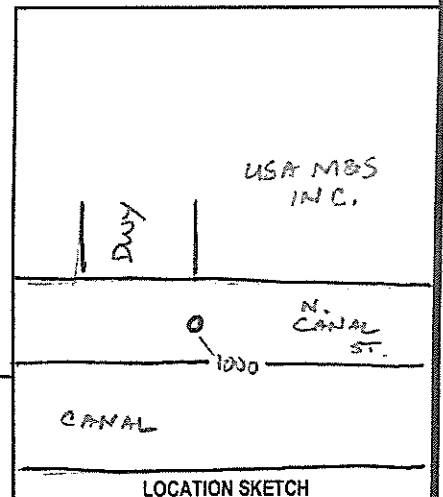
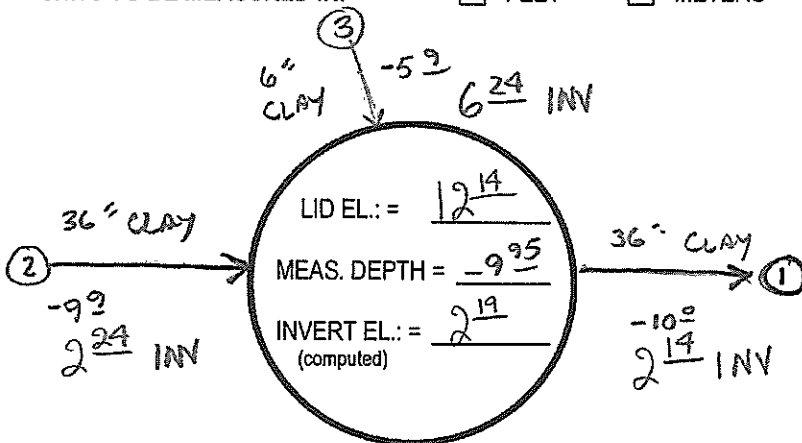
NEAREST CROSS STREET: S. LINDEN AVE.

NEAREST ADDRESS No.: 338 N. CANAL ST.

SPECIAL MARKINGS: N/A

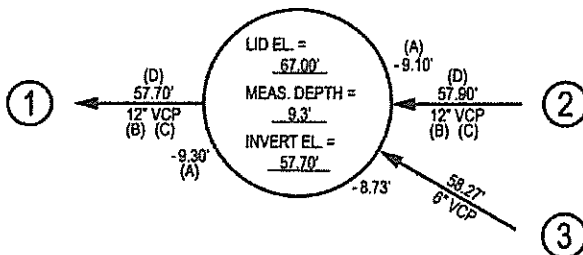


UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
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CLIENT:

CITY OF SO. SF

CREW:

CP/JM

JOB No.:

15695-101

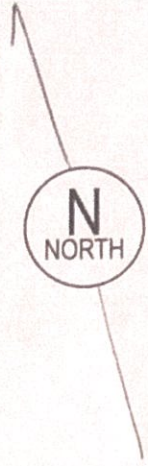
DATE:

2018/12/28

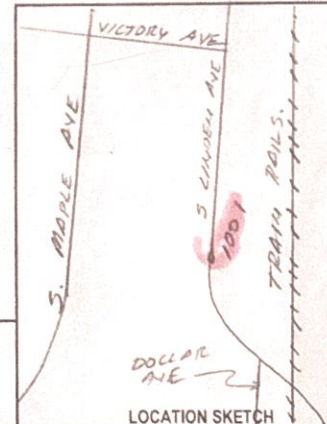
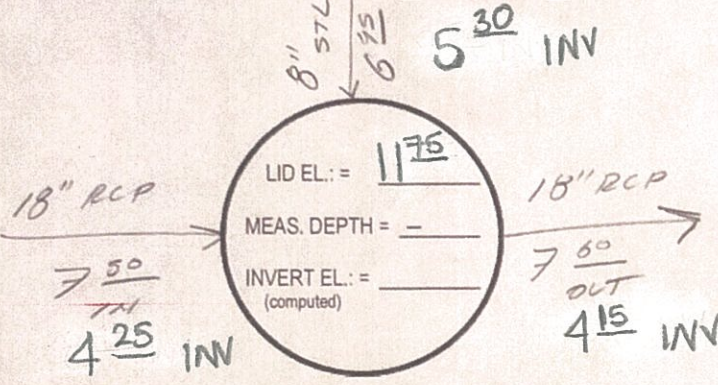
MANHOLE DIPSHEET

PROJECT NAME: SSP - AXEL PROJECT LOCATION: SOUTH SAN FID PAGE NUMBER: 5 FIELD BOOK: _____
 OF 8 PAGES PAGE: _____

POINT I.D.: 1001
 MANHOLE No.: _____ SSMH
 MANHOLE TYPE: SS SD ELEC TEL OTHER: _____
 STREET NAME(S): 5 LINDEN AVE
 NEAREST CROSS STREET: DOLLAR AVE
 NEAREST ADDRESS No.: _____
 SPECIAL MARKINGS: _____

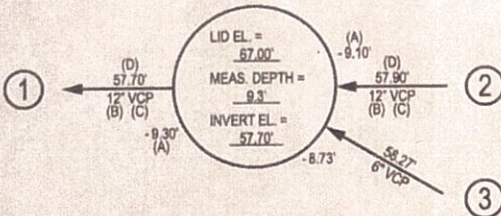


UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (in appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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CLIENT: AXEL
 JOB No.: 15695-101

CREW: EB/MY
 DATE: 2018-12-18

MANHOLE DIPSHEET	PROJECT NAME:	PROJECT LOCATION:	PAGE NUMBER: 6	FIELD BOOK:
	SSP - AXEL	SOUTH SAN JO	OF 8 PAGES	PAGE:

POINT I.D.: 002

MANHOLE No.: SSMH

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

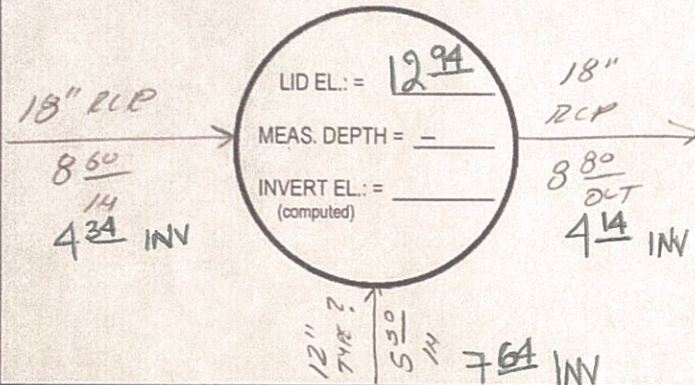
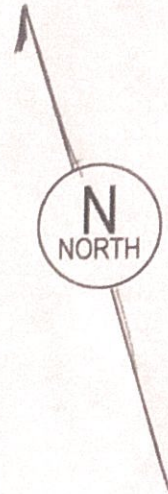
STREET NAME(S): S LINDEN AVE

NEAREST CROSS STREET: DOLLAR AVE

NEAREST ADDRESS No.: _____

SPECIAL MARKINGS: _____

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:

(A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
 (B) PIPE OUTSIDE DIAMETER (in appropriate units)
 (C) PIPE TYPE
 (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

- GENERAL FIELD INSTRUCTIONS:**
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T TOWILL
 SURVEYING | MAPPING | GIS

CLIENT: AXEL

JOB No.: 15695-101

CREW: EB / MY

DATE: 2018-12-18

POINT I.D.: 1005

MANHOLE No.: R1

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

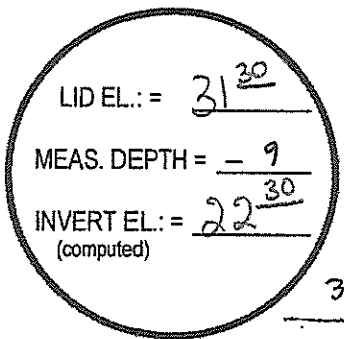
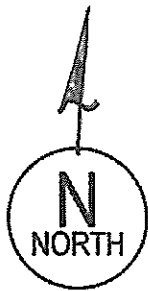
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NEAREST CROSS STREET: CYPRESS AVE

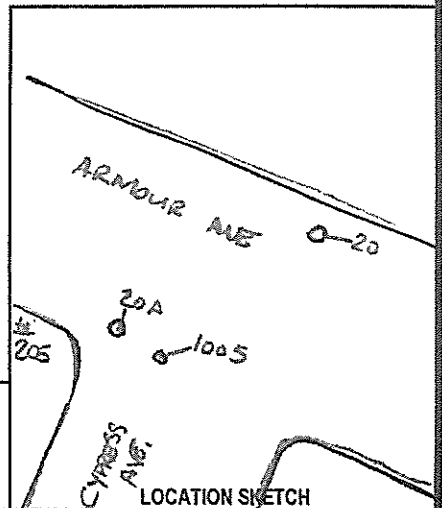
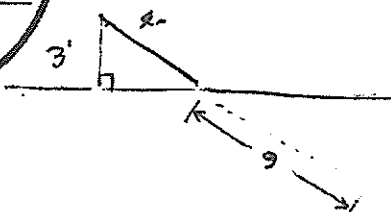
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SPECIAL MARKINGS: "CLEANOUT"

UNITS TO BE MEASURED IN: FEET METERS

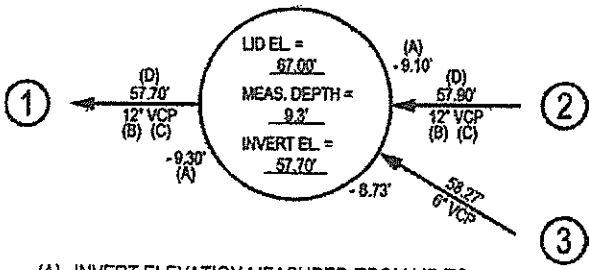


6" P.V.C.
PIPE SLANTED @ 45°
9' +/- MEASURED
22.30 INV



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
- (B) PIPE OUTSIDE DIAMETER (In appropriate units)
- (C) PIPE TYPE
- (D) LID ELEVATION MINUS MEASURED DEPTH OF PIPE (reduce in office)

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CLIENT:
CITY OF SO. SF

CREW:
JM / CP

JOB No.:
15695-101

DATE:
2018/12/28

POINT I.D.: "MH"

MANHOLE No.: _____

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

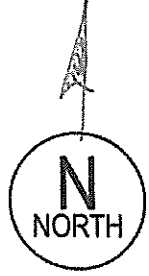
STREET NAME(S): N. CANAL ST.

NEAREST CROSS STREET: S. LINDEN AVE.

NEAREST ADDRESS No.: 26 S. LINDEN AVE.

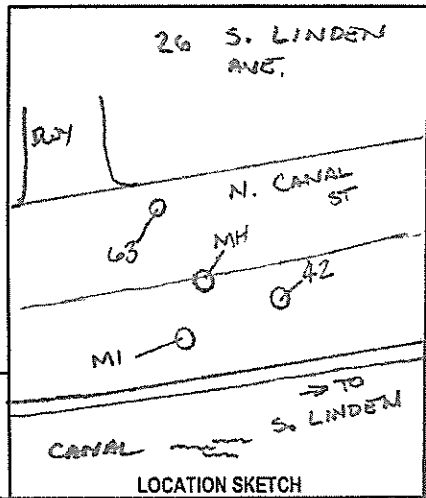
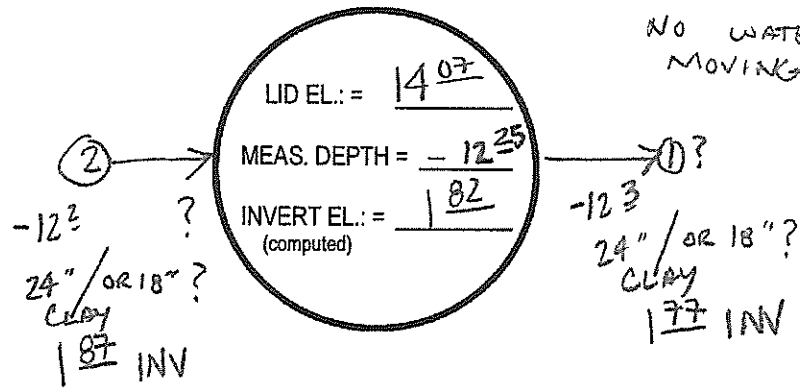
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UNITS TO BE MEASURED IN: FEET METERS



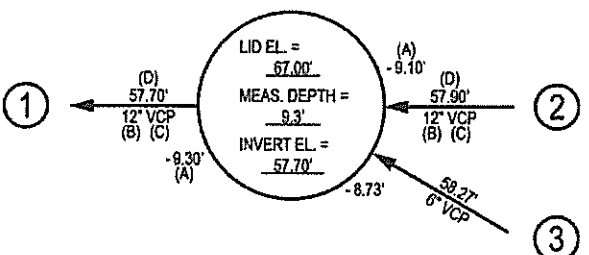
PLUGGED !! ?

NO WATER MOVING.



PICTURE FILENAMES:

EXAMPLE:



- (A) INVERT ELEVATION MEASURED FROM LID TO BOTTOM OF PIPE
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CLIENT: CITY OF SO. SF

CREW: JM / CP

JOB No.: 15695-101

DATE: 2018/12/28

POINT I.D.: "M1"

MANHOLE No.: _____

MANHOLE TYPE: SS SD ELEC TEL OTHER: _____

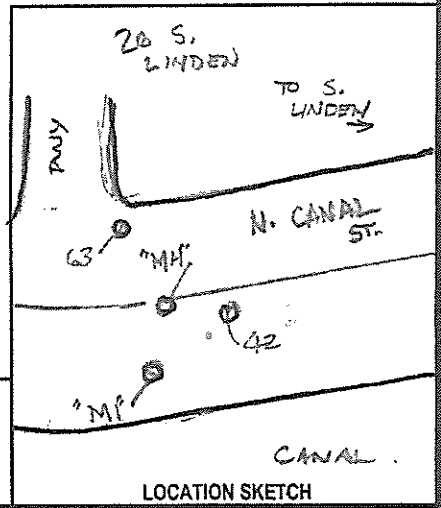
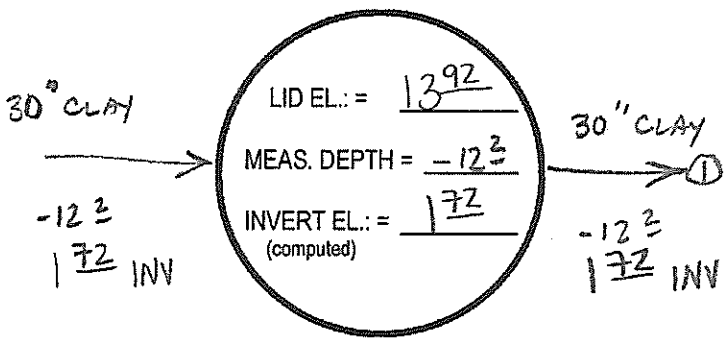
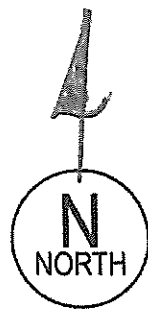
STREET NAME(S): N. CANAL

NEAREST CROSS STREET: S. LINDEN

NEAREST ADDRESS No.: 26 S. LINDEN

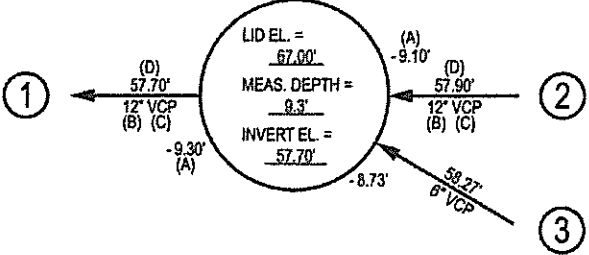
SPECIAL MARKINGS: N/A

UNITS TO BE MEASURED IN: FEET METERS



PICTURE FILENAMES:

EXAMPLE:



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CLIENT: CITY OF So. SF

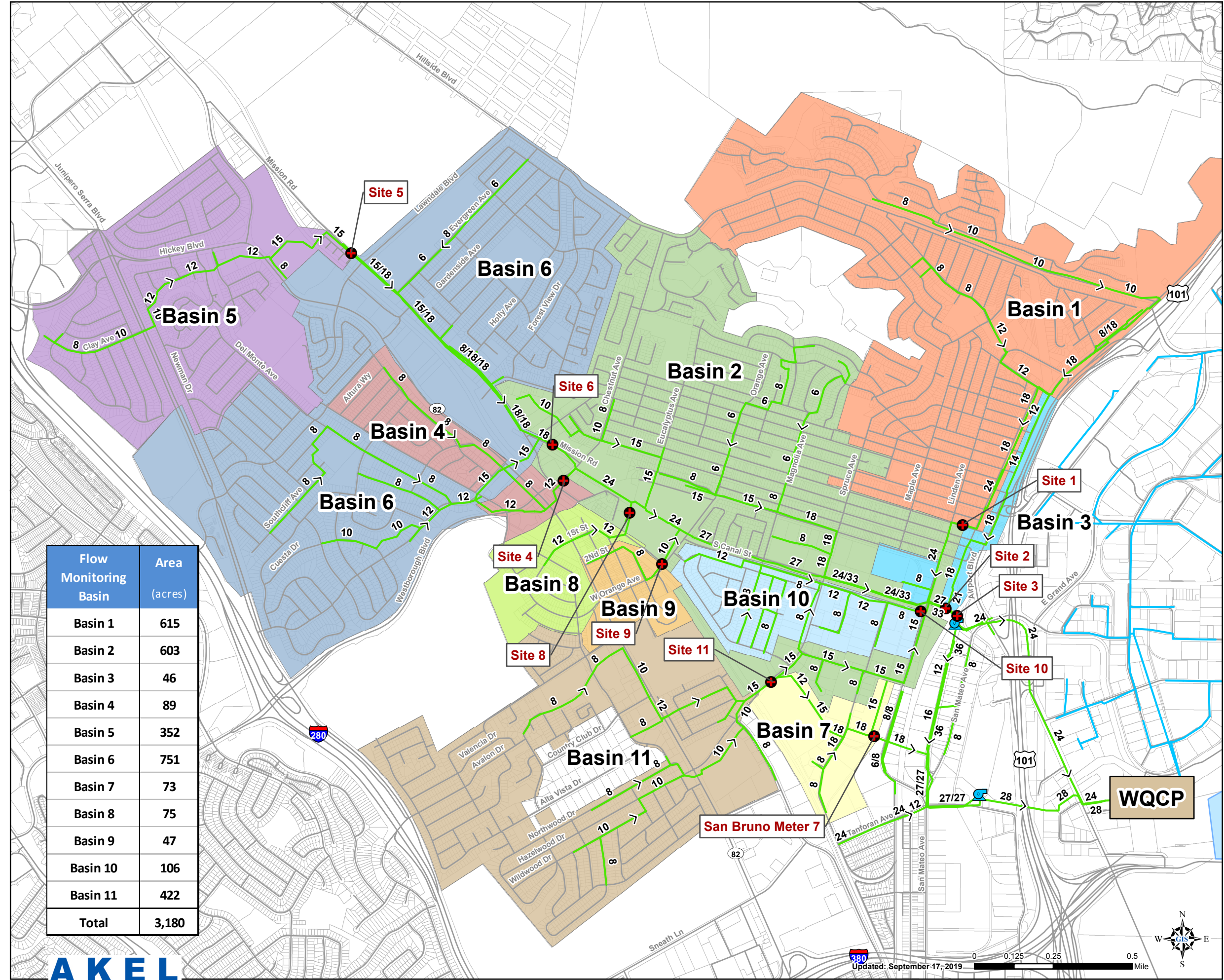
CREW: JM / CP

JOB No.: 15695-101

DATE: 2018 / 12 / 28

APPENDIX C

Hydraulic Model Calibration Exhibit



Legend

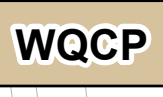
- Lift Stations
- Flow Monitor Locations
- SSF West Pipes
- SSF East Pipes

Flow Monitoring Basins

- Basin 1 (Orange)
- Basin 2 (Light Green)
- Basin 3 (Light Blue)
- Basin 4 (Red)
- Basin 5 (Purple)
- Basin 6 (Blue)
- Basin 7 (Yellow)
- Basin 8 (Light Green)
- Basin 9 (Orange)
- Basin 10 (Light Blue)
- Basin 11 (Brown)
- Parcels
- Street Centerlines

Flow Monitoring Basin	Area (acres)
Basin 1	615
Basin 2	603
Basin 3	46
Basin 4	89
Basin 5	352
Basin 6	751
Basin 7	73
Basin 8	75
Basin 9	47
Basin 10	106
Basin 11	422
Total	3,180

PRELIMINARY

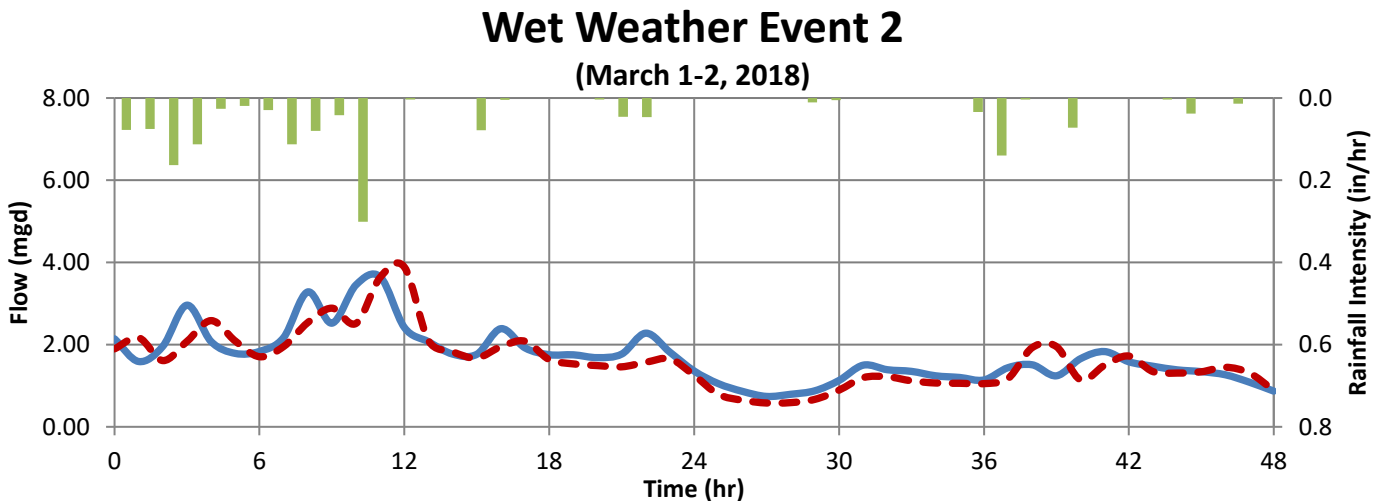
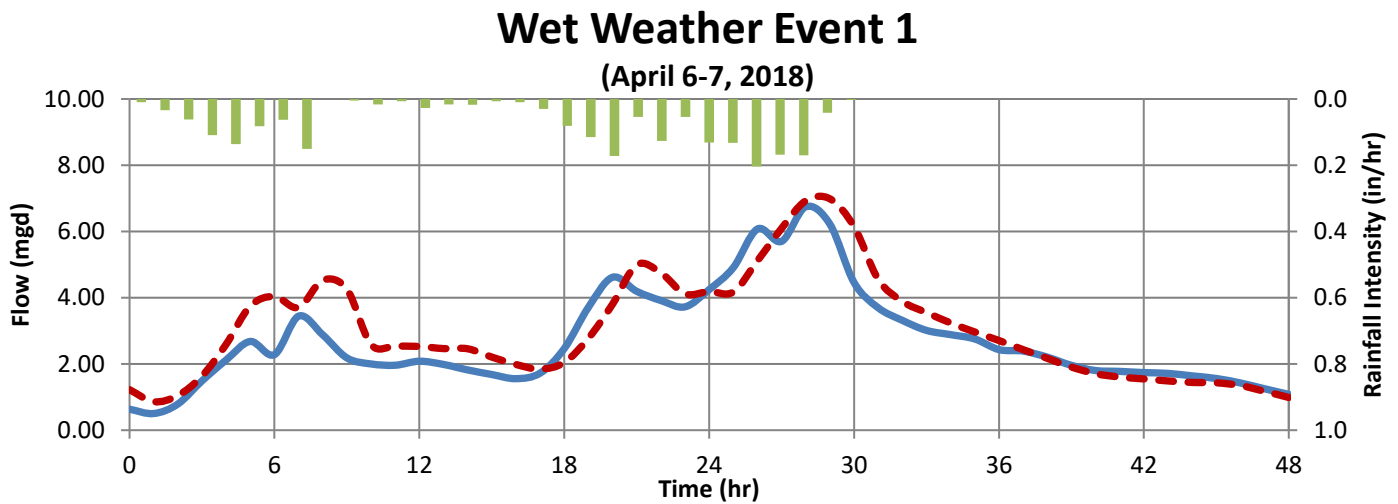
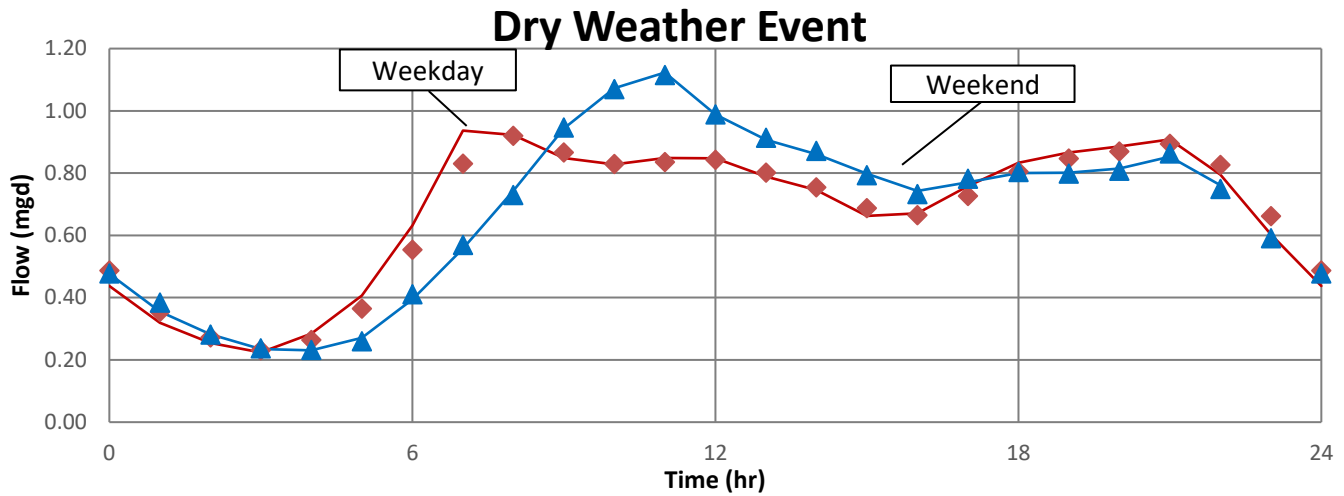


**Figure 1
Flow Monitoring Basins
City-Wide Sewer System
Master Plan
City of South San Francisco**



Updated: September 17, 2019

File Path: P:\GIS\GIS_Projects\SSF180201-CityWide SSMP\SSF_Fig-2_FlowMonitoring_091719.mxd



LEGEND

Dry Weather Event

- ▲ ◆ - Hydraulic Model
- — - V&A Flow Monitoring

PRELIMINARY

Wet Weather Event

- - Rainfall Intensity
- — - V&A Flow Monitoring
- - - - Hydraulic Model

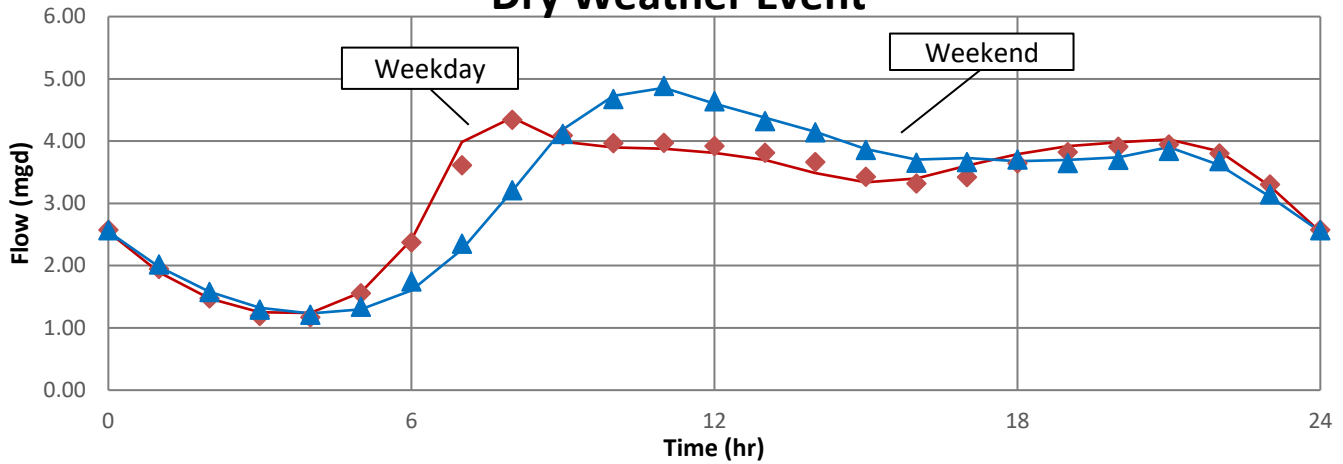
Figure 2

S-1

City-Wide Sewer System
Master Plan
City of South San Francisco

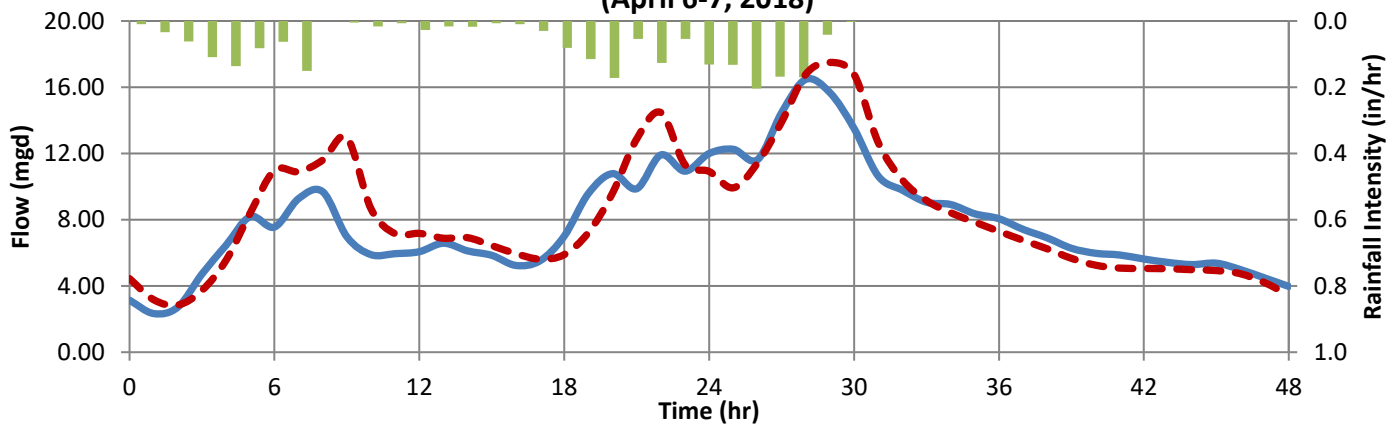


Dry Weather Event



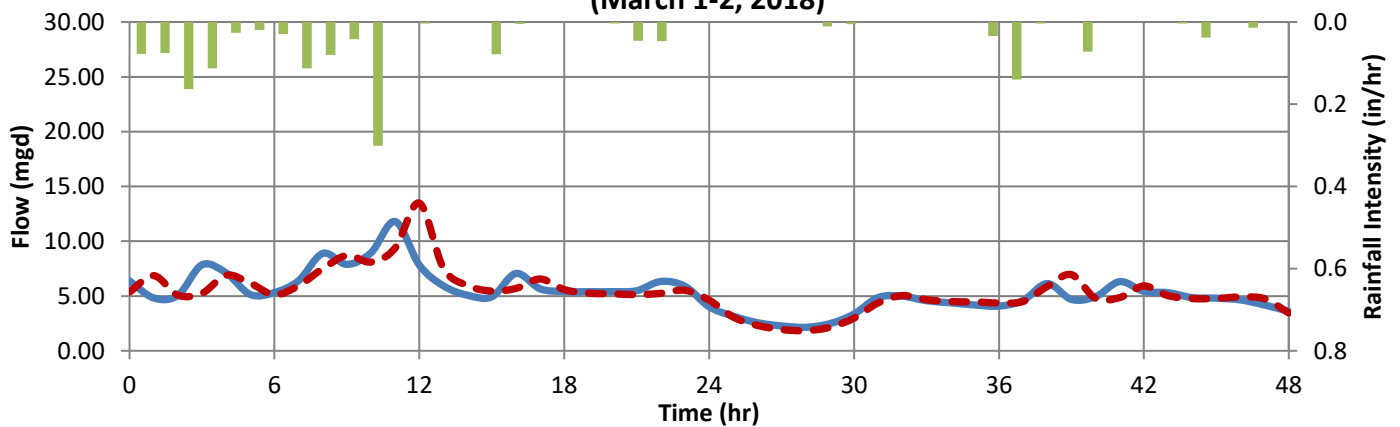
Wet Weather Event 1

(April 6-7, 2018)



Wet Weather Event 2

(March 1-2, 2018)



LEGEND

Dry Weather Event

- ▲ ◆ - Hydraulic Model
- — - V&A Flow Monitoring

PRELIMINARY

Wet Weather Event

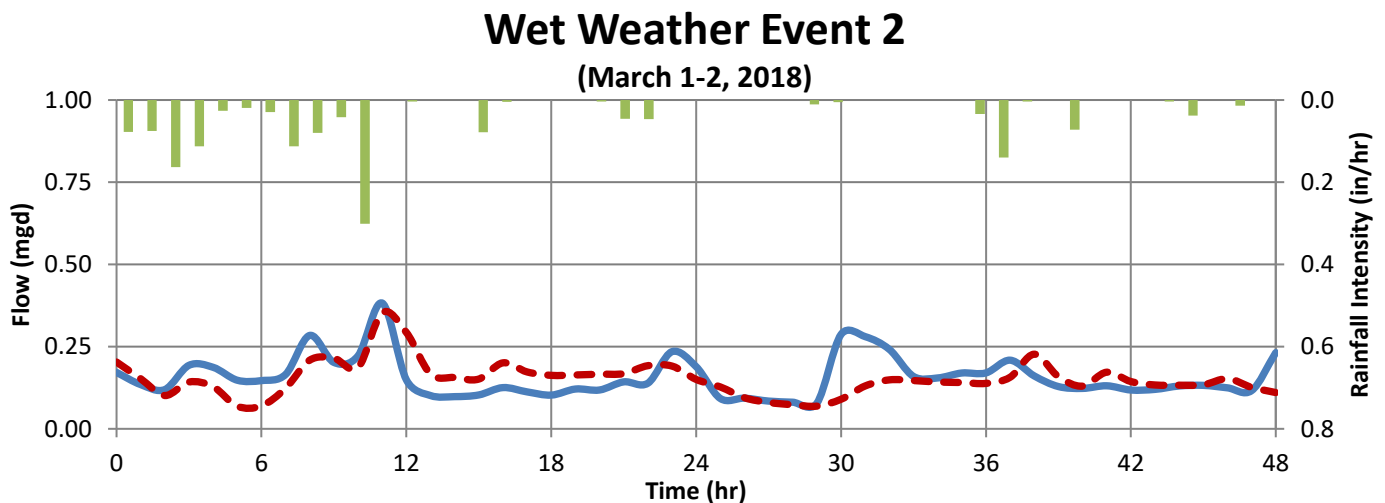
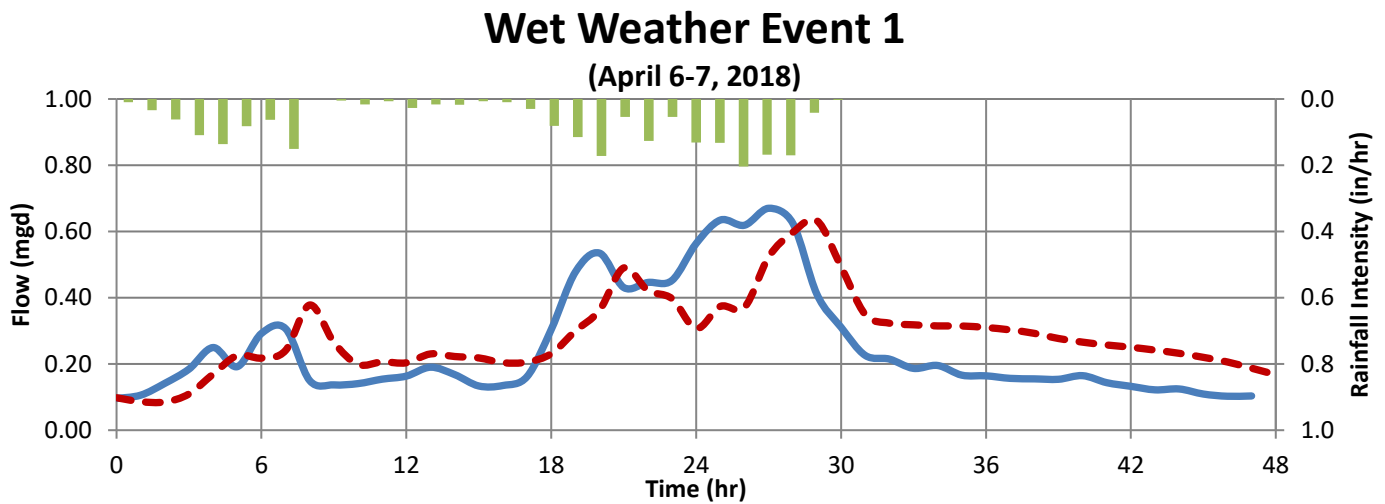
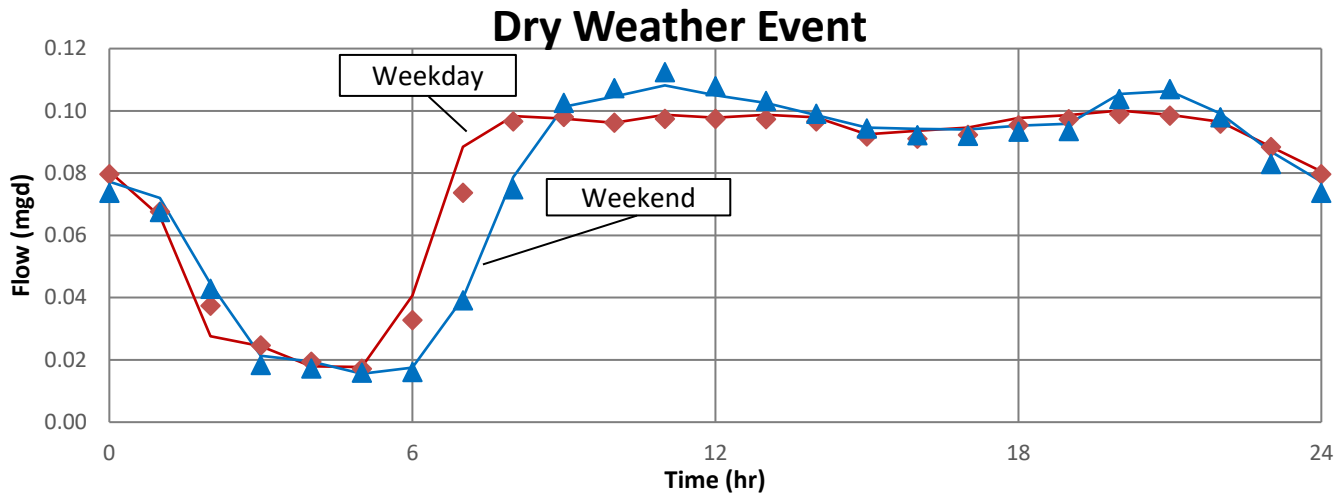
- - Rainfall Intensity
- — - V&A Flow Monitoring
- - - - Hydraulic Model

Figure 3

S-2

City-Wide Sewer System
Master Plan
City of South San Francisco





LEGEND

Dry Weather Event

- ▲ ◆ - Hydraulic Model
- — - V&A Flow Monitoring

PRELIMINARY

Wet Weather Event

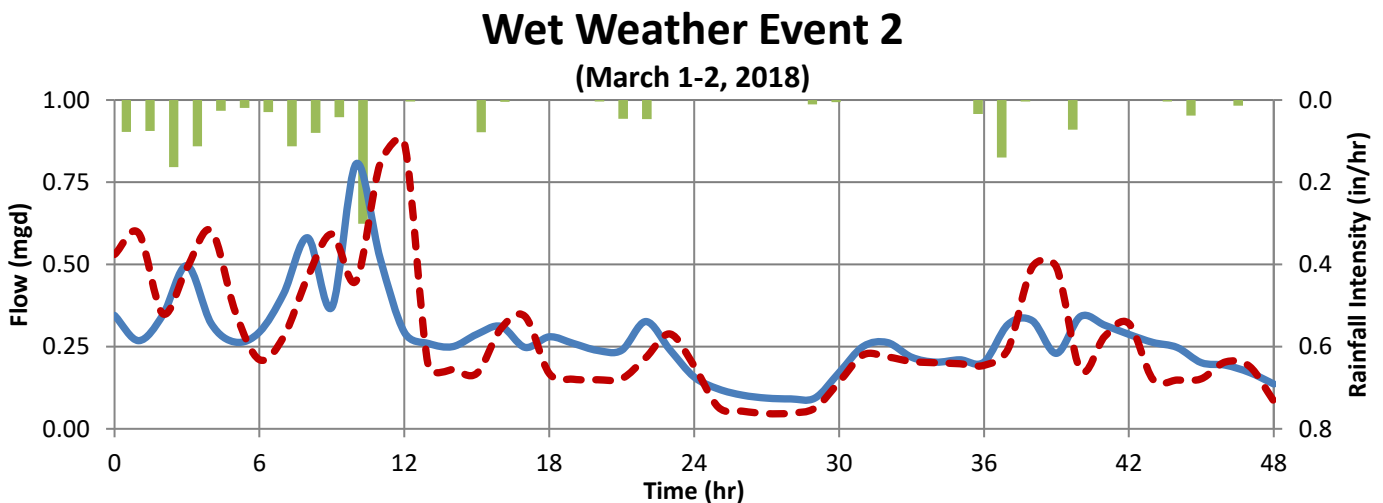
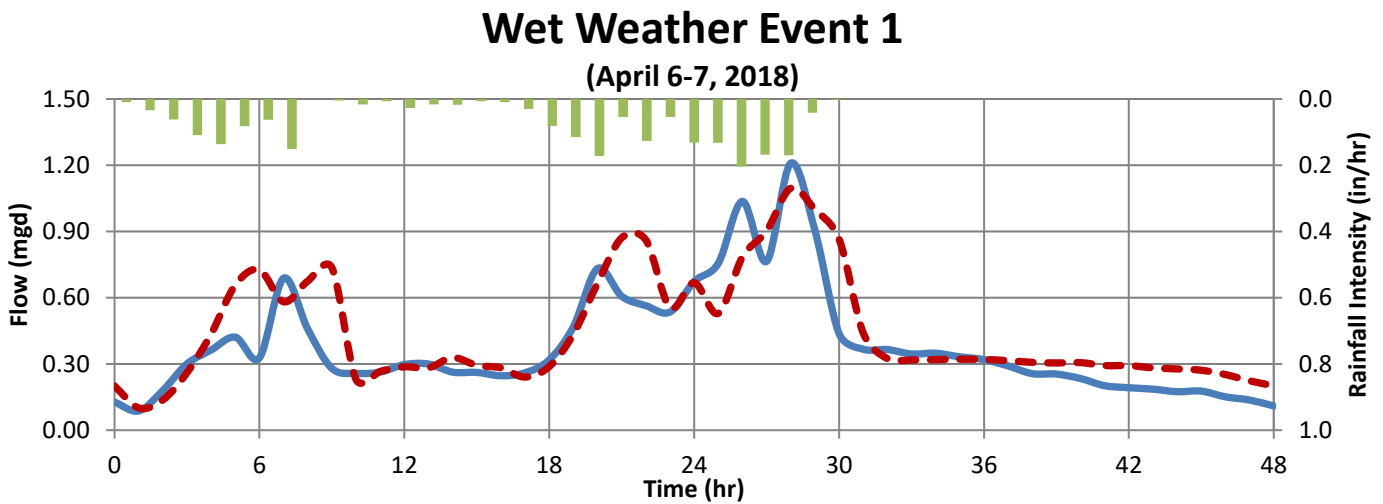
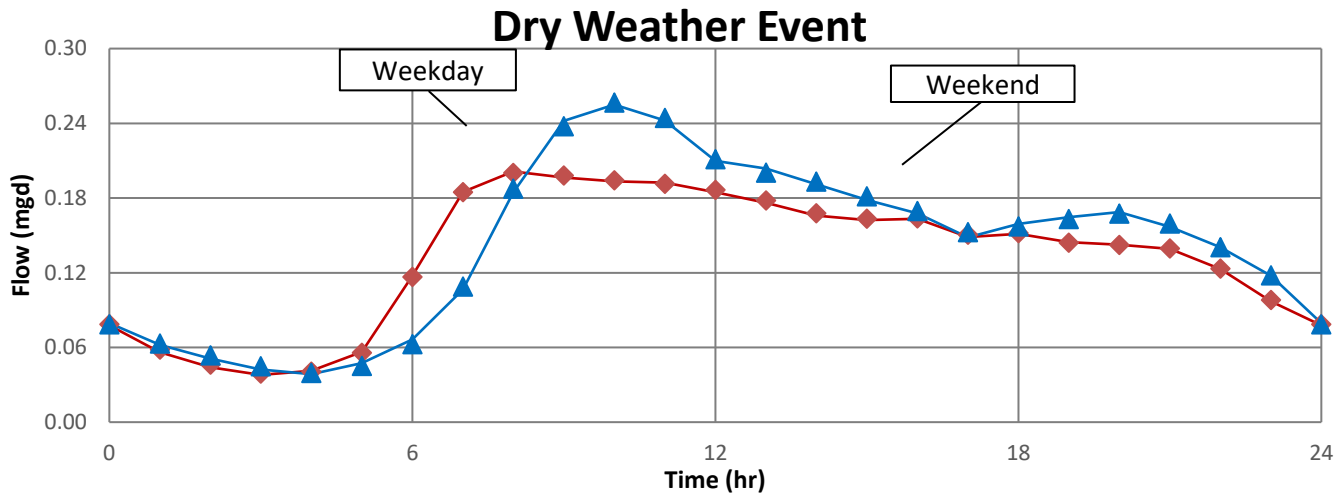
- - Rainfall Intensity
- - V&A Flow Monitoring
- - - Hydraulic Model

Figure 4

S-3

City-Wide Sewer System
Master Plan
City of South San Francisco





LEGEND

Dry Weather Event

- ▲ ◆ - Hydraulic Model
- — - V&A Flow Monitoring

PRELIMINARY

Wet Weather Event

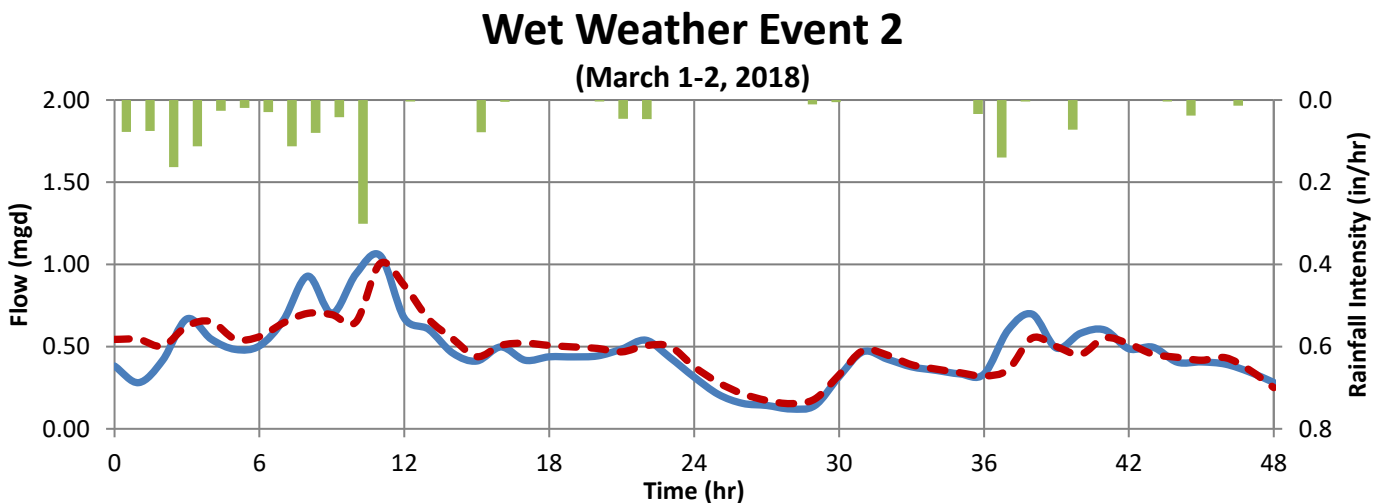
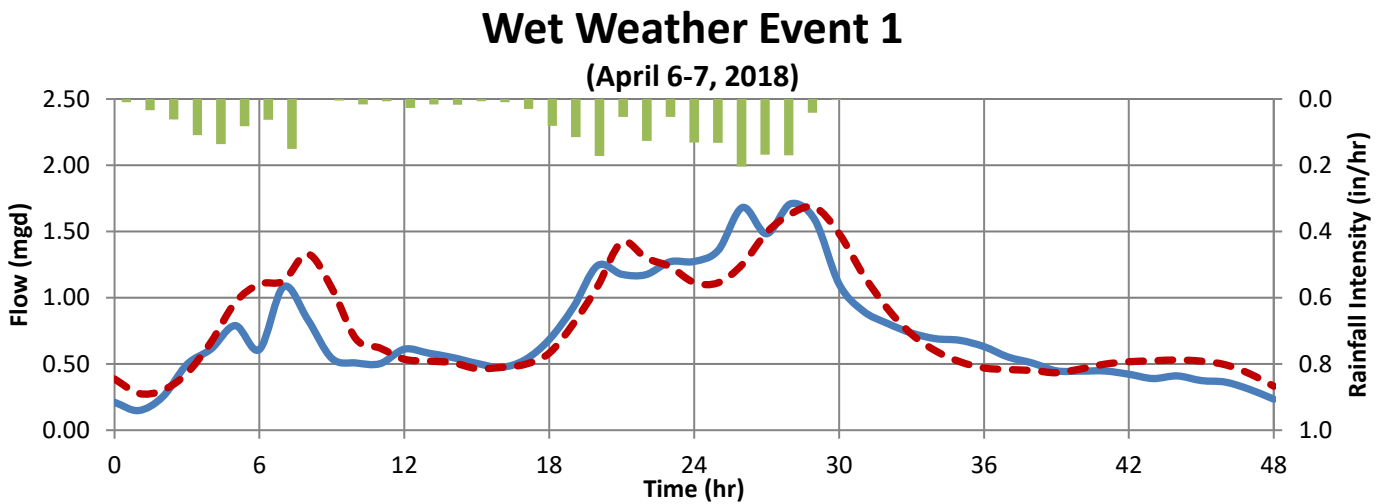
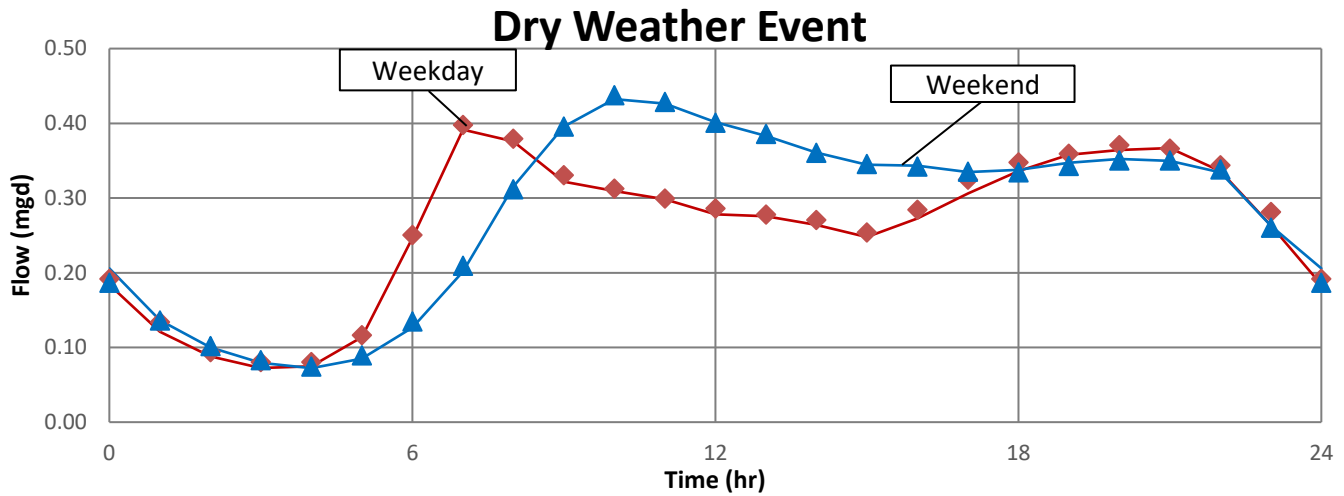
- - Rainfall Intensity
- — - V&A Flow Monitoring
- - - - Hydraulic Model

Figure 5

S-4

City-Wide Sewer System
Master Plan
City of South San Francisco





LEGEND

Dry Weather Event

- ▲ ◆ - Hydraulic Model
- — - V&A Flow Monitoring

PRELIMINARY

Wet Weather Event

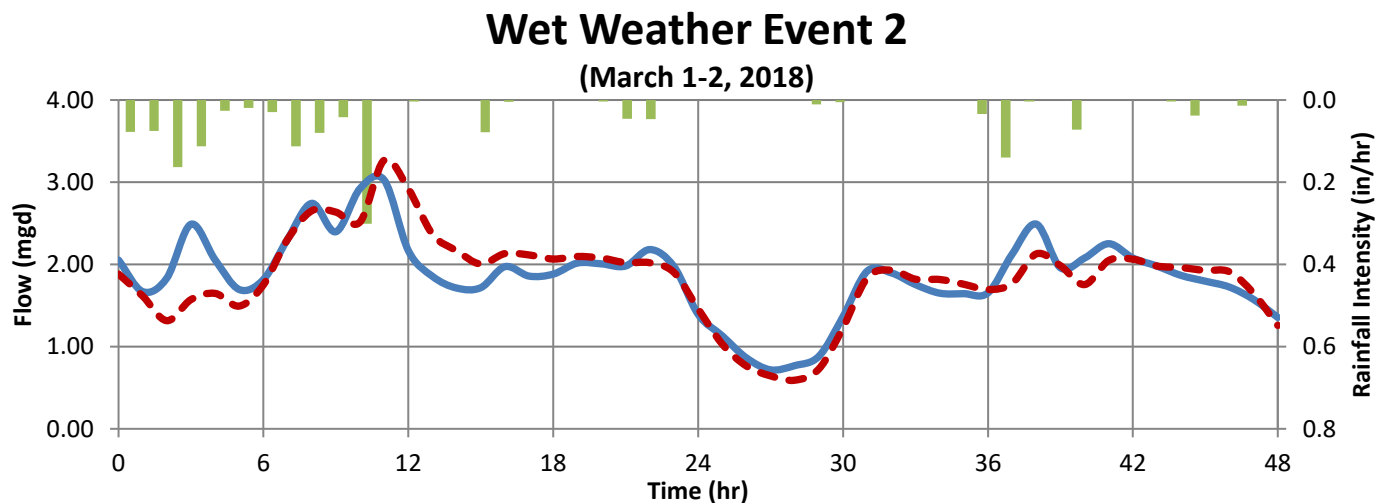
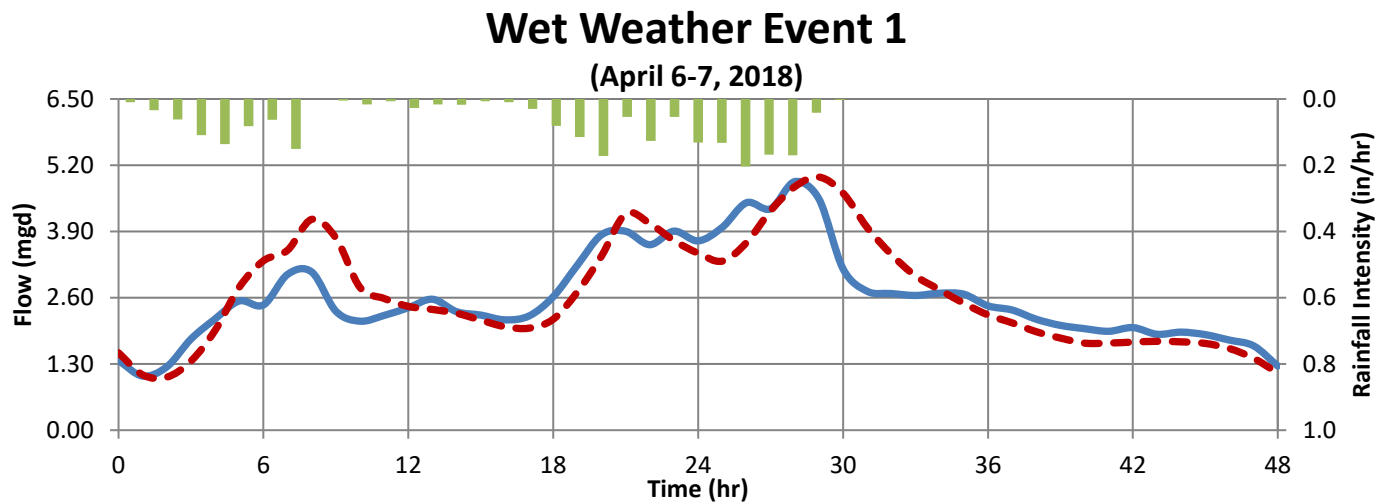
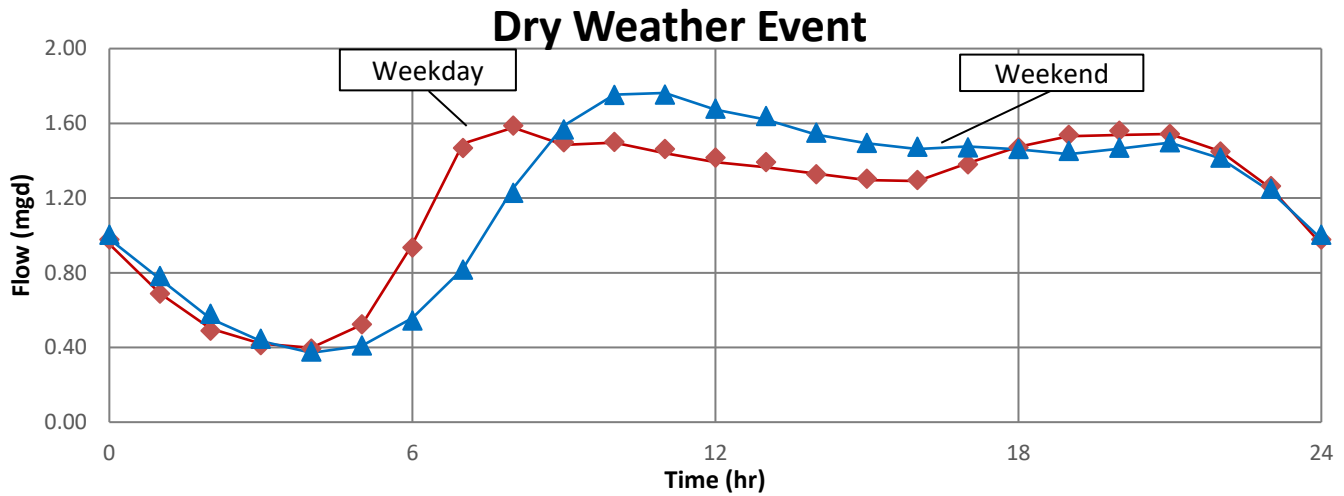
- - Rainfall Intensity
- - V&A Flow Monitoring
- - - Hydraulic Model

Figure 6

S-5

City-Wide Sewer System
Master Plan
City of South San Francisco





LEGEND

Dry Weather Event

- ▲ ◆ - Hydraulic Model
- — - V&A Flow Monitoring

PRELIMINARY

Wet Weather Event

- - Rainfall Intensity
- - V&A Flow Monitoring
- - - Hydraulic Model

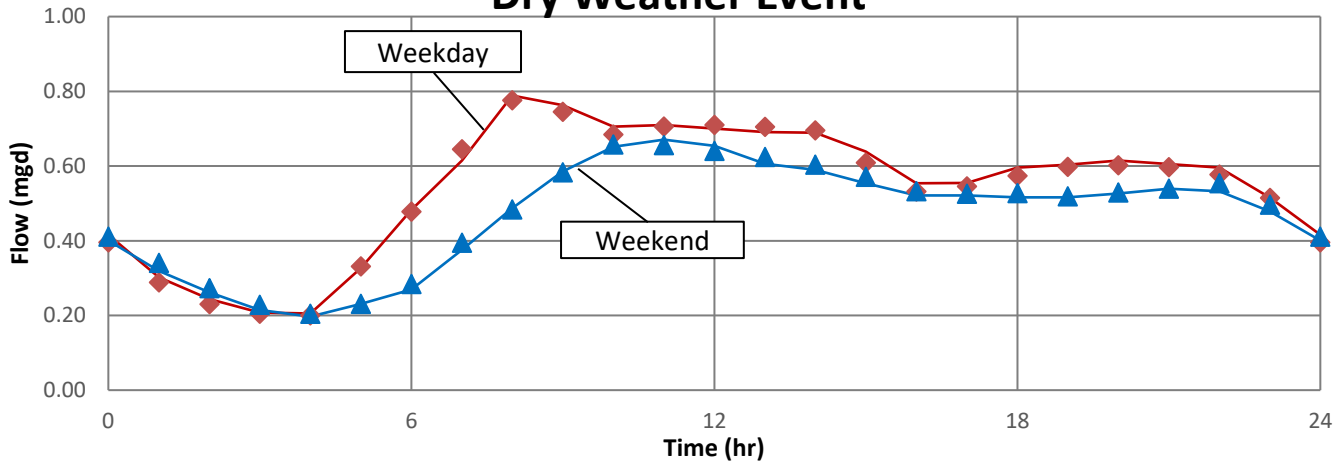
Figure 7

S-6

City-Wide Sewer System
Master Plan
City of South San Francisco

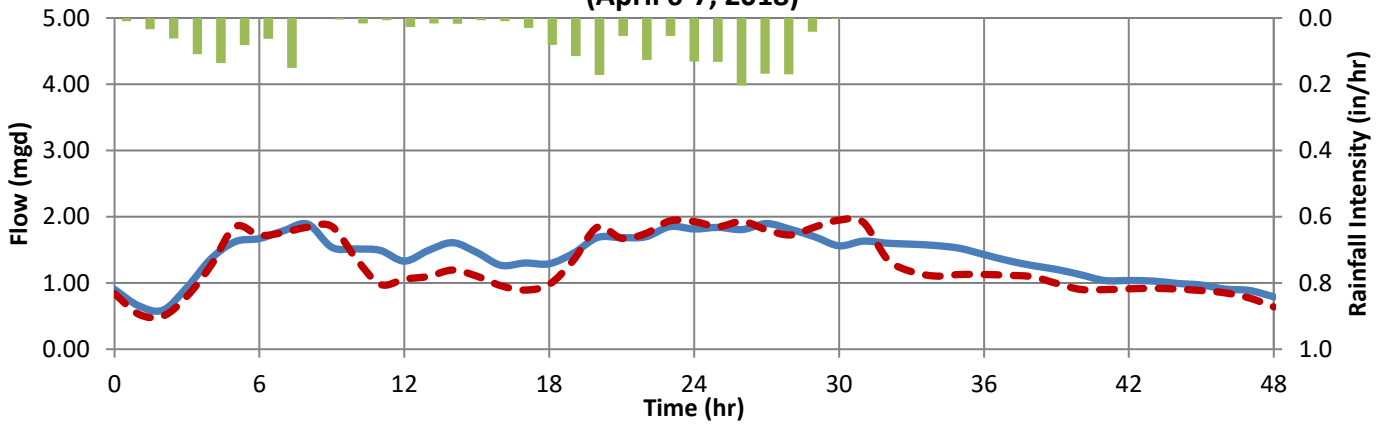


Dry Weather Event



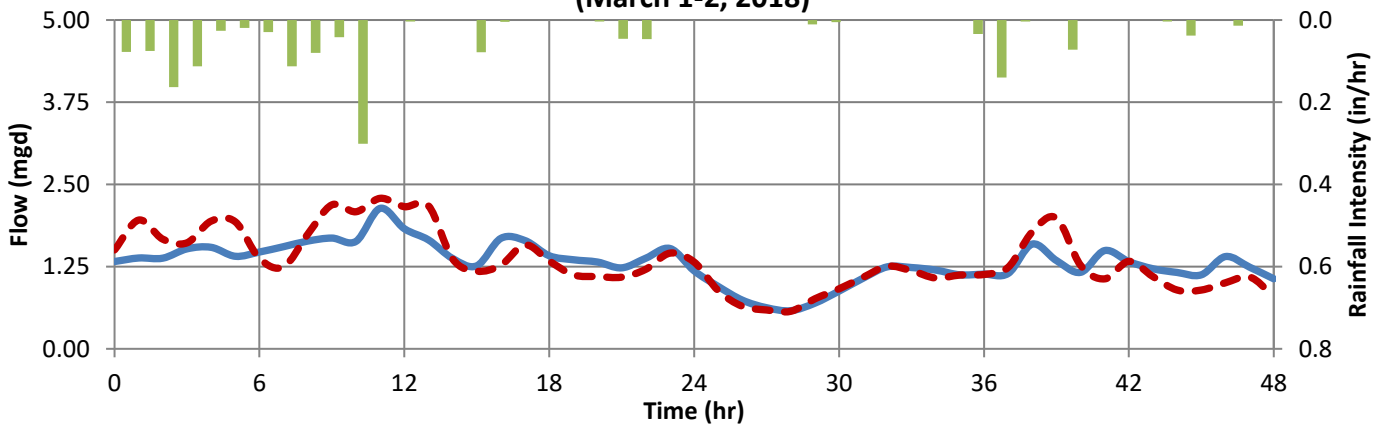
Wet Weather Event 1

(April 6-7, 2018)



Wet Weather Event 2

(March 1-2, 2018)



LEGEND

Dry Weather Event

- ▲ ◆ - Hydraulic Model
- — - V&A Flow Monitoring

PRELIMINARY

Wet Weather Event

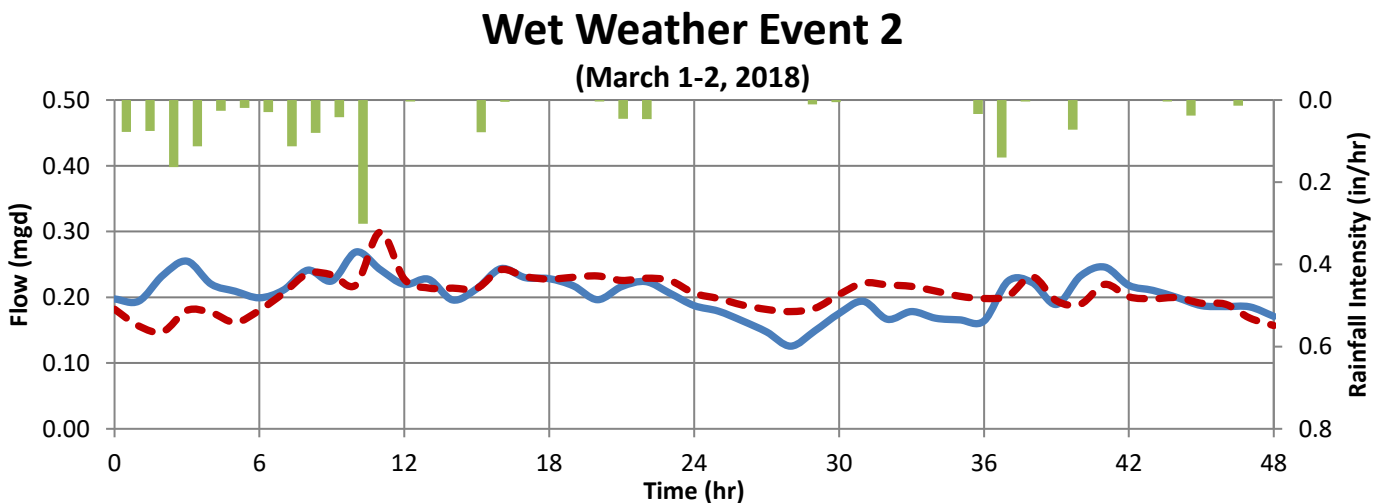
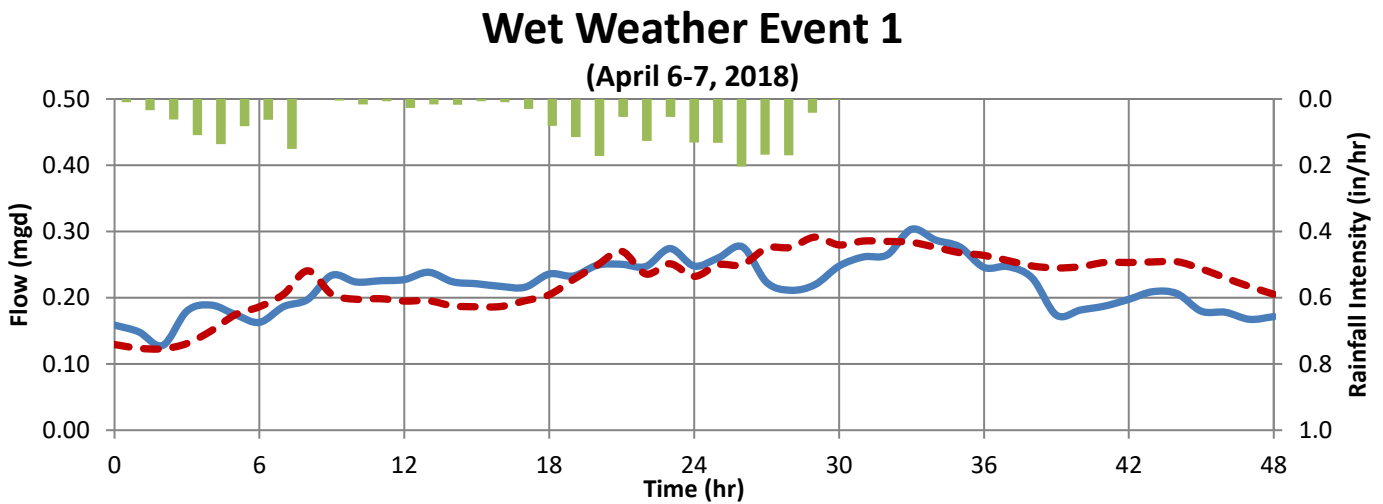
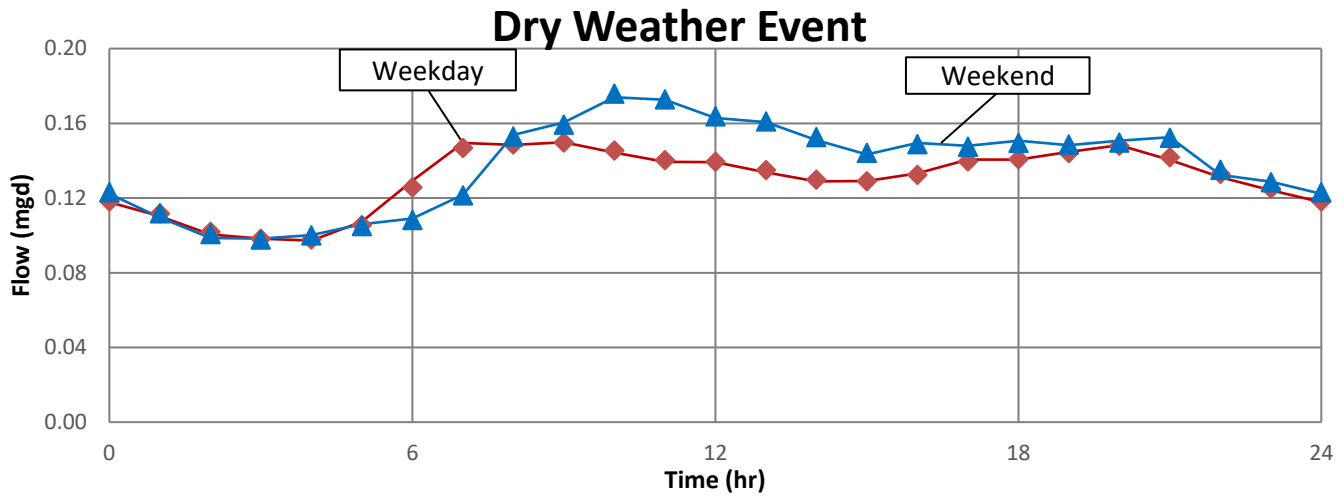
- - Rainfall Intensity
- — - V&A Flow Monitoring
- - - - Hydraulic Model

Figure 8

S-7

City-Wide Sewer System
Master Plan
City of South San Francisco





LEGEND

Dry Weather Event

- ▲ ◆ - Hydraulic Model
- — - V&A Flow Monitoring

PRELIMINARY

Wet Weather Event

- - Rainfall Intensity
- - V&A Flow Monitoring
- - - Hydraulic Model

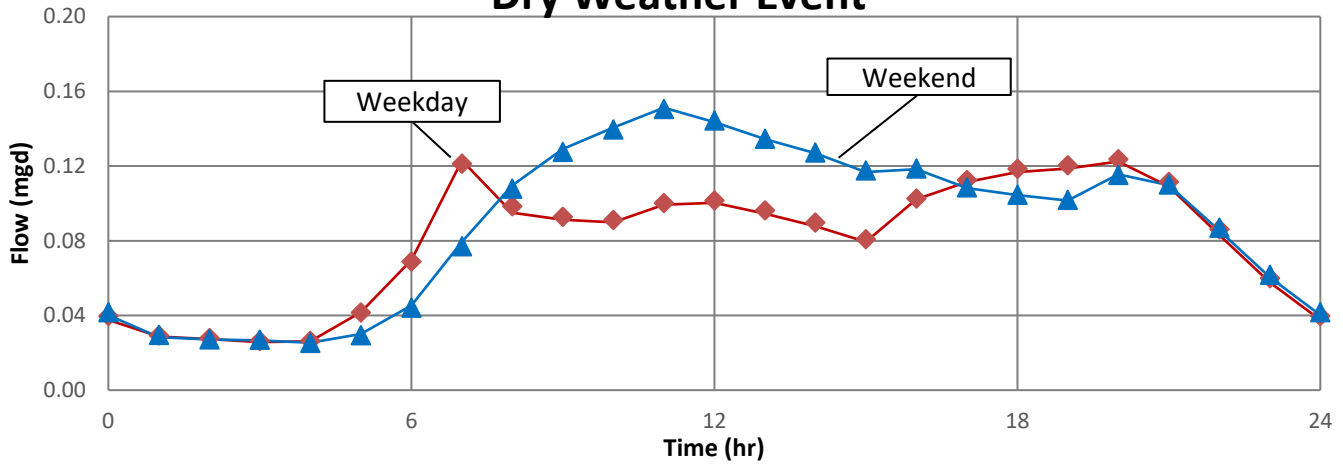
Figure 9

S-8

City-Wide Sewer System
Master Plan
City of South San Francisco

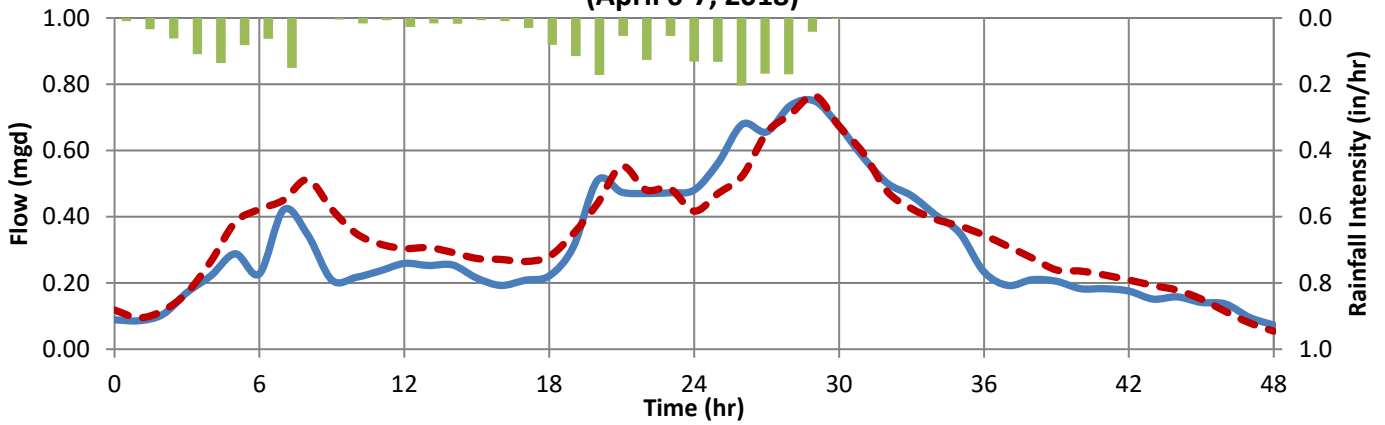


Dry Weather Event



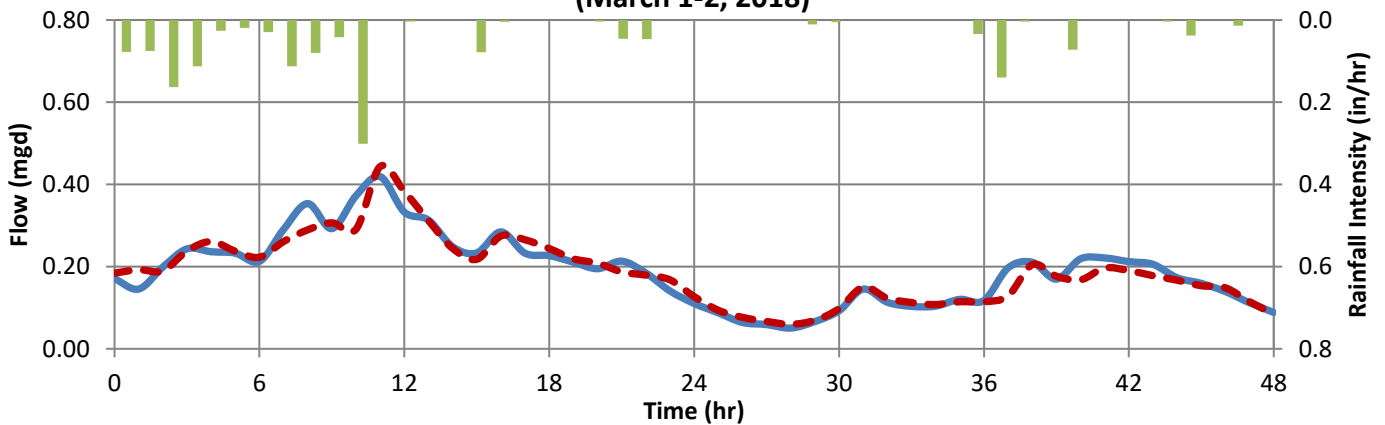
Wet Weather Event 1

(April 6-7, 2018)



Wet Weather Event 2

(March 1-2, 2018)



LEGEND

Dry Weather Event

- ▲ ◆ - Hydraulic Model
- — - V&A Flow Monitoring

PRELIMINARY

Wet Weather Event

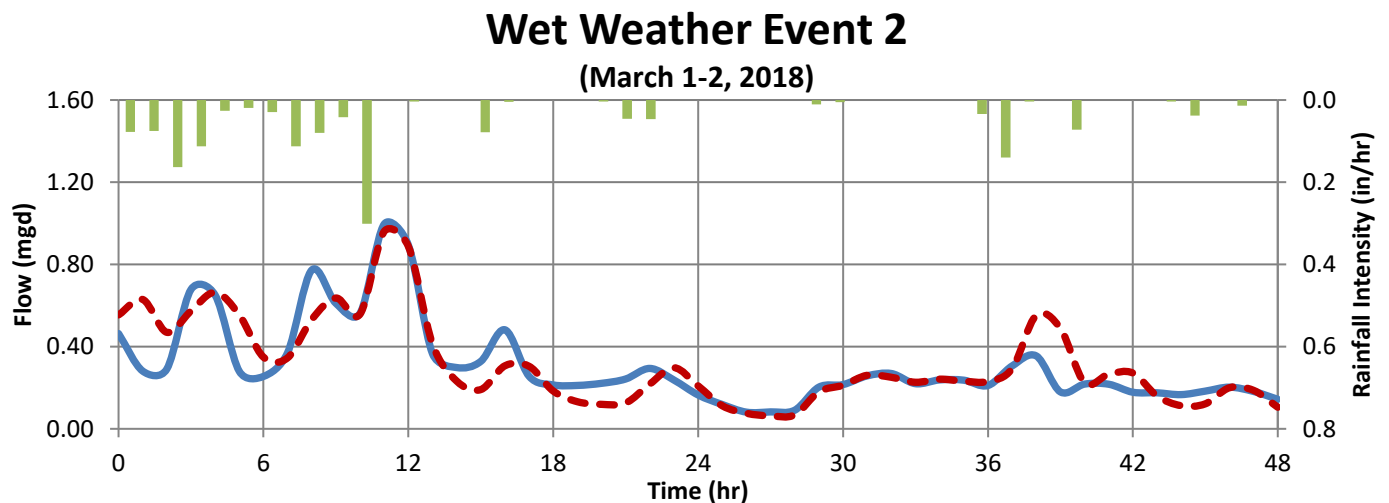
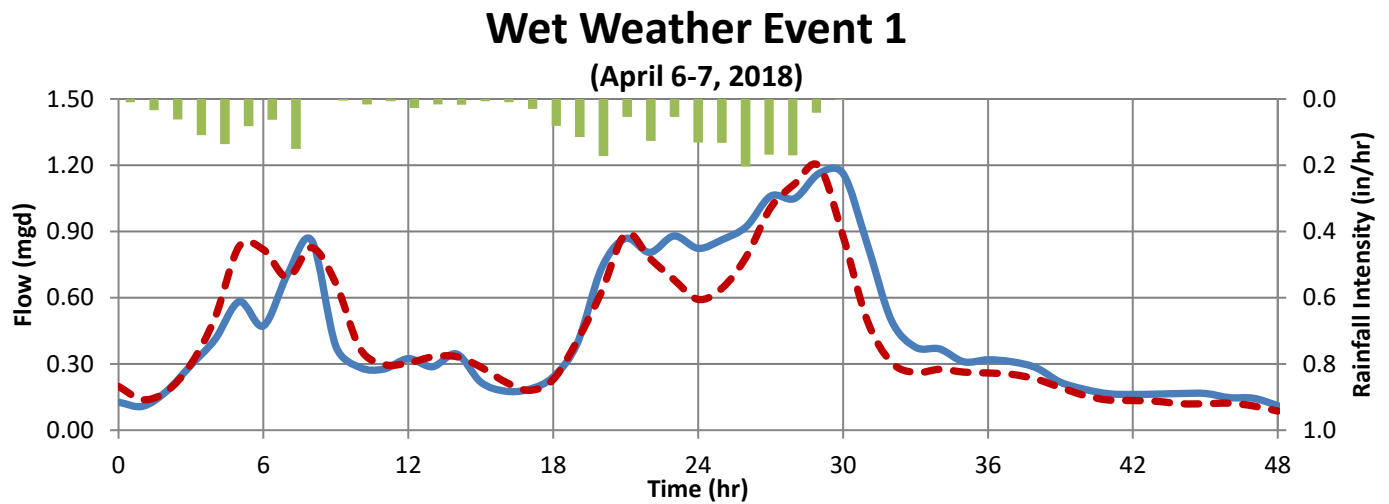
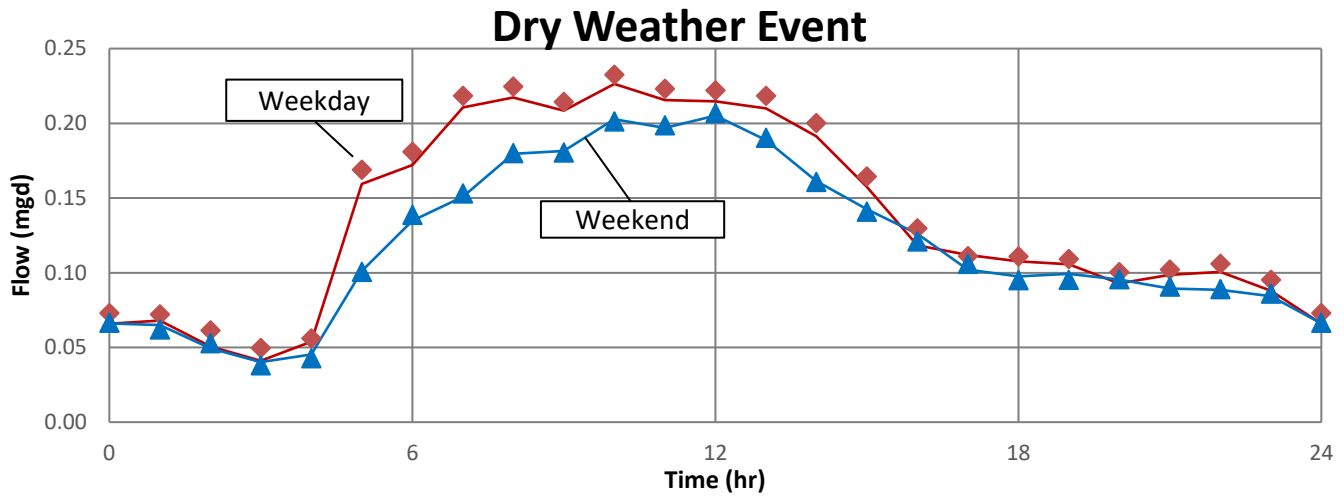
- - Rainfall Intensity
- — - V&A Flow Monitoring
- - - - Hydraulic Model

Figure 10

S-9

City-Wide Sewer System
Master Plan
City of South San Francisco





LEGEND

Dry Weather Event

- ▲ ◆ - Hydraulic Model
- — - V&A Flow Monitoring

PRELIMINARY

Wet Weather Event

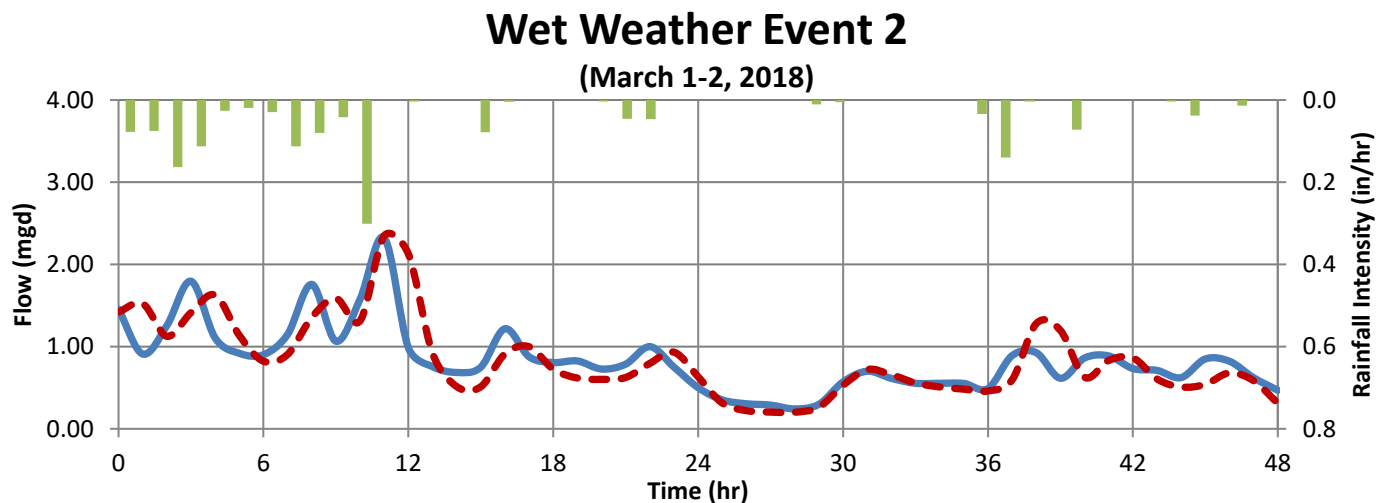
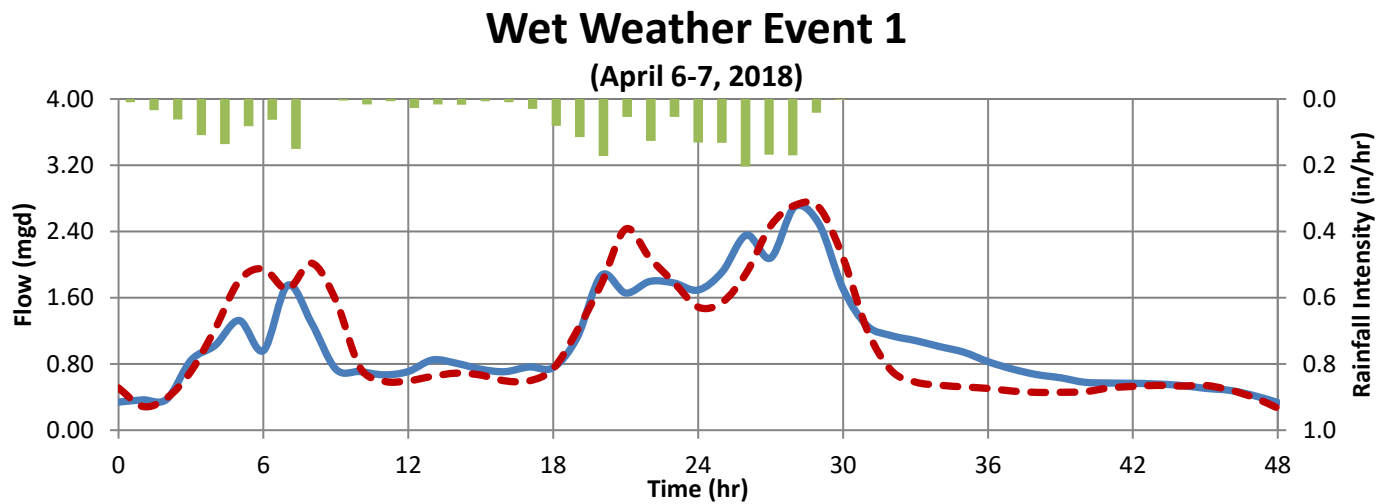
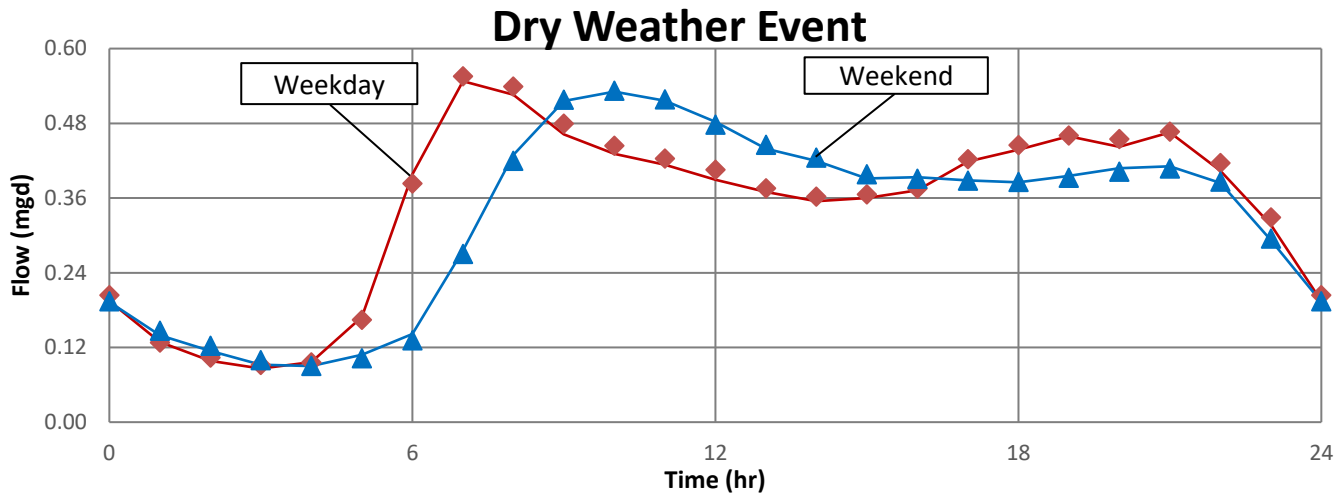
- - Rainfall Intensity
- — - V&A Flow Monitoring
- - - - Hydraulic Model

Figure 11

S-10

City-Wide Sewer System
Master Plan
City of South San Francisco





LEGEND

Dry Weather Event

- ▲ ◆ - Hydraulic Model
- — - V&A Flow Monitoring

PRELIMINARY

Wet Weather Event

- - Rainfall Intensity
- — - V&A Flow Monitoring
- - - - Hydraulic Model

Figure 12

S-11

City-Wide Sewer System
Master Plan
City of South San Francisco

