Section 7
Recommendations

SECTION 7 – RECOMMENDATIONS

Section 2 of this SMP described a thorough assessment of existing facilities. Sections 3, 4 and 5 described the flow monitoring and Interceptor Model Calibration components for this SMP. Section 6 used the calibrated Interceptor Model to analyze a number of capital improvement options for their impacts on Interceptor capacity. The goals of this section of the SMP are to:

1. Define the project in the VVWRA Capital Improvements Plan that will affect Interceptor Capacity.
2. Identify additional Interceptor improvements required to meet capacity requirements based on results of the Capacity Analysis described in Section 6.
3. Present a recommended schedule for construction of the improvements based on the projected future system flows and modeled scenarios.
4. Summarize capital costs for the Interceptor capacity improvements.
5. Prepare an estimate of probable cost for the manhole rehabilitation improvements recommended from the Existing Facilities Assessment.

7.1 INTERCEPTOR CAPACITY ANALYSIS RESULTS AND RECOMMENDATIONS

The following subregional Water Reclamation Plants (WRP) and related improvements have been identified as part of VVWRA's Strategic Plan to provide additional capacity in the system as well as provide recycled water to the area. The facilities described below are included in the Capital Improvement Plan (CIP):

1. Construction of a 2.0 mgd capacity WRP (1.0 mgd equipment initially installed) and associated lift station in the City of Hesperia.

2. Construction of a 2.0 mgd capacity WRP (1.0 mgd equipment initially installed) north of Highway 18 at Brewster Park in the Town of Apple Valley.

3. Construction of the Eastside Interceptor and 4.0 mgd capacity Eastside WRP in the vicinity of Stoddard Wells Road and the outlet of the North Apple Valley Interceptor. This project, in the current VVWRA CIP, is a developer driven project and no firm timeline is currently set for design and construction.

4. Construct recycled water distribution systems from the subregional plants to identified recycled water customers.

Capital cost estimates have been developed for the subregional facilities as part of the CIP and on-going preliminary designs. These costs are summarized below in Table 7-1.

Table 7-1
Subregional WRP Cost Summary

Recommended Project	Capital Cost	Cost Source
Apple Valley Brewster Park WRP and Nanticoke Bypass Sewer	$27,449,000	Carrolo Engineers 10% WRP Design Report and RBF Nanticoke Bypass Sewer, Draft PDR
Hesperia WRP-1 and Pump Station	$28,510,000	Carrolo Engineers 10% WRP Design Report
Eastside Regional WRP and Interceptor	$54,854,900	VVWRA CIP
Total	**$110,813,900**	

VVWRA CIP = VVWRA Capital Improvements Plan

In addition to the subregional plants and related facilities identified above the following summarizes the recommended projects developed in the Master Plan Report from the Capacity Assessment:

1. Construction of the Santa Fe Bypass Relief Interceptor in the City of Hesperia as identified in the City's 2007 Sewer Master Plan. This project is currently in design, with construction expected to be complete in 2010.

2. Construction of the North Hesperia Relief Interceptor adjacent to the existing Interceptor from Bear Valley Rd to its connection with the SVL/CSA-64 Interceptor. This project is currently in design, with construction expected to commence in 2010.

3. Construction of a SVL/CSA-64 Relief Interceptor from the Hesperia Interceptor connection to the Upper Narrows. This project is currently in the initial stages of the design phase, with construction expected to commence in 2010.

4. Analysis and required upgrades to the South Apple Valley Riverside Pump Stations. Potential improvements include replacement of fixed speed drives with variable frequency drives and reprogramming of the controls to limit peak flows to the furthest downstream end of the South Apple Valley Interceptor.

5. Improvements to the Junction Structure at the upstream end of the Victorville double barrel Interceptor Section to improve distribution of flow.

6. Construction of a new Junction Structure at the outlet of VSD-4 into the Victorville double barrel Interceptor to allow flow into the Relief Sewer for improved flow distribution.

Capital cost estimates have been developed for the interceptor improvements in item 1 through 6 above as part of this master plan. These costs are summarized below in Table 7-2.

Table 7-2
Interceptor Upgrades Capital Cost Summary

Recommended Project	Capital Cost	Cost Source
Santa Fe Bypass Relief Interceptor	$3,005,756	VVWRA CIP
North Hesperia Relief Interceptor	$2,962,667	VVWRA SMP
Spring Valley Lake/CSA-64 Relief Interceptor	$2,010,220	VVWRA SMP
South Apple Valley Riverside #2 Pump Station Upgrades	$250,000	VVWRA SMP
Junction Structure Upgrades at Manhole VSD-3 Connection	$150,000	VVWRA SMP
New Junction Structure at VSD-4 Connection	$250,000	VVWRA SMP
Total	**$8,628,643**	

VVWRA CIP = VVWRA Capital Improvements Plan (Cost derived by others)
VVWRA SMP = VVWRA Sewer Master Plan (Cost derived herein)

7.1.1 Phasing of Improvements

The capacity analysis indicates that there are several critical sections of Interceptor that are currently over capacity, or will be over capacity soon should flows increase moderately in the near future as expected. To alleviate these issues the following projects are recommended for implementation in Phase 1, anticipated to be on-line by the end of 2012.

Recommended Phase 1 Improvements
On-line in 2012 (Service Area ADWF of 14.2 mgd)

- Hesperia Santa Fe Bypass Relief Interceptor – The 18-inch diameter Santa Fe Bypass is critical to complete in Phase 1 for relief of the I Avenue section of Interceptor through downtown Hesperia as indicated in the City of Hesperia Master Plan.

- Hesperia North Relief Interceptor – This project is critical to relieve the Hesperia Interceptor with a modeled capacity of 2.20 mgd expected to occur in 2012. The existing Interceptor is also susceptible to clogging due to the varying diameters along its reach, and is recommended for construction in Phase 1.

- South Apple Valley WRP, Gravity Sewer and Reclaimed System – The Apple Valley WRP is critical to relieve the South Apple Valley Interceptor, that is currently over capacity.

- South Apple Valley Riverside Pump Station Upgrades – Modifications to this pump station are necessary to moderate the peak flows pumped in to the downstream section of the SAV Interceptor.

Additional projects will be required to relieve downstream sections of the Interceptor beyond 2012 and have been divided into Phase 2 and Phase 3 projects recommended to come on-line in 2014 (Service Area ADWF of 15.8 mgd) and 2016 (Service Area ADWF of 17.2 mgd), respectively.

Recommended Phase 2 Improvements
On-line by 2014 (Service Area ADWF of 15.8 mgd)

- Hesperia WRP-1, Pump Station and Force Main – This project is on the VVWRA CIP schedule for completion by 2012, however, the Interceptor relief projects recommended in Phase 1 for Hesperia will provide capacity in the Hesperia sections for the near future. The WRP-1 project, however, provides an additional benefit in supplying the City of Hesperia with a reclaimed water source that can offset potable water and may be desired for implementation in Phase 1. The Hesperia WRP-1 will be required to come online to unload flow from the downstream Victorville Sections of the Interceptor by 2014.

- New Junction Structure at VSD-4 Connection – The junction structure modifications at the VSD-4 connection will provide better flow distribution through both the Main Interceptor and Relief Interceptor at this junction and downstream. Details of this are described in the *2007 VVWRA Facilities Plan*

Amendment This connection is anticipated to see a large portion of Victorville's future flow growth and is therefore, recommended to occur in Phase 2.

- Junction Structure Modification at Victorville Manhole 2-26 – The junction structure modifications at Victorville 2-26 will provide better flow distribution through both the Main Interceptor and Relief Interceptor that begins at this junction. This provides additional capacity life in the double barrel interceptor reach from this point to the VSD-4 connection. This combined with the VSD-4 junction structure recommended will expand capacity in the Double Barrel to 18 mgd ADWF.

Recommended Phase 3 Improvement
Schedule of Construction Yet To Be Determined

- Eastside WRP and Eastside Interceptor – To further relieve the Victorville Interceptors from the Upper Narrows to the RWWRF, the Eastside WRP and Interceptor is required prior to a total Service Area Flow of 20.7 MGD, corresponding to the year 2021 in the latest flow projections. There is currently no timeline set for this project in VVWRA's CIP.

7.2 CONDITION ASSESSMENT RESULTS AND RECOMMENDATIONS

The field condition assessment was conducted, as described in Section 2, along the following Interceptor reaches:

1. Hesperia Interceptor
2. Spring Valley Lake/CSA-64 Interceptor
3. South Apple Valley Interceptor
4. North Apple Valley Interceptor
5. Victorville Schedule 1 and 2 Interceptors
6. Victorville Schedule 1 and 2 Relief Interceptors

7.2.1 Condition Assessment Recommendations

The rehabilitation and repair recommendations from the condition assessment are grouped into three categories according to an assigned priority level, as described in Section 2. The improvement Tables are included in this SMP in Appendix E. A portion of the recommended items for South Apple Valley were completed in April 2008, shortly after the initial field assessment, due to the urgent nature of the repairs. Many of the manhole cover frames were found to be corroded to a point that jeopardized their structural integrity. Many of these manholes were located in and along Highway 18 and posed a serious liability risk to the VVWRA.

Costs for the rehabilitation work were developed and included in the recommendations tables 5in Appendix E. Costs were estimated based on recent contractor pricing and material quotes from vendors and are in 2009 dollars. The manholes identified for repairs that have been completed are included in the tables for reference; however the costs for these repairs are not included in the estimates.

A brief overview of each pipe section and the general results from the condition assessment is given below:

7.2.2 Hesperia

The Hesperia Interceptor is a PVC pipeline ranging in sizes from 10 to 24-inch diameter. The pipeline was constructed in 1981 and 1982. There are a total of 87, 48-inch diameter, concrete manholes spaced at 300-400 feet along the relatively straight pipe runs and located at all significant changes in bearing or grade.

The manhole inspections revealed the system to be in relatively good condition for a pipeline nearing 30 years old. There were no manholes that posed an immediate concern in regard to structural integrity or rim failure. In the process of assessing the manholes one key issues came to light that requires immediate attention due to the potential negative impact to the VVWRA sewer system flow capacity in the City of Hesperia and downstream Interceptor Reaches. Several manholes were identified, in areas prone to

collecting runoff, which are low lying or buried and present a potential for excessive inflow from flood irrigation operations and rain events. Those manholes exhibiting this condition are considered high priority as shown in Appendix E.

Additional items observed with the Hesperia system that are recommended for repair are as follows:

- Manhole that exhibited minor to partial corrosion of the structure and cover frames
- Manholes where loss of grout, causing separation between the grade rings, were identified.

7.2.3 Spring Valley Lake (SVL)/CSA-64

The SVL/CSA-64 Interceptor is a Vitrified Clay Pipe (VCP) pipeline ranging in size from 21-inch to 42-inch diameter. The pipeline was constructed in 1973. There are a total of 23, 48-inch diameter, concrete manholes spaced at 300-400 feet along the relatively straight pipe runs and located at all significant changes in bearing or grade. The pipeline originates at the outlet of the Spring Valley Lake Community near Mojave Narrows Regional Park, continues through the park and parallels the existing BNSF railroad tracks and Mojave River to its outlet into the Victorville Schedule 6 Interceptor.

The results of the condition assessment for this Interceptor reach concluded that the manholes are generally in fair condition given the age of the Interceptor. The following issues were identified and recommended for repairs:

- Sections of the SVL/CSA-64 Interceptor are located through open fields and pastures that are routinely flood irrigated. This fact, in conjuction with several of the manhole rims constructed at or below grade is likely to allow large quantities of inflow during irrigation activities and storm events.
- Root intrusion was identified in manholes near the Spring Valley Lake outlet. This can be attributed to the age of the pipeline and is a potential source of

infiltration into the system given the probability of high groundwater in areas near the Mojave River.

- Corrosion of manhole structures and cover frames.
- Manholes with unfinished or diminished interior coatings.

7.2.4 South Apple Valley (SAV)

The SAV Interceptor is constructed of Polyvinyl Chloride (PVC) and Ductile Iron Pipe (DIP) ranging in size from 10-inch to 16-Inch Diameter. The pipeline was constructed in 1981. There are a total of 71 48-inch diameter concrete manholes spaced at 300-400 feet along the relatively straight pipe runs and located at all significant changes in bearing or grade. The pipeline originates near the intersection of Dale Evans Parkway and Highway 18 in South Apple Valley. The pipeline continues westerly within and adjacent to Highway 18, past Apple Valley Rd, and heads southwesterly behind the Lewis Learning Center to its outlet into Victorville Schedule 5 Interceptor.

In the process of assessing the manhole conditions, a key issue came to light that required immediate attention due to the potential liabilities to VVWRA and their member agencies. Many of the manhole frames and covers, particularly in the upstream half of the SAV Interceptor exhibited significant corrosion and had potential for failure. Due to the locations of these manholes, along and within Highway 18, this issue had the capability to not only cause damage to vehicles, but possible injury to their passengers. The list of manhole cover frames and covers to be replaced were prioritized as follows:

- Highest Priority – Manhole cover frame exhibits significant corrosion and structural integrity is compromised. Manhole is located within the traveled way.
- High Priority - Manhole cover frame exhibits fair to significant corrosion and structural integrity may be compromised. Manhole is located off of the traveled way, but is relatively accessible.
- Lower Priority – Manhole cover frame exhibits fair to significant corrosion. Manhole is not accessible to vehicular traffic.

Below are sample photos of the damage levels seen in the cover frames and manholes along the South Apple Valley Interceptor:

South Apple Valley Manhole #42
(Located in Outer Hwy 18)

South Apple Valley Manhole #70
(Recommended for complete replacement)

It is speculated that the extensive corrosion in this particular section of Interceptor is directly related to the odor issues which have been a consistent nuisance along this stretch. This line is fed by two force mains originating from the Apple Valley (Nanticoke) and Otoe Pump Stations. These pump stations and force mains discharge raw sewage, at high velocity, into the SAV interceptor near its furthest upstream manholes. This can cause a release of Hydrogen Sulfides (H_2S) that has damaging corrosion effects on the Interceptor facilities. VVWRA has contracted with an outside consultant to conduct a study to determine the cause of the odors and potential remedies.

In conjunction with the manholes slated for cover and cover frame replacement, re-coating on the interior of the manholes is recommended for the many of these structures.

7.2.5 North Apple Valley (NAV)

The North Apple Valley Interceptor is the newest pipe in the VVWRA Interceptor collection system, built in 2002 and 2003. The Interceptor has a total of 104, 48-inch diameter, concrete manholes. The pipeline originates from the High Desert Juvenile Detention and Assessment Center near Bell Mountain and extends south along Dale Evans Parkway to Stoddard Wells Road. From the Stoddard Wells Road and Dale Evans Parkway intersection the pipeline heads south and southwesterly across the 15 Freeway into the City of Victorville. The Interceptor continues southwest generally along Stoddard Wells Road to its outlet into the Victorville Schedule 4 Interceptor.

Due to the recent construction of this pipeline and manholes this Interceptor exhibits no need for rehabilitation activities at this time.

7.2.6 Victorville Reaches 1 and 2 (Double Barrel)

The final stretch of Interceptor into the RWWRF is the Victorville Schedules 1 and 2 sewers and Schedules 1 and 2 relief sewers. Schedules 3, 4 and 5 in the Victorville section of the VVWRA Interceptor were assessed in the 2005 Facilities plan and the 2007 Facilities Plan update. Schedule 1 and 2 are 36" reinforced concrete pipeline, constructed from 1976 to 1978. A relief sewer was constructed parallel to these sewers in 1992. The relief sewer is a 42-inch diameter reinforced concrete pipe.

The results of the condition assessment for these Interceptor reaches concluded that the manholes are generally in fair condition given the age of the Interceptor. The following issues were identified and recommended for repairs:

- Several of the manhole rims are constructed at or below grade and are likely to allow larger quantities of inflow during storm events. These are recommended to be raised above grade.

- Corrosion of manhole structures and cover frames was identified along much of the stretch. These were recommended for repair and prioritized based on the severity of the damage.
- Cleaning and coating of the manholes was recommended for many manholes along these reaches.

Appendices

APPENDIX A

SURVEY DATA

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JOB NO. 10-104667.013
SHEET NO. _____ OF _____
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CHECKED BY _____ DATE _____

MANHOLE DIAGRAM HESPERIA
FILE: 667E008

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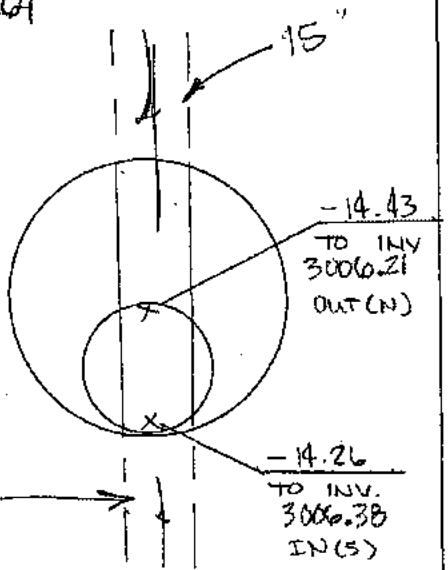

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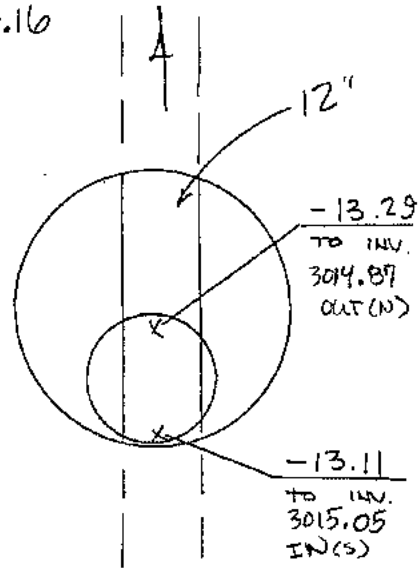

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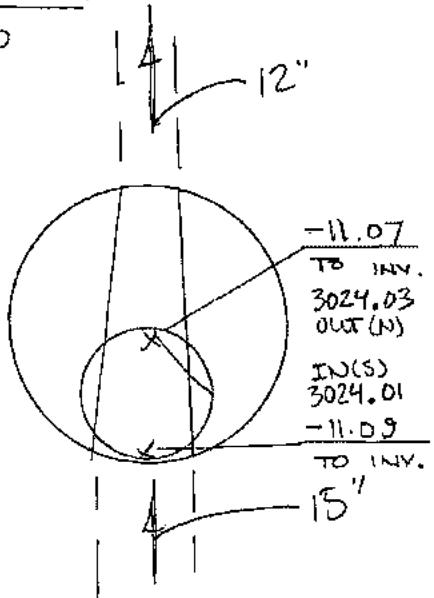

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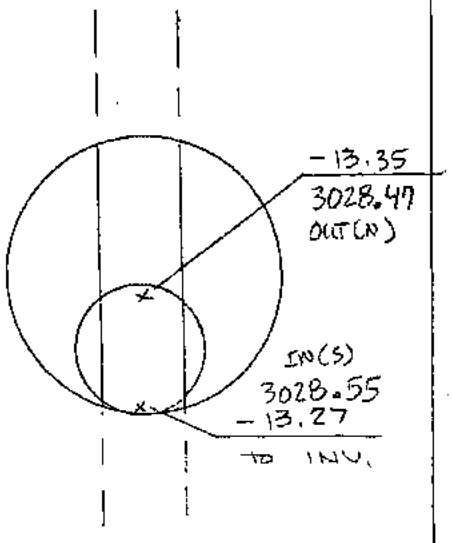

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NOTES: SMH # 74

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MANHOLE DIAGRAM HESPERIA
FILE: 667E008

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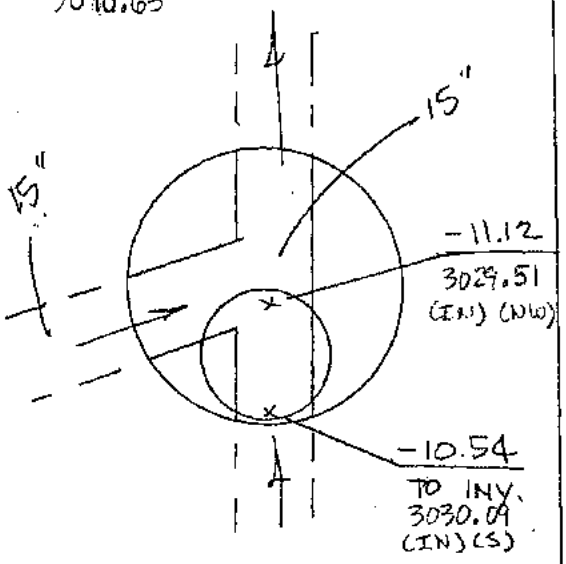

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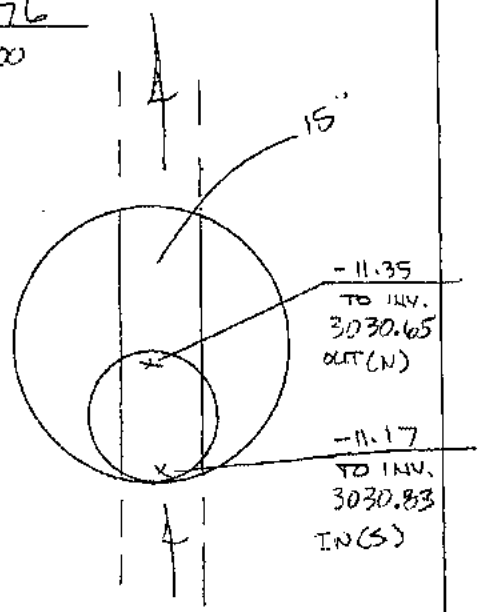

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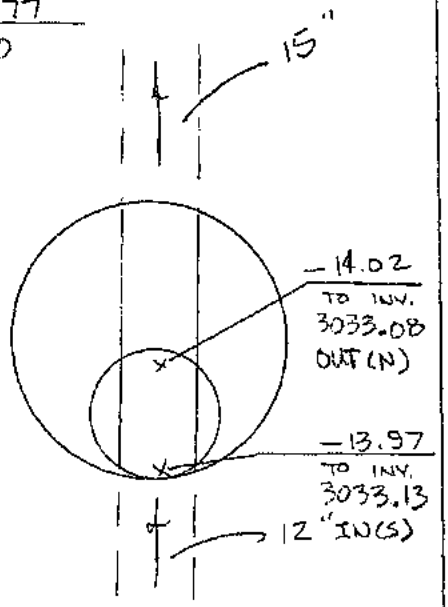

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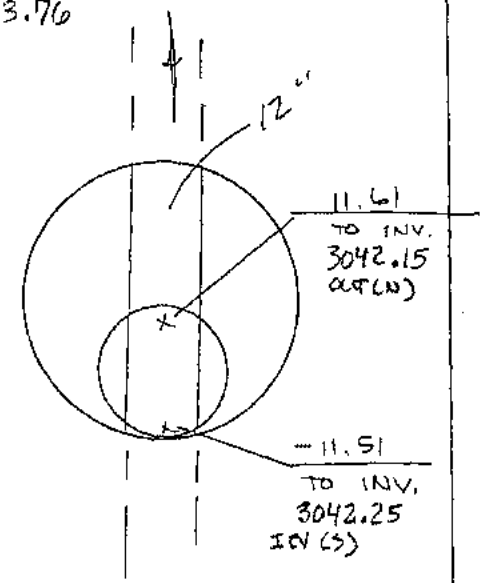

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NOTES: SMH # 78

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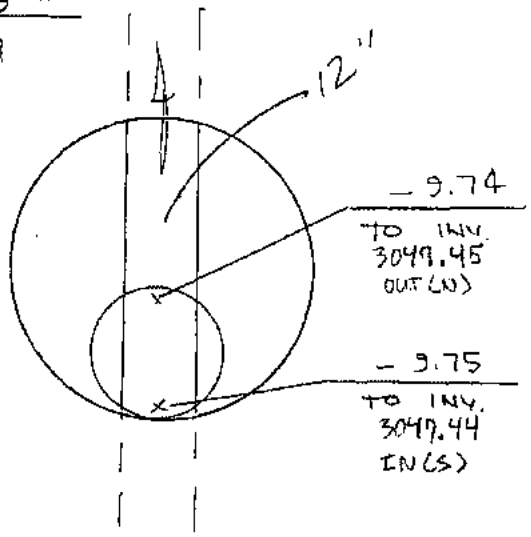

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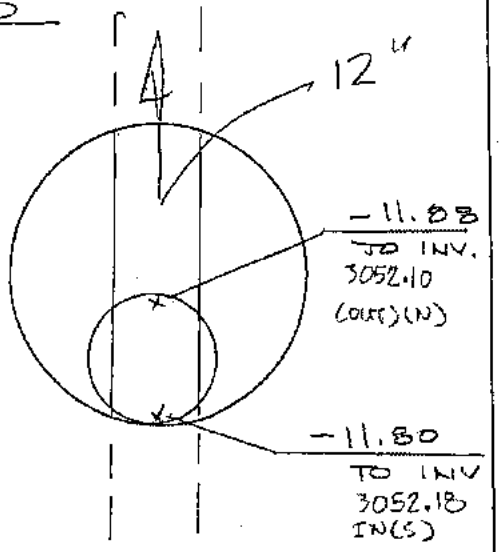

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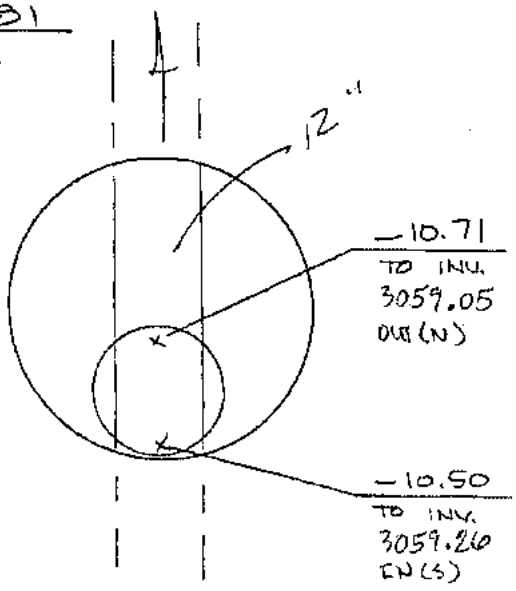

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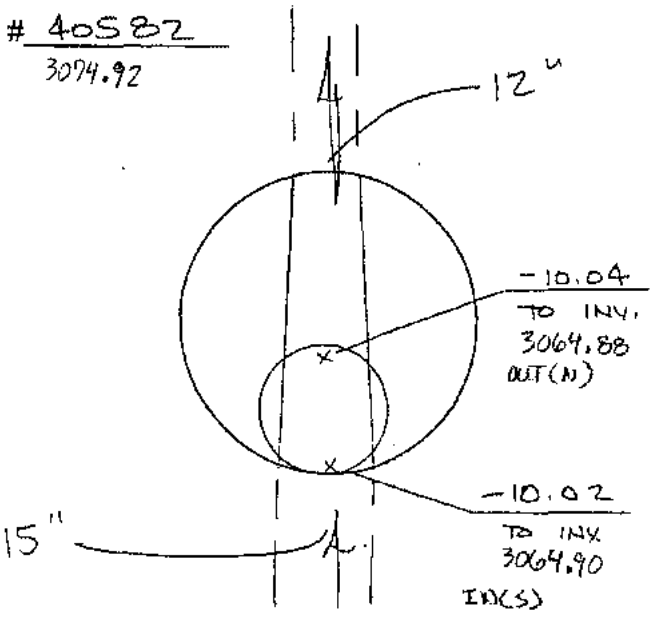

WATER LEVEL MED 6" ± TIME 11:15

NOTES: SMH # 82

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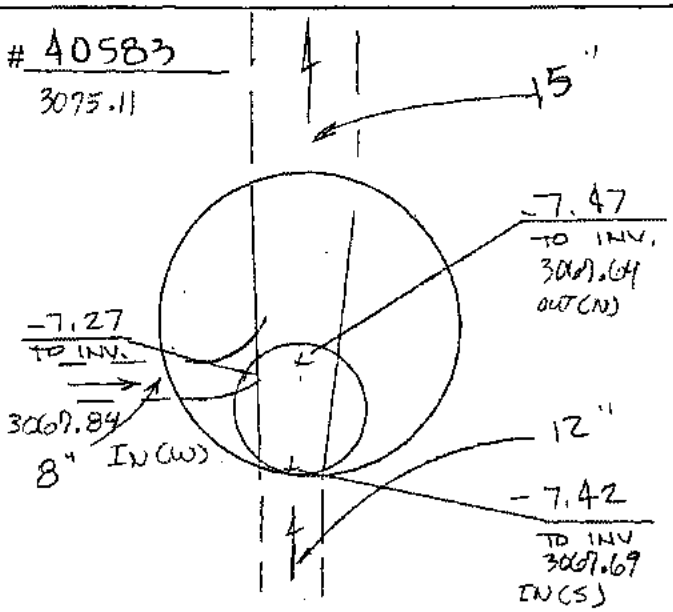

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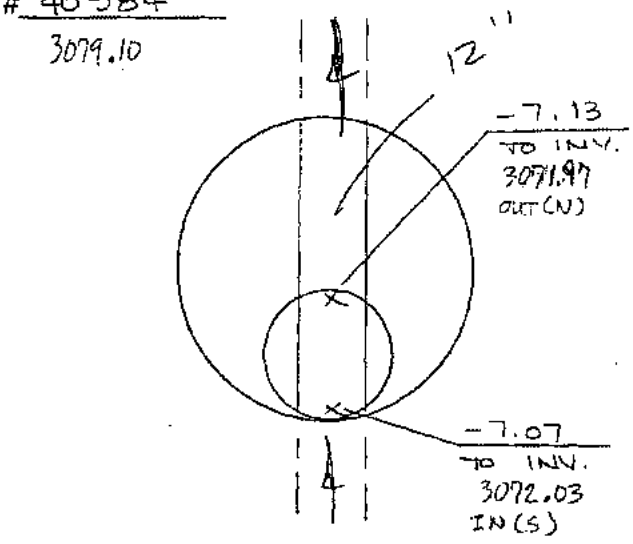

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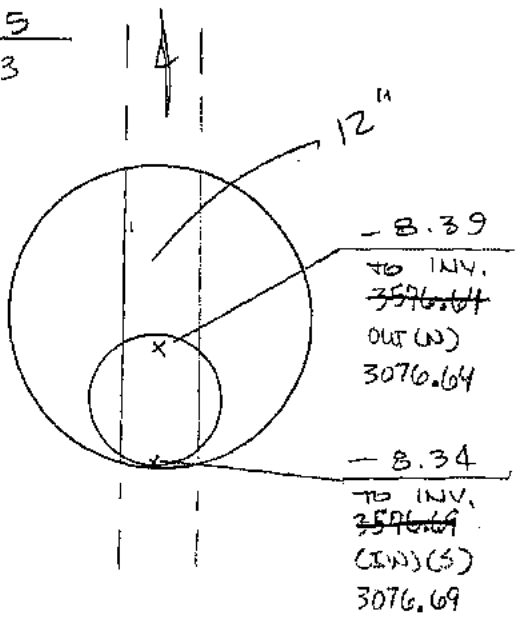

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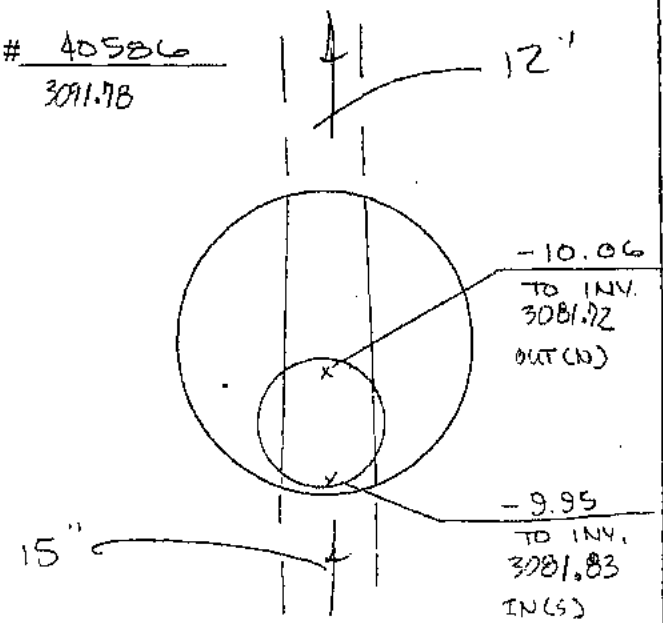

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NOTES: SMH # 86

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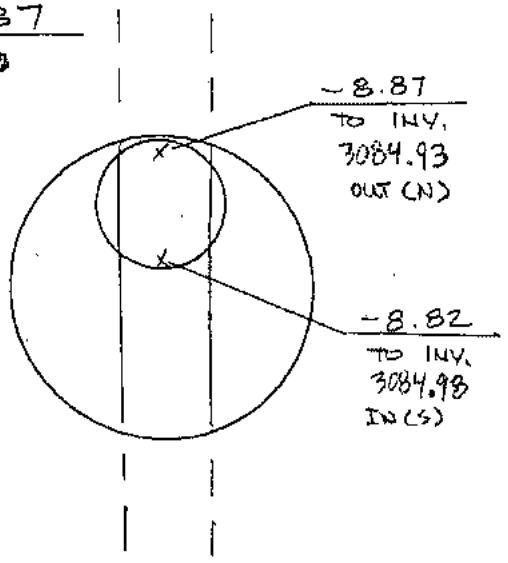

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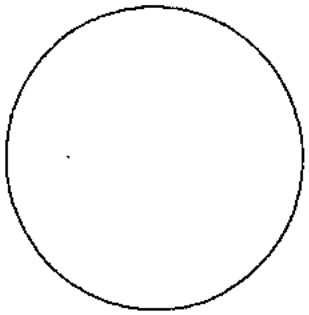

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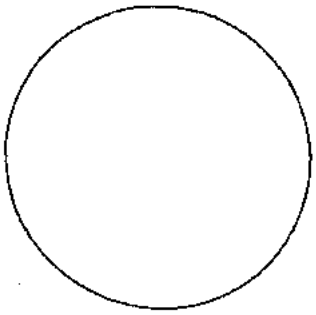

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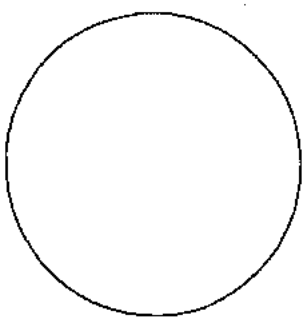

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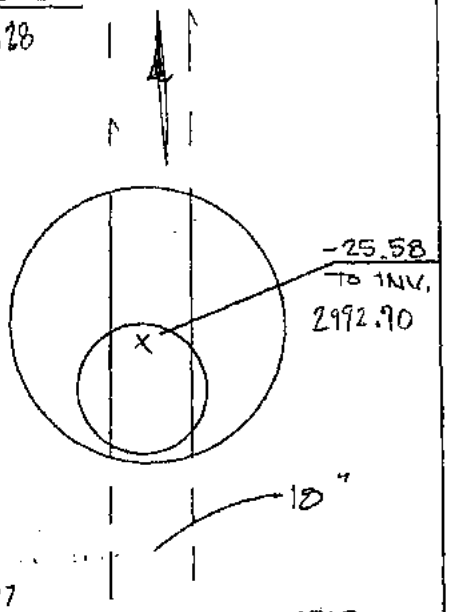
4-87

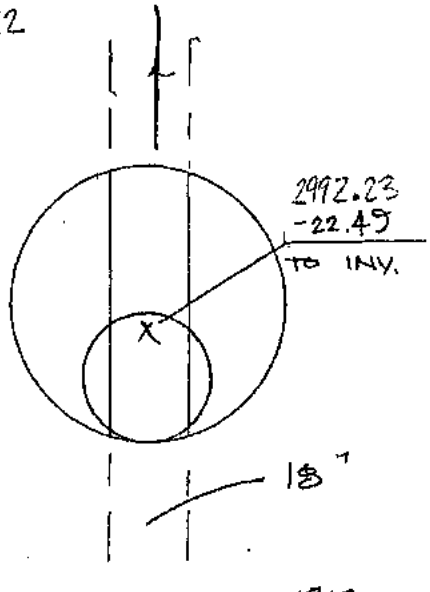
MANHOLE DIAGRAM AVE "I"
HESPERIA

40515
3018.28



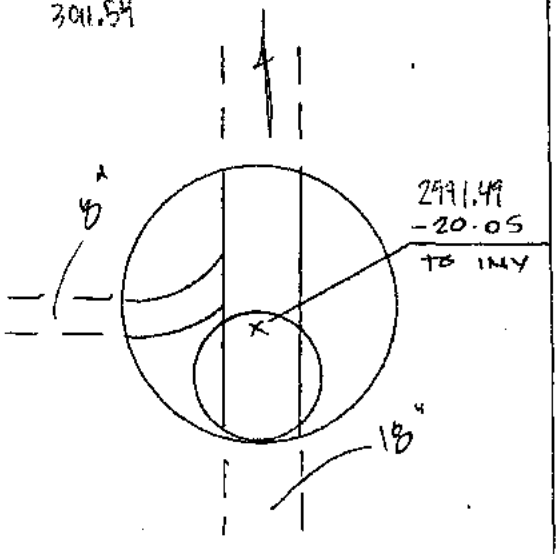
12/10/07
WATER LEVEL MED TIME 13:30
NOTES: SMH # 58 ALLEN BOLTED

40514
3018.12



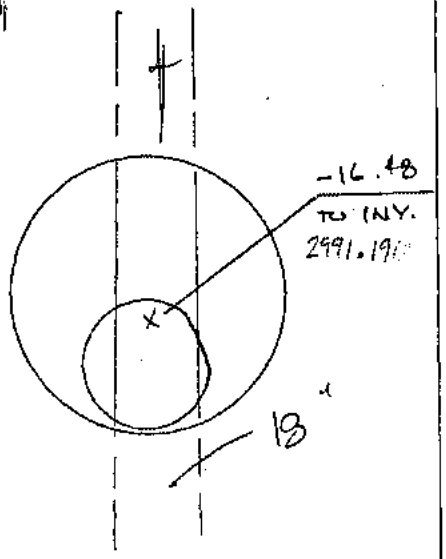
WATER LEVEL MED TIME 12:30 PM
NOTES: SMH # 57

40513
3011.54



WATER LEVEL MED TIME 13:00
NOTES: SMH # 56 -20.05

40512
3007.64



WATER LEVEL MED TIME 13:00
NOTES: SMH # 55 -16.48

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JOB NAME V. V. W. R. A.

JOB NO. 10-104667.013

SHEET NO. _____ OF _____

DESIGNED BY _____ DATE _____

CHECKED BY CS/DM DATE 12/07/07

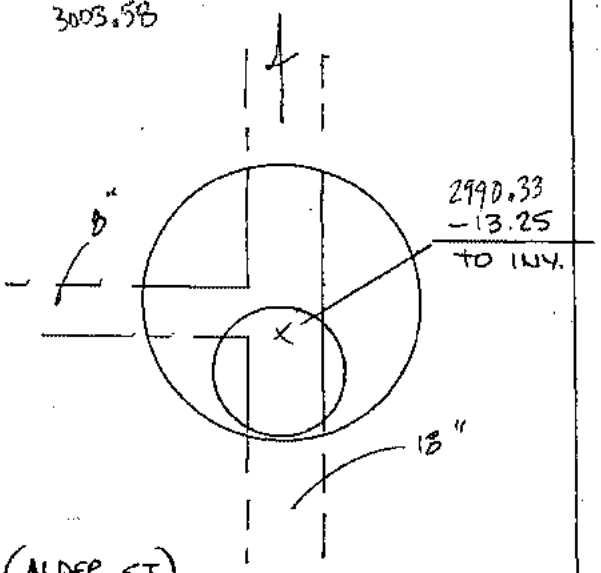
5 of 7

MANHOLE DIAGRAM AVE "I"

HESPERIA 34667E007

40511

3003.58



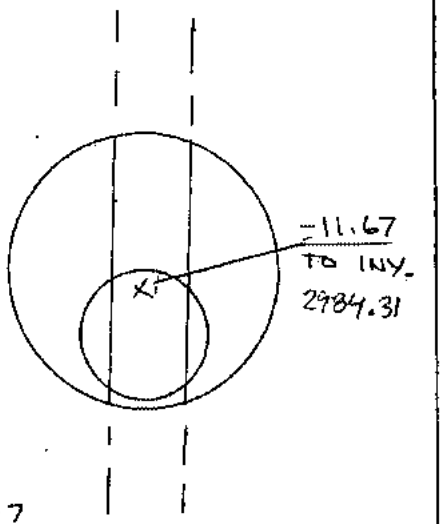
(ALDER ST)

WATER LEVEL FULL TIME 13:00

NOTES: SMH# 54 (MILD GLOG)

40510

2995.98



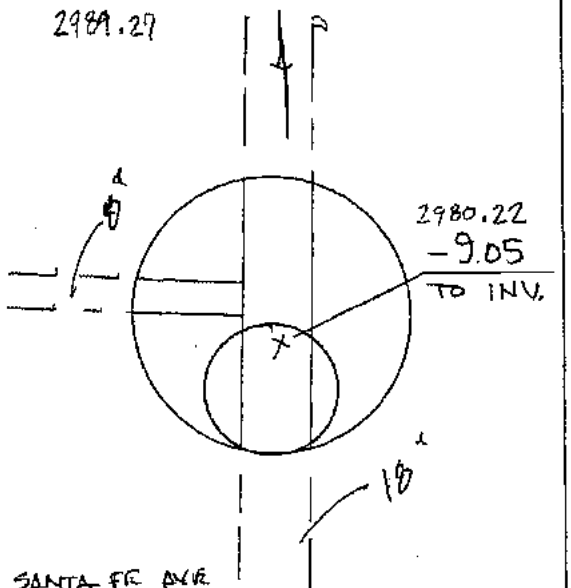
12/10/07
SYCAMORE PROD

WATER LEVEL MED TIME 13:00

NOTES: SMH# 53 ALLEN BOLTED

40509

2989.27



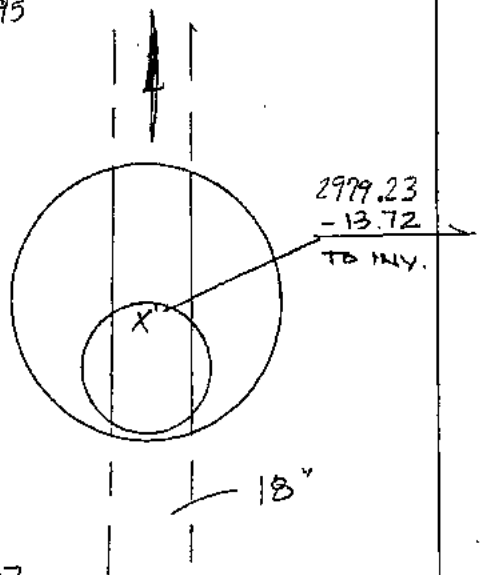
SANTA FE AVE.

WATER LEVEL MED TIME 13:30

NOTES: SMH# 52 - 9.05

40508

2992.95



12/10/07

WATER LEVEL MED TIME 12:30

NOTES: SMH# 51 ALLEN BOLTED

SURVEY OF V.V.W.R.A. AVE "I" JOB NO. 10-104667.013 BOOK _____ PAGE _____

SURVEYED BY CS/DM DATE 12/11/07 1 of 3

☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☒ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: AVE "I" HESPERIA INSTRUMENT NO: DNA10 SP# 334205

CHECKED BY: FILE: 3454667 LINE 1 ROD NO: 559 - 584, 585, 586

TURN #	+	H.I.	-	ELEV.	REMARKS
BM "I 41"				3124.375	USGS 1924 W.HW R/R N. OF EUCALYPTUS SANTA FE
	7.312	3131.687	235/310		
TP1			6.909	3124.778	C-NAIL N'LY EP @ FH/PP
	1.723	26.501	200/190		
TP2			7.478	19.023	C-NAIL IN AC @ PP
	3.578	22.602	278/260		
TP3			12.281	10.321	" "
	0.102	10.423	155/182		
TP4			11.249	3099.174	C-NAIL IN AC @ NW ECR PARKWAY
	3.223	3102.397	222/230		
TP5			4.928	97.469	C-NAIL IN N.EP
	2.496	99.966	244/278		
TP6			11.075	88.891	" " @ PP
	11.530	3100.421	fr24		
TP7			4.853	95.568	" "
	0.763	96.332	249/266	3022.508	
SS			8.648	3087.683	40519 SMH #60 N. Rim EUCALYPTUS AVE "I"
TP8			11.327	85.004	C-NAIL W. LIP AVE "I"
"	3.134	88.139	267/213		
SS			5.549	3082.590	40518 SMH #61 N. Rim
TP9			8.204	79.934	C-NAIL W LIP AVE "I"
	5.013	84.947	293/268		
SS			7.201	3077.747	40519 SMH #62 N. Rim
SS			2.602	3082.345	40520 SMH #63 N. Rim
TP10			2.316	82.631	C-NAIL W'LY LIP AVE "I"
	9.438	92.069	272/308		
SS			5.549	3086.521	40521 SMH #64 N. Rim
TP11			7.193	84.876	C-NAIL W. LIP AVE "I"
	1.714	86.590	214/180		
SS			2.678	3083.912	40522 SMH #65 N. Rim
TP12			11.625	74.964	C-NAIL W LIP @ NW RTN I/E
	0.938	3075.903	252/		

E. ON EUCALYPTUS

S. ON AVE "I"

SURVEY OF V.V.W.R.A. JOB NO. 10-10 4667.013 BOOK _____ PAGE _____

SURVEYED BY CS/DM DATE 12/11/07 2 of 3

☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☒ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: AVE "I" HESPERIA INSTRUMENT NO: DNA10 S# 334205

CHECKED BY: FILE: 345L67 LINE 1 ROD NO: 559-584, 585 & 586

TURN #	+	H.I.	–	ELEV.	REMARKS
SS			2.061	3073.842	SMH # 66 (40523) - N. Rim
SS			8.296	3067.607	SMH # 67 (40524) - N. Rim
TP 13			8.010	67.893	C.NAIL W. LIP AVE "I"
	12.294	80.187	211/210		
SS			9.804 †	3070.382	SMH # 68 (40525) N. Rim
SS			7.486 †	3072.700	SMH # 69 (40526) " "
SS			0.827 †	3079.360	SMH # 70 (40527) N. Rim
TP 14			1.178	3079.009	C NAIL, W. LIP @ S. EP (10770 AVE "I")
	1.082	80.090	211/210		
TP 15			12.196	67.894	(TP 13) C.NAIL W. LIP @ C.B.
	9.675	77.569	284/252		
TP 16			0.024	77.546	C.NAIL N. LIP AVE "E"
	12.226	89.772	183/183		
TP 17			0.608	89.164	C.NAIL N. EP AVE "E"
	11.829	3100.993	194/197		
TP 18			1.693	99.300	C.NAIL E. EP AVE "G" @ PP
	1.148	3100.447	271/278		
TP 19			12.413	88.034	GOD W. SIDE PP @ LOW PT
	13.132	3101.166	275/274		
TP 20			1.933	99.233	C.NAIL W. EP AVE "G"
	1.161	3100.394	324/378		
TP 21			3.461	96.933	C NAIL, EP @ N. GATE POST
	0.797	97.731	181/201		
TP 22			7.759	89.972	C-NAIL S. EP EUCALYPTUS
	11.019	3100.991	305/325		
TP 23			4.990	96.001	" "
	9.300	3105.301	299/220		
TP 24			0.298	3105.003	" "
	12.819	17.822	203/131		
TP 25			0.977	16.845	C.NAIL N. EP EUCALYPTUS

AVE "I" S'LY ON AVE "G" NW TO N. ON AVE "G" W. ON EUCALYPTUS

SURVEY OF V.V.W.R.A. JOB NO. 10-104667.013 BOOK _____ PAGE _____

SURVEYED BY CS/DM DATE 12/11/07 3 of 3

☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☐ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: AVE "I" HESPERIA INSTRUMENT NO: DNA10 S# 334205

CHECKED BY: FILE: 345L667 LINE 1 ROD NO: 559-584, 585 / 586

W. ON EUCALYPTUS

TURN #	+	H. I.	−	ELEV.	REMARKS
	8.033	3124.878	283/279		
TP 26			1.435	23.444	C.NAIL S.ETW @ S.END C/G
	9.514	32.958	228/200		
TP 27			5.490	27.468	C.NAIL IN AC P.LOT @ SEC EUC/SANTA FE
	4.051	31.519	154/194		
TP 28 (BM)			7.150	3124.369	√IN USGS "L41" W.SIDE R/R
				(3124.375)	

SURVEY OF V.V.W.R.A. JOB NO. 10-104667.013 BOOK _____ PAGE _____

SURVEYED BY CS/DM DATE 12/12/07 1-43

☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☑ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: AVE "I" HESPERIA INSTRUMENT NO: DNA10 S# 334205

CHECKED BY: FILE: 346L667 LINE 1 ROD NO: 559 - 584, 585 & 586

TURN #	+	H. I.	−	ELEV.	REMARKS
BM "L41" ✓				3124.375 ✓	USGS 1924 W. RIM E R/R N. OF SANTA FE
	3.113	27.488	124/120		
TP 1			12.264	15.224	1"x1" E. R/R R/W
	3.333	18.556	211/207		
TP 2			8.469	10.087	C. NAIL W. EP ON E. SANTA FE
	2.441	12.528	254/219		
TP 3			9.308	3103.220	" "
	1.933	05.153	254/278		
TP 4			11.685	3093.469	" "
	8.801	3102.269	312/319		
TP 5			8.221	94.049	" "
	0.256	94.305	320/303		
TP 6			7.197	87.107	" "
	1.056	88.163	368/370		
TP 7			10.578	77.586	1"x1" IN FIELD W. SIDE E. SANTA FE
	1.249	78.835	264/264		
TP 8			12.591	66.243	LOD W. SIDE DIRT RD
	1.421	67.664	135/120		
TP 9			12.845	54.819	LOD BETWEEN TWO DIRT RDS
	2.135	56.955	260/256		
TP 10			8.168	48.787	LO D W. EDGE DIRT RD
	2.402	51.189	342/341		
TP 11			11.821	39.367	LO D E. EDGE DIRT RD (E. SIDE R/R)
	1.187	40.554	275/282		
TP 12			7.823	32.731	" "
	4.456	37.187	251/189		
SS # 40501			6.598	3030.588	SMH # 43 ✓ N'LY RIM
SS # 40502			7.834	3029.353	SMH # 44 ✓ " "
TP 13			6.743	30.444	LOD GRAVEL D/W 15' S'LY MH # 44
	7.109	37.552	301/287		
SS # 40503			5.465	3032.087	SMH # 45 ✓ N'LY RIM
TP 14			3.062	34.491	LO D GRAVEL D/W HI-GRADE LOT

E. SANTA FE

085.004

N'LY ON

N'LY E SIDE R/R

SMH #43

BEAR VALLEY

E'LY ON S. TOE

SURVEY OF V.V.W.R.A. JOB NO. 10-104667.013 BOOK _____ PAGE _____

SURVEYED BY CS/DM DATE 12/12/07 2 of 3

☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☒ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: AVE "I" HESPERIA INSTRUMENT NO: DNA10 S# 334205

CHECKED BY: FILE: 346667 LINE 1 ROD NO: 559 – 584, 585 & 586

S'LY SEWER EASEMENT

S'LY ON AVE "I"

TURN #	+	H. I.	–	ELEV.	REMARKS
BM	7.204	3041.694	211/214		
SS 40504			8.795	3032.899	SMH # 47 N'LY Rim
TP 15			7.987	33.707	60D SE SIDE HI GRADE YARD
	12.175	45.883	172/180		
SS # 40505			11.323	3034.560	SMH # 48 N'LY Rim
TP 16			1.376	44.507	1"X1" W. SIDE EASEMENT
	12.951	57.458	56/67		
SS # 40506			2.305	3055.153	SMH # 49 N'LY Rim
TP 17			0.745	56.713	60D E. SIDE EASEMENT
	6.297	63.010	87/106		
TP 18			5.094	57.917	1"X1" IN FIELD E. OF EAS.
	6.771	64.687	207/211		
SS # 40507			9.378	3055.309	SMH # 50 N'LY Rim
SS # 40508			6.795	3057.892	SMH # 51 N'LY Rim
TP 19			6.429	58.258	C.NAIL, S'LY EP, D/W 11810 AVE "I"
	2.845	61.103	264/284		
SS # 40509			6.961	3054.141	SMH # 52 N'LY Rim
TP 20			3.875	57.228	C.NAIL W. ACFL @ HW AVE "I"
	9.227	66.455	253/261		
SS # 40510			5.663	3060.791	SMH # 53 N'LY Rim
TP 21			3.303	63.152	C.NAIL @ NEC CONC. 11610 AVE "I"
	11.617	74.769	292/308		
SS # 40511			6.396	3068.372	SMH # 54 N'LY Rim
TP 22			3.243	71.525	C.NAIL W. UP, S'LY TOX
	8.935	80.861	296/301		
SS # 40512			7.609	3072.451	SMH # 55 N'LY Rim
SS # 40513			3.683	3076.378	SMH # 56 N'LY Rim
TP 23			3.696	76.365	C.NAIL, ACFL, MOC, SW PIN
	8.188	84.554	311/304		
SS # 40514			5.039	3079.514	SMH # 57 N'LY Rim
TP 24			3.712	80.842	C.NAIL, W. ACFL

SURVEY OF V.V. W.R.A. JOB NO. 10.104467.013 BOOK ____ PAGE ____

SURVEYED BY CS/DM DATE 12/12/07 3 of 3

☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☒ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: AVE I HESPERIA INSTRUMENT NO: DNA10 S# 334205

CHECKED BY: FILE: 346L667 LINE 1 ROD NO: 559-584, 585 & 586

TURN #	+	H. I.	–	ELEV.	REMARKS
	8.105	3088.947	326/320		
SS# 40515			5.804	3083.143	SMH# 58 ✓ N'LY Rim
SS# 101			5.428	3083.518	1"IP W/PP RBF C.P.
SS# 40516			3.158	3085.789	SMH # 59 ✓ N'LY Rim
TP 25			3.756	85.191	C.NAIL, W. ACFL
	7.341	92.532	294/215		
TP 26 (TBM)			7.528	3085.004 ✓	TP8 ✓ 345L667 LINE 1 (C.NAIL W/ LIP AVE "I")
				(3085.004)	

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MANHOLE DIAGRAM 1

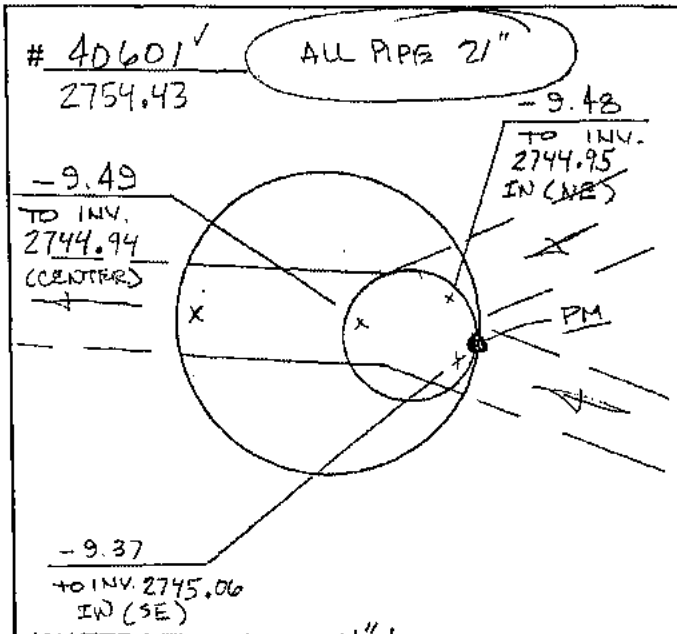
FILE: 667E009

JOB NAME V.V.W.R.A. / HESPERIA LINE
JOB NO. 10-104667.013
SHEET NO. _____ OF _____
DESIGNED BY CS/DM DATE 01/09/08
CHECKED BY _____ DATE _____

40601 ✓

2754.43

ALL PIPE 21"

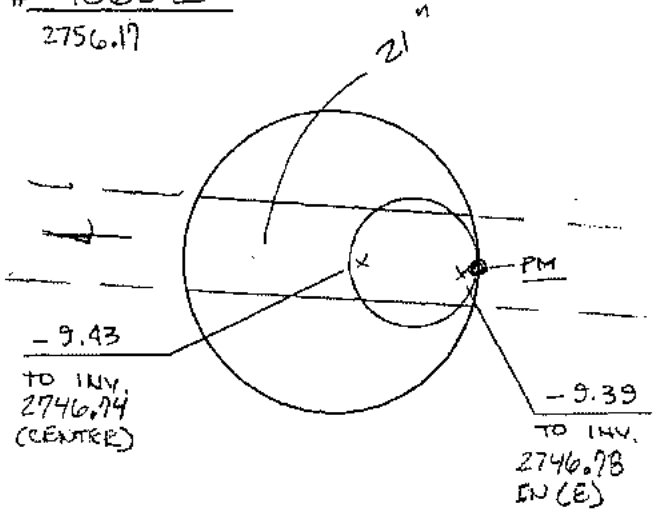


WATER LEVEL MED. 11"± TIME 09:20

NOTES: SMH # 1 (Bottom Outlet Rough)
ALLEN HEADS

40602 ✓

2756.19

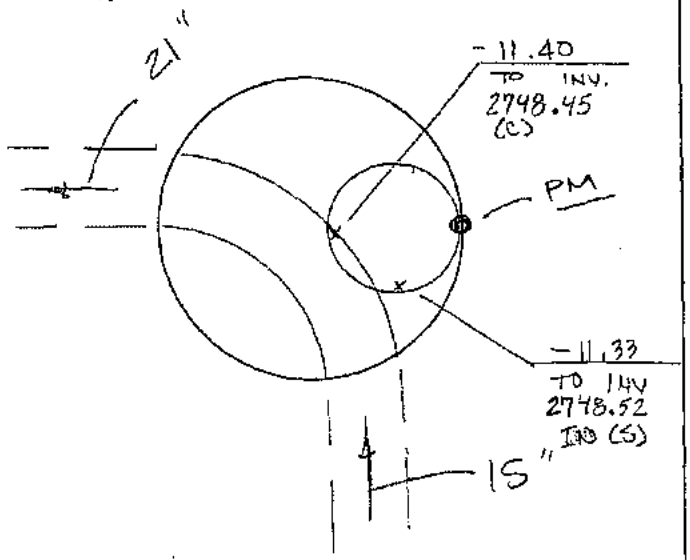


WATER LEVEL MED 10"± TIME 09:45

NOTES: SMH ± 2 REGIONAL PARK
ALLEN HEADS

40603 ✓

2759.85

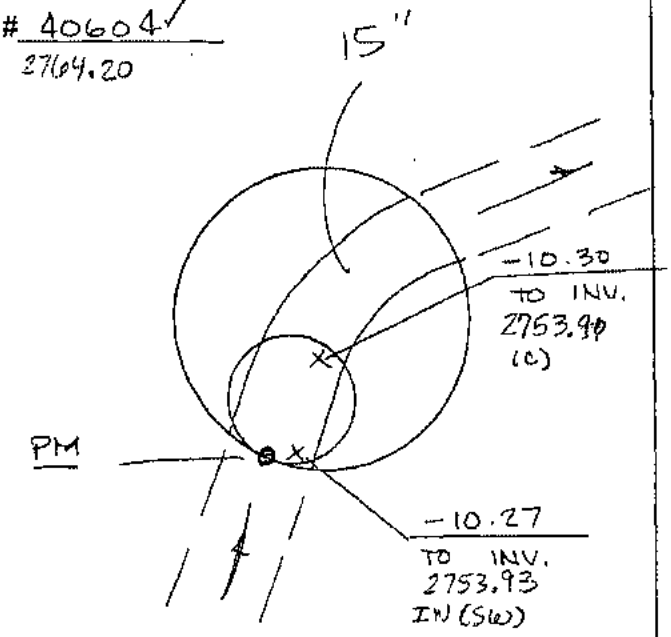


WATER LEVEL MED 9"± TIME 09:55

NOTES: SMH 3 REGIONAL PARK
ALLEN HEADS

40604 ✓

2764.20



WATER LEVEL HIGH 12"± TIME 10:30

NOTES: SMH # 4
ALLEN HEADS

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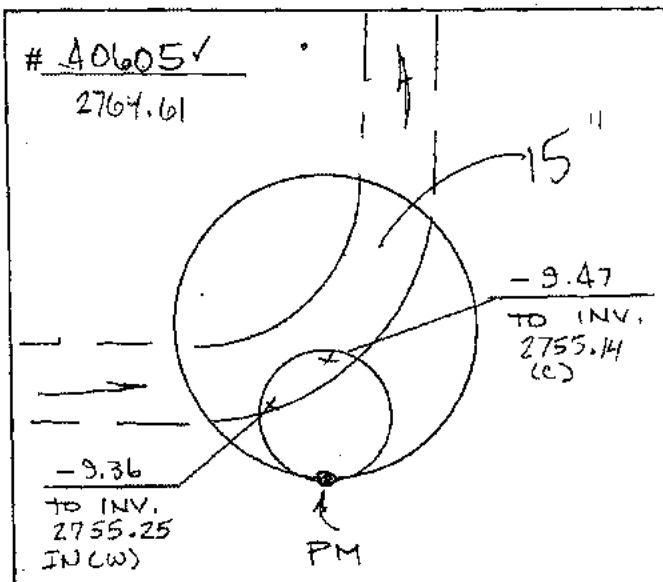
MANHOLE DIAGRAM HESPERIA

FILE: 667E009

JOB NAME V.V.W.R.A. / HESPERIA
JOB NO. 10-104667.013
SHEET NO. _____ OF _____
DESIGNED BY CS/DM DATE 01/09/08
CHECKED BY _____ DATE _____

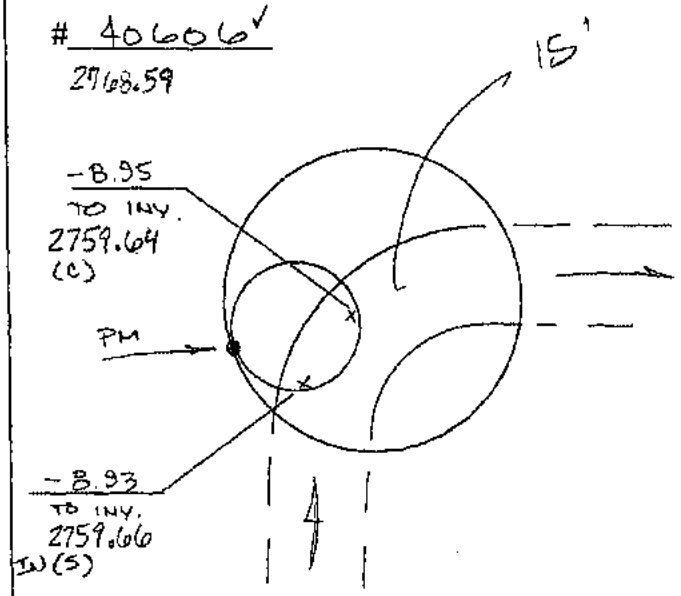
40605 ✓
2764.61



FAST
WATER LEVEL FULL 13" TIME 13:15

NOTES: SMH # 5
ALLEN HEADS

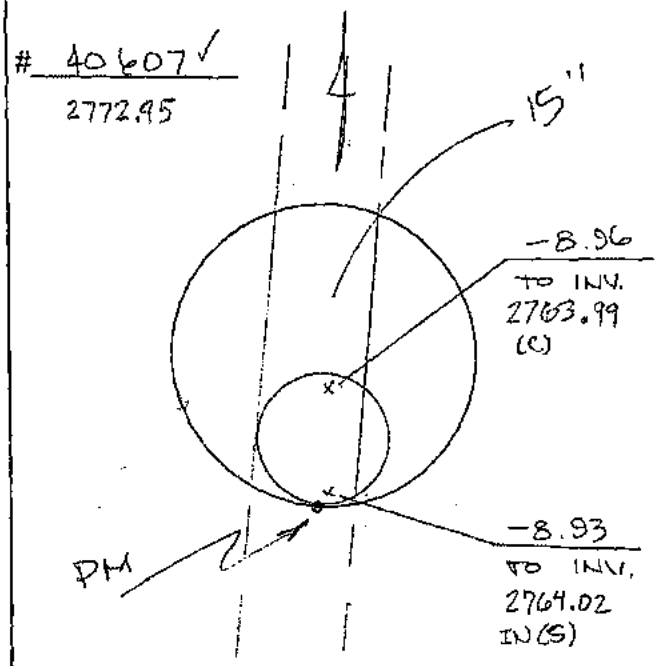
40606 ✓
2768.59



WATER LEVEL MED 10" TIME 11:15

NOTES: SMH # 6
ALLEN HEADS

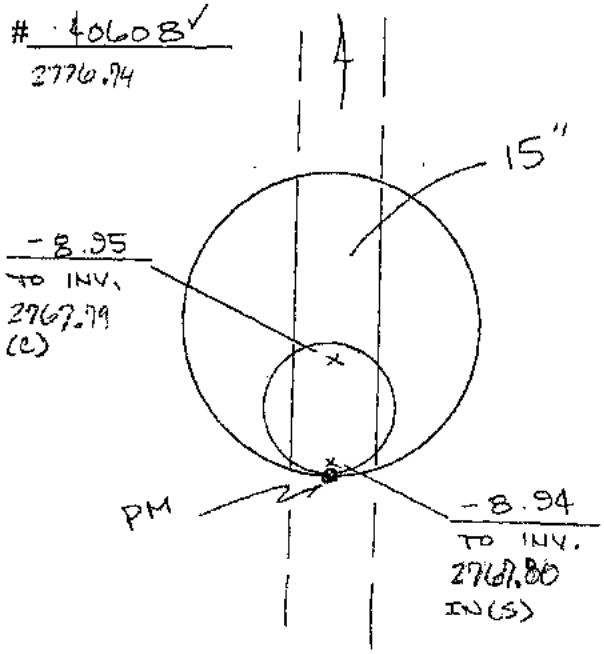
40607 ✓
2772.95



WATER LEVEL MED 10½ TIME 11:30

NOTES: SMH # 7
ALLEN HEADS

40608 ✓
2776.94



WATER LEVEL MED 10" TIME 11:45

NOTES: SMH # 8
ALLEN HEADS

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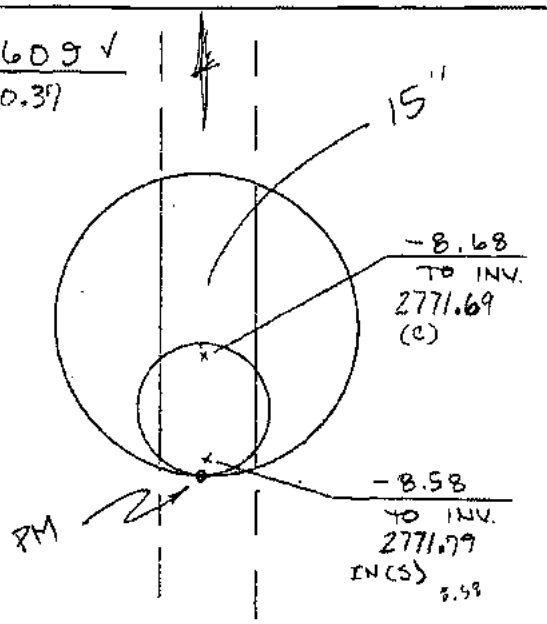
MANHOLE DIAGRAM

FILE: 667E009

JOB NAME V.V.W.R.A. / HESPERIA
JOB NO. 10.104667.013
SHEET NO. _____ OF _____
DESIGNED BY CS/DM DATE 01/09/08
CHECKED BY _____ DATE _____

40609 ✓

2780.37

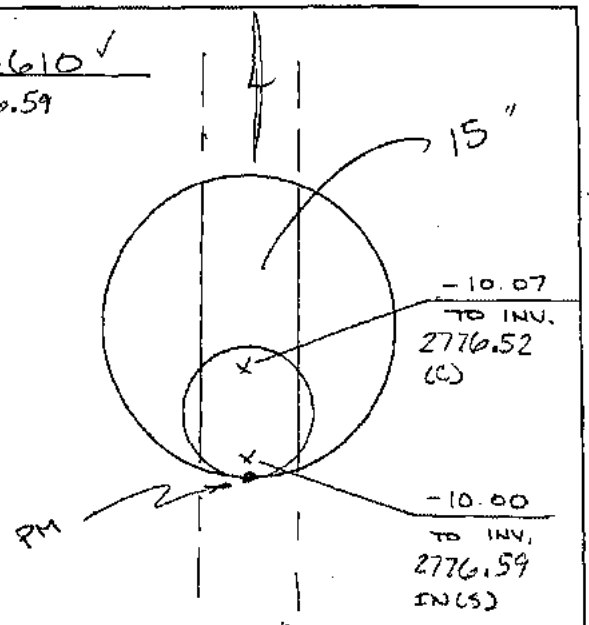


WATER LEVEL MED 11"± TIME 12:30

NOTES: SMH # 9
SPECIAL ALLEN HEADS

40610 ✓

2786.59

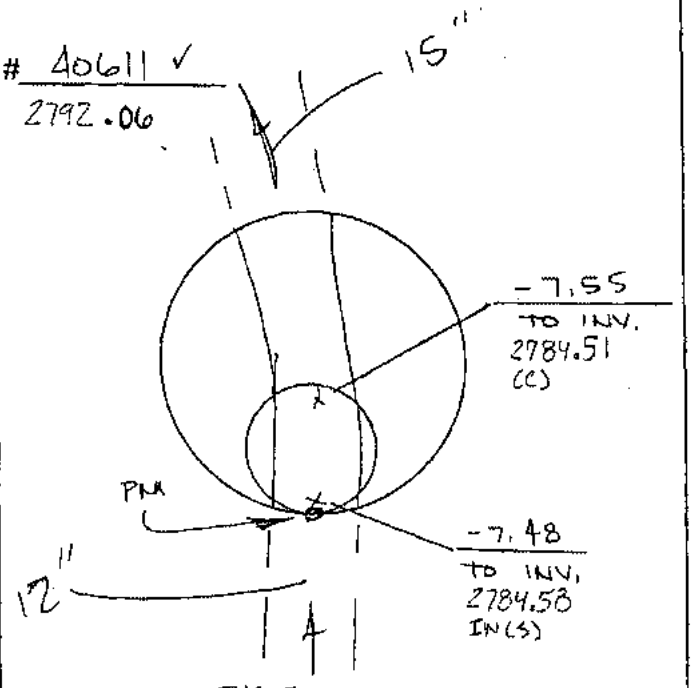


WATER LEVEL FULL 18" TIME 12:45

NOTES: SMH # 10 (OVERFULL)
SPECIAL ALLEN HEADS

40611 ✓

2792.06

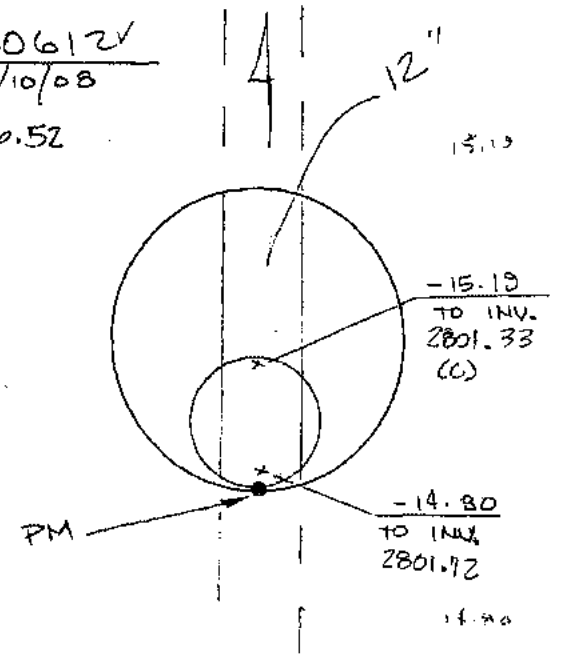


FAST
WATER LEVEL MED 10" TIME 13:03
NOTES: SMH # 11

SPECIAL ALLEN HEADS

40612 ✓

01/10/08
2816.52



WATER LEVEL MED 10" TIME 08:30
NOTES: SMH # 12

SPECIAL ALLEN HEADS

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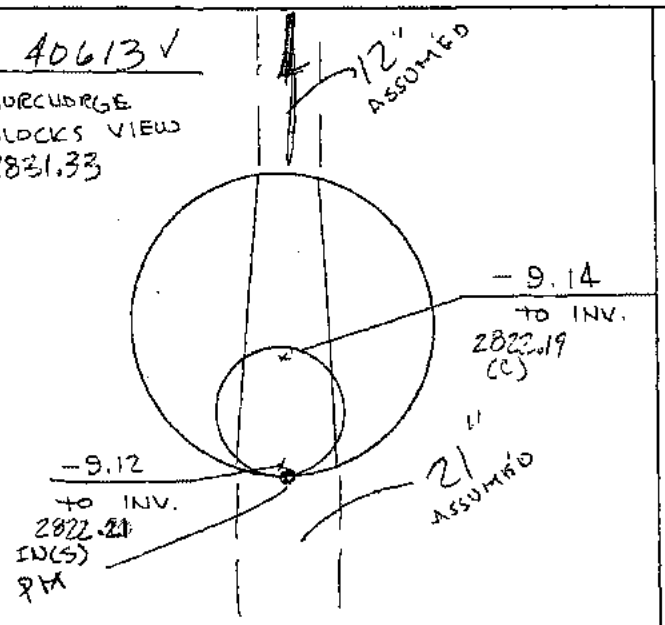
MANHOLE DIAGRAM

FILE: 667E009

JOB NAME V.V.W.R.A. / HESPERIA LINE
JOB NO. 10.104667.013
SHEET NO. ____ OF ____
DESIGNED BY CS/DM DATE 01/10/08
CHECKED BY ____ DATE ____

40613 ✓

SURCHARGE BLOCKS VIEW
2831.33

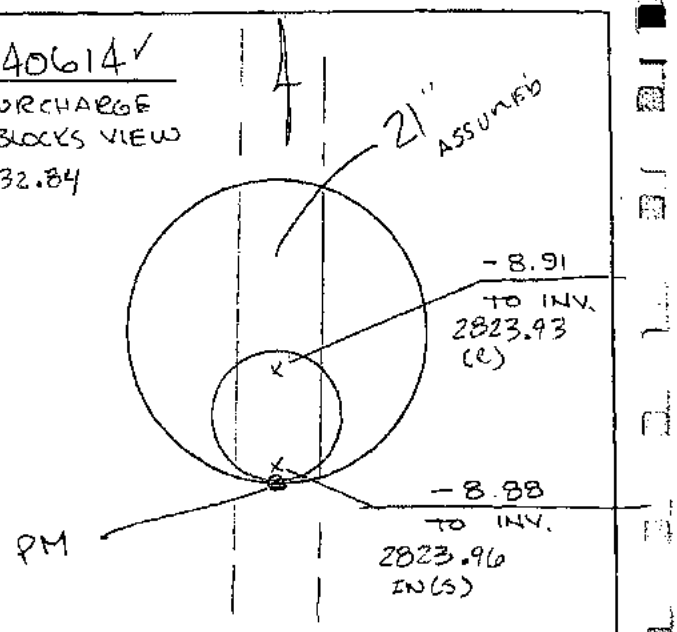


WATER LEVEL Full 38" TIME 08:50

NOTES: SMH # 13 (SURCHARGED)
SPECIAL ALLEN HEADS

40614 ✓

SURCHARGE BLOCKS VIEW
2832.84

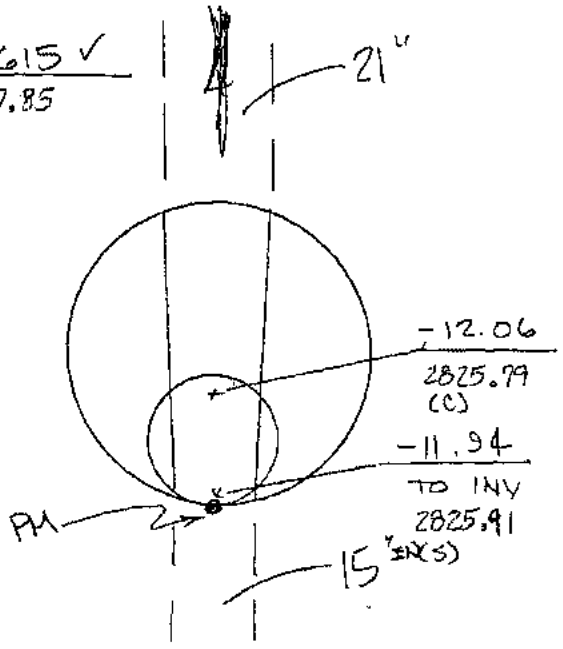


WATER LEVEL Full 22" TIME 09:15

NOTES: SMH # 14 (SURCHARGE)
ALLEN HEADS

40615 ✓

2837.85

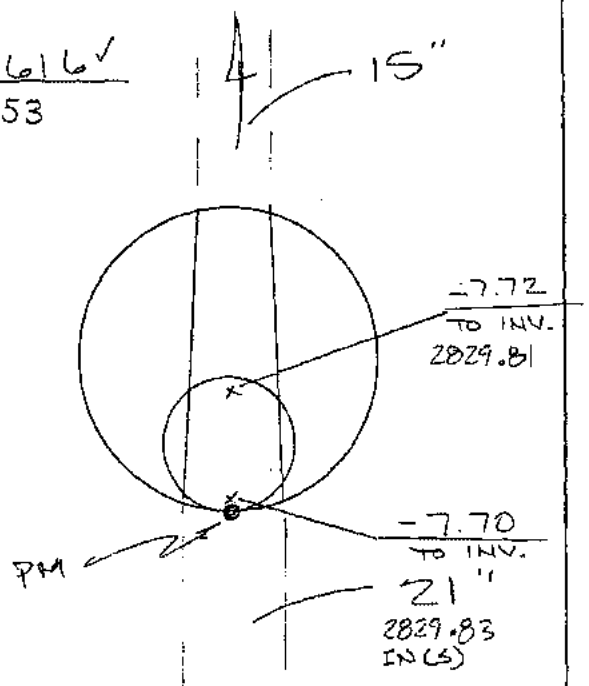


WATER LEVEL MED 8" TIME 09:30
NOTES: SMH # 15

ALLEN HEADS

40616 ✓

2839.53



WATER LEVEL MED 11" TIME 09:45
NOTES: SMH # 16

ALLEN HEADS

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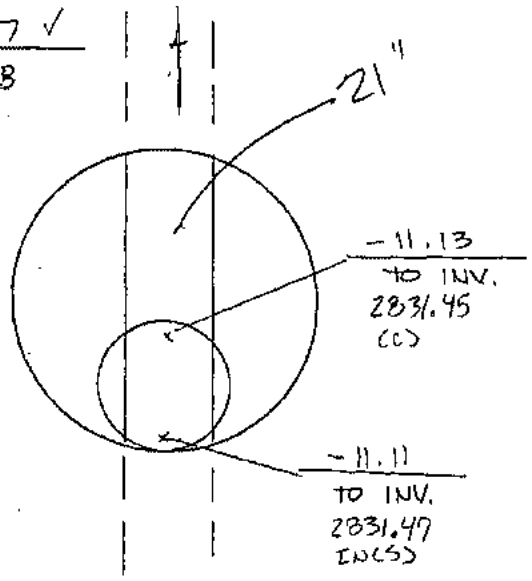
MANHOLE DIAGRAM

FILE: 667E009

JOB NAME V.V.W.R.A. / HESPERIA
JOB NO. 10·104667.013
SHEET NO. _____ OF _____
DESIGNED BY CS/DM DATE 01/10/08
CHECKED BY _____ DATE _____

40617 ✓

2842.58

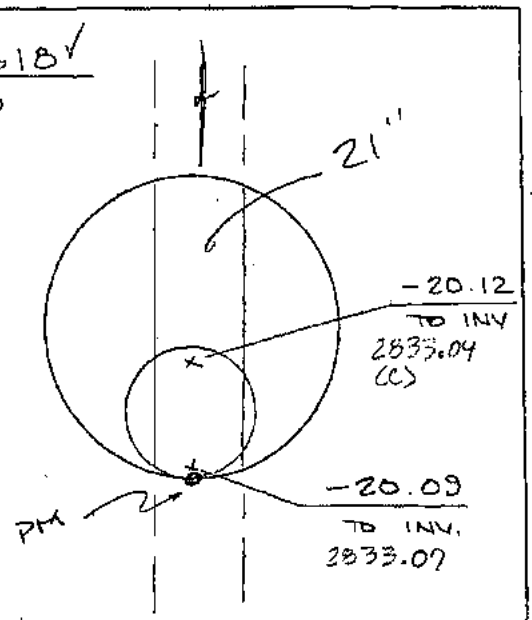


WATER LEVEL MED 11" TIME 10:00

NOTES: SMH # 17
SPECIAL ALLEN HEADS

40618 ✓

2853.16

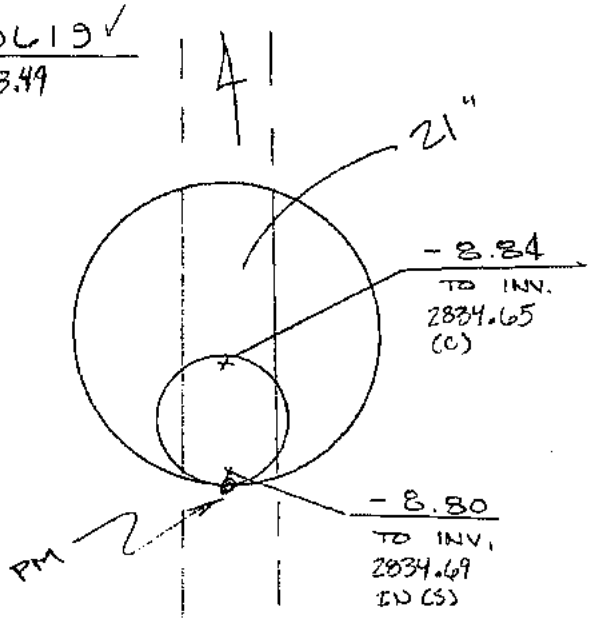


WATER LEVEL MED 10" TIME 10:30

NOTES: SMH # 18
SPECIAL ALLEN HEADS

40619 ✓

2843.49



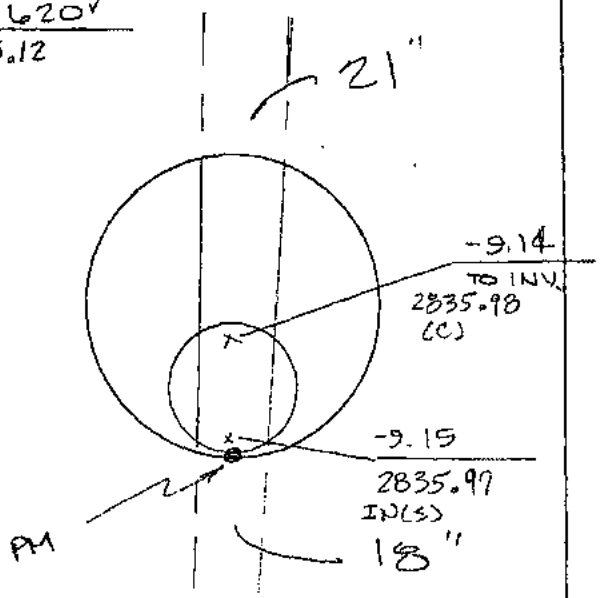
WATER LEVEL MED 9" TIME 10:50
NOTES: SMH # 19

ALLEN HEADS

*

40620 ✓

2845.12



WATER LEVEL MED 10" TIME 11:10
NOTES: SMH # 20

SPECIAL ALLEN HEADS

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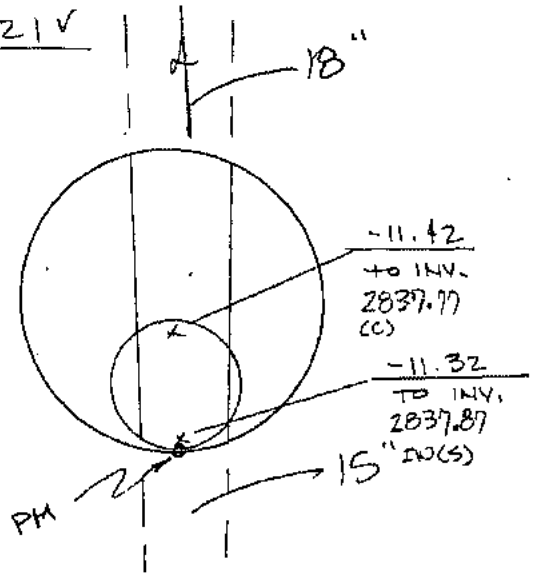
MANHOLE DIAGRAM

FILE: 667E009

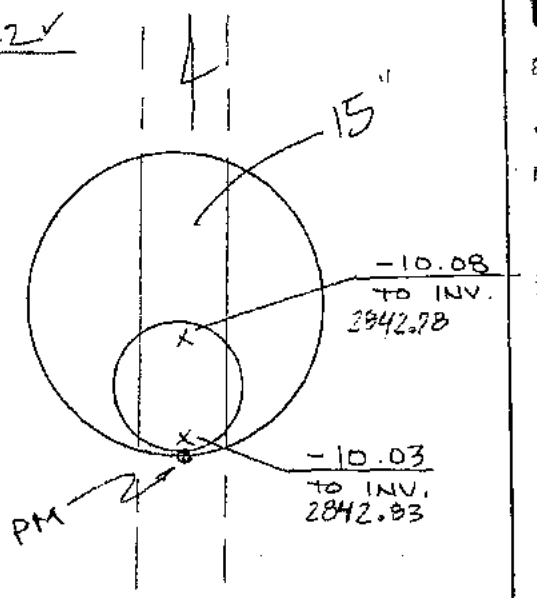
JOB NAME V.V.W.R.A. / HESPERIA
JOB NO. 10·10 4667.013
SHEET NO. ____ OF ____
DESIGNED BY CS/DM DATE 01/10/08
CHECKED BY ____ DATE ____

40621 ✓
2849.19



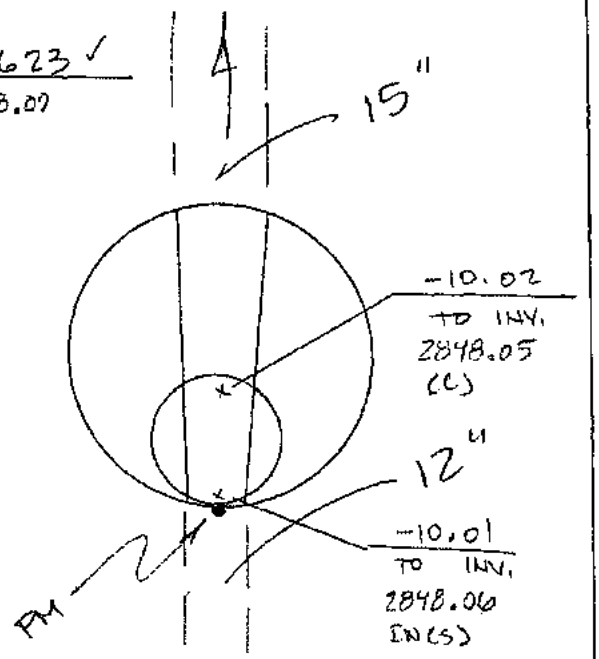
WATER LEVEL MED 9" TIME 11:25
NOTES: SMH # 21
ALLEN HEADS

40622 ✓
2852.86



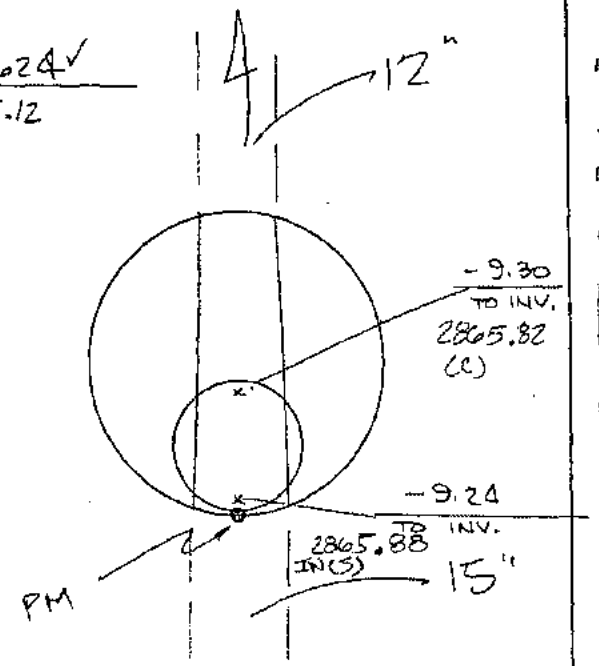
WATER LEVEL MED 11" TIME 11:35
NOTES: SMH # 22
ALLEN HEADS

40623 ✓
2858.09



WATER LEVEL MED 10" TIME 12:30
NOTES: SMH # 23

40624 ✓
2875.12



WATER LEVEL MED 10" TIME ____
NOTES: SMH # 24

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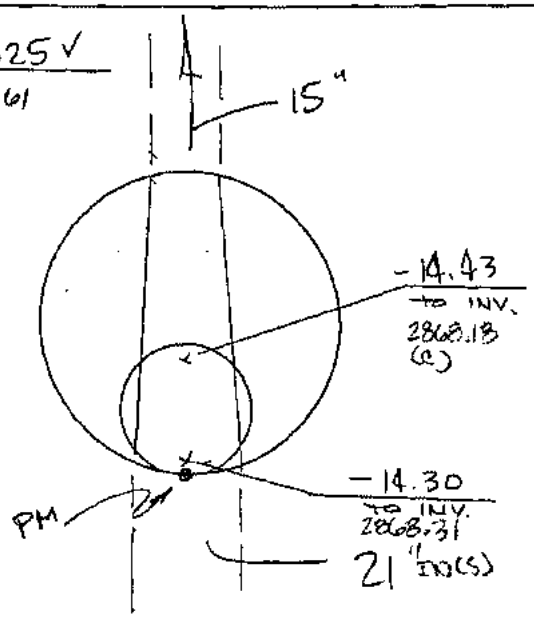
MANHOLE DIAGRAM

FILE: 667E009

JOB NAME Y.V.W.R.A. / HESPERIA
JOB NO. 10-104667.013
SHEET NO. ____ OF ____
DESIGNED BY CS/DM DATE 01/10/08
CHECKED BY ____ DATE ____

40625 ✓

2882.61

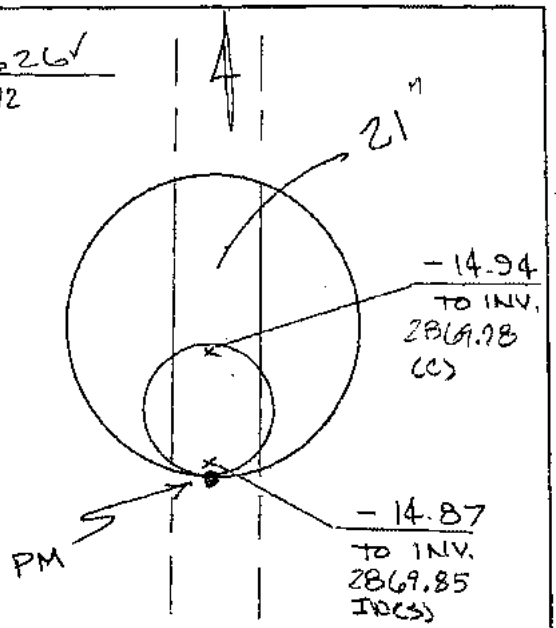


WATER LEVEL MED 12" TIME 13:00

NOTES: SMH # 25
ALLEN HEADS

40626 ✓

2884.72

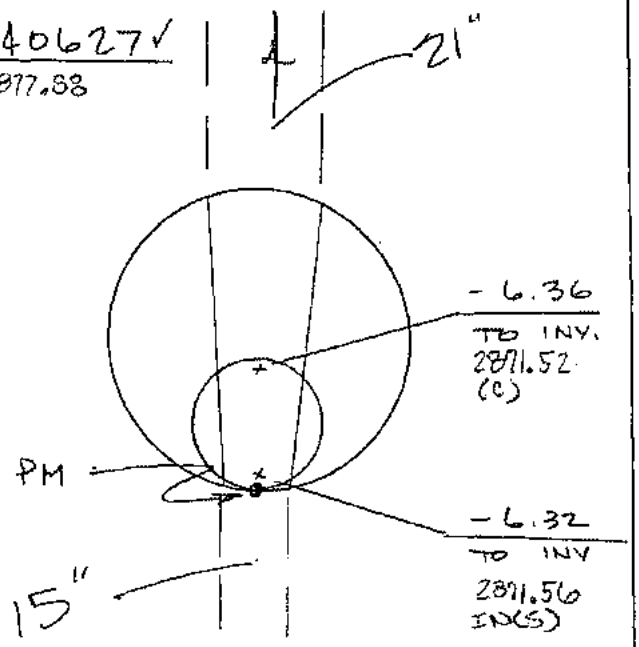


WATER LEVEL MED 10" TIME 13:15

NOTES: SMH # 26
ALLEN HEADS

40627 ✓

2877.88



WATER LEVEL MED 10" TIME 13:30

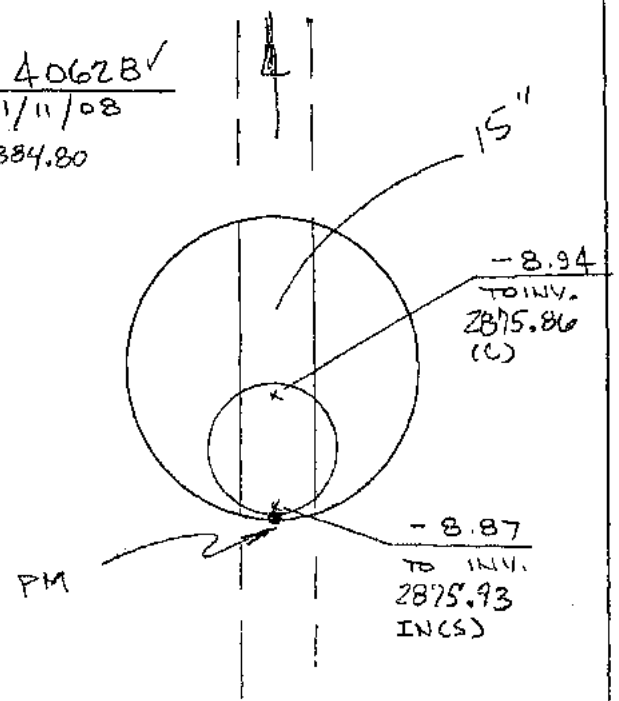
NOTES: SMH # 27

ALLEN HEADS

40628 ✓

01/11/08

2884.80



WATER LEVEL MED 6" TIME 07:30

NOTES: SMH # 28

ALLEN HEADS

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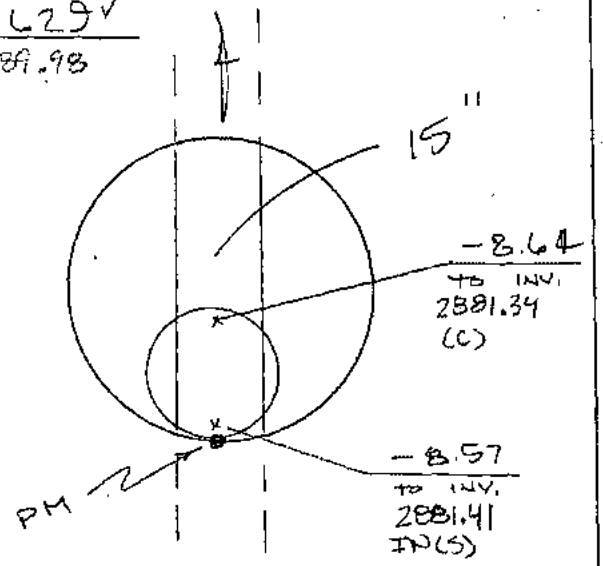
MANHOLE DIAGRAM

FILE: 667E009

JOB NAME Y.V.W.R.A. / HESPERIA
JOB NO. 10.10 4667.013
SHEET NO. ____ OF ____
DESIGNED BY CS/DM DATE 01/11/08
CHECKED BY ____ DATE ____

40629 ✓

2889.98

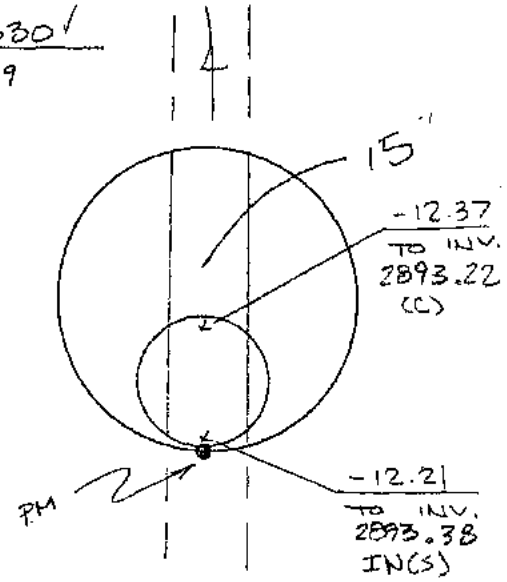


WATER LEVEL MED 7" TIME 07:40

NOTES: SMH # 29
ALLEN HEADS

40630 ✓

2905.59

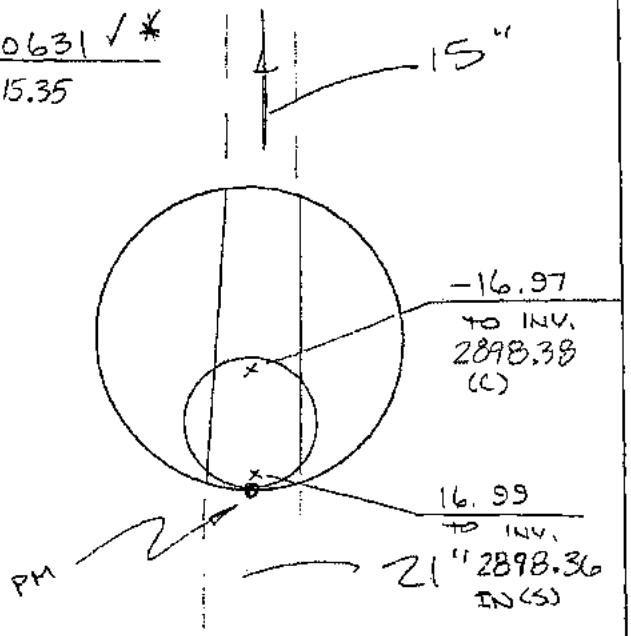


WATER LEVEL MED 7" TIME 07:55

NOTES: SMH # 30 (FLUSH)
ONE ALLEN HEAD

40631 ✓*

2915.35

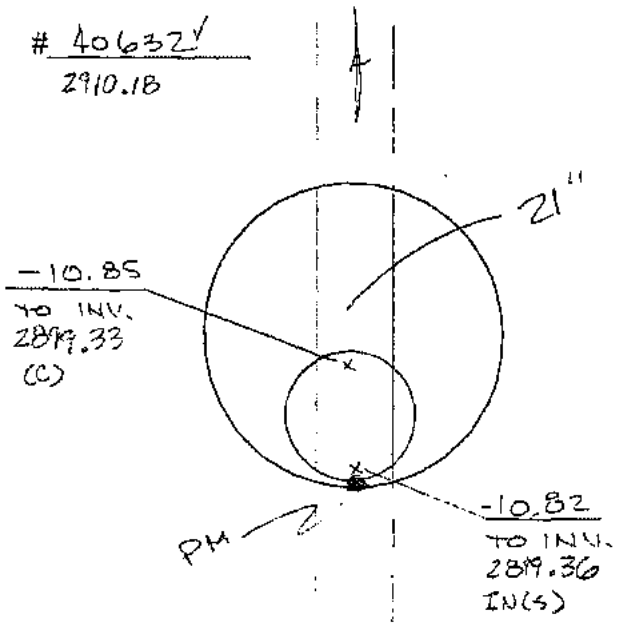


WATER LEVEL MED 10" TIME 08:15

NOTES: SMH # 31 (UP 2.0)
ALLEN HEADS

40632 ✓

2910.18



WATER LEVEL MED 9" TIME 08:25

NOTES: SMH # 32 (UP 1.0)
ALLEN HEADS

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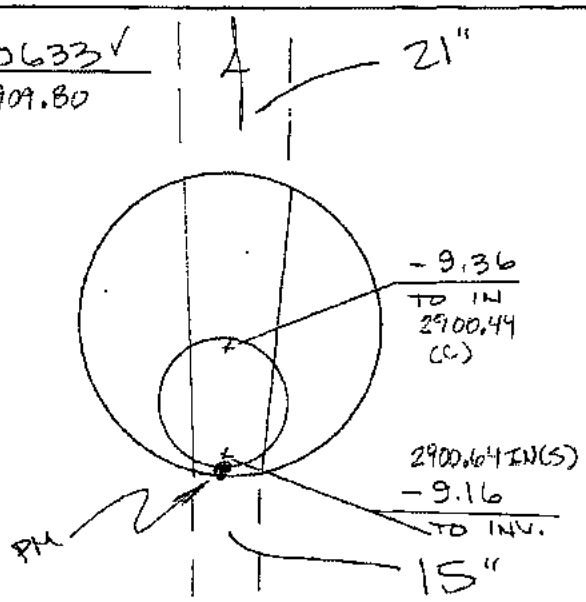
MANHOLE DIAGRAM

FILE: 667E009

JOB NAME V.V.W.R.A. / HESPERIA
JOB NO. 10.104667.013
SHEET NO. _____ OF _____
DESIGNED BY CS/DM DATE 01/11/08
CHECKED BY _____ DATE _____

40633 ✓

2909.80

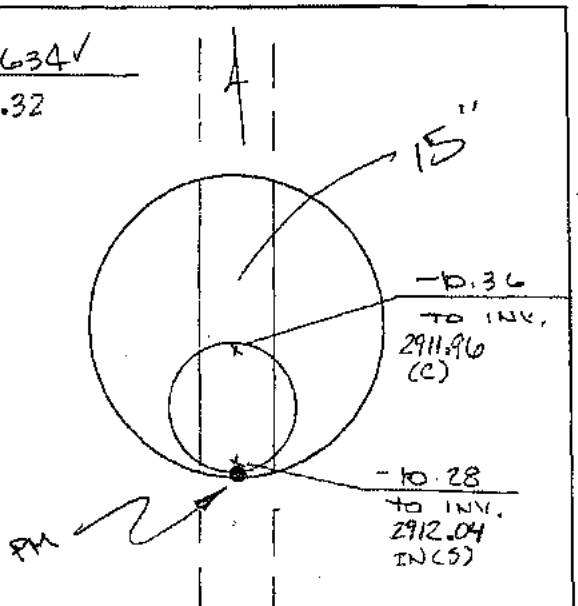


WATER LEVEL MED 9" TIME 08:35

NOTES: SMH # 33 (FLUSH)
ALLEN HEADS

40634 ✓

2922.32

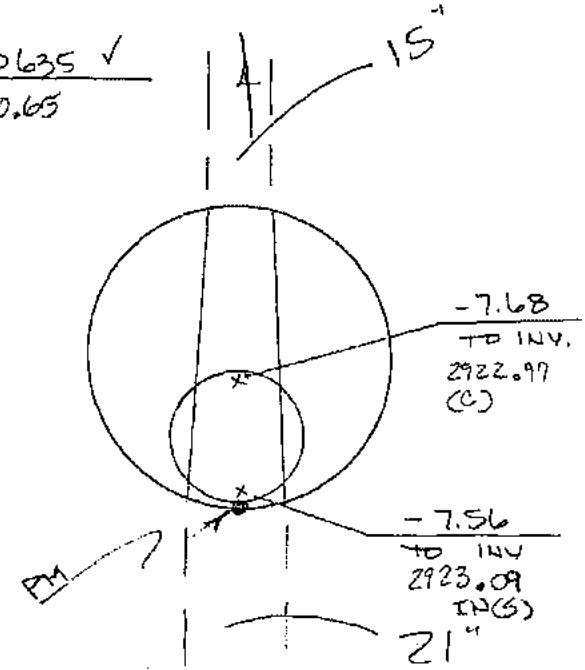


WATER LEVEL MED 10" TIME 9:00

NOTES: SMH # 34 (UP 0.8)
ALLEN HEADS

40635 ✓

2930.65

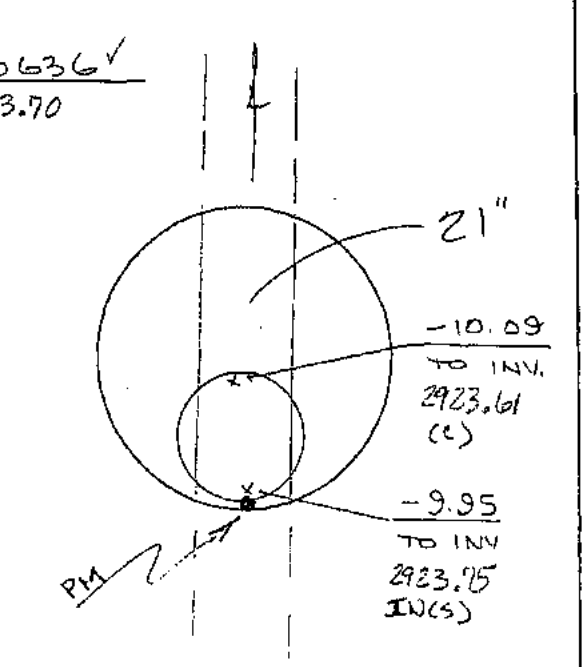


WATER LEVEL MED 10" TIME 09:25

NOTES: SMH # 35 (UP 0.3)
ALLEN HEADS

40636 ✓

2933.70



WATER LEVEL MED 9" TIME 09:40

NOTES: SMH # 36 (UP 0.4)
ALLEN HEADS

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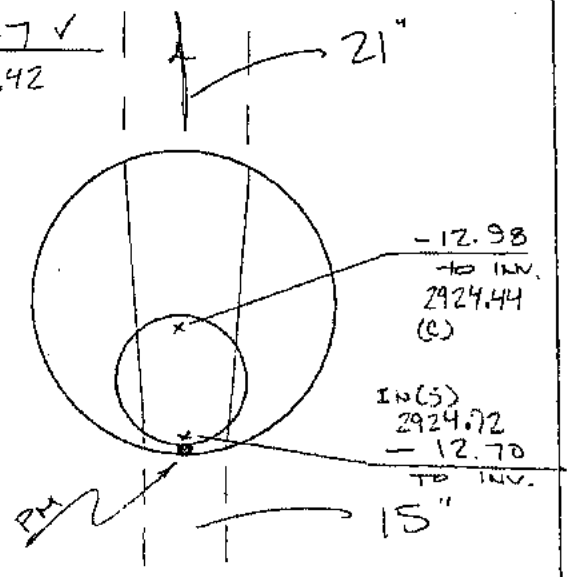
MANHOLE DIAGRAM

FILE: 6678009

JOB NAME V.V.W.R.A. / HESPERIA
JOB NO. 10.104667.013
SHEET NO. ____ OF ____
DESIGNED BY CS/DM DATE 01/11/08
CHECKED BY ____ DATE ____

40637 ✓

2937.42

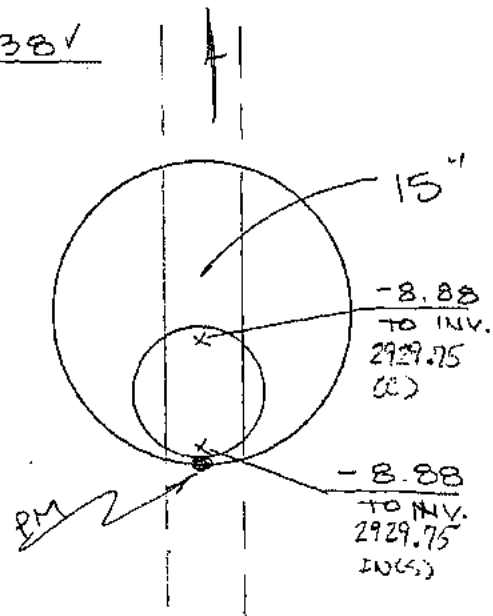


WATER LEVEL MED 11" TIME 09:50

NOTES: SMH # 37 (UP 0.7)
ALLEN HEADS

40638 ✓

2938.63

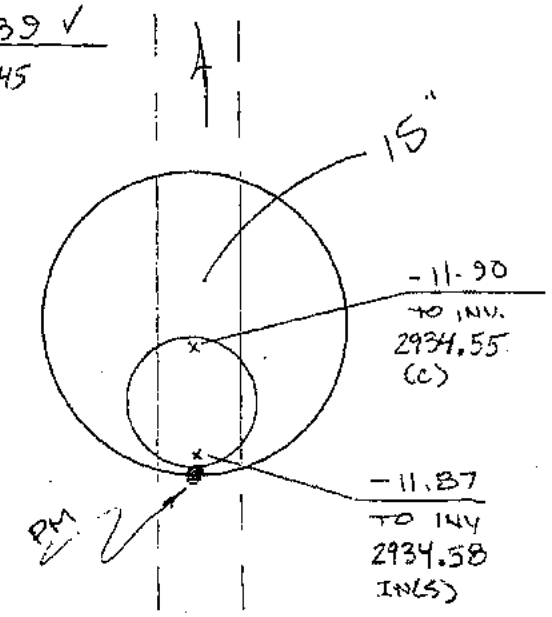


WATER LEVEL MED 11" TIME 10:00

NOTES: SMH # 38 (FLUSH)
ALLEN HEADS

40639 ✓

2946.45

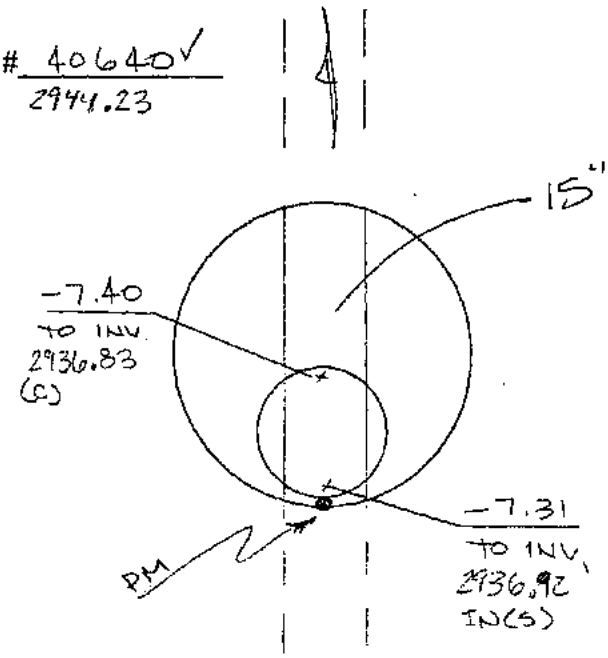


WATER LEVEL MED 11" TIME 10:15
NOTES: SMH # 39 (UP 0.2)

ALLEN HEADS

40640 ✓

2944.23



WATER LEVEL MED 11" TIME 10:30
NOTES: SMH # 40 (FLUSH)

ALLEN HEADS

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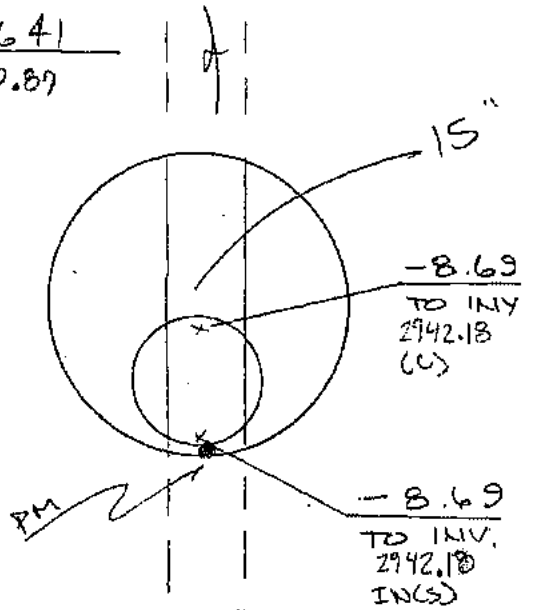
MANHOLE DIAGRAM

FILE: 667E009

JOB NAME V.V.W.R.A. / HESPERIA
JOB NO. 10-104667.013
SHEET NO. _____ OF _____
DESIGNED BY _____ DATE _____
CHECKED BY CS/DM DATE 01/11/08

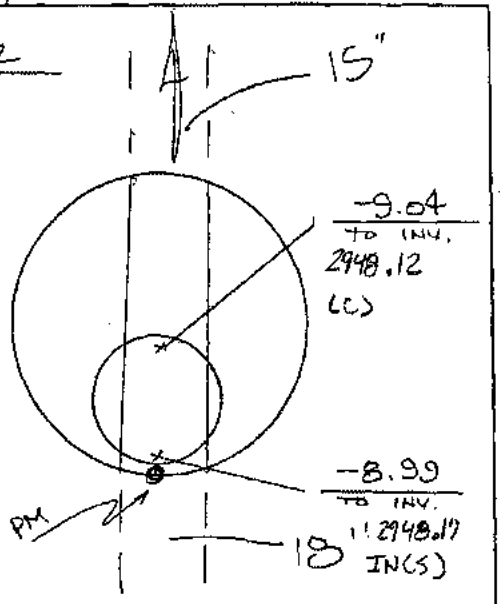
40641
2950.89



WATER LEVEL MED 11" TIME 10:40

NOTES: SMH # 41 (FLUSH)

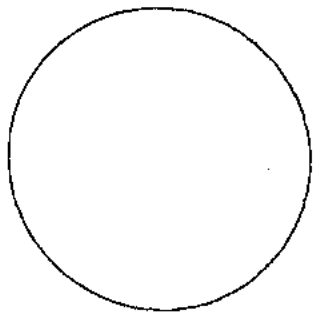
40642
2957.16



WATER LEVEL MED 12" TIME 11:30

NOTES: SMH # 42 (UP 0.5)

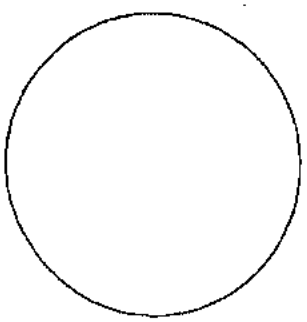
#_____



WATER LEVEL _____ TIME _____

NOTES: _____

#_____



WATER LEVEL _____ TIME _____

NOTES: _____

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JOB NAME VVWRA FACILITY

JOB NO. 05-100175

SHEET NO. 1 OF 3

DESIGNED BY _____ DATE 4-23-07

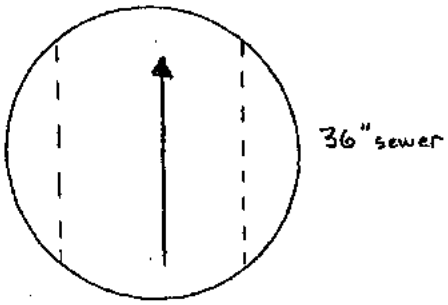
CHECKED BY _____ DATE _____

MANHOLE DIAGRAM

✓ 2629.50 RIM

1-11

G111 M1



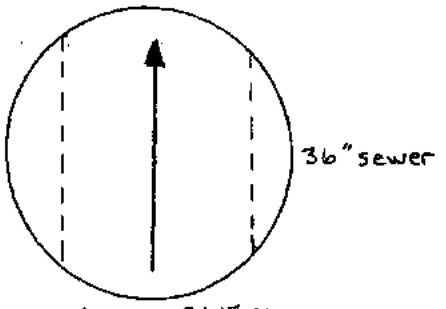
WATER LEVEL ½ FULL TIME 11:16

NOTES: DIP - 14 25

✓ 2635.31 RIM

RS-12 (161)

TOPO & GRS12M1



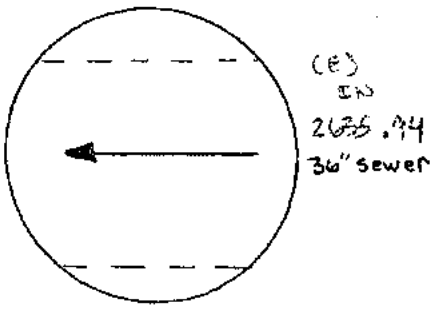
WATER LEVEL ½ FULL TIME 11:05

NOTES: DIP - 20 15

2650.14 RIM

3-2151

G32 M1



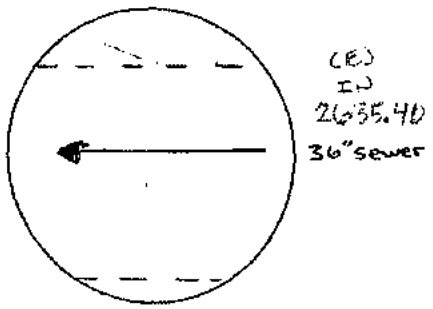
WATER LEVEL ½ FULL TIME 12:00

NOTES: DIP-14 20

2649.83

3-4

G34M1



WATER LEVEL ½ FULL TIME 12:19

NOTES: DIP - 14 48

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JOB NAME VVWRA FACILITY

JOB NO. 65-100175

SHEET NO. 2 OF 3

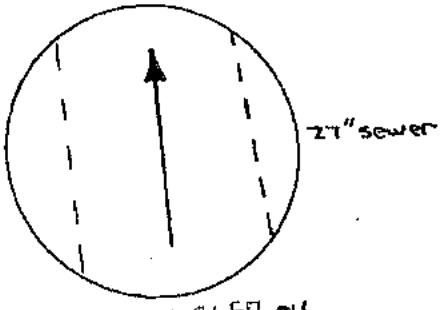
DESIGNED BY _____ DATE 4-23-07

CHECKED BY _____ DATE _____

MANHOLE DIAGRAM

2667.69 RIM

3-17
G3117 M1



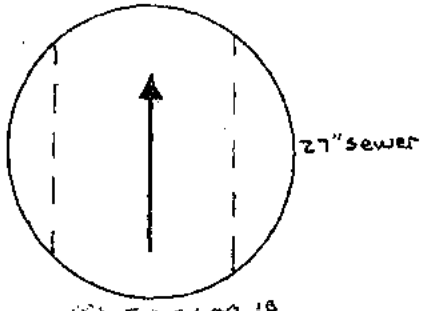
(SW) IN 2657.84

WATER LEVEL 3/4 FULL TIME 12:53

NOTES: DIP - 10 59

2619.93 RIM

4-18
G418M1



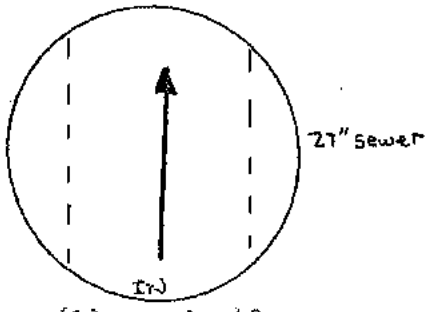
(S) IN 2609.18

WATER LEVEL 1/2 FULL TIME 3:36

NOTES: DIP - 10 75

2701.96 RIM

4-19
G419M1



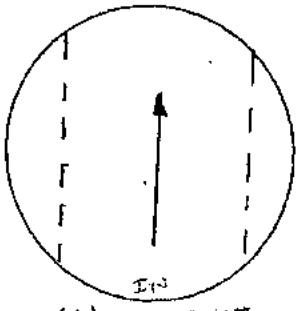
(S) 2690.68

WATER LEVEL 1/4 FULL TIME 3:45

NOTES: DIP - 11 08

2702.53 RIM

4-20
G420M1



(S) 2693.43

WATER LEVEL 1/2 FULL TIME 4:00

NOTES: DIP - 10 10

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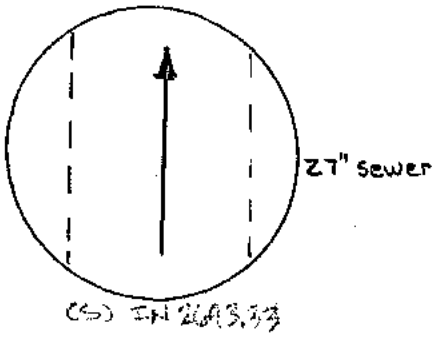
MANHOLE DIAGRAM

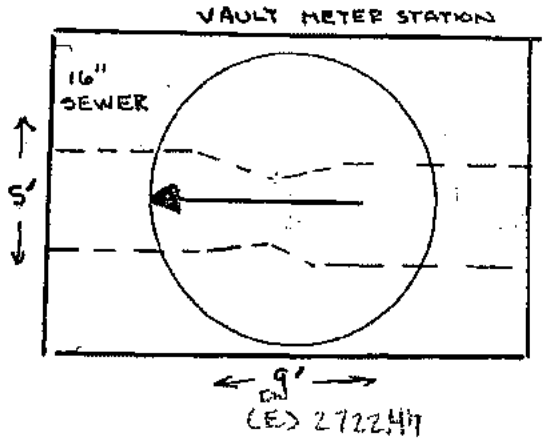
JOB NAME VVWRA FACILITY
JOB NO. 65-100175
SHEET NO. 3 OF 3
DESIGNED BY _____ DATE 4-23-07
CHECKED BY _____ DATE _____

4-21 — 2704.43 RIM
G42IMI



WATER LEVEL 1/2 FULL TIME 4:05
NOTES: DIP-11 10

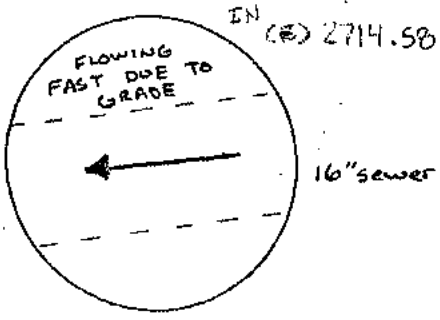
AVMS (1160) — 2732.99 RIM
GAVMSMI
APPLE VALE METER STATION



WATER LEVEL 1/8 FULL TIME 8:12
NOTES: DIP-10 50

---

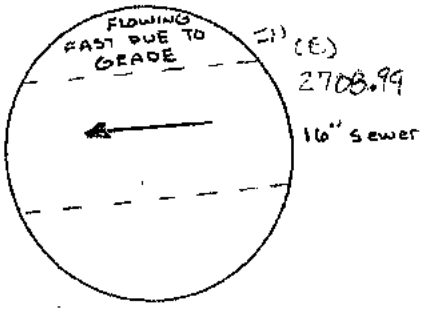
3 — 2724.93 RIM
G3MI



WATER LEVEL 1/4 FULL TIME 7:35
NOTES: DIP-10 15

---

2 — 2719.48 RIM
G2MI



WATER LEVEL 1/4 FULL TIME 7:45
NOTES: DIP-10 49

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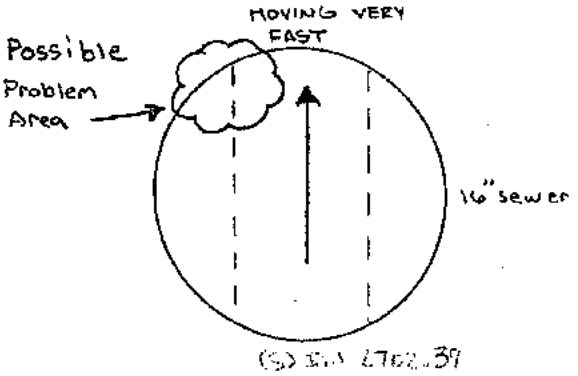
JOB NAME VVWRA
JOB NO. 65-100175
SHEET NO. 4 OF 4
DESIGNED BY _____ DATE 5-24-07
CHECKED BY _____ DATE _____

MANHOLE DIAGRAM

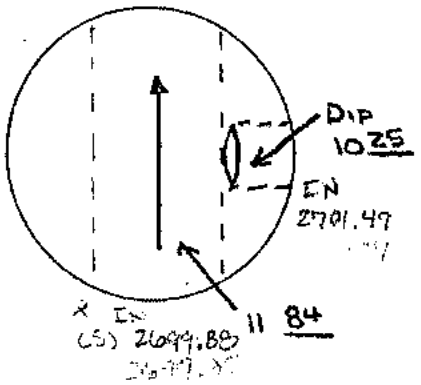
5-7
2718.84 RIM
G57M1



WATER LEVEL 3/4 FULL TIME 10:16
NOTES: DIP - 16 47

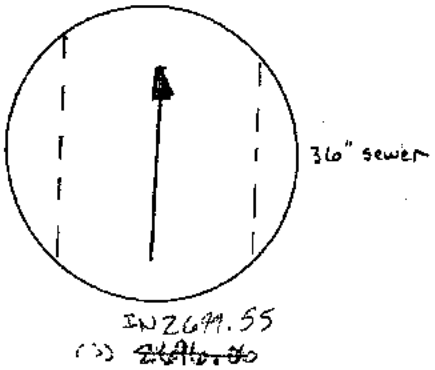
5-5
2711.72 RIM (2711.49)
G55M1

~~NOT ABLE TO OPEN 36 BOLTS~~ TORCHED OFF BOLTS.



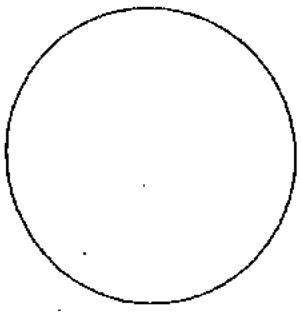
WATER LEVEL 3/4 FULL TIME 10:44
NOTES: AS NOTED

5-3
~~2701.95 RIM~~
2711.44 RIM
G53M1 = 31 %
G53M2 = L/O



WATER LEVEL FULL TIME 12:40
NOTES: DIP - 11 89

#



WATER LEVEL _____ TIME _____
NOTES: _____

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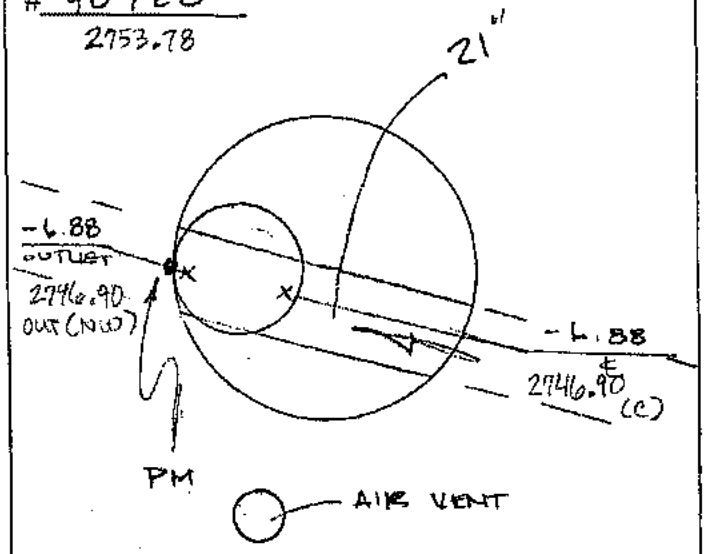
MANHOLE DIAGRAM

FILE: 667E010

JOB NAME V.V.W.R.A. / SPRING VALLEY
JOB NO. 10.10667.013
SHEET NO. ____ OF ____
DESIGNED BY ____ DATE ____
CHECKED BY CS/DM DATE 01/14/08

40722

2753.78

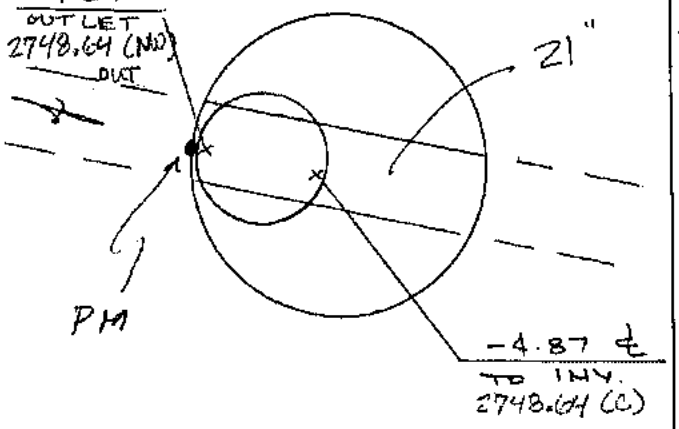


WATER LEVEL MED 7" TIME 09:30

NOTES: SV # 22 (DN 0.1)
3/4" BOLTS

40723

2753.51

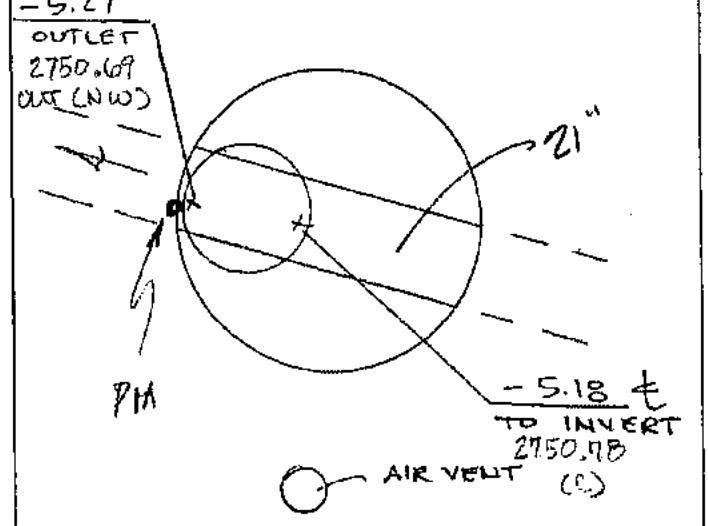


4.87
WATER LEVEL MED 8" TIME 10:15

NOTES: SV # 23 (DN 1.0)
3/4" BOLTS

40724

2755.96

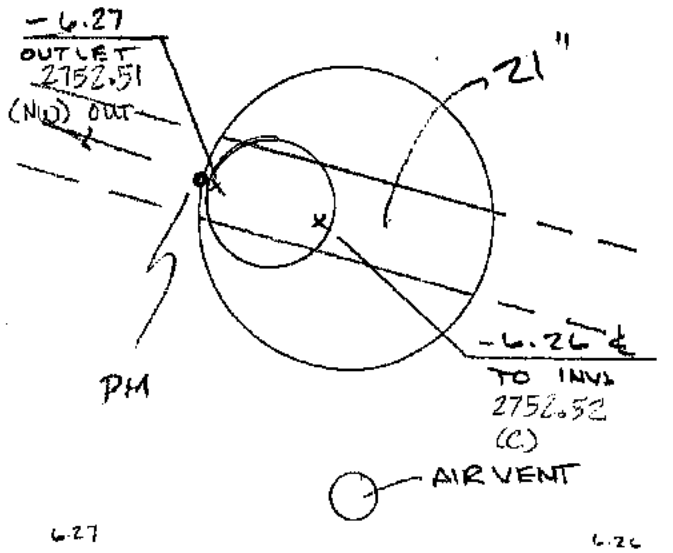


WATER LEVEL MED 7" TIME 10:45
NOTES: SV # 24 FLUSH

NO BOLTS

40725

2758.78



6.27 6.26
WATER LEVEL MED 7" TIME 11:00
NOTES: SV # 25 FLUSH

NO BOLTS

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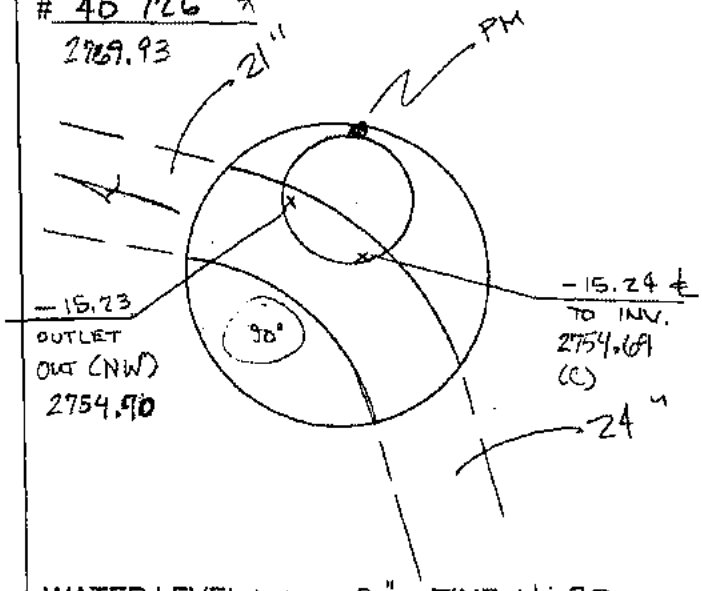
MANHOLE DIAGRAM

FILE: 667E010

JOB NAME Y.V.W.R.A. / SPRING VALLEY
JOB NO. 10 104667 013
SHEET NO. _____ OF _____
DESIGNED BY _____ DATE _____
CHECKED BY CS/DM DATE 01/14/08

40726 *

2769.93

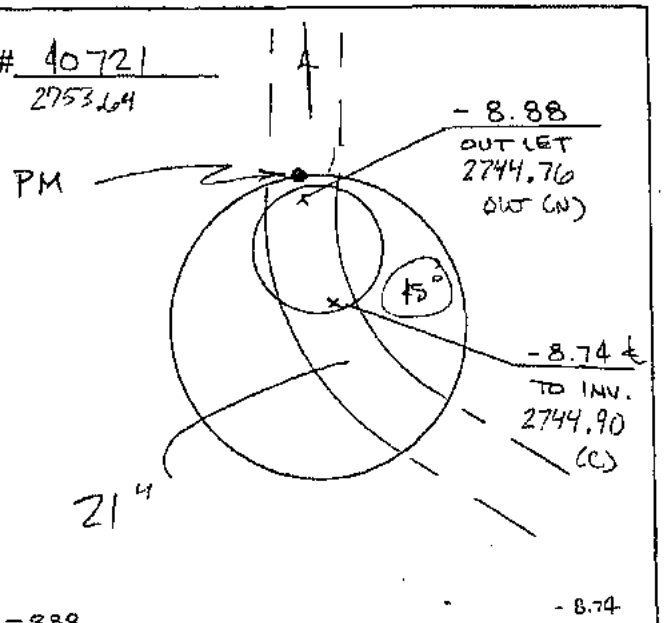


WATER LEVEL MED 8" TIME 11:20

NOTES: SV # 26 (UP 0.3)
NO ALLEN HEAD

40721

2753.64



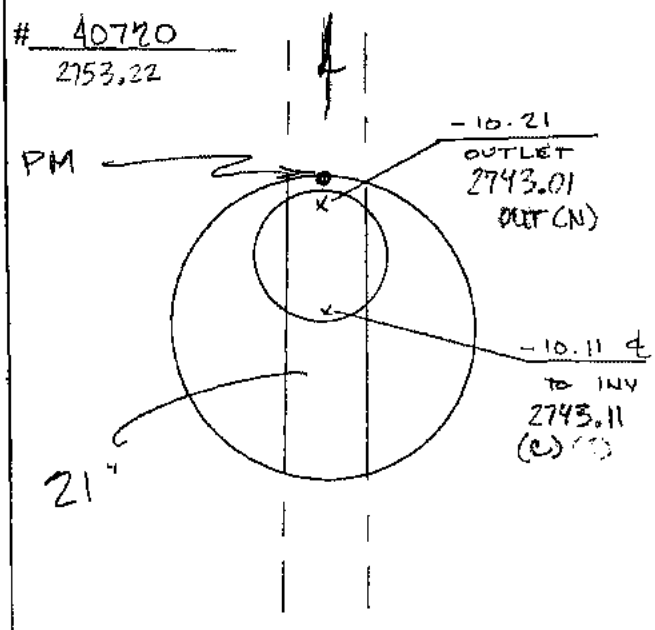
-8.88 -8.74

WATER LEVEL MED 13" TIME 11:45

NOTES: SV # 21 (FLUSH)
3/4" BOLTS

40720

2753.22

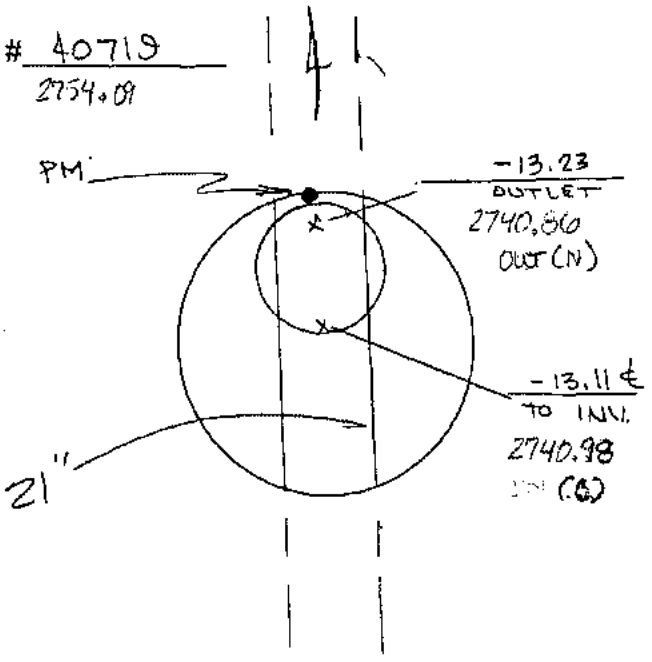


WATER LEVEL MED 10" TIME 12:15
NOTES: SV # 20 (FLUSH IN AC)

3/4" BOLTS

40719

2754.09



WATER LEVEL MED 12" TIME 12:30
NOTES: SV # 19 (FLUSH)

NO BOLTS

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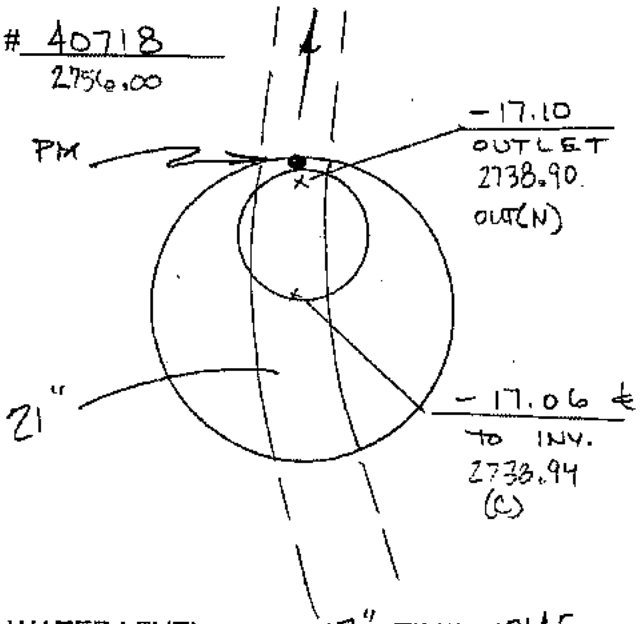
MANHOLE DIAGRAM

FILE: 6672010

JOB NAME V.V.W.R.A. / SPRING VALLEY
JOB NO. 10.104667.0013
SHEET NO. ____ OF ____
DESIGNED BY ____ DATE ____
CHECKED BY CS/DM DATE 01/14/08

40718

2756.00

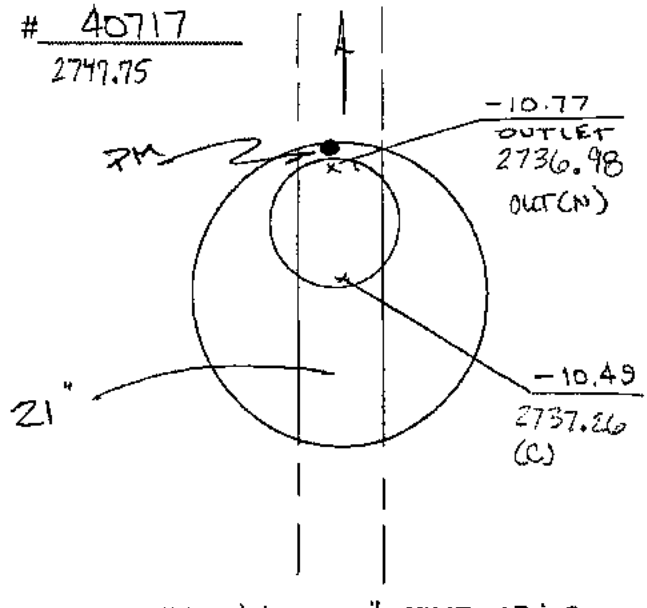


WATER LEVEL MED 12" TIME 12:45

NOTES: SV #18 (FLUSH)
3/4" BOLTS

40717

2749.75

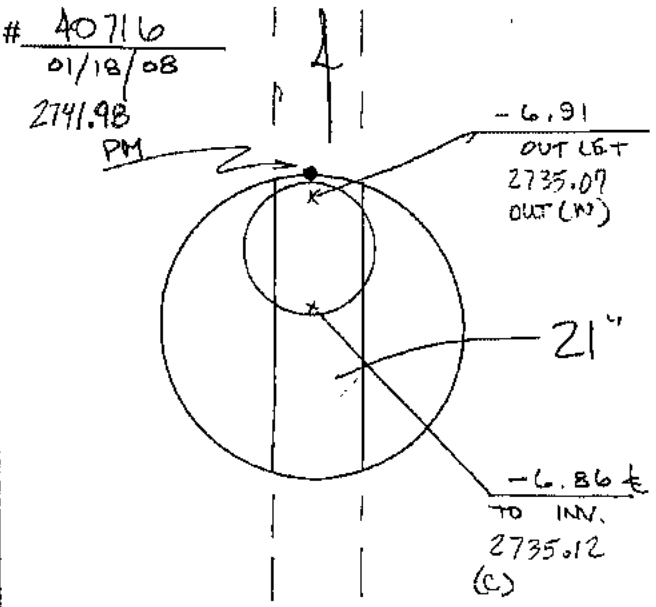


WATER LEVEL MED 13" TIME 13:30

NOTES: SV # 17 (DN 0.2)
3/4" BOLTS

40716

01/18/08
2741.98

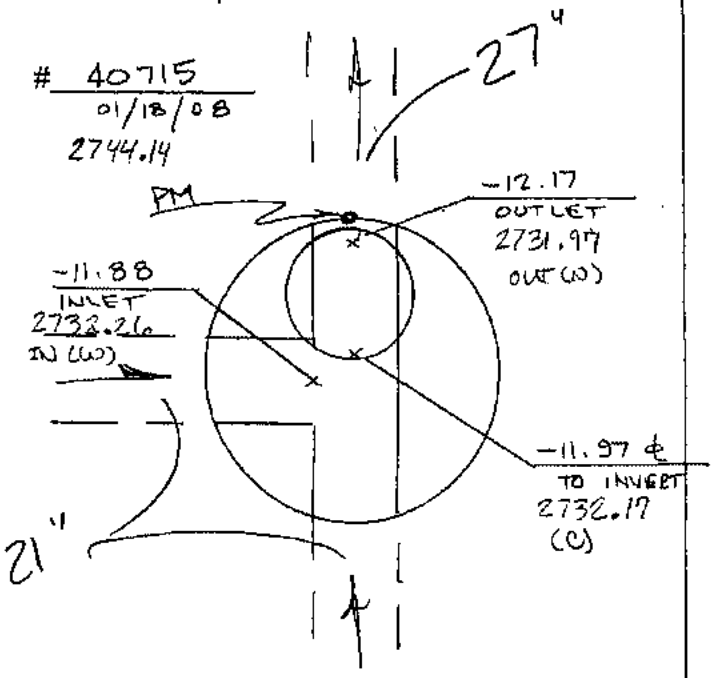


WATER LEVEL MED 11" TIME 10:00
NOTES: SV #16 (FLUSH)

UNBOLTED

40715

01/18/08
2744.14



WATER LEVEL MED 12" TIME 10:20
NOTES: SV #15 (TURBULENT) (FLUSH)

UNBOLTED

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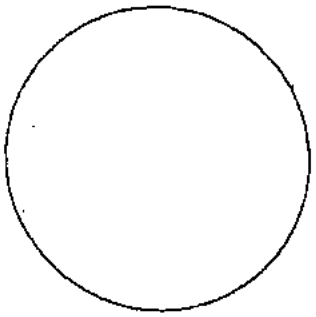
MANHOLE DIAGRAM

FILE: 667E010

JOB NAME V.V.W.R.A / SPRING VALLEY
JOB NO. 10.10 4667.013
SHEET NO. _____ OF _____
DESIGNED BY _____ DATE _____
CHECKED BY CS/DM DATE 01/18/08

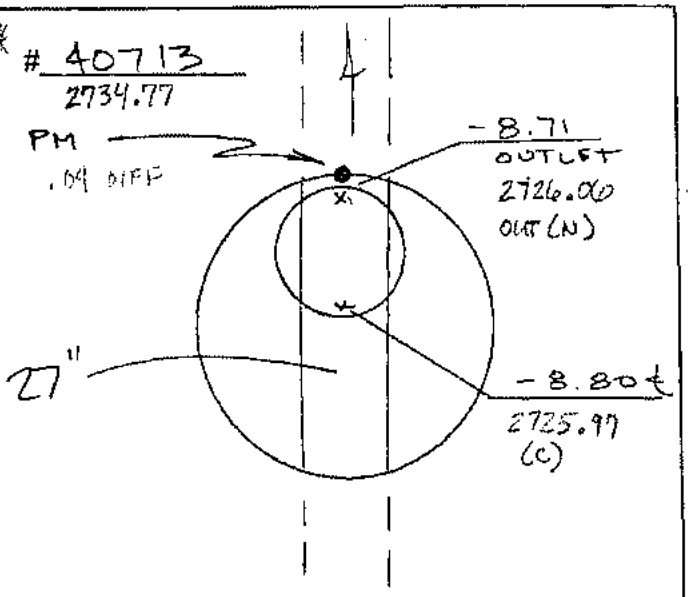
#_____



WATER LEVEL _____ TIME _____

NOTES: SV # 14 SFN

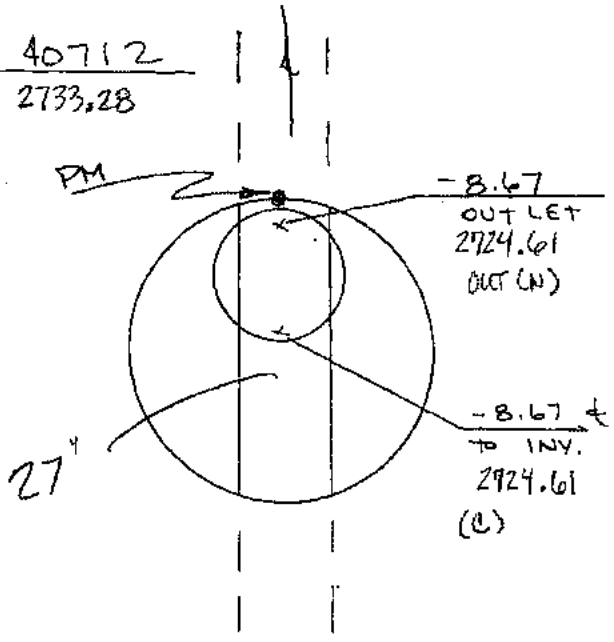
40713
2734.77



WATER LEVEL MED 11" TIME 10:55

NOTES: SV # 13 (FLUSH)
UNBOLTED

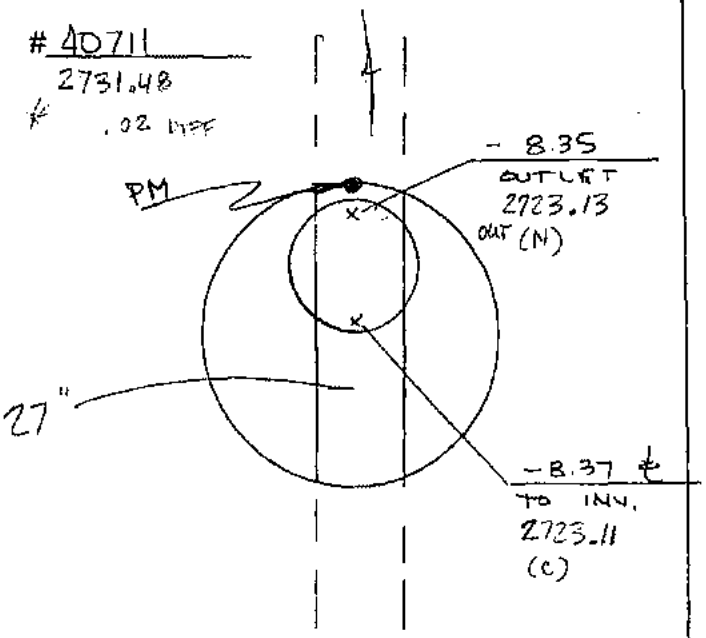
40712
2733.28



WATER LEVEL MED 16" TIME 11:30

NOTES: SV # 12 (FLUSH)
UNBOLTED

40711
2731.48
.02 DIFF



WATER LEVEL MED 17" TIME 11:50

NOTES: SV # 11 (FLUSH)
UNBOLTED

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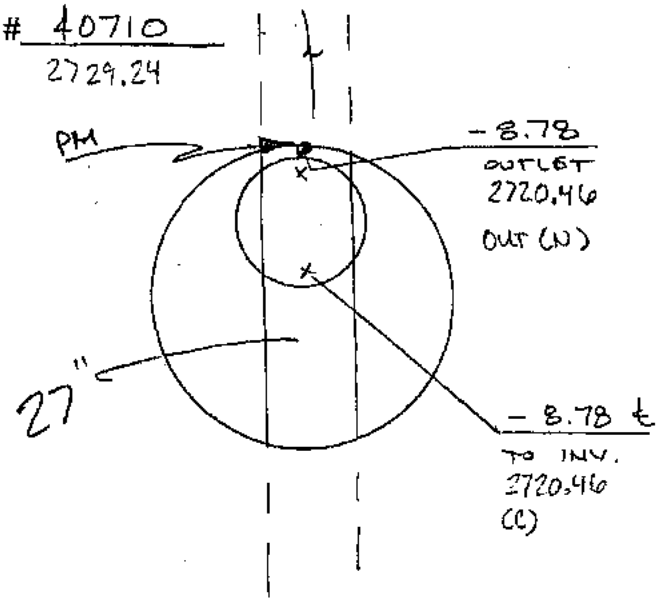
MANHOLE DIAGRAM

FILE: 667E010

JOB NAME V.V. W.R.A. / SPRING VALLEY
JOB NO. 10·104667.013
SHEET NO. _____ OF _____
DESIGNED BY _____ DATE _____
CHECKED BY CS/DM DATE 01/18/08

40710

2729.24

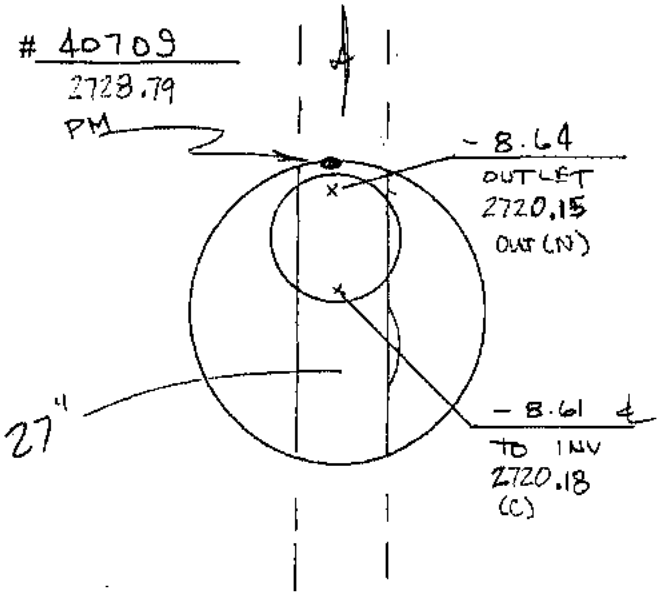


WATER LEVEL MED 17" TIME 12:10

NOTES: SV # 10 (FLUSH)
UNBOLTED

40709

2728.79

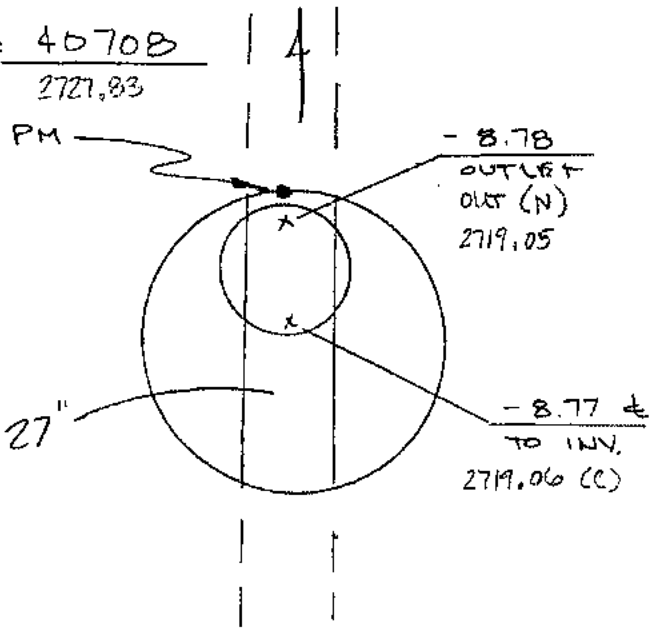


WATER LEVEL MED 17" TIME 12:35

NOTES: SV # 9 (FLUSH)
UNBOLTED

40708

2727.83

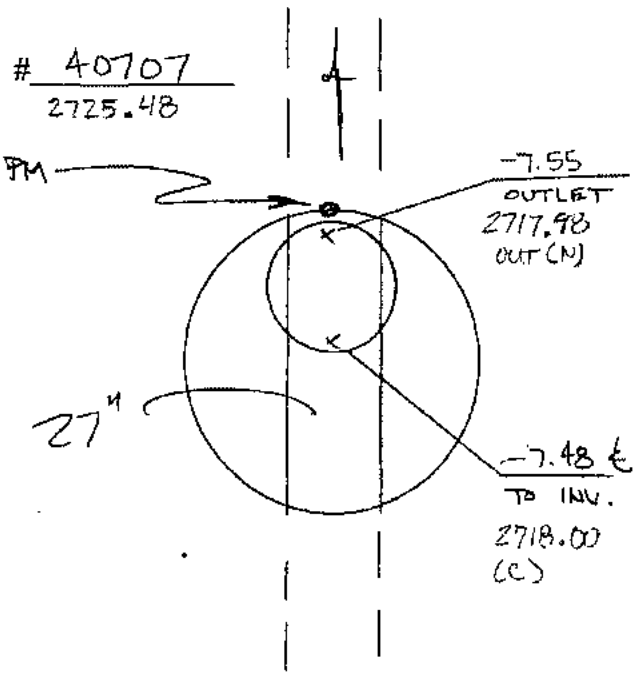


WATER LEVEL MED 17" TIME 12:50
NOTES: SV #8 (FLUSH)

UNBOLTED

40707

2725.48



WATER LEVEL MED 15" TIME 13:15
NOTES: SV #7 (UP 0.5)

UNBOLTED

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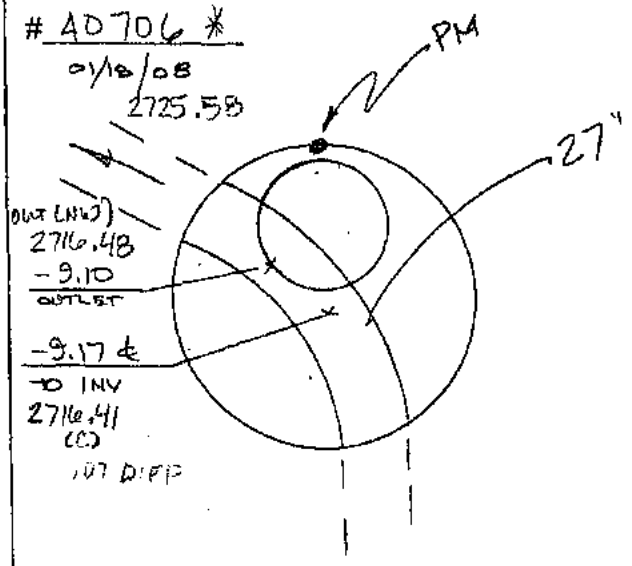
MANHOLE DIAGRAM

FILE: 667E010

JOB NAME V.V.W.R.A. / SPRING VALLEY
JOB NO. 10.10.4667.013
SHEET NO. _____ OF _____
DESIGNED BY _____ DATE _____
CHECKED BY CS/DM DATE 01/18/08

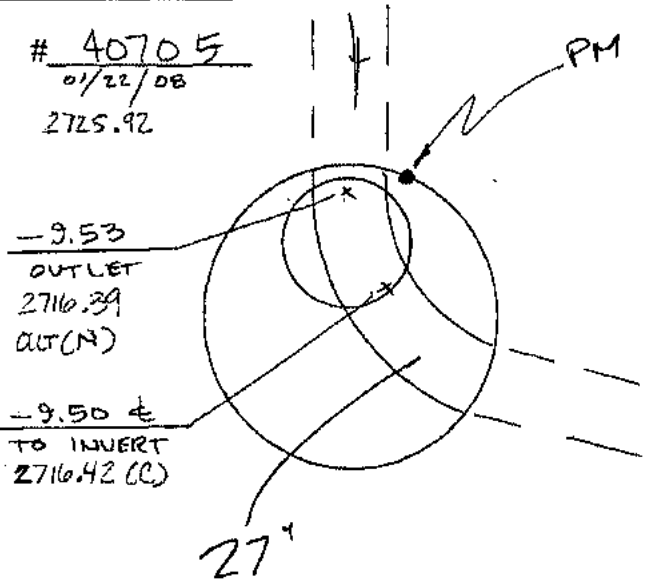
40706 *
01/18/08
2725.58



WATER LEVEL MED 17" TIME 13:35

NOTES: SV #6 (UP 0.8)
UNBOLTED

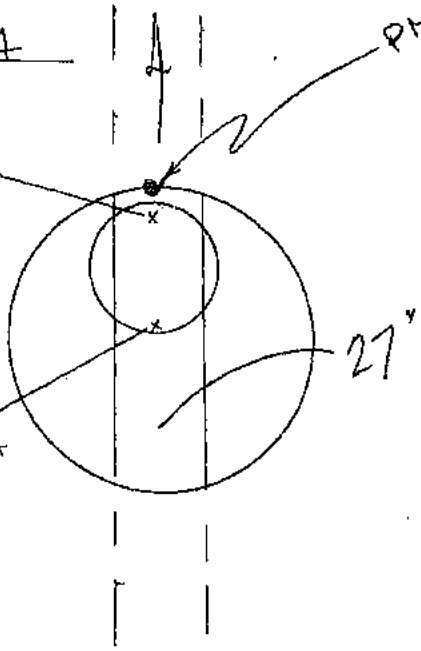
40705
01/22/08
2725.92



WATER LEVEL MED 12" TIME 07:40

NOTES: SV # 5 UP 0.4
UNBOLTED

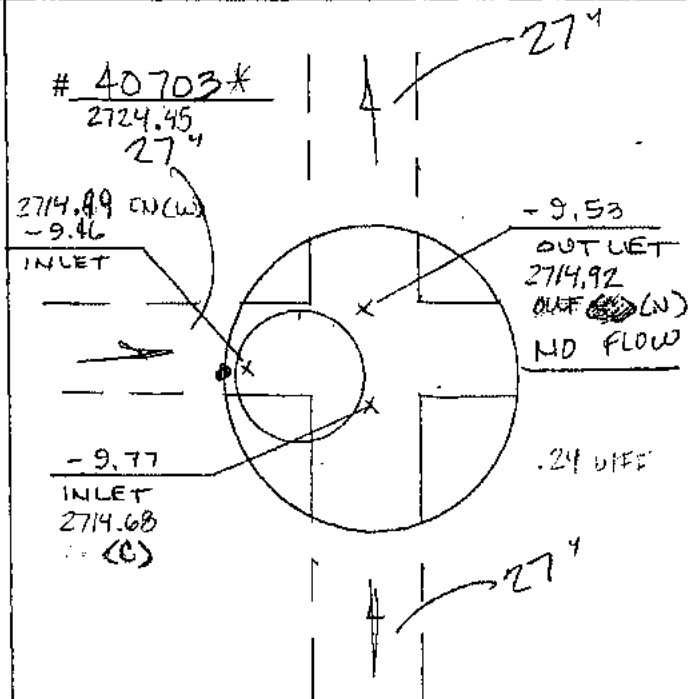
40704
01/22/08
2725.93
-10.62
OUTLET
2715.31
OUT (N)



WATER LEVEL MED 13" TIME 07:50
NOTES: SV # 4 FLUSH

UNBOLTED

40703*
2724.45



WATER LEVEL HIGH 22" TIME 8:00
NOTES: SV # 3 (UP 0.4)

RING LOOSE UNBOLTED

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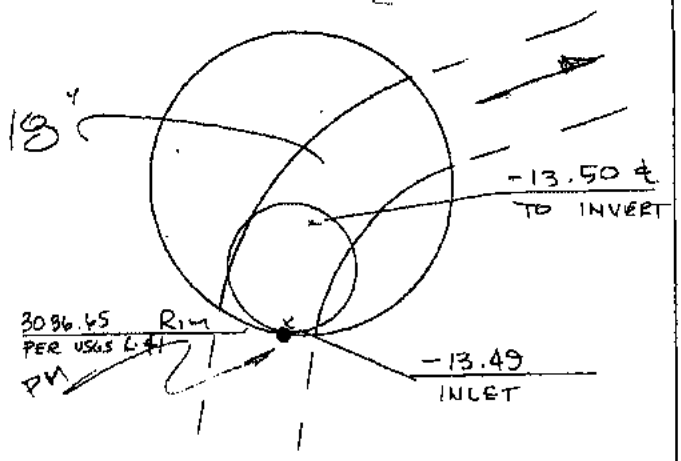
MANHOLE DIAGRAM HESPERIA

FILE: 667E010

JOB NAME V.V.W.R.A. / HESPERIA
JOB NO. 10 10 4667.013
SHEET NO. _____ OF _____
DESIGNED BY _____ DATE _____
CHECKED BY CS / DM DATE 01/18/08

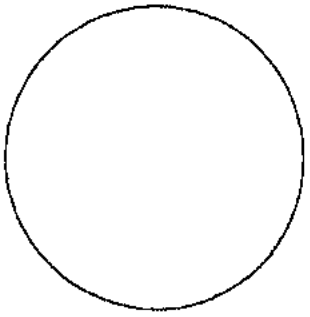
40546 UNCOVERED



WATER LEVEL MED 9" TIME 8:50

NOTES: SMH # 46 (TRICKS ON TOP)
ALLEN HEADS

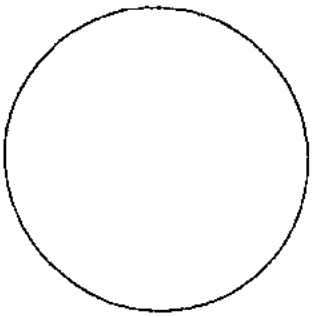
#



WATER LEVEL _____ TIME _____

NOTES: _____

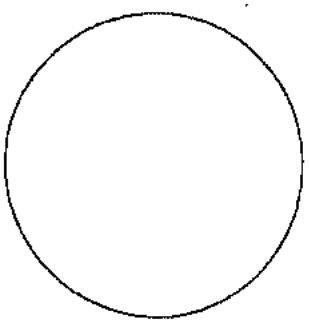
#



WATER LEVEL _____ TIME _____

NOTES: _____

#



WATER LEVEL _____ TIME _____

NOTES: _____

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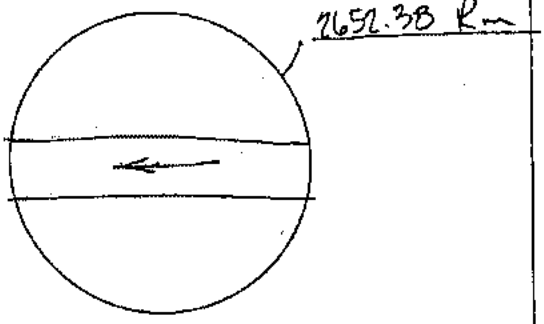
MANHOLE DIAGRAM

ADD'L MH's

JOB NAME Y.V.W.R.A. 1 of 2
JOB NO. 10·104667.012 T2
SHEET NO. _____ OF _____
DESIGNED BY CS/AG DATE 06/21/07
CHECKED BY _____ DATE _____

3-3'

50,014

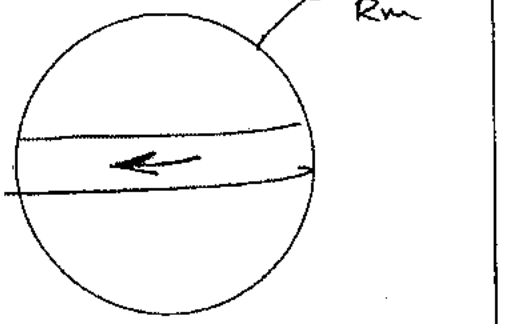


WATER LEVEL 1/2 TIME 8:00 AM

NOTES: -16.15 2636.23 INV

✓ # 4-16A

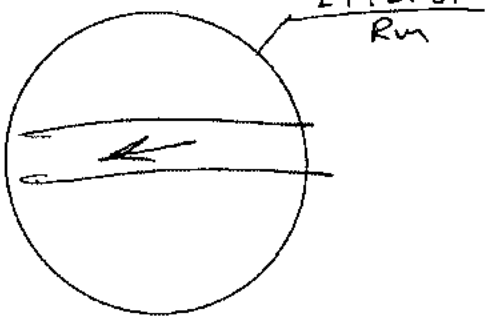
50,040



WATER LEVEL 3/4 TIME 08:53

NOTES: -11.90 2687.28 INV

5-2'

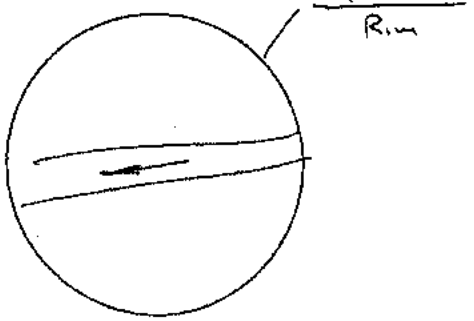


WATER LEVEL 1/2 TIME 09:38

NOTES: -13.80 2699.01 INV.

* ✓ # 4-24

50,015



WATER LEVEL 3/4 TIME 10:30

NOTES: -14.49 2697.60

-14.91 2697.69

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MANHOLE DIAGRAM

ADD'L MH'S

JOB NAME V.V.W.R.A. 2 of 2

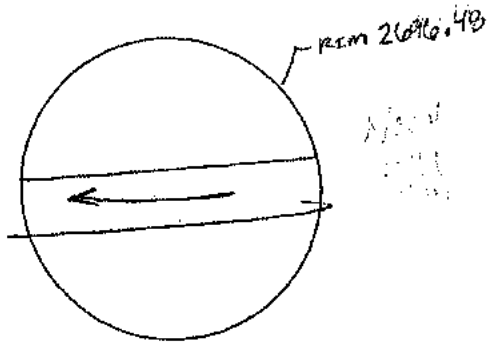
JOB NO. 10·104667.012 T2

SHEET NO. _____ OF _____

DESIGNED BY CS/AO DATE 06/21/07

CHECKED BY _____ DATE _____

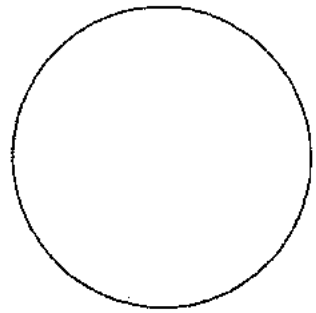
4-16B * Square



WATER LEVEL 3/4 TIME 10:47

NOTES: −10.54 INV. 2,685.94

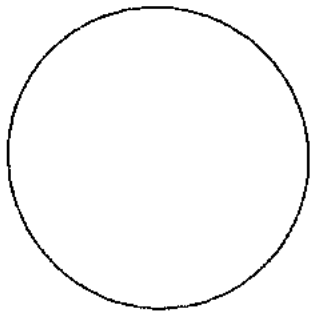
#



WATER LEVEL _____ TIME _____

NOTES: _____

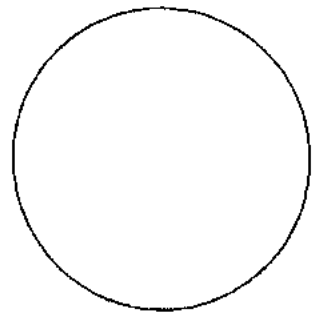
#



WATER LEVEL _____ TIME _____

NOTES: _____

#



WATER LEVEL _____ TIME _____

NOTES: _____

- 6 -

FIELD BOOK NO. 52 FIELD BOOK PAGE NO. 1 SHEET 1 OF _____

SURVEY FIELD NOTES

RBF CONSULTING 3300 EAST GUASTI ROAD, SUITE 100, ONTARIO, CALIFORNIA 91761 • PHONE (909) 974-4900 • FAX (909) 974-4004

SITE NAME: SPRING VALLEY

CLIENT NAME: V.V.W.R.A. AS-STAKED FILENAME: 667E018

SURVEY DATE(S): 03/10/08 RBF JOB NO.: 10-105398.001

SURVEY CHIEF(S): SCARBOROUGH CHAINMEN: MEYER

TRACT NO. *OR* PARCEL NO. (CIRCLE ONE & PROVIDE NO. IF APPLICABLE): _____

STREET NAME(S) (IF APPLICABLE): _____

LOT NO.(S) (IF APPLICABLE): _____

SURVEY TYPE: *(CHECK ONE OR MORE TYPES OF SURVEY CATEGORIES)*

____ CONTROL	[Boundary surveys; ALTA, site control; aerial control; level loops; etc.]
X TOPO	[Design surveys ("E" topos); removal topos; subdrains; stockpiles; etc.]
____ CERTIFY	[As-built ("A") topos; certification field notes; LDVs; FFVs; RGA; etc.]
____ GRADING	[All grading stakes; blue tops; daylights; RG 20/80s; etc.]
X SEWER	[Sewer & sewer laterals; etc.]
____ WATER	[Water lines; water services; FHs; etc.]
____ STORM DRAIN	[Storm drain systems (pipes; boxes; structures; etc.)]
____ DRY UTILS	[Dry utilities (all underground dry utilities; vaults; street lights; etc.)]
____ STR IMPRV	[All street improvements; curb; driveways; bridges; paving; sawcuts; etc.]
____ WALLS	[Retaining walls; free standing walls; monument walls; fences; etc.]
____ BLDG STKS	[Stakes for: Buildings; pools; tanks; architectural features; etc.]
____ MONITOR	[Monitoring projects]
____ MISC	[Miscellaneous—anything that does not fit within the above options. If necessary, another category can be added to this list, in the future, to avoid overusing this]

DESCRIPTION OF WORK: GPS & LEVEL MISSING SMH #14

REQUIRES OFFICE REDUCTION?: ☑ Yes ☐ No

EXTRA OR WORK TICKET?: ☐ Yes # _____ ☐ No

IMPORTANT NOTE TO CONTRACTORS

Contractors are cautioned to observe the following rule in using the grade stakes given by this office for putting in curbs, walls, sewers and all other work. Three consecutive points that are shown to be on the same rate of slope must be used in common in order that any variation out of a perfect straight grade may be detected and in case any such discrepancy is found, the same must be reported. Otherwise this office will not be responsible for any error in the grade of the finished work. The grades shown hereon take precedence over any grades marked in the field.

FOR OFFICE USE ONLY. DO NOT WRITE BELOW THIS LINE.

PDF FILE NO. _____

RBF Consulting
3300 East Guasti Road, Suite 100, Ontario, California, 91761
(909) 974-4900

3/11/2008 5:47:31 AM

RBF GPS Data Login Sheet

Client: VVWRA
Job Number: 10105998
Description: Spring Valley SMH #14

The following Files have been transferred by: CS/DM
into this folder:

h:\Pdata\10105998\Calcs\Survey\Field\Gps\Raw\070dat08_10105998

File Name	Date Created	File Size
39620701.dat	3/11/2008 5:47:30 AM	147114
39620701.T01	3/11/2008 5:47:30 AM	30544
50160701.dat	3/11/2008 5:47:30 AM	70318
50160701.T01	3/11/2008 5:47:30 AM	13955
667E018.dc	3/11/2008 5:47:30 AM	3457
667E018.job	3/11/2008 5:47:30 AM	6022

Book ____ Page 3

Sheet ____ of ____

1 of

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MULTIPLE OBSERVATION GPS LOG SHEET

Job No.	Date	Day	Job Name
10.105998.001	03/10/08	70 B	V.V.W.R.A / SPRING VALLEY

Observer	Equip. No.	Antenna Type	Antenna Meas. Technique
C. SCARBOROUGH D. MEYER	18 TRIMBLE GRN R7	Zephyr Geodetic/Zephyr (circled: Zephyr Geodetic) Compact L1L2 w/GP | wo/GP | L1L2 Geo w/GP | 4800 | Other	B.O.N. Edge of GP (circled) | Base | Phase Center | Other

This Unit is the: Base (circled) Rove Fast Static | RTK File Name: 667E018 (LINK 667E010)

Station No.	Name	Start Time	Stop Time	H.I.(m)	Description
File Name / Monument Location / Target Offset / Notes					
G104	# 104	13:25	14:12	1.480 4.80	1" IP w/PP RBF C.P. (DN 0.1)
FROM LT TURN N. OF GUARD SHACK (MOJAVE NARROWS NAT. PARK) GO N'LY 0.4 mi± TO SMH IN AC RD // W'LY 200'± TO C.P. (E'LY 10'± OF BWIRE FENCE)					

RBF CONSULTING

Book ______ Page 4

Sheet ______ of ______

2 of

MULTIPLE OBSERVATION GPS LOG SHEET

Job No.	Date	Day	Job Name
10.105998.001	03/10/08	70	Y.V.W.R.A. / SPRING VALLEY

Observer	Equip. No.	Antenna Type	Antenna Meas. Technique
C. SCARBOROUGH D. MEYER	18 TRIMBLE GRN R8	R8 Zephyr Geodetic/Zephyr Compact L1L2 w/GP | wo/GP | L1L2 Geo w/GP | 4800 | (Other)	B.O.M. Edge of GP | (Base) | Phase Center | Other

This Unit is the: Base (Rove) Fast Static | RTK File Name: 667E018 (LINKED 667E010)

Station No.	Name	Start Time	Stop Time	H.I.(m)	Description
File Name / Monument Location / Target Offset / Notes					
40714	SV # 14	13:36	13:39	2m	26" SMH (DN 1.5)
FROM INT @ CHINQUAPIN RIDGECREST, GO N'LY 0.2mi± // W'LY 300'± // N'LY 1.0mi± ON E'LY R/R FRONTAGE // E'LY 50'± TO SMH					

SURVEY OF V.V.W.R.A. / SPRING VALLEY JOB NO. 10.105398.001 BOOK _____ PAGE 5

SURVEYED BY CS/DM DATE 03/10/08 3 of 3

☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☑ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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Contractors are cautioned to observe the following rule in using the grade stakes given by this office for putting in curbs, walls, sewers and all other work. Three consecutive points that are shown to be on the same rate of slope must be used in common in order that any variation out of a perfect straight grade may be detected and in case any such discrepancy is found, the same must be reported. Otherwise this office will not be responsible for any error in the grade of the finished work. The grades shown hereon take presidence over any grades marked in the field.

OFFSET: SV SMH # 14 FILE: 070L667.GSI INSTRUMENT NO: DNA03 SER# 334205

CHECKED BY: (REF: 022L667.GSI) LINE 1 ROD NO: 559-584, 585 & 586

TURN #	+	H. I.	–	ELEV.	REMARKS
#40713				2734.626	SV #13, PM ON N'LY RIM
	6.858	41.484	231/233		
40714			6.703	2734.781	SV #14, CHISLE LINE ON N'LY RIM
	12.820	47.601	221/229		
#40715			3.597	2744.004	SV #15, PM ON N'LY RIM

FIELD BOOK NO. 52 FIELD BOOK PAGE NO. 6 SHEET 1 OF _____

SURVEY FIELD NOTES

RBF CONSULTING
3300 EAST GUASTI ROAD, SUITE 100, ONTARIO, CALIFORNIA
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SITE NAME: N. APPLE VALLEY

CLIENT NAME: V.V.W.R.A. AS-STAKED FILENAME: 667E017

SURVEY DATE(S): 03/04 — 03/10/08 RBF JOB NO.: 10·105998.001

SURVEY CHIEF(S): SCARBOROUGH CHAINMEN: MEYER

TRACT NO. *OR* PARCEL NO. (CIRCLE ONE & PROVIDE NO. IF APPLICABLE): _____

STREET NAME(S) (IF APPLICABLE): STODDARD

LOT NO.(S) (IF APPLICABLE): _____

SURVEY TYPE: *(CHECK ONE OR MORE TYPES OF SURVEY CATEGORIES)*

____ CONTROL	[Boundary surveys; ALTA, site control; aerial control; level loops; etc.]
X TOPO	[Design surveys ("E" topos); removal topos; subdrains; stockpiles; etc.]
____ CERTIFY	[As-built ("A") topos; certification field notes; LDVs; FFVs; RGA; etc.]
____ GRADING	[All grading stakes; blue tops; daylights; RG 20/80s; etc.]
X SEWER	[Sewer & sewer laterals; etc.]
____ WATER	[Water lines; water services; FHs; etc.]
____ STORM DRAIN	[Storm drain systems (pipes; boxes; structures; etc.)]
____ DRY UTILS	[Dry utilities (all underground dry utilities; vaults; street lights; etc.)]
____ STR IMPRV	[All street improvements; curb; driveways; bridges; paving; sawcuts; etc.]
____ WALLS	[Retaining walls; free standing walls; monument walls; fences; etc.]
____ BLDG STKS	[Stakes for: Buildings; pools; tanks; architectural features; etc.]
____ MONITOR	[Monitoring projects]
____ MISC	[Miscellaneous—anything that does not fit within the above options. If necessary, another category can be added to this list, in the future, to avoid overusing this]

DESCRIPTION OF WORK: N. APPLE VALLEY SMH's

REQUIRES OFFICE REDUCTION?: ☑ Yes ☐ No

EXTRA OR WORK TICKET?: ☐ Yes #_____ ☐ No

IMPORTANT NOTE TO CONTRACTORS

Contractors are cautioned to observe the following rule in using the grade stakes given by this office for putting in curbs, walls, sewers and all other work. Three consecutive points that are shown to be on the same rate of slope must be used in common in order that any variation out of a perfect straight grade may be detected and in case any such discrepancy is found, the same must be reported. Otherwise this office will not be responsible for any error in the grade of the finished work. The grades shown hereon take precedence over any grades marked in the field.

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PDF FILE NO._____

RBF Consulting
3300 East Guasti Road, Suite 100, Ontario, California, 91761
(909) 974-4900

3/11/2008 5:44:09 AM

RBF GPS Data Login Sheet

Client: VVWRA
Job Number: 10105998
Description: N.Apple Valley SMH's

The following Files have been transferred by: CS/DM
into this folder:

h:\Pdata\10105998\Calcs\Survey\Field\Gps\Raw\071dat08_10105998

File Name	Date Created	File Size
39620630.dat	3/11/2008 5:44:06 AM	1032734
39620630.T01	3/11/2008 5:44:06 AM	193395
39620640.dat	3/11/2008 5:44:06 AM	1148360
39620640.T01	3/11/2008 5:44:06 AM	215734
39620650.dat	3/11/2008 5:44:06 AM	1134257
39620650.T01	3/11/2008 5:44:08 AM	213308
39620665.dat	3/11/2008 5:44:08 AM	971612
39620665.T01	3/11/2008 5:44:08 AM	183554
39620671.dat	3/11/2008 5:44:08 AM	1094194
39620671.T01	3/11/2008 5:44:08 AM	204842
39620700.dat	3/11/2008 5:44:08 AM	823381
39620700.T01	3/11/2008 5:44:08 AM	155661
50160630.dat	3/11/2008 5:44:08 AM	26399
50160630.T01	3/11/2008 5:44:08 AM	6783
50160640.dat	3/11/2008 5:44:08 AM	1798522
50160640.T01	3/11/2008 5:44:08 AM	301683
50160650.dat	3/11/2008 5:44:08 AM	1371983
50160650.T01	3/11/2008 5:44:08 AM	238076
50160660.dat	3/11/2008 5:44:08 AM	230796
50160660.T01	3/11/2008 5:44:08 AM	42956
50160661.dat	3/11/2008 5:44:08 AM	762055
50160661.T01	3/11/2008 5:44:08 AM	126233
50160670.dat	3/11/2008 5:44:08 AM	1272540
50160670.T01	3/11/2008 5:44:08 AM	210272
50160700.dat	3/11/2008 5:44:08 AM	759396
50160700.T01	3/11/2008 5:44:08 AM	130648
667E017.dc	3/11/2008 5:44:08 AM	73339
667E017.job	3/11/2008 5:44:08 AM	85415

C:\Gps Login Sheets\Gps Login Sht 00499.txt

Book ______ Page 8

Sheet ______ of ______ 1 of 9

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MULTIPLE OBSERVATION GPS LOG SHEET

Job No.	Date	Day	Job Name
10.105998.001	03/04/08	64	V.V.W.R.A / APPLE N. VALLEY

Observer	Equip. No.	Antenna Type	Antenna Meas. Technique
C. SCARBOROUGH D. MEYER	18 TRIMBLE GRN R7	(Zephyr Geodetic)/Zephyr Compact L1L2 w/GP | wo/GP | L1L2 Geo w/GP | 4800 | Other	B.O.N. (Edge of GP) | Base | Phase Center | Other

This Unit is the: (Base) Rove Fast Static — RTK File Name: 667E017

Station No.	Name	Start Time	Stop Time	H.I.(m)	Description
File Name / Monument Location / Target Offset / Notes					
G109	#109	07:13	13:48	1.485 4.87	1" IP w/PP RBF C.P. UP 0.2
FROM APP INT @ STODDARD WELLS/S. OUTER HWY 15, GO S'LY 0.1 MI // SW'LY 0.1 MI UP DIRT RD TO C.P. @ H.P.					
10.105998.001	03/05/08 (65)	CS/DM V.V.W.RA	GRN R7 18	ZEPHYR GEOD	BASE: 667E017 (B.O.N)
G109	#109	07:16	14:02	1.471 4.83	1" IP w/PP RBF CP (UP 0.2)
SAME AS ABOVE					
10.105998.001	03/06/08 (66) CS/DM	V.V.W.R.A.	GRN R7 18	ZEPHYR GEOD	BASE: 667E017 (B.O.N)
G109	#109	07:16	12:53	1.404 4.61	1" IP w/PP RBF C.P. (UP 0.2)
SAME AS ABOVE					
10.105998.001	03/07/08 (67) CS/DM	V.V.W.R.A	GRN R7 18	ZEPHYR GEOD	BASE: 667E017 (B.O.N.)
G109	#109	07:11	13:28	1.454 4.77	1" IP w/PP RBF CP, (UP 0.2)
SAME AS ABOVE					
10.105998.001	03/10/08 (70) CS/DM	V.V.W.R.A.	GRN R7 18	ZEPHYR GEOD	BASE: 667E017 (B.O.N)
G109	#109	07:23	12:20	1.435 4.71	1" IP w/PP RBF C.P. (UP 0.2)
SAME AS ABOVE					

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STATION RECOVERY

Job No.	Date
10·105998.001	03/03/08

Job Name: V.V.W.R.A. / N. APPLE VALLEY

Observer: CS/DM

Station Name:	Number:
G109	#109

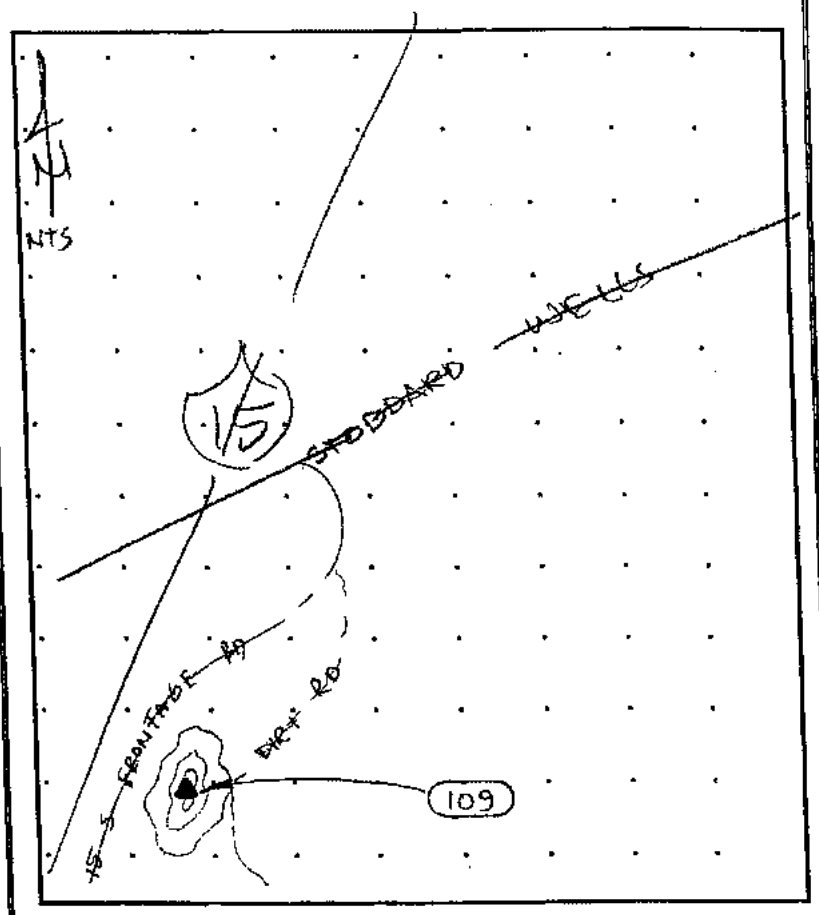
Stamping: RBF C.P.

Center Mark: P.M.

Description: [Found] [Set]

1" IP w/ PP

0.2 [Above] [Below] the Surface



Obstructions to visability: (Trees, Buildings, Radio Trans, ect.) Clear to within 15 ☒

State: California County: SAN BERNARDINO City: APPLE VALLEY

General Location: Thomas Brothers, Page 4207, Index A4

Access instructions & permitting req. Unrestricted access ☒

Required to reach: 2WD ☒ 4WD ☐ On foot ☐

Monument inscribed FROM INT @ STODDARD WELL & OUTER HWY 15 S., GO S'LY 0.1 MI // SW'LY 0.1 MI± ON DIRT RD UP TO C.P. SET @ H.P.

Photo No.

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MULTIPLE OBSERVATION GPS LOG SHEET

Job No.	Date	Day	Job Name
10.105998.001	03/04/08	64	V.V.W.R.A / N. APPLE VALLEY

Observer	Equip. No.	Antenna Type	Antenna Meas. Technique
C. SCARBOROUGH / D. MEYER	18 TRIMBLE GRN R8	R8 Zephyr Geodetic/Zephyr Compact L1L2 w/GP | wo/GP | L1L2 Geo w/GP | 4800 | (Other)	B.O.M. Edge of GP | (Base) | Phase Center | Other

This Unit is the: Base (Rove) Fast Static — RTK File Name: 4678017

Station No.	Name	Start Time	Stop Time	H.I.(m)	Description
File Name / Monument Location / Target Offset / Notes					
G105M2	#105	07:29	07:32	2m	SPIKE/WSHR RBF CP (FLUSH)
FROM INT @ STODDARD WELLS/LANGLEY, GO E'LY 0.15 mi± // N'LY 25'± TO C.P. ON PP LINE PROD.					
41180	NAV #80	07:44	07:47	2m	32" SMH (UP 0.5)
FROM APP INT @ QUARRY RD/HARRIS LN, GO SW'LY 75'± TO SMH					
41179	NAV #79	08:13	08:16	2m	" "
" ", GO SW'LY 550'± TO SMH ON SEWER ACCESS RD					
41178	NAV #78	08:35	08:38	2m	" "
" ", GO SW'LY 1050'± TO SMH ON S.A.R.					
41177	NAV #77	08:49	08:52	2m	32' SMH (UP 1.0)
" ", GO SW'LY 1450'± TO SMH ON S.A.R.					
41176	NAV #76	09:04	09:07	2m	32" SMH (UP 0.5)
" " GO SW'LY 1850'± TO SMH ON S.A.R.					
41175	NAV #75	09:16	09:19	2m	32" SMH (UP 1.0)
" " GO SW'LY 0.5mi± TO SMH ON S.A.R.					
41174	NAV #74	09:31	09:34	2m	32" SMH (UP 1.0)
" ", GO SW'LY 0.5mi± TO SMH ON S.A.R.					
41173	NAV #73	09:50	09:53	2m	" "
" " GO SW'LY 0.6mi± TO SMH ON S.A.R.					
41172	NAV #72	10:06	10:09	2m	" "
" ", GO SW'LY 0.6mi± TO SMH ON S.A.R.					
41171	NAV #71	10:24	10:27	2m	32" SMH (UP 0.5)
" " GO SW'LY 0.7mi± TO SMH ON S.A.R.					
41170	NAV #70	10:38	10:41	2m	32" SMH (UP 1.0)
" " GO SW'LY 0.7mi± TO SMH ON S.A.R.					
41169	NAV #69	10:56	10:59	2m	" "
" " GO SW'LY 0.8mi± TO SMH ON S.A.R.					

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Book ____ Page 11

Sheet ____ of ____

MULTIPLE OBSERVATION GPS LOG SHEET

4 of 9

Job No.	Date	Day	Job Name
10.105998.001	03/04/08	64	V.V.W.R.A. / N. APPLE VALLEY

Observer	Equip. No.	Antenna Type	Antenna Meas. Technique
C. SCARBOROUGH D. MEYER	18 TRIMBLE 5700 R8	R8 Zephyr Geodetic/Zephyr Compact L1L2 w/GP | w/oGP L1L2 Geo w/GP | 4800 | Other	B.O.M. Edge of GP (Base) | Phase Center | Other

This Unit is the: Base (Rove) Fast Static — RTK File Name: 067E017

Station No.	Name	Start Time	Stop Time	H.I.(m)	Description
File Name / Monument Location / Target Offset / Notes					
41168	NAV # 68	11:11	11:14	2m	32"D SMH (UP 1.0)
FROM APP INT @ QUARRY/HARRIS LN, GO SW'LY 0.9mi ± TO SMH ON SEWER ACCESS Rd.					
41167	NAV # 67	11:27	11:30	2m	" "
"	" GO SW'LY 1.0mi ± TO SMH ON S.A.R.				
41166	NAV # 66	11:45	11:48	2m	" "
FROM INT @ STODDARD WELLS/JOHNSON, GO E'LY 0.7 mi ± // N'LY 25' ± TO SMH IN DIP					
41165	NAV # 65	12:05	12:08	2m	" "
"	" // SW'LY 350' ± TO SMH ON S.A.R.				
41164	NAV # 64	12:21	12:25	2m	" "
"	" // S'W'LY 0.15mi ± TO SMH ON S.A.R.				
41163	NAV # 63	12:40	12:43	2m	" "
"	" // S'W'LY 0.25mi ± TO SMH ON S.A.R.				
41162	NAV # 62	13:01	13:04	2m	" "
"	" // SW'LY 0.3 mi ± TO SMH ON S.A.R.				
41161	NAV # 61	13:18	13:21	2m	" "
"	" // SW'LY 0.4mi ± TO SMH ON S.A.R.				
41160	NAV # 60	07:58	08:01	2m	" "
FROM INT @ S OUTER HWY 15 / STODDARD WELLS, GO E'LY 0.8mi ± // E'LY 0.8mi ± TO SMH ON DIRT SEWER ACCESS RD					
41159	NAV # 59	08:23	08:26	2m	" "
"	" // E'LY 0.7mi ± TO SMH ON DIRT S.A.R.				
41158	NAV # 58	08:41	08:44	2m	" "
"	" // E'LY 0.65mi ± TO SMH ON DIRT S.A.R.				
41157	NAV # 57	08:54	08:57	2m	" "
"	" // E'LY 0.6mi ± TO SMH ON DIRT S.A.R.				
41156	NAV # 56	09:09	09:12	2m	" "
"	" // E'LY 0.5mi ± TO SMH ON DIRT S.A.R.				

03/04/08

03/05/08

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MULTIPLE OBSERVATION GPS LOG SHEET

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Job No.	Date	Day	Job Name
10.105998.001	03/05/08	65	P.V.W.R.A. / N. APPLE VALLEY

Observer	Equip. No.	Antenna Type	Antenna Meas. Technique
C. SCARBOROUGH D. MEYER	18 TRIMBLE GRN R8	R8 Zephyr Geodetic/Zephyr Compact L1L2 w/GP | w/oGP | L1L2 Geo w/GP | 4900 | Other	B.O.M. Edge of GP | (Base) | Phase Center | Other

This Unit is the: Base (Rove) Past Static | RTK File Name: 667E017

Station No.	Name	Start Time	Stop Time	H.I.(m)	Description
File Name / Monument Location / Target Offset / Notes					
41155	NAV # 55	09:27	09:30	2m	32"D SMH (UP 1.0)
FROM INT @ S. OUTER HWY 15 / STODDARD WELLS, GO E'LY 0.8mi± // E'LY 0.4mi± TO SMH ON DIRT SEWER ACCESS RD					
41154	NAV # 54	09:53	09:56	2m	" "
" " // E'LY 0.3mi± TO SMH ON DIRT S.A.R.					
41153	NAV # 53	10:19	10:22	2m	" "
" " // E'LY 0.2mi± TO SMH ON DIRT S.A.R.					
41152	NAV # 52	10:34	10:37	2m	" "
" " // E'LY 0.15mi± TO SMH ON DIRT S.A.R.					
41151	NAV # 51	10:48	10:51	2m	" "
" " // E'LY 0.1mi± TO SMH ON DIRT S.A.R.					
41150	NAV # 50	11:09	11:12	2m	" "
FROM INT @ S. OUTER HWY 15 / STODDARD WELLS, GO E'LY 0.85mi± TO SMH ON SE'LY EDGE RD					
41149	NAV # 49	11:30	11:33	2m	" "
" " , GO E'LY 0.8mi± TO SMH ON S'LY SIDE RD					
41148	NAV # 48	11:47	11:50	2m	" "
" " , GO E'LY 0.7mi± TO SMH ON S'LY SIDE RD					
41147	NAV # 47	12:02	12:05	2m	" "
" " , GO E'LY 0.6mi± TO SMH ON S'LY SIDE RD					
41146	NAV # 46	12:17	12:20	2m	" "
" " , GO E'LY 0.5mi± TO SMH ON S'LY SIDE RD					
41145	NAV # 45	12:31	12:34	2m	" "
" " , GO E'LY 0.4mi± TO SMH ON S'LY SIDE RD					
41144	NAV # 44	12:45	12:48	2m	" "
" " , GO E'LY 0.35mi± TO SMH ON S'LY SIDE RD					
41143	NAV # 43	12:57	13:00	2m	32"SMH (UP 0.5)
" " , GO E'LY 0.25mi± TO SMH ON S'LY SIDE RD					

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MULTIPLE OBSERVATION GPS LOG SHEET

Job No.	Date	Day	Job Name
10-105998.001	03/05/08	65	V.V.W.R.A / No. Apple Valley

Observer	Equip. No.	Antenna Type	Antenna Meas. Technique
C. Scarborough D. Meyer	18 TRIMBLE GRN R8	R8 Zephyr Geodetic/Zephyr Compact L1L2 w/GP | w/oGP | L1L2 Geo w/GP | 4800 | Other	B.O.M. Edge of GP | Base | Phase Center | Other

This Unit is the: Base (Rove) Fast Static — RTK File Name: 6L78017

03/05/08

Station No.	Name	Start Time	Stop Time	H.I.(m)	Description
File Name / Monument Location / Target Offset / Notes					
41142	NAV # 42	13:12	13:15	2m	32" D SMH (UP 1.0)
From Int @ S. Outer Hwy 15/Stoddard Wells, Go E'ly 0.2mi ± to SMH on S'ly side RD					
41141	NAV # 41	13:31	13:34	2m	" "
"	", Go E'ly 0.1mi ± to SMH on S'ly side RD				
41140A	NAV # 40A	13:45	13:48	2m	" "
"	", Go E'ly 300' ± to SMH on S'ly side RD				
41140	NAV # 40	07:47	07:50	2m	32" SMH (FLUSH)
SMH @ SE Cor. Stoddard Wells RD & S. Outer Hwy 15					
41138	NAV # 38	07:53	07:56	2m	32" SMH (UP 0.5)
From Int @ S. Outer Hwy 15 / Stoddard Wells, Go W'ly 450' ± to SMH on S. side RD					
41136A	NAV # 36A	08:00	08:03	2m	32" SMH (DWN 1.0)
From Int w/ Hwy 15 on Stoddard Wells Rd, Go W'ly 0.1mi ± // SE'ly 50' ± to SMH (opposite PP # 435548E					
41136	NAV # 36	08:07	08:10	2m	32" SMH (UP 0.5)
"	", Go W'ly 0.2mi ± / S'ly 50' ± to SMH				
41135	NAV # 35	08:13	08:16	2m	32" SMH (FLUSH)
"	", Go W'ly 0.25mi ± to SMH @ S. EP				
41134	NAV # 34	10:02	10:05	2m	" "
"	", Go W'ly 0.35mi ± to SMH @ S. EP				
41133	NAV # 33	10:26	10:29	2m	" "
"	", Go W'ly 0.45mi ± to SMH @ S. EP				
41132	NAV # 32	10:51	10:54	2m	" "
From Int @ Osborne/Stoddard Wells, Go E'ly 100' ± to SMH on S'ly E.P.					
41131	NAV # 31	11:16	11:19	2m	32" SMH (UP 0.3)
"	", Go SW'ly 400' ± to SMH on S'ly E.P.				
41130	NAV # 30	11:51	11:54	2m	32" SMH (FLUSH)
"	", Go SW'ly 0.15mi ± to SMH along S'ly EP				

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MULTIPLE OBSERVATION GPS LOG SHEET

Job No.	Date	Day	Job Name
10.105998.001	03/06/08	66	N.V.W.R.A./N. APPLE VALLEY

Observer	Equip. No.	Antenna Type	Antenna Meas. Technique
C. SCARBOROUGH / D. MEYER	18 TRIMBLE GRN R8	R8 — Zephyr Geodetic/Zephyr Compact L1L2 w/GP / wo/GP / L1L2 Geo w/GP / 4800 / Other (circled)	B.O.M. — Edge of GP / Base (circled) / Phase Center / Other

This Unit is the: Base / Rove (circled) / Fast Static — RTK File Name: 667E017

Station No.	Name	Start Time	Stop Time	H.I.(m)	Description
File Name / Monument Location / Target Offset / Notes					
41129	NAV #29	12:11	12:14	2m	32"D SMH (FLUSH)
FROM INT @ OSBORNE / STODDARD WELLS, GO SW'LY 0.25 MI± TO SMH ALONG S'LY EP					
41128	NAV #28	12:33	12:36	2m	" "
" ", GO SW'LY 0.35 MI± TO SMH, ON S'LY SIDE RD					
41127	NAV #27	07:24	07:27	2m	32" SMH (UP 0.5)
" ", GO SW'LY 0.45 MI± TO SMH ON S'LY SIDE RD					
41126B	NAV #26B	07:59	08:02	2m	" "
" ", GO SW'LY 0.55 MI± TO SMH ON S'LY SIDE RD					
41126A	NAV #26A	08:14	08:17	2m	32" SMH (UP 1.0)
" " GO SW'LY 0.55 MI± TO SMH ON N'LY SIDE RD					
41125	NAV #25	08:29	08:32	2m	" "
" " GO SW'LY 0.6 MI± TO SMH ON N'LY SIDE RD					
41124B	NAV #24B	08:48	08:51	2m	" "
" ", GO SW'LY 0.7± TO SMH ON N'LY SIDE RD					
41124A	NAV #24A	08:59	09:02	2m	32" SMH FLUSH
" ", GO SW'LY 0.7 MI± TO SMH ON S'LY SIDE RD					
41123	NAV #23	09:19	09:22	2m	" "
" ", GO SW'LY 0.8 MI± TO SMH ON S'LY SIDE RD					
41122	NAV #22	09:35	09:38	2m	" "
" ", GO SW'LY 0.9 MI± TO SMH ON S'LY SIDE RD					
41121	NAV #21	09:49	09:52	2m	" "
" ", GO SW'LY 0.95 MI± TO SMH ON S'LY SIDE RD					
41120	NAV #20	10:03	10:06	2m	" "
" ", GO SW'LY 1.05 MI± TO SMH ON S'LY SIDE RD					
41119	NAV #19	10:19	10:22	2m	" "
" ", GO S'LY 1.15 MI± TO SMH ON S'LY SIDE RD					

03/07/08

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RBF CONSULTING

MULTIPLE OBSERVATION GPS LOG SHEET

Job No.	Date	Day	Job Name
10.105998.001	03/07/08	67	V.V.W.R.A./N. Apple Valley

Observer	Equip. No.	Antenna Type	Antenna Meas. Technique
C. Scarborough, D. Meyer	18 TRIMBLE GRN R8	R8 (Zephyr Geodetic/Zephyr; Compact L1L2 w/GP | wo/GP | L1L2 Geo w/GP | 4800 | Other — Other circled)	B.O.M. (Edge of GP | Base | Phase Center | Other — Base circled)

This Unit is the: Base (Rove — circled) Fast Static | RTK File Name: 667E017

Station No.	Name	Start Time	Stop Time	H.I.(m)	Description
File Name / Monument Location / Target Offset / Notes					
41118	N.AV #18	10:36	10:39	2m	32"D SMH (FLUSH)
From Int @ Osborne/Stoddard Wells, Go SW'ly 1.2mi ± to SMH on S'ly side Rd.					
41117	NAV #17	11:08	11:11	2m	" "
" " Go SW'ly 1.25mi ± to SMH on S'ly side Rd					
41116	NAV #16	11:21	11:24	2m	" "
" ", Go SW'ly 1.3mi ± to SMH on S'ly side Rd					
41115	NAV #15	11:35	11:38	2m	" "
" ", Go SW'ly 1.4mi ± to SMH on S'ly side Rd					
41114	NAV #14	11:53	11:56	2m	" "
" ", Go SW'ly 1.5mi ± to SMH on S'ly side Rd					
41113	NAV #13	12:08	12:12	2m	" "
" ", Go SW'ly 1.55mi ± to SMH on S'ly side Rd					
41112	NAV #12	12:22	12:25	2m	" "
" " Go SW'ly 1.65mi ± to SMH on S'ly side Rd					
41111	NAV #11	12:39	12:42	2m	" "
" ", Go SW'ly 1.75mi ± to SMH on S'ly side Rd (M.O.C.)					
41110	NAV #10	12:57	13:00	2m	" "
SMH in NW Quadrant of Int Stoddard Wells/Dante					
41109A	NAV #9A	07:50	07:53	2m	" "
From Int @ Stoddard Wells/Dante, Go W'ly 350' ± to SMH in WB Lane, Dante					
41109	NAV #9	08:31	08:34	2m	" "
" ", Go W'ly 680' ± to SMH in EB Lane, Dante					
41108	NAV #8	08:43	08:47	2m	" "
SMH in Int of Dante/Bimini					
41107	NAV #7	08:58	09:01	2m	" "
From Int @ Dante/Bimini, Go S'ly 440' ± to SMH in AC					

Margin notes: 03/07/08 (beside 41113–41110); 03/10/08 (beside 41109A–41107)

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MULTIPLE OBSERVATION GPS LOG SHEET

Job No.	Date	Day	Job Name
10105998.001	03/10/08	70	V.V.W.R.A / N. Apple Valley

Observer	Equip. No. TRIMBLE	Antenna Type	Antenna Meas. Technique
C. Scarborough D. Meyer	18 GRN R8	R8 Zephyr Geodetic/Zephyr Compact L1L2 w/GP | wo/GP | L1L2 Geo w/GP | 4800 | (Other)	B.O.M. Edge of GP | (Base) | Phase Center | Other

This Unit is the: Base / (Rove) / Fast Static — RTK File Name: 667 E017

Station No.	Name	Start Time	Stop Time	H.I.(m)	Description
File Name / Monument Location / Target Offset / Notes					
41106	NAV # 6	09:13	09:16	2m	32" SMH (FLUSH)
FROM INT @ DANTE/BIMINI, GO S'LY 890'± TO SMH IN AC					
41105	NAV #5	09:28	09:31	2m	" "
SMH IN AC, S. SIDE, INT OF BIMINI/ABBEY LN.					
41104	NAV. #4	09:42	09:45	2m	" "
FROM INT @ BIMINI/ABBY LN, GO W'LY 360'± TO SMH IN EB LANE					
41103	NAV # 3	10:02	10:05	2m	" "
" ", GO W'LY 360'± // S'LY 350'± TO SMH IN FIELD					
41102	NAV # 2	10:18	10:21	2m	32" SMH (UP 0.3)
" ", GO W'LY 360'± // S'LY 700'± TO SMH IN FIELD					
41101B	NAV #1B	10:33	10:36	2m	32" SMH (FLUSH)
" ", GO W'LY 360'± // S'LY 1050'± TO SMH E. 10'± OF CLF @ BLDG					
41101A	NAV # 1A	10:37	10:40	2m	32" SMH (UP 0.5)
" ", GO W'LY 360'± // S'LY 1075'± TO SMH @ SE COR CLF @ BLDG					
41101	NAV # 1	10:46	10:49	2m	32" SMH (FLUSH)
" ", GO W'LY 360'± // S'LY 1075'± // W'LY 50'± TO SMH ON S. SIDE BLDG					
S_41R	USGS BM "S-41R"	12:05	12:08	2m	4" BC RESET 1952 (DWN 0.2)
FROM INT @ NB 15 "E" ST. OFFRAMP / "E" ST, GO NW'LY 0.2mi± TO GUARD SHACK // NW'LY 0.2mi± TO BM, 40'± W'LY OF DOUBL DOORS @ OFFICE OF CEMEX					

1050

DOUBLE DOOR

1' SW'LY

5' SE'LY

32" TEGG

H:\pdata\10000100\10\5gps-this\V-forms\Recovery.wd3

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JOB NAME V.V.W.R.A. / N. APPLE VALLEY

JOB NO. 10 10 5998.001

SHEET NO. _____ OF _____

DESIGNED BY _____ DATE _____

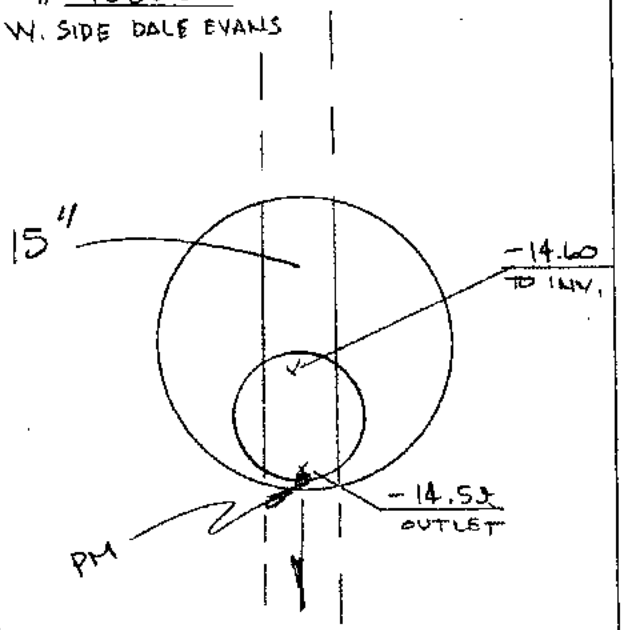
CHECKED BY CS/DM DATE 03/03/08

MANHOLE DIAGRAM

FILE: 667E011

40899

W. SIDE DALE EVANS

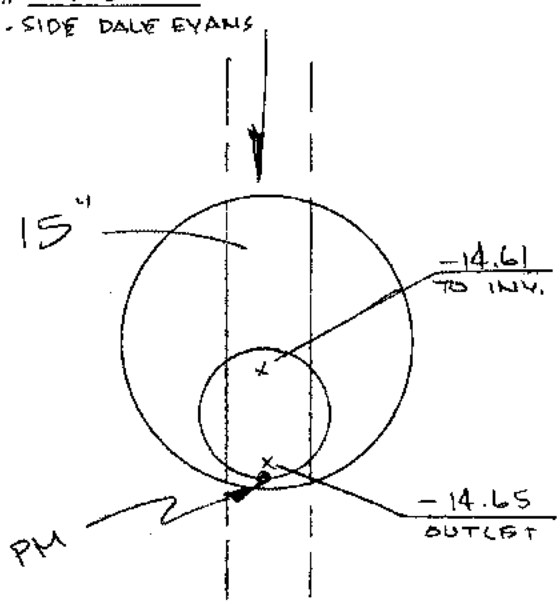


WATER LEVEL LOW 1" TIME 08:45

NOTES: NAV 99 (32" SMH FLUSH SPECIAL BOLTS)

40900

W. SIDE DALE EVANS

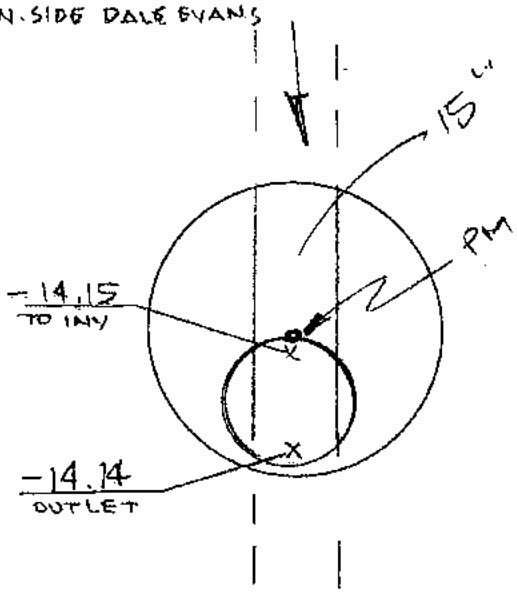


WATER LEVEL WET 1" TIME 08:55

NOTES: NAV 98 (32" SMH FLUSH SPECIAL BOLTS)

40901

W. SIDE DALE EVANS

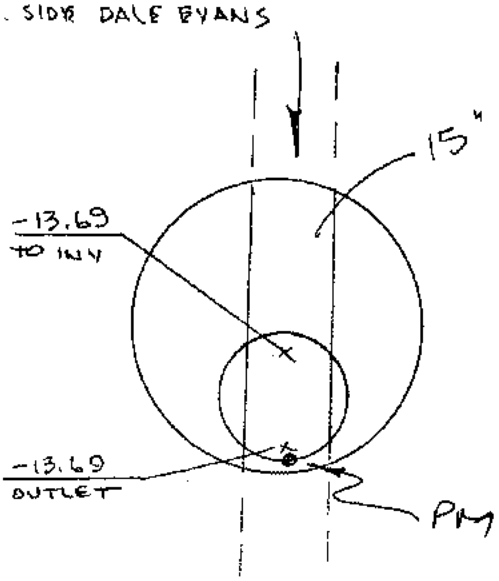


WATER LEVEL LOW 1" TIME 09:05

NOTES: NAV 97 (32" SMH FLUSH SPECIAL BOLTS)

40902

W. SIDE DALE EVANS



WATER LEVEL LOW 1" TIME 09:15

NOTES: NAV 96 (FLUSH 32" SMH SPECIAL BOLTS)

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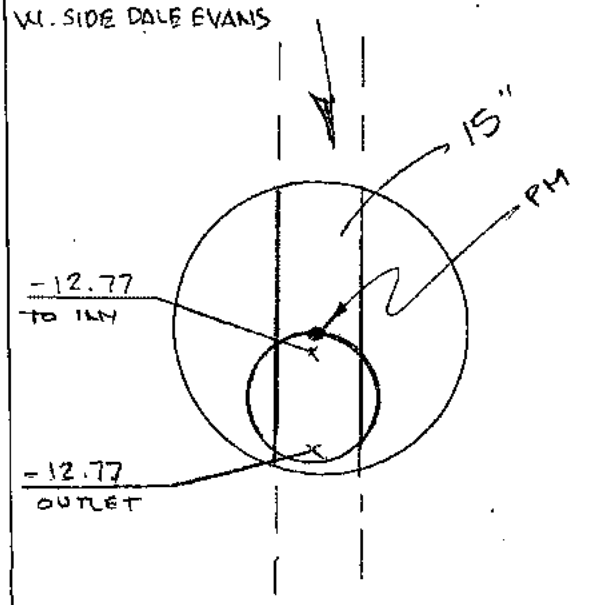
JOB NAME V.V.W.R.A / N. APPLE VALLEY
JOB NO. 10 10 5998.001
SHEET NO. ____ OF ____
DESIGNED BY ____ DATE ____
CHECKED BY CS/DM DATE 03/03/08

MANHOLE DIAGRAM

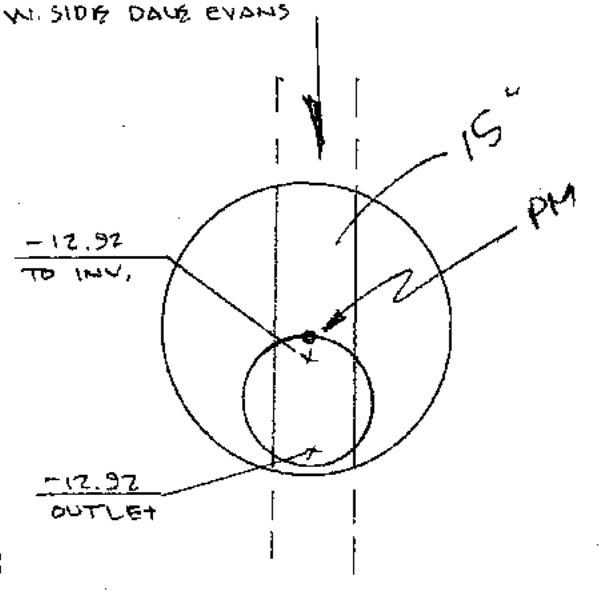
FILE: 667E011

40903
W. SIDE DALE EVANS



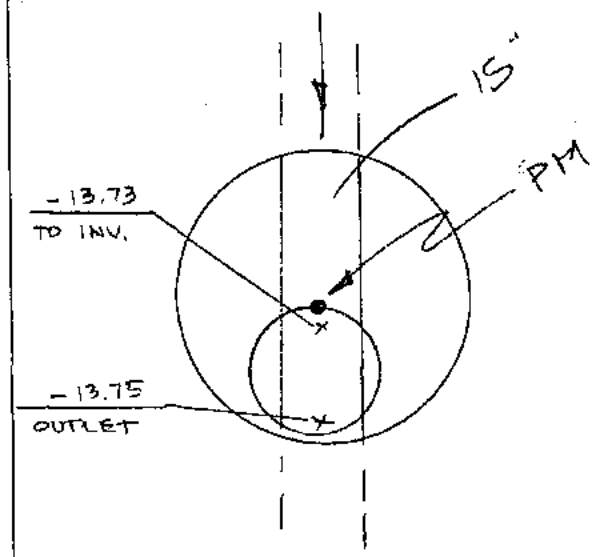
WATER LEVEL Low 1" TIME 09:30
NOTES: NAV 95 (FLUSH 32" SMH SPECIAL BOLTS)

40904
W. SIDE DALE EVANS



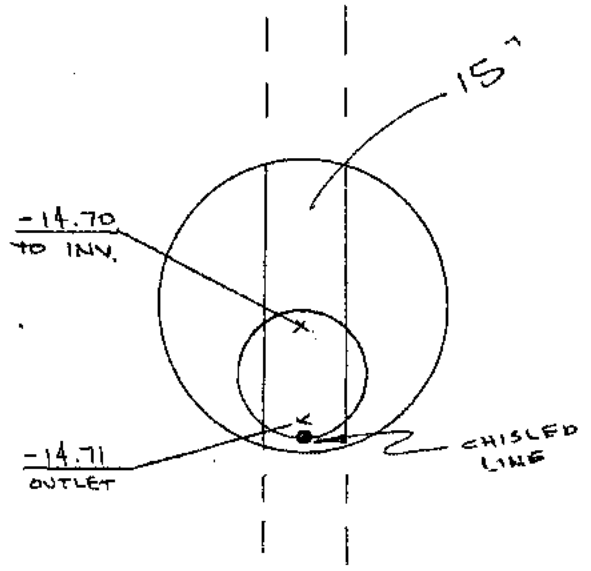
WATER LEVEL Low 1" TIME 10:25
NOTES: NAV 94 (FLUSH, 32" SMH SPECIAL BOLTS)

40905



WATER LEVEL Low 1" TIME 10:35
NOTES: NAV 93 (FLUSH 32" SMH W/ SPECIAL BOLTS)

40906



WATER LEVEL Low 1" TIME 10:45
NOTES: NAV 92 (FLUSH, 32" SMH W/ SPECIAL BOLTS)

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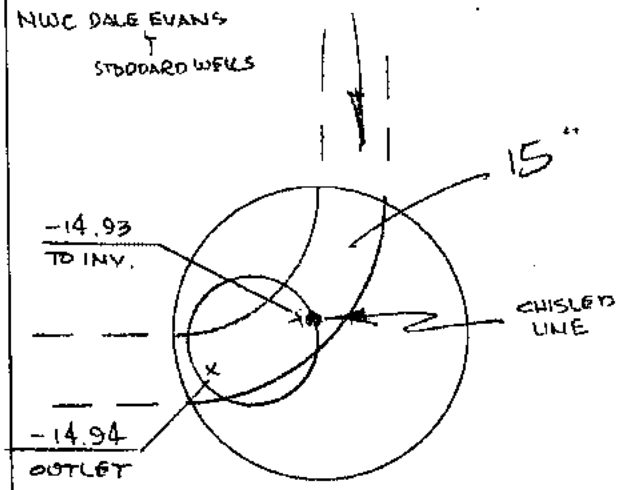
JOB NAME Y.V.W.R.A. / N. APPLE VALLEY
JOB NO. 10.105998.0001
SHEET NO. ____ OF ____
DESIGNED BY ____ DATE ____
CHECKED BY CS/DM DATE 03/03/08

MANHOLE DIAGRAM

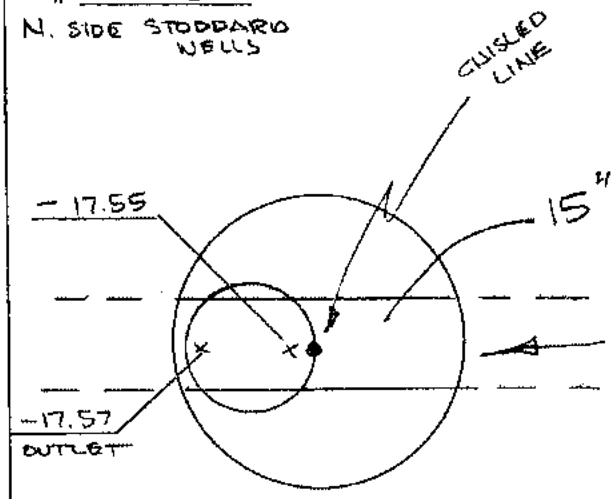
FILE: 667E011

40907
NWC DALE EVANS & STODDARD WELLS



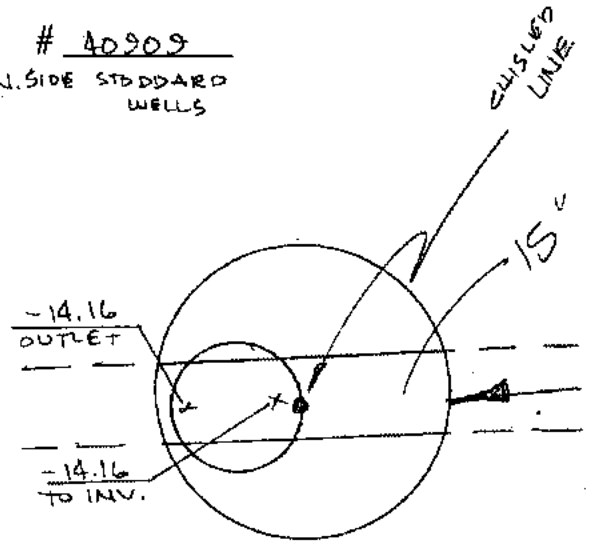
WATER LEVEL Low 2" TIME 11:00
NOTES: NAV 91 (FLUSH, 32" SMH W/ SPECIAL BOLTS)

40908
N. SIDE STODDARD WELLS



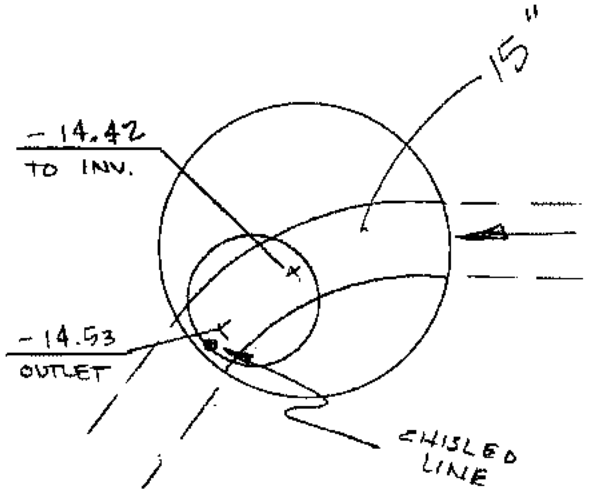
WATER LEVEL Low 2" TIME 11:15
NOTES: NAV. 90 (FLUSH, 32" SMH W/ SPECIAL BOLTS)

40909
N. SIDE STODDARD WELLS



WATER LEVEL Low 1" TIME 11:30
NOTES: NAV 89 (FLUSH, 32" SMH W/ SPECIAL BOLTS)

40910
N. SIDE STODDARD WELLS



WATER LEVEL Low 1" TIME 11:40
NOTES: NAV 88 (FLUSH, 32" SMH W/ SPECIAL BOLTS)

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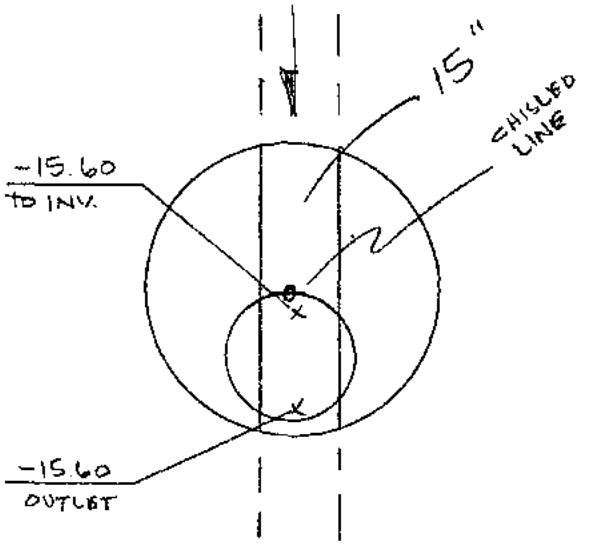
JOB NAME V.V.W.R.A / N. Apple Valley
JOB NO. 10.105998.001
SHEET NO. ____ OF ____
DESIGNED BY ____ DATE ____
CHECKED BY CS/DM DATE 03/03/08

MANHOLE DIAGRAM

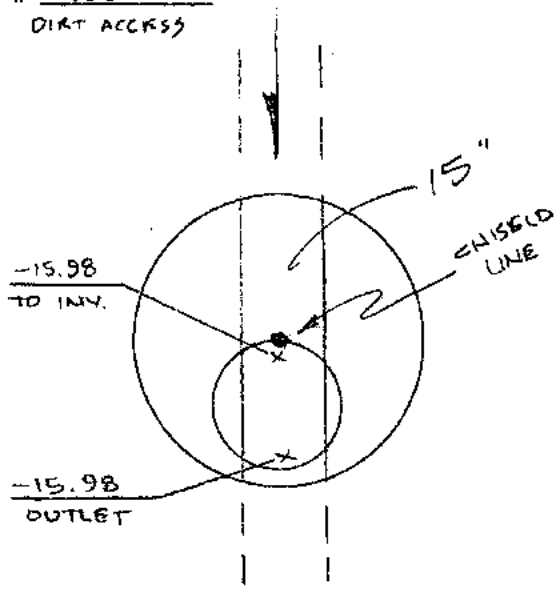
FILE: 667E011

40911
DIRT ACCESS



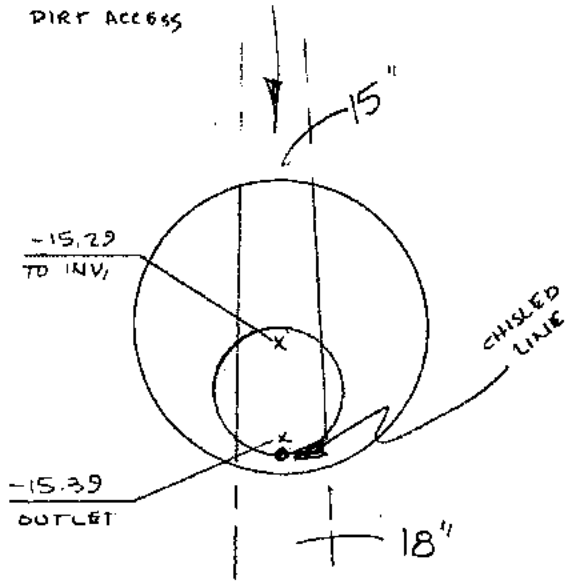
WATER LEVEL Low 1" TIME 11:55
NOTES: NAV 87 (UP 0.5, 32"SMH W/SPECIAL BOLTS)

40912
DIRT ACCESS



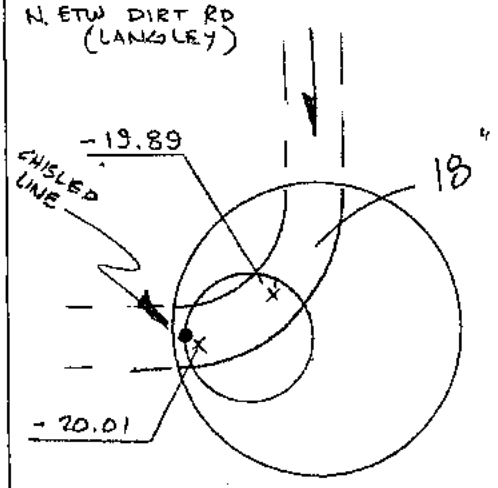
WATER LEVEL Low 1" TIME 12:10
NOTES: NAV 86 (UP 1.0, 32"SMH W/SPECIAL BOLTS)

40913
DIRT ACCESS



WATER LEVEL Low 1" TIME 12:20
NOTES: NAV 85 (UP 1.0, 32"SMH W/SPECIAL BOLTS)

40914
N. ETW DIRT RD (LANGLEY)



WATER LEVEL Low 1" TIME 12:35
NOTES: NAV 84 (UP 0.5, 32"SMH W/SPECIAL BOLTS)

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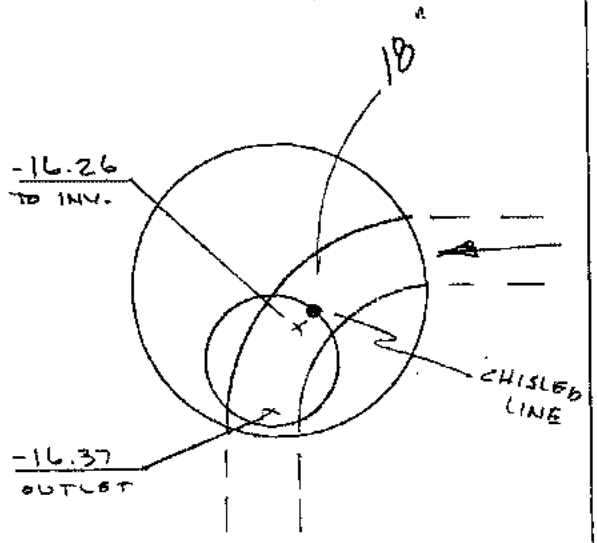
JOB NAME V.V.W.R.A. / N. Apple Valley
JOB NO. 10 105998.001
SHEET NO. ____ OF ____
DESIGNED BY ____ DATE ____
CHECKED BY CS/DM DATE 03/03/08

MANHOLE DIAGRAM

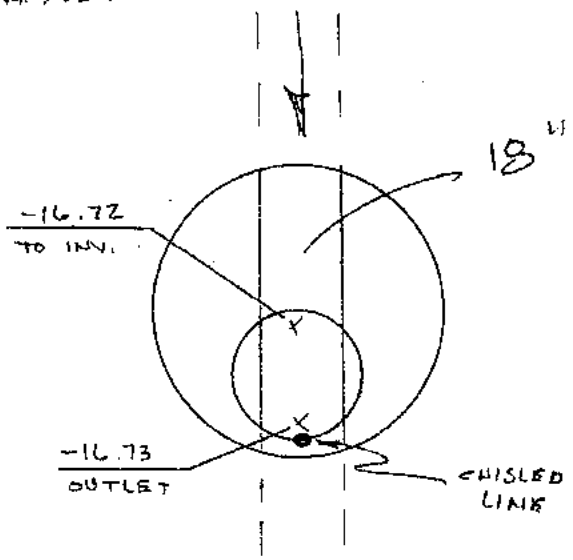
FILE: 667E011 & 667E017

40915
S. ETW DIRT RD (LANGLY)



WATER LEVEL Low 1" TIME 12:45
NOTES: NAV 83 (FLUSH, 32" SMH W/ SPECIAL BOLTS)

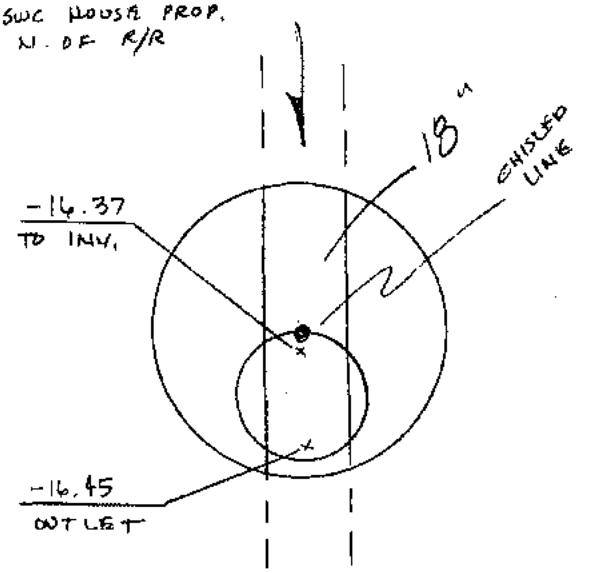
40916
W. SIDE HOUSE PROP



WATER LEVEL Low 1" TIME 12:55
NOTES: NAV 82 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

FILE: 667E011

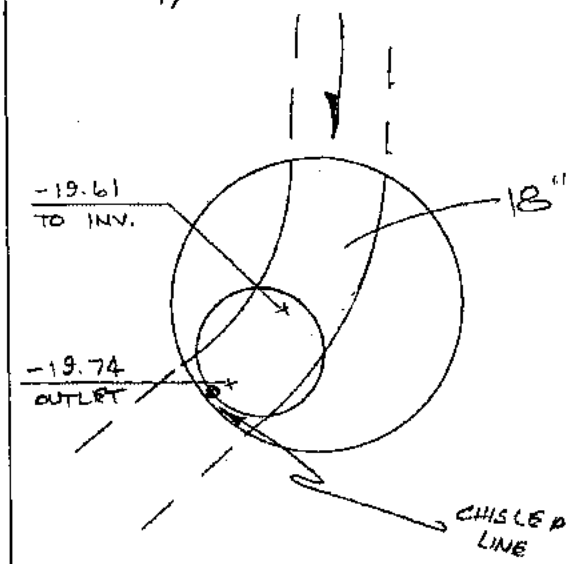
40917
SWC HOUSE PROP. N. OF R/R



WATER LEVEL Low TIME 13:15
NOTES: NAV 81 (UP 0.5, 32" SMH W/ SPECIAL BOLTS)

FILE: 667E017 03/04/08

41180
SWC QUARRY / HARRIS



WATER LEVEL Low 1" TIME 07:55
NOTES: NAV 80 (UP 0.5, 32" SMH W/ SPECIAL BOLTS)

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JOB NAME V.V.W.R.A. / N. APPLE VALLEY

JOB NO. 10 · 105998 · 001

SHEET NO. _____ OF _____

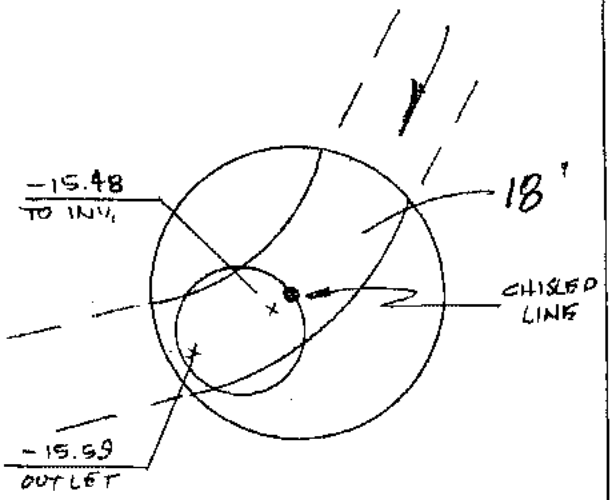
DESIGNED BY _____ DATE _____

CHECKED BY CS/DM DATE 03/04/08

MANHOLE DIAGRAM

FILE: 667E017

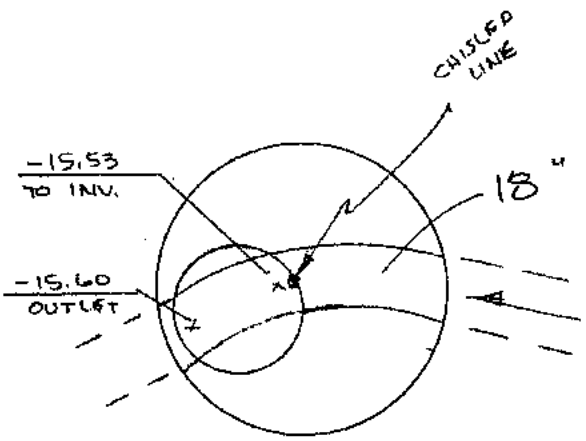
41179
DIRT SEWER ACCESS RD



WATER LEVEL Low 1" TIME 08:20

NOTES: NAV #79 (UP 0.5, 32" SMH W/ SPECIAL BOLTS)

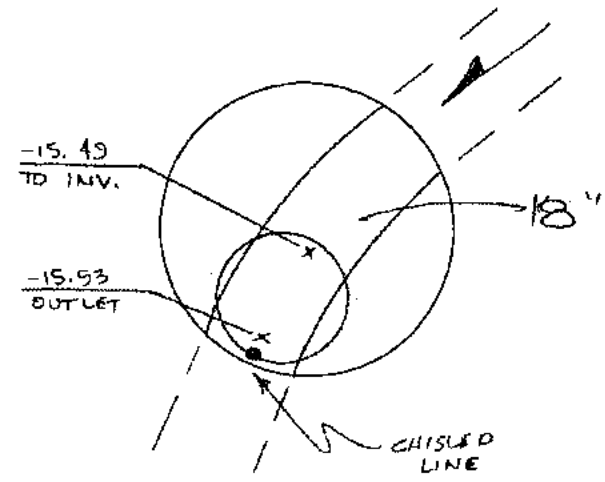
41178
DIRT S.A.R.



WATER LEVEL Low 1" TIME 08:40

NOTES: NAV #78 (UP 0.5, 32" SMH W/ SPECIAL BOLTS)

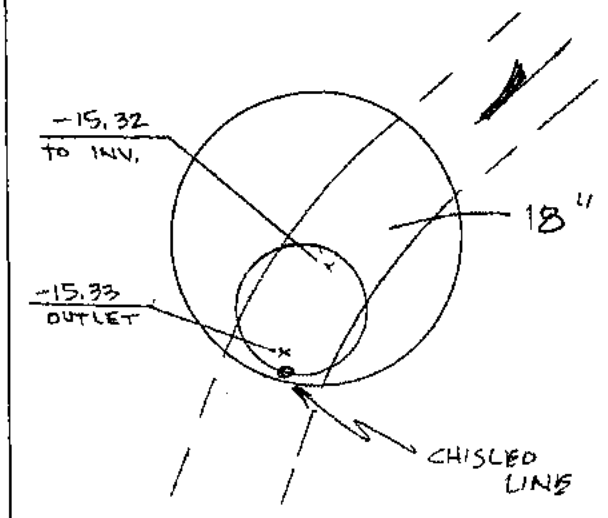
41177
DIRT S.A.R.



WATER LEVEL Low 1" TIME 08:55

NOTES: NAV #77 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

41176
DIRT S.A.R.



WATER LEVEL Low 1" TIME 09:10

NOTES: NAV #76 (UP 0.5, 32" SMH W/ SPECIAL BOLTS)

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JOB NO. 10-105998.001
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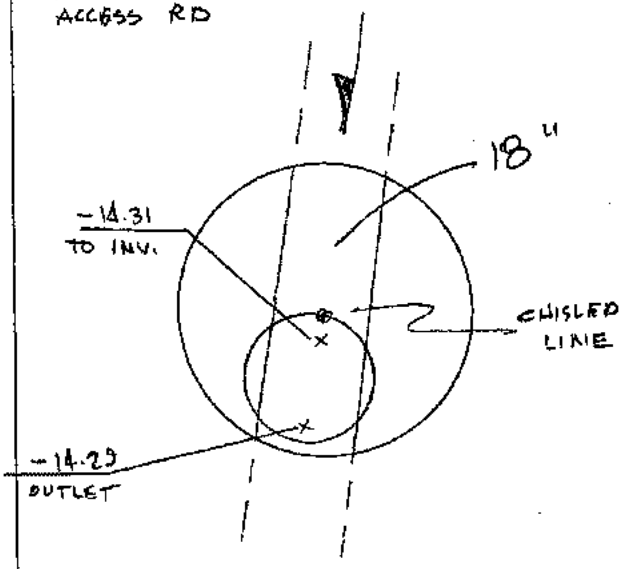
MANHOLE DIAGRAM

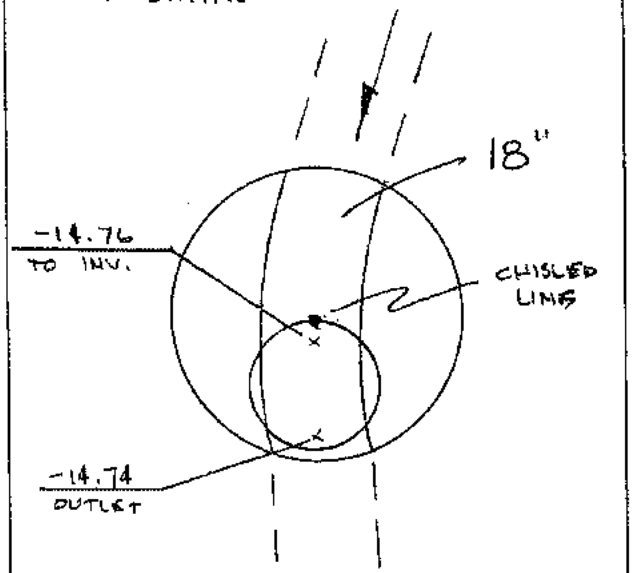
FILE: 667E017

41175
DIRT SEWER ACCESS RD



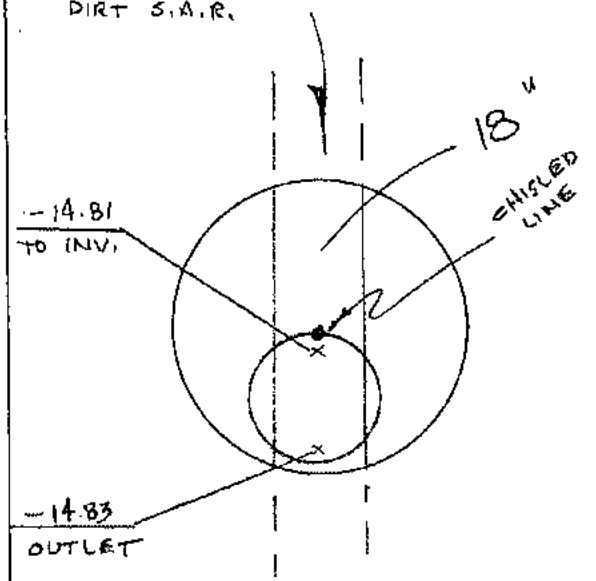
WATER LEVEL Low 1" TIME 09:20
NOTES: NAV # 75 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

41174
DIRT S.A.R.



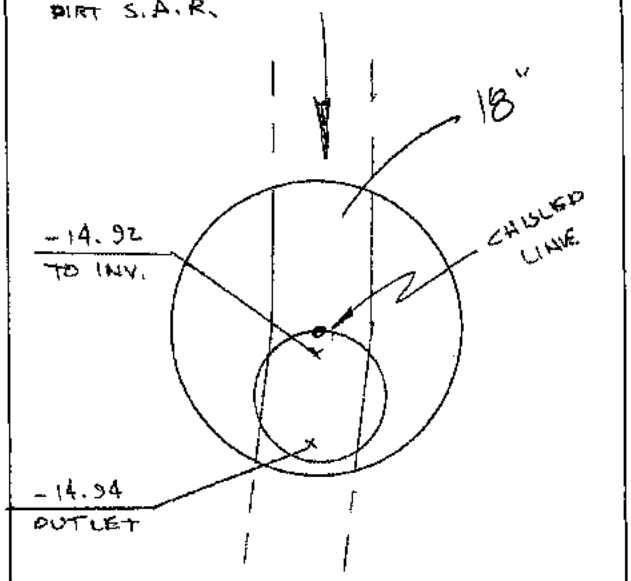
WATER LEVEL Low 2" TIME 09:35
NOTES: NAV # 74 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

41173
DIRT S.A.R.



WATER LEVEL Low 1" TIME 09:55
NOTES: NAV # 73 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

41172
DIRT S.A.R.



WATER LEVEL Low 1" TIME 10:15
NOTES: NAV # 72 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

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SHEET NO. _____ OF _____
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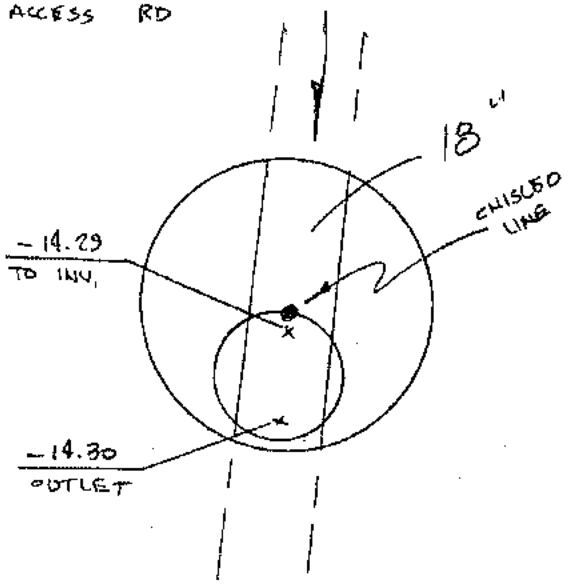
MANHOLE DIAGRAM

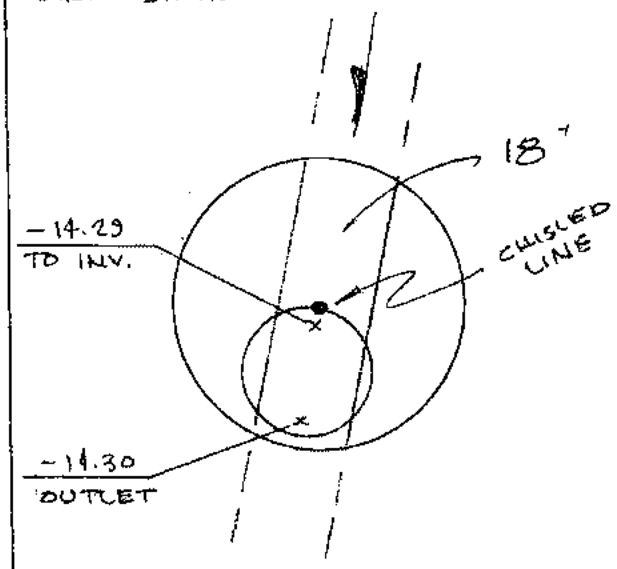
FILE: 667E017

41171
DIRT SEWER ACCESS RD



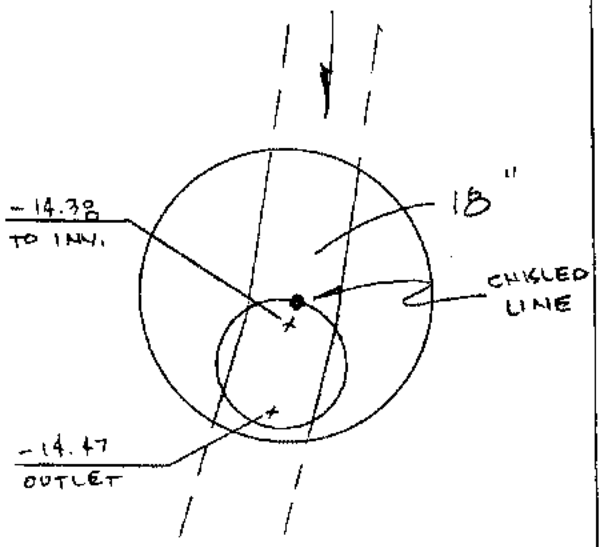
WATER LEVEL low 1" TIME 10:30
NOTES: NAV #71 (UP 0.5, 32" SMH w/ SPECIAL BOLTS)

41170
DIRT S.A.R.



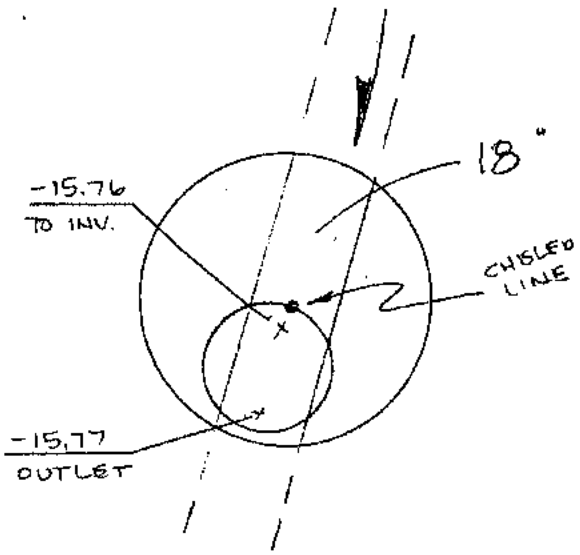
WATER LEVEL low 1" TIME 10:45
NOTES: NAV #70 (UP 1.0, 32" SMH w/ SPECIAL BOLTS)

41169
DIRT S.A.R.



WATER LEVEL low 1" TIME 11:00
NOTES: NAV #69 (UP 1.0, 32" SMH w/ SPECIAL BOLTS)

41168
DIRT S.A.R.



WATER LEVEL low 2" TIME 11:15
NOTES: NAV #68 (UP 1.0, 32" SMH w/ SPECIAL BOLTS)

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JOB NO. 10 105998.001
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DESIGNED BY _____ DATE _____
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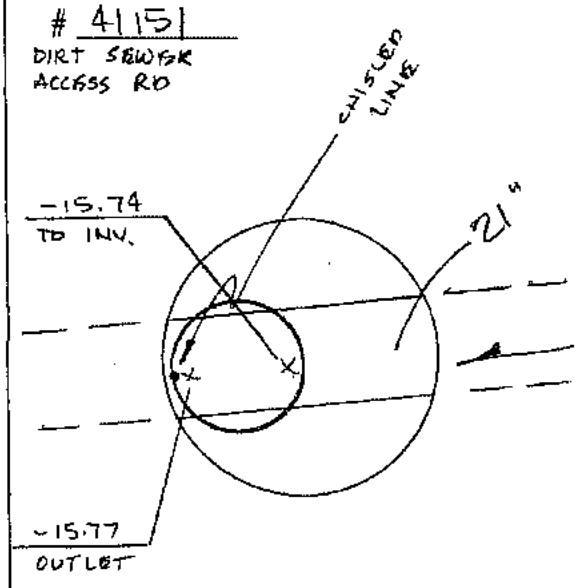
MANHOLE DIAGRAM

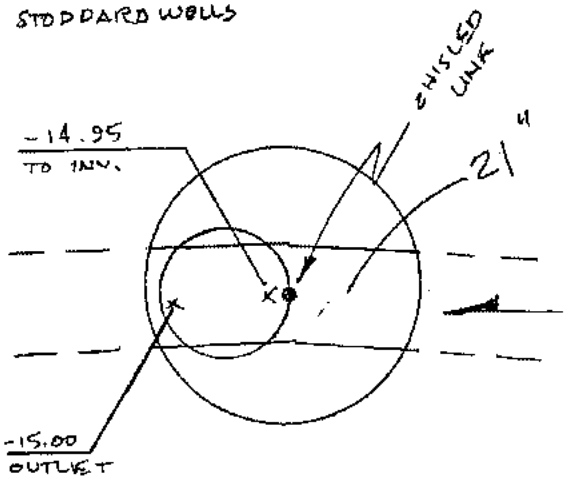
FILE: 667E017

41151
DIRT SEWER ACCESS RD



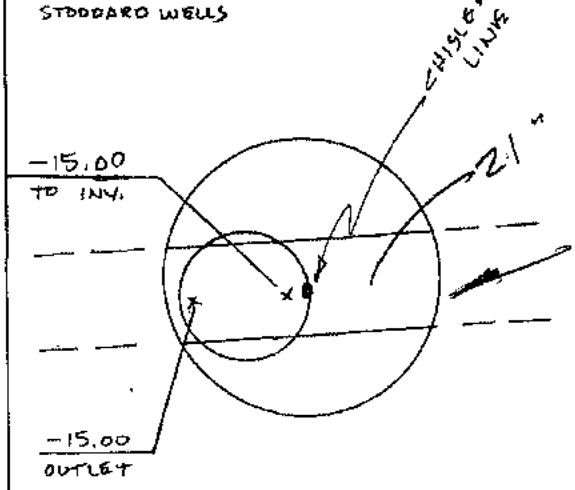
WATER LEVEL Low 1" TIME 10:55
NOTES: NAV# 51 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

41150
SE SIDE STODDARD WELLS



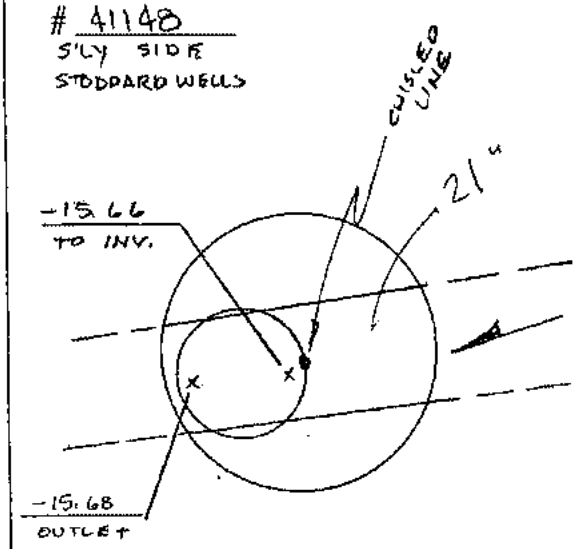
WATER LEVEL Low 2" TIME 11:15
NOTES: NAV# 50 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

41149
S'LY SIDE STODDARD WELLS



WATER LEVEL Low 2" TIME 11:35
NOTES: NAV# 49 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

41148
S'LY SIDE STODDARD WELLS



WATER LEVEL Low 1" TIME 11:55
NOTES: NAV# 48 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

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SHEET NO. ____ OF ____
DESIGNED BY ____ DATE ____
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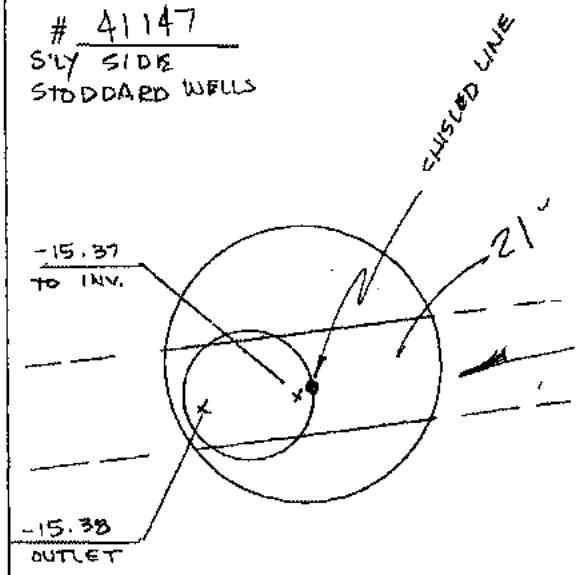
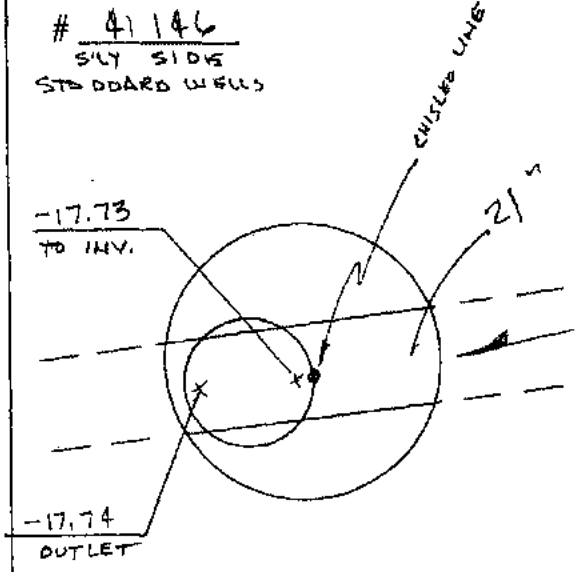
MANHOLE DIAGRAM
FILE: 667E017

41147
S'LY SIDE
STODDARD WELLS



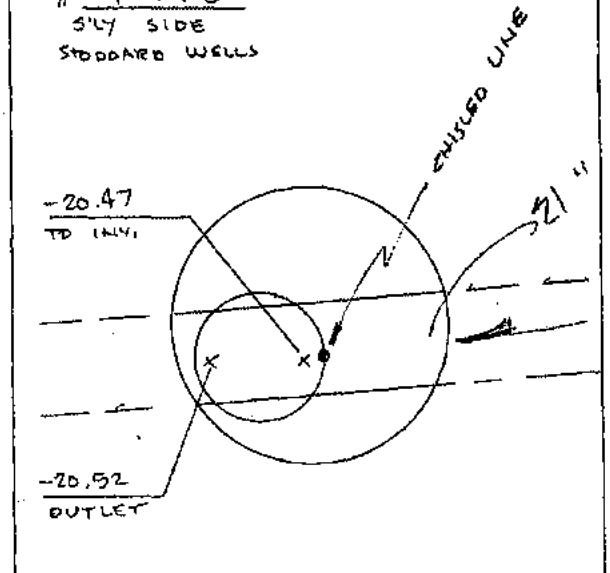
WATER LEVEL Low 1" TIME 12:10
NOTES: NAV#47 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

41146
S'LY SIDE
STODDARD WELLS



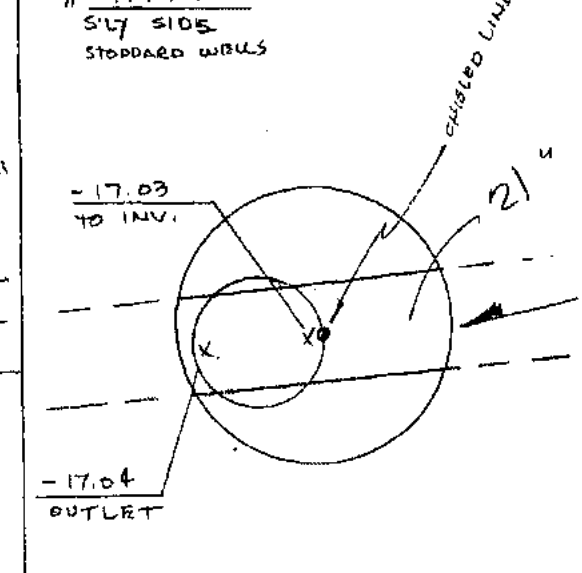
WATER LEVEL Low 2" TIME 12:25
NOTES: NAV#46 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

41145
S'LY SIDE
STODDARD WELLS



WATER LEVEL Low 2" TIME 12:40
NOTES: NAV#45 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

41144
S'LY SIDE
STODDARD WELLS



WATER LEVEL Low 1" TIME 12:50
NOTES: NAV#44 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

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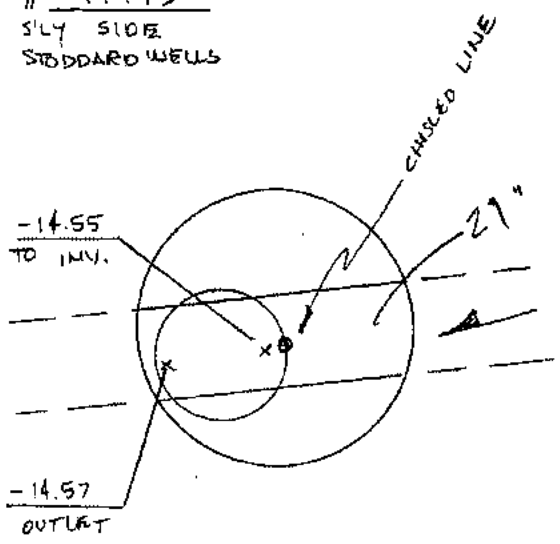
JOB NO. 10-10 5998.001
SHEET NO. ____ OF ____
DESIGNED BY ____ DATE ____
CHECKED BY CS/DM DATE 03/05/08

MANHOLE DIAGRAM

FILE: 667E017

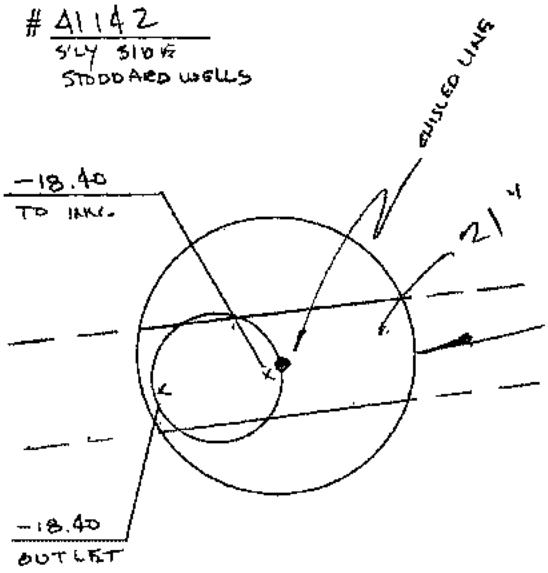
14.45
14.70

41143
S'LY SIDE
STODDARD WELLS



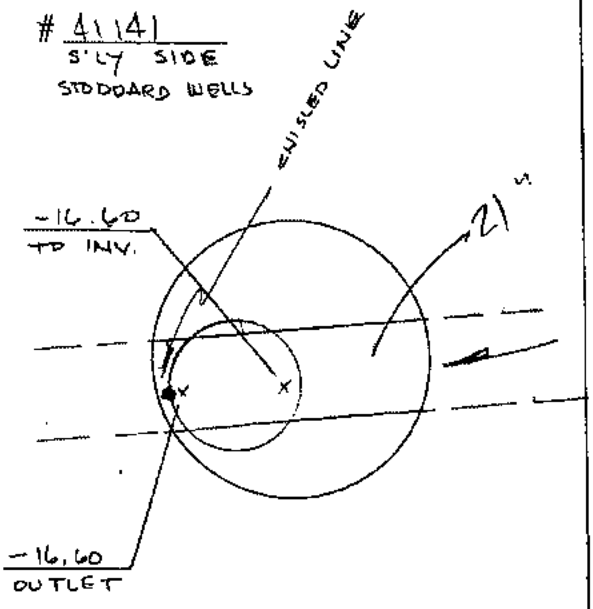
WATER LEVEL Low 1" TIME 13:05
NOTES: NAV#43 (UP 0.5, 32" SMH W/ SPECIAL BOLTS)

41142
S'LY SIDE
STODDARD WELLS



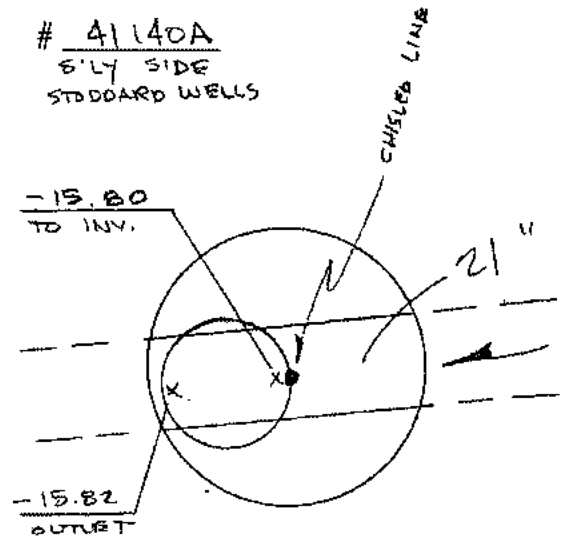
WATER LEVEL Low 1" TIME 13:20
NOTES: NAV#42 (UP 1.0, 32" SMH W/ SPECIAL BOLTS)

41141
S'LY SIDE
STODDARD WELLS



WATER LEVEL Low 2" TIME 13:35
NOTES: NAV#41 (UP 1.0, 32" SMH W/ SPECIAL BOLTS

41140A
S'LY SIDE
STODDARD WELLS



WATER LEVEL Low 1" TIME 13:50
NOTES: N.A.V.#40A (UP 1.0, 32" SMH W/ SPECIAL BOLTS

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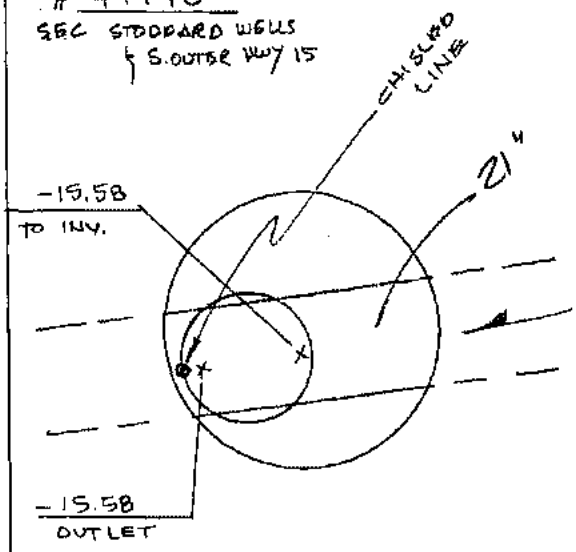
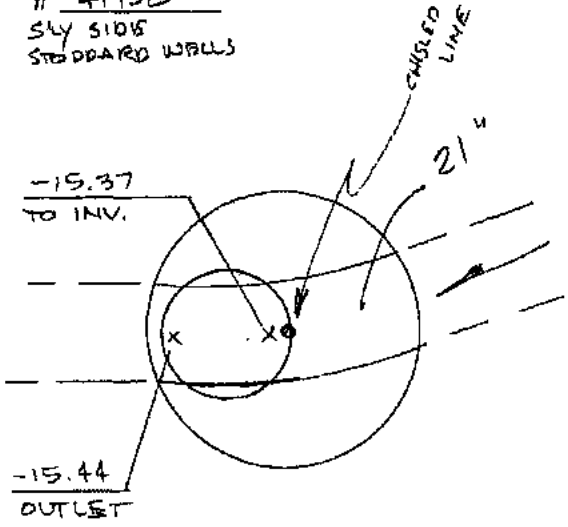
MANHOLE DIAGRAM
FILE: 667E017

41140
SEC STODDARD WELLS & S. OUTER HWY 15



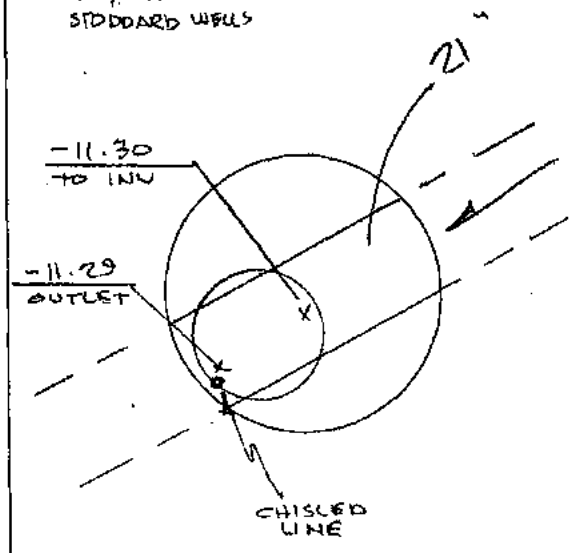
WATER LEVEL WET TIME 08:35
NOTES: NAV# 40 (FLUSH, 32"SMH W/ SPECIAL BOLTS)

41138
S'LY SIDE STODDARD WELLS



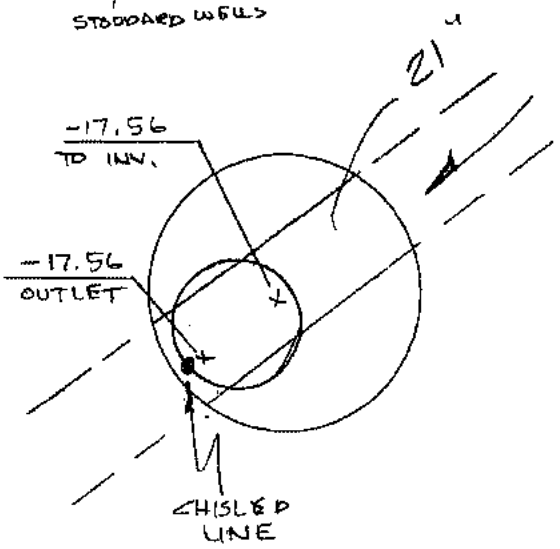
WATER LEVEL WET TIME 08:55
NOTES: NAV# 38 (UP 0.5, 32"SMH W/ SP

41136A
S'LY SIDE STODDARD WELLS



WATER LEVEL Pool 1" TIME 08:55
NOTES: NAV# 36A (DWN 1.0) 32"SMH W/ SPECIAL BOLTS)

41136
S'LY SIDE STODDARD WELLS



WATER LEVEL Pool 1" TIME 09:25
NOTES: NAV# 36 (UP 0.5, 32"SMH W/ SPECIAL BOLTS)

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JOB NO. 10.10 5998.001
SHEET NO. ____ OF ____
DESIGNED BY ____ DATE ____
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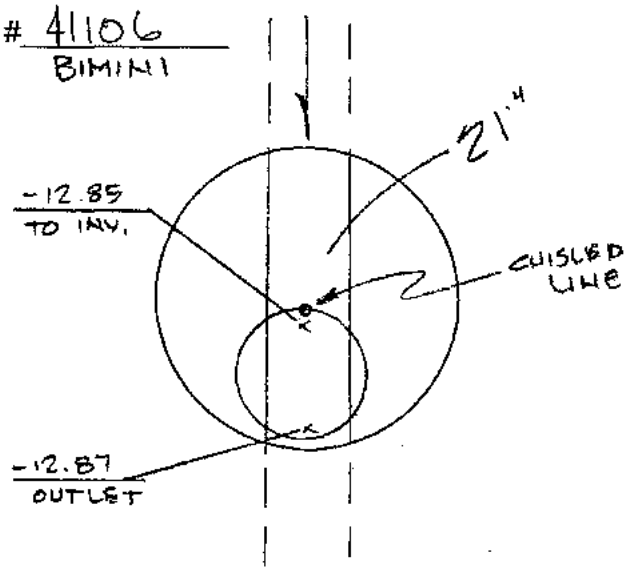
MANHOLE DIAGRAM

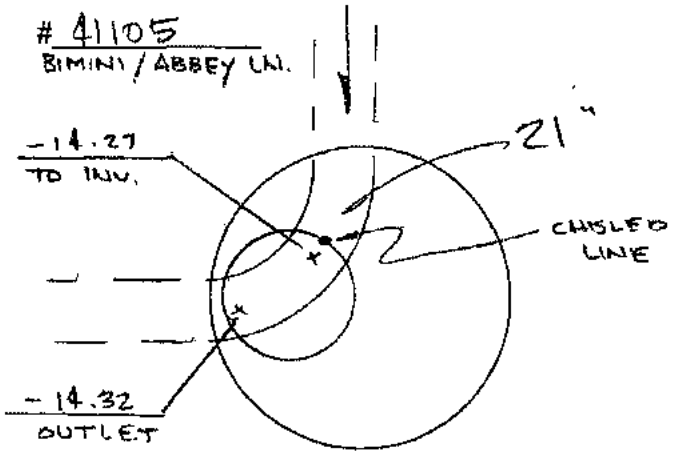
FILE: 667E017

41106
BIMINI



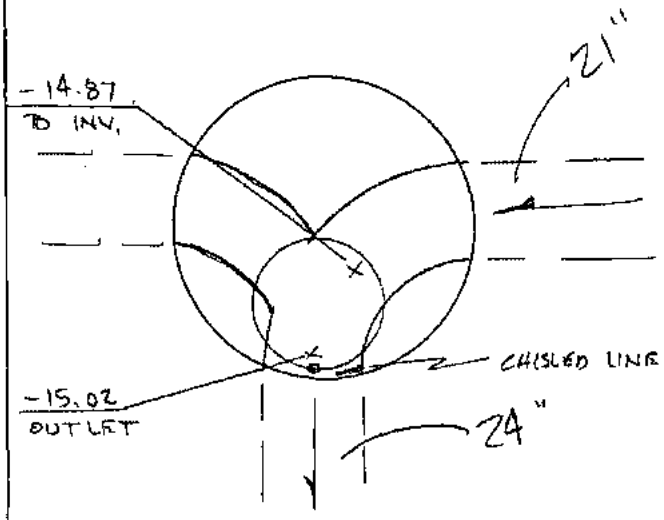
WATER LEVEL Low 1" TIME 09:20
NOTES: NAV# 6 (FLUSH, 32" SMH W/ SPECIAL BOLTS)

41105
BIMINI / ABBEY LN.



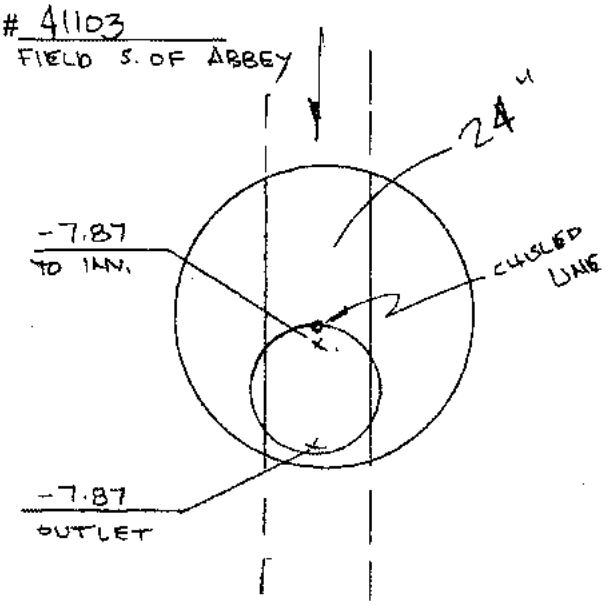
WATER LEVEL Low 1" TIME 09:35
NOTES: NAV# 5 (FLUSH, 32" SMH W/ SPECIAL BOLTS)

41104
ABBEY LN



WATER LEVEL Low 1" TIME 09:50
NOTES: NAV# 4 (FLUSH, 32" SMH W/ SPECIAL BOLTS)

41103
FIELD S. OF ABBEY



WATER LEVEL Low (Pool) 2" TIME 10:10
NOTES: NAV# 3 (FLUSH, 32" SMH W/ SPECIAL BOLTS)

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MANHOLE DIAGRAM

FILE: 667E017

JOB NAME V.V.W.R.A. / N. APPLE VALLEY
JOB NO. 10 104667.001
SHEET NO. _____ OF _____
DESIGNED BY _____ DATE _____
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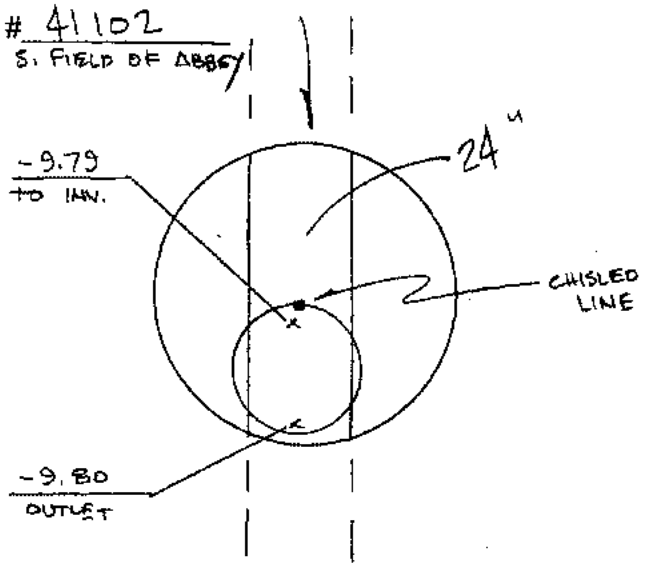
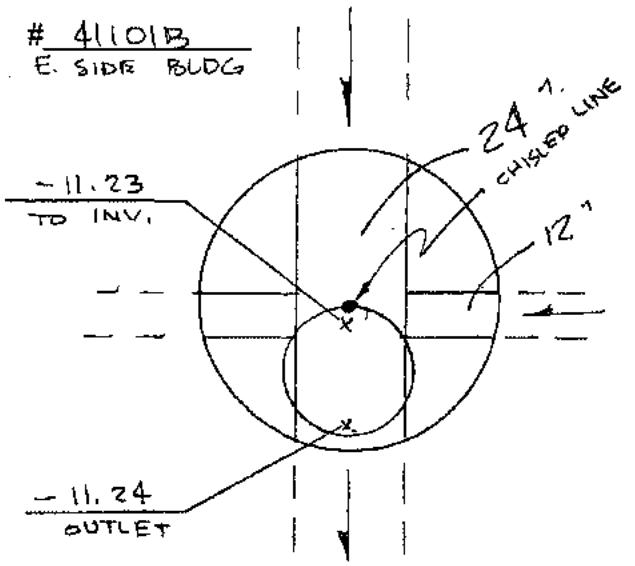
41102
S. FIELD OF ABBEY



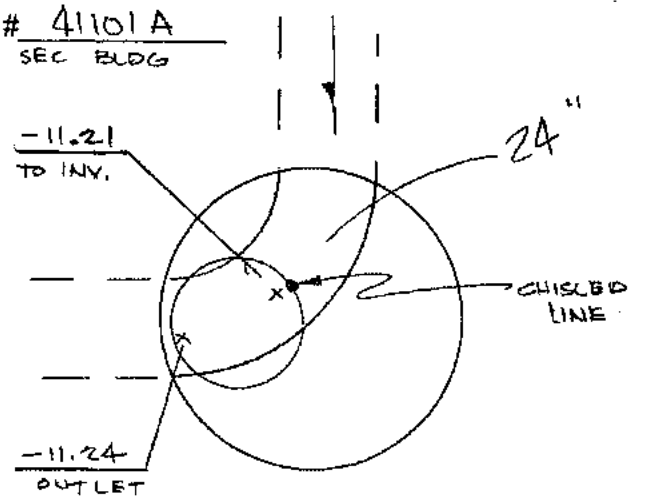
WATER LEVEL Low 1" TIME 10:25
NOTES: MH#2 (UP 0.3, 32" SMH W/ SPECIAL BOLTS)

41101B
E. SIDE BLDG



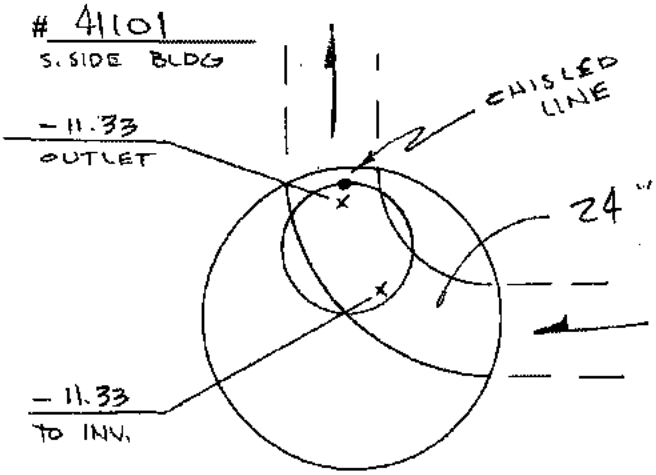
WATER LEVEL Low 3" TIME 10:40
NOTES: MH#1B (FLUSH, 32" SMH W/ SPECIAL BOLTS)

41101A
SEC BLDG



WATER LEVEL Low 4" TIME 10:50
NOTES: MH#1A (UP 0.5, 32" SMH W/ SPECIAL BOLTS)

41101
S. SIDE BLDG



WATER LEVEL Low 4" TIME 11:00
NOTES: MH#1 (FLUSH, 32" SMH W/ SPECIAL BOLTS)

FIELD BOOK NO. 52 FIELD BOOK PAGE NO. 43 SHEET 1 OF _____

SURVEY FIELD NOTES

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91761 • PHONE (909) 974-4900 • FAX (909) 974-4004

SITE NAME: NORTH AV LINE

CLIENT NAME: VVWRA AS-STAKED FILENAME: 071L998

SURVEY DATE(S): 3/11/08 - 03/14/08 RBF JOB NO.: 10105998

SURVEY CHIEF(S): C. Scarborough CHAINMEN: D. MEYER

TRACT NO. *OR* PARCEL NO. (CIRCLE ONE & PROVIDE NO. IF APPLICABLE): —

STREET NAME(S) (IF APPLICABLE): —

LOT NO.(S) (IF APPLICABLE): —

SURVEY TYPE: *(CHECK ONE OR MORE TYPES OF SURVEY CATEGORIES)*

[X] CONTROL	[Boundary surveys; ALTA, site control; aerial control; level loops; etc.]
[ ] TOPO	[Design surveys ("E" topos); removal topos; subdrains; stockpiles; etc.]
[ ] CERTIFY	[As-built ("A") topos; certification field notes; LDVs; FFVs; RGA; etc.]
[ ] GRADING	[All grading stakes; blue tops; daylights; RG 20/80s; etc.]
[ ] SEWER	[Sewer & sewer laterals; etc.]
[ ] WATER	[Water lines; water services; FHs; etc.]
[ ] STORM DRAIN	[Storm drain systems (pipes; boxes; structures; etc.)]
[ ] DRY UTILS	[Dry utilities (all underground dry utilities; vaults; street lights; etc.)]
[ ] STR IMPRV	[All street improvements; curb; driveways; bridges; paving; sawcuts; etc.]
[ ] WALLS	[Retaining walls; free standing walls; monument walls; fences; etc.]
[ ] BLDG STKS	[Stakes for: Buildings; pools; tanks; architectural features; etc.]
[ ] MONITOR	[Monitoring projects]
[ ] MISC	[Miscellaneous—anything that does not fit within the above options. If necessary, another category can be added to this list, in the future, to avoid overusing this]

DESCRIPTION OF WORK: LEVEL RUN THROUGH SMH RIMS ON N. AV LINE

REQUIRES OFFICE REDUCTION?: [X] Yes [ ] No

EXTRA OR WORK TICKET?: [ ] Yes # _____ [X] No

IMPORTANT NOTE TO CONTRACTORS

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FOR OFFICE USE ONLY. DO NOT WRITE BELOW THIS LINE.

PDF FILE NO. _____

SURVEY OF V.V.W.R.A. SMH's JOB NO. 10-105998.001 BOOK _____ PAGE 44

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☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☒ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: N. APPLE VALLEY LINE INSTRUMENT NO: DNA10 SER# 334205

CHECKED BY: FILE: 0711998 LINE 1 ROD NO: 559-584, 585 & 586

TURN #	+	H.I.	−	ELEV.	REMARKS
"S-41R"				2695.23	4"BC @ SWC CEMEV OFFICE BLDG
	2.877	2698.107	241/232		
TP 1			3.654	94.453	TOP ROCK IN RAIL YARD NE'LY OF BLDG
	8.001	2702.454	285/285		
TP 2			3.739	98.716	GOD IN GRAVEL W'LY ETW
	8.006	06.722	316/325		
TP 3			4.351	2702.371	" " E'LY ETW
	3.044	2705.416	363/363		
TP 4			9.418	2695.997	GOD W'LY ETW, UPPER RD (W. SIDE) AROUND POND
	3.245	2699.242	277/270		
TP 5			12.537	2686.706	GOD IN FALLEN STUMP @ E'LY BEND RD
	1.123	87.829	241/230		
TP 6			9.459	78.370	GOD IN SAND
	3.484	81.854	198/203		(CROSS RIVER ON N. SIDE E/R)
TP 7			4.986	76.868	GOD N. ETW NE SIDE RIVER
	10.398	87.265	191/165		
TP 8			4.285	82.980	1"X1" W. OF GATE ON DIKE
	6.794	89.775	121/131		
TP 9			2.938	86.836	1"X1" E. TOP SLOPE E. DIKE
	5.322	92.158	346/355		
TP 10			4.976	87.182	" "
	6.111	93.292	192/202		
SS# 41101			6.268	2687.025	CHISLE MARK ON N. RIM NAV# 1
SS# 41101A			6.378	2686.915	NAV# 1A CM ON N'LY RIM
TP 11			6.963	86.329	1"X1" E. OF NAV# 1A
	5.288	91.617	337/342		
SS# 41101B			4.369	2687.248	NAV# 1B CM ON N'LY RIM
SS# 41102			4.331	2687.286	NAV# 2 " "
TP 12			4.622	86.994	1"X1" IN SEWER EAS.
	11.818	98.812	312/318		
SS# 41103			11.346	2687.467	NAV#3 CM ON N'LY RIM
SS "AT33"			2.358	2696.455	AT W/MAG & TIN, AC ABBEY LN.

S'LY ACROSS GRAVEL YARD

SE SIDE R/R BRIDGE

E'LY TO E. DIKE RIVER

S'LY ON E. DIKE

W'LY ALONG SEWER LINE

SURVEY OF V.V.W.R.A. SMN's JOB NO. 10.105998.001 BOOK _____ PAGE 45

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☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☒ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: N. APPLE VALLEY LINE INSTRUMENT NO: DNA10 SER# 334205

CHECKED BY: FILE: 071L998 LINE 1 ROD NO: 559-584, 585 & 586

TURN #	+	H. I.	–	ELEV.	REMARKS
TP 13			5.273	2693.540	1"X1" S.TB W. END ABBEY LN
	0.931	2694.470	211/224		
TP 14			11.668	82.802	1"X1" IN DIRT BERM
	1.889	84.691	158/185		
TP 15			8.350	76.341	60D N ETW ON E. SIDE RIVER
	6.039	82.381	214/213		
TP 16			3.758	78.623	60D GR RD, E. SIDE R/R BRIDGE
	6.283	84.906	158/169		
TP 17			1.401	83.505	60D @ OUTSIDE APPX GRAVEL RD
	7.632	91.137	105/88		
TP 18			4.873	86.264	60D E. ETW, E RD AROUND POND
	5.785	92.049	192/217		
TP 19			4.356	87.093	" "
	12.240	2699.333	240/282		
TP 20			2.069	97.264	60D W. ETW
	10.378	2707.642	326/318		
TP 21			6.422	2701.220	" "
	1.956	2703.176	359/365		
TP 22			6.988	96.188	60D IN GRAVEL BETWEEN BLDG/RAILS
	2.510	98.698	274/265		
TP 23			5.920	92.777	PAINT DOT TO S'LY SIDE ACCESS RD
	6.444	99.222	75/78		
"S-41R"			4.003	2695.218	4"BC USGS BM (2695.23)

W'LY ACROSS RIVER

S'LY ACROSS GRAVEL YARD

W'LY TO BM

SURVEY OF V.V.W.R.A. SMH'S JOB NO. 10-105998.001 BOOK _____ PAGE 46

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☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☑ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: N. APPLE VALLEY LINE INSTRUMENT NO: DNA10 SER# 334205

CHECKED BY: FILE: 071998 LINE 2 ROD NO: 559-584, 585, 586

TURN #	+	H. I.	−	ELEV.	REMARKS	
"AT33"				2696.455	AT "MAG" TIN, AC ABBEY LN	-0.29
	8.208	2704.663	186/183			
SS# 41104			7.835	2696.828	NAV#4, CHISLE MARK S'LY RIM	
SS# 41105			2.294	2702.369	NAV#5, " " N'LY RIM	
TP 1			1.913	2702.75	C.NAIL, S.TB @ INT ABBY/BIMINI	
	9.397	12.147	302/302			
SS# 41106			3.158	2708.989	NAV#6, CM ON N'LY RIM	
TP 2			1.152	10.994	C'NAIL, W.LIP, 25'± S'LY OF FH	
	9.463	20.457	247/251			
SS# 41107			4.170	2716.287	NAV#7, CM ON N. RIM	
TP 3			0.444	20.013	C.NAIL, W. EP	
	8.388	28.401	141/139			
SS# 41108			4.022	2724.379	NAV#8, CM ON NE'LY RIM	
SS# 200			3.876	2724.525	2"BC ¼ SEC 33/34 BIMINI/DANTE	-0.73
TP 4			1.026	27.376	C.NAIL, N. EP @ FH, DANTE	
	11.596	38.972	170/175			
SS# 41109			5.706	2733.267	NAV#9, CM ON E'LY RIM	
TP 5			0.529	38.443	C.NAIL, S'LY EP @ PRC	
	10.151	48.594	203/195			
SS# 41109A			7.689	2740.905	NAV#9A, CM ON E'LY RIM	
TP 6			4.105	44.489	C.NAIL, S'LY EP @ APT	
	12.442	56.931	125/110			
SS# 41110			7.866	2749.065	NAV#10, CM ON NE'LY RIM	
SS# 201			7.792	2749.140	1"IP "NJT @ ℄ INT STODDARD/DANTE	-0.34
TP 7			1.695	55.236	C.NAIL, E. EP ON STODDARD	
	12.366	67.602	183/183			
SS# 41111			2.230	2765.372	NAV#11, CM ON N'LY RIM	
TP 8			1.662	65.941	C.NAIL E'LY EP	
	8.661	74.601	258/258			
SS# 41112			4.395	2770.206	NAV#12, CM ON NE'LY RIM	
TP 9			4.757	69.845	C.NAIL, E'LY EP	

E'LY ON ABBEY

N'LY ON BIMINI

E'LY ON DANTE

NE'LY ON STODDARD

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☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☑ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: N. Apple Valley Line INSTRUMENT NO: DNA10 SER# 334205

CHECKED BY: FILE: 0711998 LINE 2 ROD NO: 559-584, 585 & 586

TURN #	+	H. I.	–	ELEV.	REMARKS	
	2.448	2772.293	356/355			
SS# 41113			4.308	2767.984	NAV#13, CHISLED MARK ON SW'LY RIM	
SS# AT34			4.864	2767.429	FD AT34, SHOT AC @ CTR TGT	-0.35
TP 10			3.486	68.807	C-NAIL E'LY EP STODDARD WELLS	
	7.311	76.118	343/343			
SS# 41114			7.020	2769.098	NAV#14, CM ON NE'LY RIM	
SS# 41115			3.782	2772.336	NAV#15, " "	
TP 11			2.921	73.197	C-NAIL E'LY EP	
	7.307	80.504	327/333			
SS# 41116			4.897	2775.608	NAV#16, CM ON NE'LY RIM	
TP 12			3.265	77.240	C-NAIL, E'LY EP	
	10.214	87.453	284/284			
SS# 41117			7.971	2779.482	NAV#17, CM ON SW'LY RIM	
TP 13			1.752	85.701	C-NAIL, E'LY EP	
	11.675	97.376	326/331			
SS# 41118			9.089	2788.287	NAV#18, CM ON NE'LY RIM	
SS# 41119			2.458	2794.918	NAV#19, " "	
TP 14			1.503	95.873	C-NAIL, E'LY EP	
	7.869	2803.742	345/337			
SS# 41120			6.658	2797.084	NAV#20, CM ON SW'LY RIM	
TP 15			8.910	94.833	C-NAIL, E'LY EP	
	7.686	2802.519	319/314			
SS# 41121			8.466	2794.053	NAV#21, CM ON SW'LY RIM	
TP 16			5.444	97.075	C-NAIL, E'LY EP	
	10.433	07.507	306/311			
SS# 41122			8.726	2798.782	NAV#22, CM ON NE'LY RIM	
TP 17			4.032	2803.475	C-NAIL, E'LY EP	
	9.367	12.842	325/320			
SS# 41123			8.955	2803.887	NAV#23, CM ON NE'LY RIM	
SS# 41124A			5.409	2807.434	NAV#24A, CM ON SW'LY RIM	
SS# 41124B			4.582	2808.260	NAV#24B	
SS# 203			4.040	2808.802	N'LY 1"IP W/NUT & STODDARD WELLS	-0.32

NE'LY ON STODDARD WELLS

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☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☒ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: N. APPLE VALLEY LINE INSTRUMENT NO: DNALO SSR# 334205

CHECKED BY: FILE: 07IL998 LINE 2 ROD NO: 559-584, 585 & 586

TURN #	+	H. I.	–	ELEV.	REMARKS
TP 18			3.397	2809.445	C·NAIL, E'LY EP STODDARD WELLS
	9.065	2818.510	301/299		
SS# 41125			5.020	2813.491	NAV# 25, CHISLED MARK ON W&'LY RIM
TP 19			2.519	15.991	C·NAIL, E'LY EP
	9.926	25.917	307/303		
SS# 41126A			5.641	2820.276	NAV# 26A, CM ON SW'LY RIM
SS# 41126B			3.459	2822.458	NAV# 26B, CM ON NE'LY RIM
TP 20			3.593	22.318	C·NAIL, E'LY EP
	8.991	31.309	301/299		
SS# 41127			5.758	2825.551	NAV# 27, CM ON SW'LY RIM
TP 21			2.873	28.436	C·NAIL, E'LY EP
	9.232	37.668	313/315		
SS# 41128			7.760	2829.908	NAV# 28, CM ON NE'LY RIM
SS# 208			5.981	2831.687	1"IP W/PP RCE 26457 & STODDARD WELLS -0.130
SS# 41129			3.201	2834.467	NAV# 29, CM ON NE'LY RIM
TP 22			3.035	34.633	C·NAIL, E'LY EP
	11.202	45.835	267/274		
SS# 41130			5.247	2840.589	NAV# 30, CM ON NE'LY RIM
TP 23			4.725	41.111	C·NAIL, E'LY EP
	9.168	50.279	230/229		
SS# 41131			2.540	2847.739	NAV# 31, CM ON NE'LY RIM
TP 24			2.115	48.163	C·NAIL, E'LY EP
	11.768	59.931	227/228		
SS# 214			7.033	2852.898	2"IP W/NAIL (LLB) SE COR OSBORNE/STODDARD -0.33
TP 25			6.404	53.527	C·NAIL, E'LY EP
	9.713	63.240	289/289		
SS# 41132			7.845	2855.395	NAV# 32, CM ON NE'LY RIM
SS# 41133			4.019	2859.222	NAV# 33, " "
TP 26			2.824	60.416	C·NAIL, E'LY EP
	9.468	69.884	323/324		
SS# 41134			3.872	2866.012	NAV# 34, CM ON NE'LY RIM
TP 27			6.983	62.901	C·NAIL, E'LY EP

N'LY ON STODDARD WELLS

SURVEY OF V.V.W.R.D. SMH's JOB NO. 10-105998.001 BOOK _____ PAGE 49

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☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☐ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: N. APPLE VALLEY LINE INSTRUMENT NO: DNA10 SER# 334205

CHECKED BY: FILE: D71L99B LINE 2 ROD NO: 559-584, 585 & 586

E'LY ALONG STODDARD WELLS

TURN #	+	H. I.	–	ELEV.	REMARKS	
	10.562	2873.463	266/257			
SS# 41135			4.871	2866.592	NAV#35, CHISLED MARK ON E'LY RIM	
TP 28			3.780	69.683	C.NAIL S'LY EP STODDARD WELLS	
	10.771	80.454	340/335			
SS# 41136			5.518	2874.936	NAV#36, CM ON SW'LY RIM	
TP 29			7.036	73.418	C.NAIL, S'LY EP	
	8.943	82.361	342/339			
SS# 41136A			10.415	2871.946	NAV#36A, CM ON W'LY RIM	
TP 30			4.692	77.669	TOP ROCK @ E. EDGE UNDER BRIDGE	
	11.695	89.365	237/228			
SS# 41138			5.721	2883.644	NAV#38, CM ON E'LY RIM	
TP 31			2.133	87.232	1"X1" @ SW COR STODDARD/S'LY FRONTAGE	
	6.539	93.770	298/291			
SS# 41140			5.391	2888.379	NAV#40, CM ON W'LY RIM	
SS# 41140A			2.476	2891.295	NAV#40A, CM ON E'LY RIM	
TP 32			3.732	90.038	C.NAIL S'LY EP	
	11.418	2901.456	336/321			
SS# 41141			6.559	2894.897	NAV#41, CM ON W'LY RIM	
TP 33			1.478	99.978	C.NAIL, S'LY EP	
	4.951	2904.929	377/378			
SS# 41142			4.155	2900.775	NAV#42, CM ON E'LY RIM	
SS# 41143			4.133	2900.797	NAV#43, " "	
TP 34			3.237	01.692	C.NAIL, S'LY EP	
	10.317	12.009	293/284			
SS# 41144			4.291	2907.718	NAV#44, CM ON E'LY RIM	
SS# 219			2.078	2909.931	1"IP W/PP LS 30_9 N.R/W STODDARD	-0.36
TP 35			0.660	11.349	C.NAIL, S'LY EP	
	8.834	20.188	322/328			
SS# 41145			5.144	2915.644	NAV#45, CM ON E'LY RIM	
TP 36			3.301	16.887	C.NAIL, S'LY EP	
	4.661	21.548	293/287			
SS# 41146			5.278	2916.270	NAV#46, CM ON E'LY RIM	

SURVEY OF V.V.W.R.A. SMH'S JOB NO. 10-105398.001 BOOK _____ PAGE 50

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☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☑ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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CHECKED BY: FILE: 0711998 LINE 2 ROD NO: 559-584, 585 & 586

TURN #	+	H. I.	−	ELEV.	REMARKS
TP 37			4.378	2917.170	C.NAIL, S'LY EP, STODDARD
	7.608	2924.778	327/325		
SS# 41147			6.897	2917.881	NAV# 47, CHISLED MARK ON E'LY RIM
SS# 41148			2.688	2922.090	NAV# 48, " "
TP 38			1.753	23.025	C.NAIL, S'LY EP
	6.934	29.959	331/332		
SS# 41149			4.778	2925.182	NAV# 49, CM ON E'LY RIM
TP 39			3.328	26.631	C.NAIL, S'LY EP, E'LY 25'± FROM D/U & MB
	8.079	34.710	338/341		
SS# 220			7.310	2927.400	1"IP "PP" PLS 5803 S. SIDE STODDARD -0.58
SS# 41150			5.885	2928.825	NAV# 50, CM ON E'LY RIM
SS# 41151			3.326	2932.364	NAV# 51, CM ON W'LY RIM
TP 40			3.132	31.578	GOD, E'LY 110'± FROM SMH # 51
	8.642	40.214	349/348		
SS# 41152			4.343	2935.877	NAV# 52, CM ON E'LY RIM
TP 41			3.412	36.807	GOD IN SEWER ACCESS RD
	7.433	44.239	304/307		
SS# 41153			5.056	2939.183	NAV# 53, CM ON E'LY RIM
SS# 41154			3.155	2941.084	NAV# 54, " "
TP 42			3.820	40.419	
	8.105	48.524	281/281		
SS# 41155			3.305	2945.219	NAV# 55, CM ON W'LY RIM
TP 43			3.441	45.083	GOD IN S.A.R.
	8.632	53.715	290/285		
SS# 41156			3.393	2950.322	NAV# 56, CM ON W'LY RIM
TP 44			2.470	51.246	GOD IN S.A.R.
	7.274	58.519	247/250		
SS# 41157			3.663	2954.856	NAV# 57, CM ON W'LY RIM
TP 45			3.696	54.823	GOD IN S.A.R.
	8.657	63.480	314/320		
SS# 41158			3.558	2959.923	NAV# 58, CM ON E'LY RIM
TP 46			1.842	61.639	GOD IN SAR

E'LY ON STODDARD WELLS

E'LY ON SEWER ACCESS RD

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☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☒ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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CHECKED BY: FILE: 071L998, LINE 2 ROD NO: 559-584, 585 & 586

SEWER LINE ALONG N'LY

TURN #	+	H.I.	-	ELEV.	REMARKS
	7.138	2968.777	304/302		
SS# 41159			3.359	2965.418	NAV#59, CHISLED MARK ON E'LY RIM
TP 47			3.096	65.680	60D IN SEWER ACCESS RD
	8.396	74.077	334/339		
SS# 41160			5.613	2968.464	NAV#60, CM ON E'LY RIM
SS# 41161			1.316	2972.760	NAV#61, CM ON W'LY RIM
TP #8			2.243	71.834	60D IN S.A.R.
	8.675	80.508	344/341		
SS# 41162			3.885	2976.623	NAV#62, CM ON W'LY RIM
TP 49			3.042	77.467	60D IN S.A.R.
	8.040	85.507	345/345		
SS# 41163			6.291	2979.216	NAV#63, CM ON E'LY RIM
SS# 41164			2.479	2983.028	NAV#64, " "
TP 50			1.968	83.539	60D IN S.A.R.
	8.709	92.248	323/328		
SS# 41165			4.805	2987.443	NAV#65, CM ON E'LY RIM
TP 51			2.523	89.725	C/NAIL, E'LY EP, S'LY SIDE DIP (JOHNSON)
	7.370	97.095	306/304		
SS# 41166			6.067	2991.028	NAV#66, CM ON W'LY RIM
SS# 41167			3.191	2993.905	NAV#67, CM ON NE'LY RIM
TP 52			2.430	94.665	TOP ROCK IN S.A.R.
	8.675	3003.340	338/335		
SS# 41168			4.525	2998.815	NAV#68, CM ON NE'LY RIM
TP 53			3.253	3000.086	60D IN S.A.R.
	8.358	08.445	302/301		
SS# 41169			6.583	3001.862	NAV#69, CM ON NE'LY RIM
SS# 41170			2.198	3006.246	NAV#70, " "
TP 54			2.725	05.720	60D IN S.A.R.
	8.310	14.030	273/271		
SS# 41171			3.340	3010.749	NAV#71, CM ON NE'LY RIM
TP 55			2.517	11.573	
	8.333	19.905	330/		

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☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☒ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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OFFSET: N. APPLE VALLEY LINE INSTRUMENT NO: DNA10 SB# 334205

CHECKED BY: FILE: 07IL998 LINE 2 ROD NO: 559-584, 585 & 586

NELY ALONG SEWER LINE

TURN #	+	H. I.	–	ELEV.	REMARKS
SS# 41172			4.309	3015.597	NAV# 72, CHISELED MARK ON N'LY RIM
TP 56			2.883	17.023	GOD IN SEWER ACCESS RD
	7.383	24.405	274/		
SS# 41173			5.292	3019.114	NAV# 73, CM ON N'LY RIM
SS# 41174			1.993	3022.413	NAV# 74, " "
TP 57			2.589	21.816	GOD IN S.A.R.
	8.197	30.013	253/259		
SS# 41175			6.139	3023.874	NAV# 75, CM ON N'LY RIM
SS# 41176			2.792	3027.221	NAV# 76, CM ON S'LY RIM
TP 58			4.390	25.623	GOD IN S.A.R.
	8.571	34.195	235/231		
SS# 41177			3.229	3030.966	NAV# 77, CM ON S'LY RIM
TP 59			3.947	30.248	GOD IN S.A.R.
	8.140	38.388	300/293		
SS# 41178			3.777	3034.611	NAV# 78, CM ON E'LY RIM
TP 60			3.087	3035.300	GOD IN S.A.R.
	8.574	43.874	277/276		
SS# 41179			5.237	3038.578	NAV# 79, CM ON E'LY RIM
TP 61			1.550	42.324	GOD IN S.A.R.
	10.112	52.436	228/226		
SS# 41180			6.158	3046.278	NAV# 80, CM ON W'LY RIM
SS# 41181			8.290	3044.145	NAV# 81, CM ON N'LY RIM (40917)
TP 62			7.723	44.712	GOD IN S.A.R., N'LY SIDE R/R TRACKS
	7.211	51.923	236/239		
SS# 40916			5.062	3046.862	NAV# 82, CM ON S'LY RIM
SS# 40915			3.119	3048.804	NAV# 83, CM ON N'LY RIM
TP 63			2.696	49.228	GOD ON N'LY SIDE (LANGLEY)
	8.824	58.052	208/206		
SS# 221			0.818	3057.234	1" IP W/NAIL LS 2722 (OP 0.3) NEC -0.36
SS# 105			2.247	3055.805	SPIKE/WSHR RBF CP (LANGLEY)
SS# 40914			1.756	3056.298	NAV# 84, CM ON
TP 64			6.191	51.861	GOD IN S.A.R.

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☐ CURB GRADES ☐ WATER GRADES

☐ SEWER GRADES ☒ LEVEL CIRCUIT

☐ STORM DRAIN GRADES ☐

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TURN #	+	H. I.	–	ELEV.	REMARKS
	8.082	3059.943	271/		
SS# 40913			4.581	3055.362	NAV# 85, CHISELED MARK ON S'LY RIM
TP 65			2.093	57.850	60D IN SEWER ACCESS RD
	8.465	66.315	295/231		
SS# 40912			5.669	3060.646	NAV# 86, CM ON N'LY RIM
TP 66			2.757	63.557	C.NAIL IN S.A.R.
	7.832	71.389	304/237		
SS# 40911			6.721	3064.668	NAV# 87, CM ON N'LY RIM
SS# 40910			3.063	3068.326	NAV# 88, CM ON N'LY RIM
SS# 224			2.738	3068.651	3"BC LS 6820 (DWN 0.3) -0.43
TP 67			3.878	67.511	C.NAIL, N'LY EP STODDARD WELLS
	13.106	80.616	339/333		
SS# 40909			8.088	3072.528	NAV# 89, CM ON E'LY RIM
TP 68			0.705	79.912	C.NAIL, N'LY EP STODDARD WELLS
	6.412	86.324	273/213		
SS# 40908			5.771	3080.553	NAV# 90, CM ON E'LY RIM
TP 69			3.488	82.836	C.NAIL, N'LY EP, ECE NINC STODDARD
	9.386	92.172	217/224		
SS# 40907			3.455	3082.716	NAV# 91, CM ON E'LY RIM
TP 70			5.279	86.892	C.NAIL, N'LY EP DALE EVANS
	7.913	94.806	308/311		
SS# 40906			7.910	3086.896	NAV# 92, CM ON S'LY RIM
SS# 40905			4.043	3090.763	NAV# 93, PM ON N'LY RIM
TP 71			2.702	92.164	C.NAIL, W'LY EP
	8.394	3100.498	320/317		
SS# 40904			5.819	3094.679	NAV# 94, PM ON N'LY RIM
TP 72			2.468	98.029	C.NAIL, W'LY EP
	9.422	3107.452	324/324		
SS# 40903			8.127	3099.324	NAV# 95, PM ON N'LY RIM
SS# 40902			2.951	3104.500	NAV# 96, PM ON S'LY RIM
SS# 226			2.788	3104.663	2" BC 5/4 SBCO SURV. (DWN 0.15) -0.46
TP 73			1.949	05.502	C.NAIL, W'LY EP

03/12/08 N'LY ALONG SEWER LINE

03/13/08 E'LY ON STODDARD WELLS

03/14/08 N'LY ON DALE EVANS

SURVEY OF V.V.W.R.A. SMH's JOB NO. 10-105998.001 BOOK _____ PAGE 54

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N'LY ON DALE EVANS

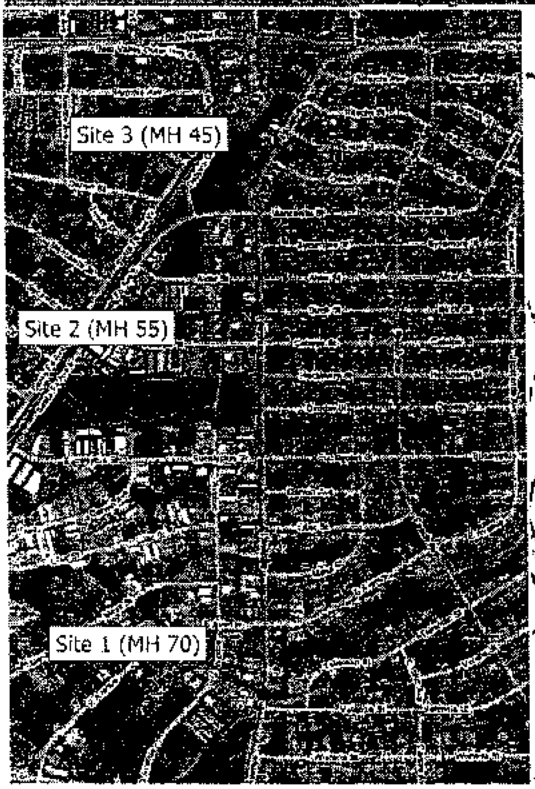
TURN #	+	H. I.	–	ELEV.	REMARKS
	9.209	3114.711	237/238		
SS# 227			8.232	3106.479	2" BC SBCO SURV. BM 1-15 1970 -0.30
SS# 40901			4.733	3109.978	NAV# 97, PM ON N'LY RIM
TP 74			2.304	12.407	C NAIL, W'LY EP, DALE EVANS
	8.744	21.151	200/204		
SS# 40900			5.998	3115.153	NAV# 98, PM ON S'LY RIM
TP 75			2.707	18.444	C NAIL, W'LY EP
	6.279	24.723	88/90		
# 40899			5.147	3119.577	NAV # 99, PM ON S'LY RIM

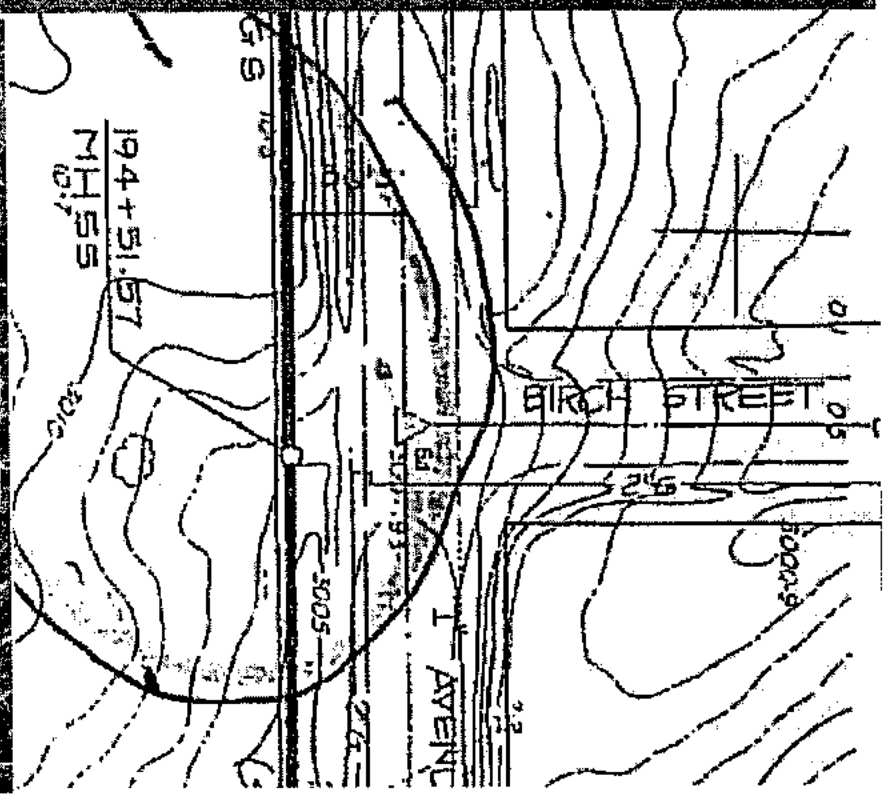
APPENDIX B

FLOW MONITORING REPORTS

Victor Valley Wastewater Reclamation Authority

Sanitary Sewer Flow Monitoring





January 2008

V&A

SANITARY SEWER FLOW MONITORING
AND
CAPACITY ANALYSIS

VICTOR VALLEY WASTEWATER RECLAMATION AUTHORITY

Prepared For:

RBF CONSULTING
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Prepared By:

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Oakland, CA 94612

8291 Aero Place
Suite 110
San Diego, CA 92123

December 2007

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TABLES

FIGURES

EXECUTIVE SUMMARY

V&A Consulting Engineers (V&A) completed sanitary sewer flow monitoring within the Victor Valley Wastewater Reclamation Authority collection system. Three sites along the Hesperia Interceptor in Hesperia, California, were monitored for 7 days from December 7, 2007 through December 14, 2007. The purpose of the study was to investigate the existing flow volumes through the sanitary sewer pipe at the flow monitoring locations. The study was authorized following a sanitary sewer overflow on the Hesperia Interceptor just prior to the flow monitoring.

The results from the sanitary sewer flow monitoring are summarized in Table 1. Snapshots of the pipe cross-sections during peak measured flows are illustrated in Figure 1. Please refer to Figure 2 for the flow monitoring locations.

Table 1. Summary of Flow Monitoring Data

Item	Site 1: 15-inch pipe	Site 2: 18-inch pipe	Site 3: 18-inch pipe
Estimated 100% Capacity of Pipeline:	3.35 MGD	4.07 MGD	4.30 MGD
Average Dry Weather Flow:	1.22 MGD	1.24 MGD	1.36 MGD
- as % of Capacity (by Volume):	36%	31%	32%
- as % of Capacity (by Level):	52%	45%	36%
Peak Measured Flow:	2.12 MGD	2.10 MGD	2.10 MGD
- as % of Capacity (by Volume):	63%	52%	49%
- as % of Capacity (by Level):	69%	58%	48%
Available Capacity over Peak Measured Flow:	1.23 MGD	1.97 MGD	2.20 MGD
- as % of Capacity (by Volume):	37%	48%	51%
- as % of Capacity (by Level):	31%	42%	52%

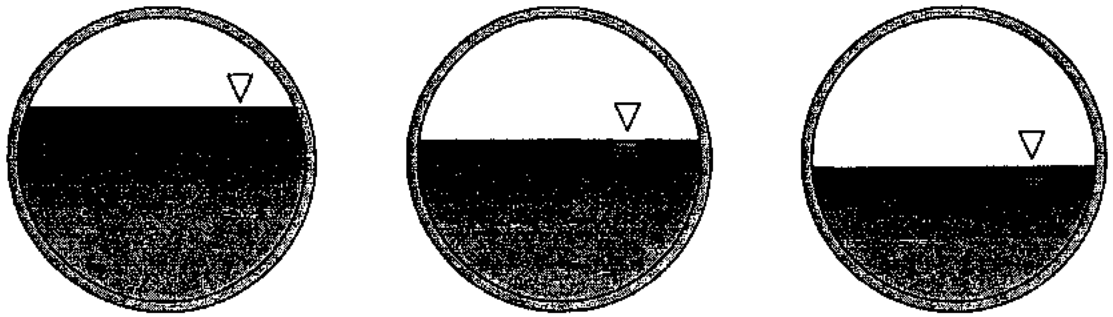


Figure 1. Peak Measured Flows: Cross-Sectional View Snapshots

INTRODUCTION

V&A was retained by RBF Consulting (RBF) to conduct sanitary sewer flow monitoring within the Victor Valley Wastewater Reclamation Authority collection system at three locations along the Hesperia Interceptor in Hesperia, California. The purpose of this study was to record the existing flow volumes through the sanitary sewer pipe. The scope of work included the following tasks:

- Install flow monitoring equipment at three locations to determine the existing sanitary sewer flow.
- Record flow data for a period of one week at 15-minute intervals.

Flow monitoring was conducted over a 7-day period from December 7, 2007 through December 14, 2007. The monitoring sites selected by RBF are shown in Figure 2:

- **Site 1:** A flow meter was installed in the upstream side of the 15-inch sanitary sewer pipe of Manhole 70, located on I Avenue, 1 manhole north of Valencia Street.
- **Site 2:** A flow meter was installed in the upstream side of the 18-inch sanitary sewer pipe of Manhole 55, located at the intersection of I Avenue and Birch Street.
- **Site 3:** A flow meter was installed in the upstream side of the 18-inch sanitary sewer pipe of Manhole 45, located off the public right of way, west of I Avenue and south of Bear Valley Road.

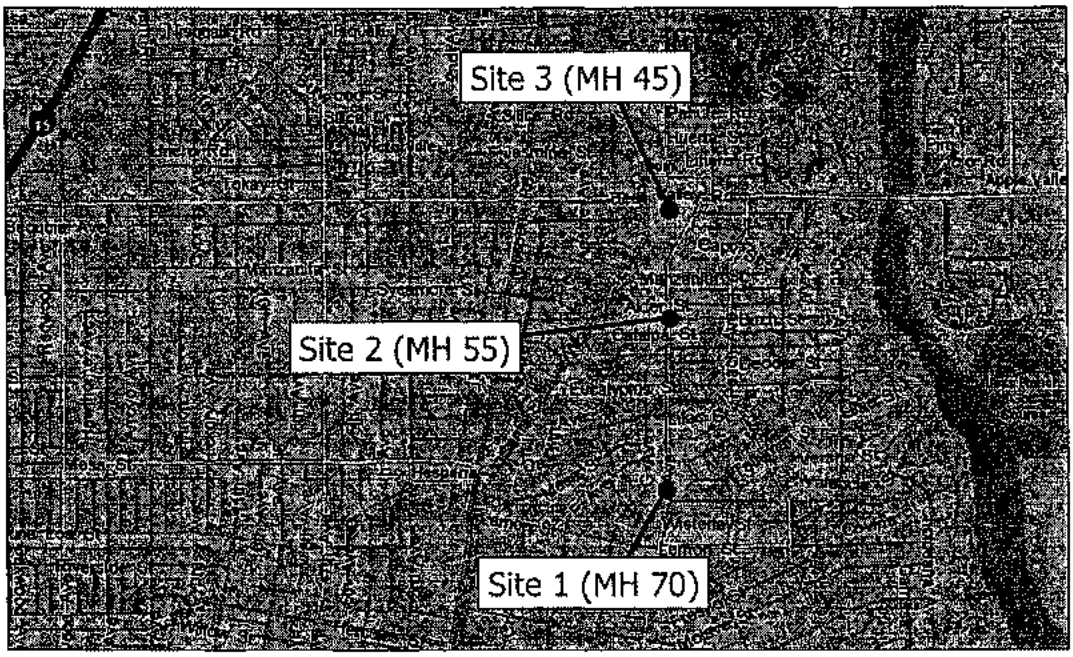


Figure 2. Street Map of Flow Monitoring Sites

FLOW MONITORING METHODS AND PROCEDURES

Meter Installation

Three Isco 2150 flow meters were installed by V&A in the sewer manholes shown in Figure 2. Isco meters use a pressure transducer to collect depth readings. Ultrasonic Doppler sensors on the probe determine the average fluid velocity. Figure 3 illustrates a typical flow meter installation.

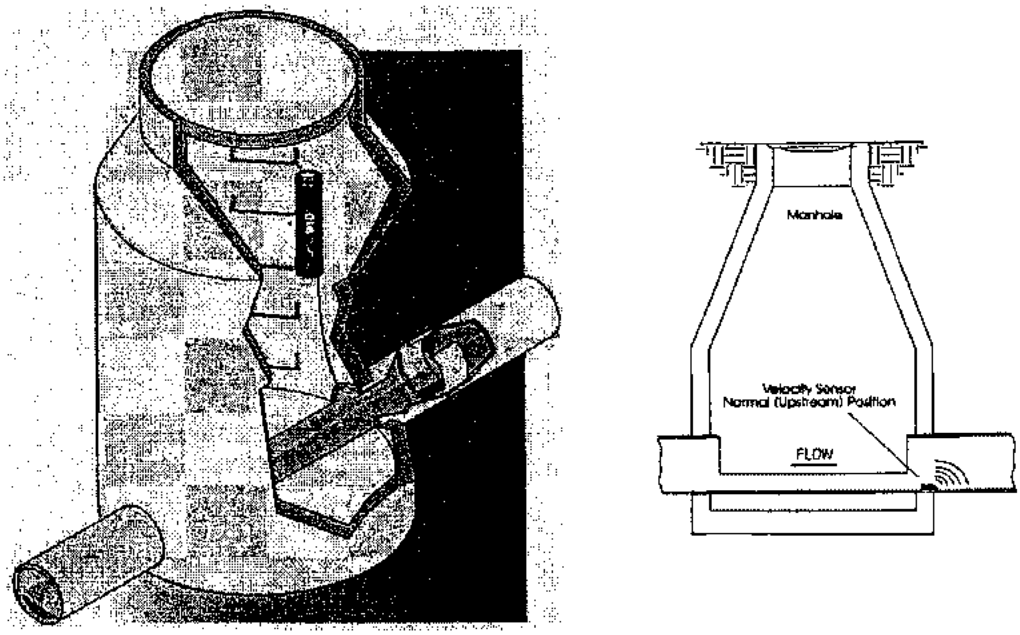


Figure 3. Flow Meter Installation Diagram

Manual level and velocity measurements were taken in the field during the flow meter installation and removal. These manual measurements are compared to the instantaneous level and velocity readings of the flow meter to ensure proper calibration and accuracy. The continuous depth and velocity readings were recorded by the flow meters in 15-minute increments. The readings were downloaded into a computer spreadsheet program for data analysis and reporting purposes.

Explanation of Report Graphs and Definition of Terms

Flow versus time graphs are created by interpolating the data recorded by the flow meter in 15-minute intervals. They represent the diurnal flow curve recorded over a given monitoring period; the data in its rawest form. Figure 4 shows a typical diurnal flow curve. The hypothetical peak, low and average flows recorded over an example monitoring period are identified on this graph. These graphs are useful in identifying the extreme limits of the flows being monitored and pinpointing any trends that might be occurring at a particular site. Flow, level and velocity graphs versus time illustrate the actual recorded data over the monitoring period and are provided in *Appendix A* of this report.

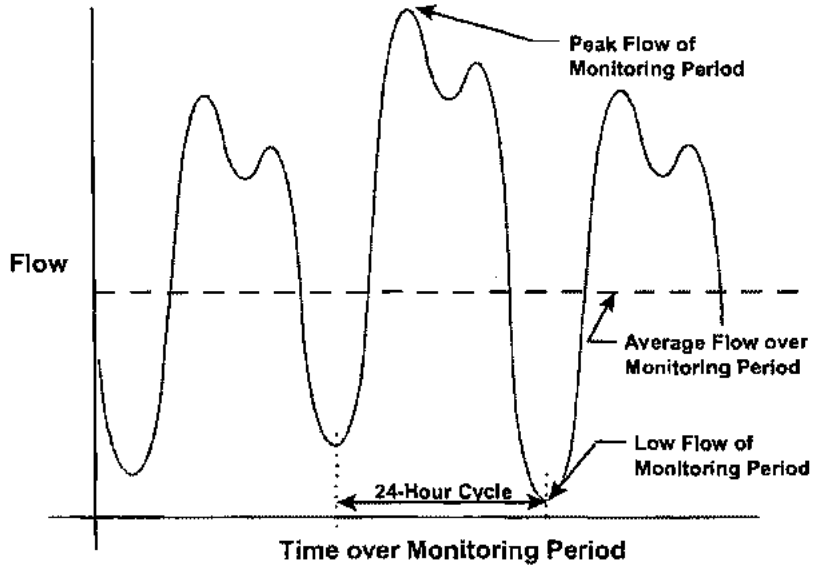


Figure 4. Diagram of Hypothetical Diurnal Flow over Monitoring Period

Dry weather flow is caused by actual waste drainage from buildings in the area. Wet weather flow includes rain-dependent infiltration and inflow which may increase the flow through the sewer pipes. The flows recorded during this study were dry weather flows only. For this report, the peak and average flows during dry weather are abbreviated as follows: ADWF = Average Dry Weather Flow; PDWF = Peak Dry Weather Flow.

FINDINGS

Flow Monitoring Results

Weekday and weekend flow patterns vary and must be separated when determining average dry weather flows. Figure 5 plots the average daily weekday and weekend flows for Site 2. Table 2 summarizes the measured average and peak dry weather flows at the flow monitoring sites during the flow monitoring period.

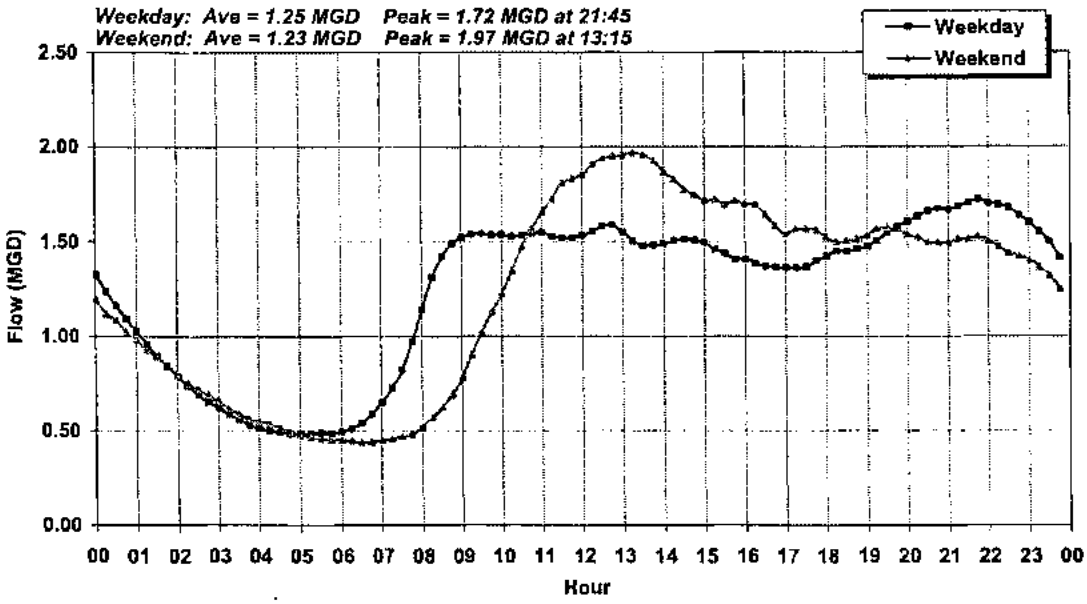


Figure 5. Average Daily Flow Graph (Site 2)

Table 2. Flow Monitoring Results

Site	Weekday Average Flow (MGD)	Weekend Average Flow (MGD)	ADWF** (MGD)	Weekend to Weekday Ratio	Peak Measured Flow (MGD)	Peak to ADWF Ratio
Site 1: 15-inch line	1.21	1.24	1.22	1.02	2.12	1.74
Site 2: 18-inch line	1.25	1.23	1.24	0.98	2.10	1.69
Site 3: 18-inch line	1.37	1.33	1.36	0.97	2.10	1.54

**ADWF calculated as (5*weekday+2*weekend)/7

Plots and tables summarizing the flows at each of the monitoring sites are shown in *Appendix A*.

Pipeline Capacity

The pipeline capacity is estimated based upon the measured data from each flow metering site. The metered flow data is plotted over the Manning's Equation flow curve and extrapolated to a full-flow scenario, as shown in Figure 6 for Site 2. Table 3 shows the estimated capacity of the pipelines at all flow monitoring sites.

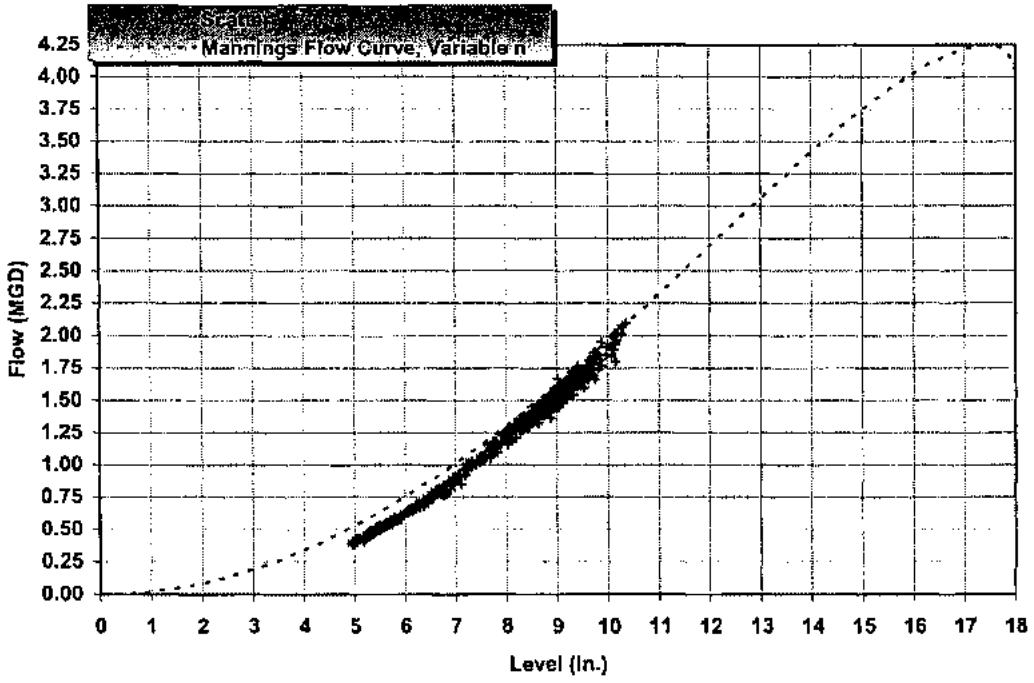


Figure 6. Site 2 Stage Curve

Table 3. Site Estimated Capacities

Site	Estimated Full-Pipe Capacity* (MGD)
Site 1: 15-inch line	3.35
Site 2: 18-inch line	4.07
Site 3: 18-inch line	4.30

*Based on metered data

Table 4 summarizes the capacity data, which includes the average dry weather flows and peak measured flows as a percent of the pipe capacity. Figures 7 through 9 show pipe cross-sectional snapshots of these conditions.

Table 4. Average Dry Weather Flow and Peak Measured Flow as Percent of Capacity

Site	100% Capacity of Line	ADWF (MGD)	ADWF as % of Capacity (by Volume)	ADWF as % of Capacity (by Level)	Peak Measured Flow (MGD)	Peak Measured Flow as % of Capacity (by Volume)	Peak Measured Flow as % of Capacity (by Level)
Site 1: 15-inch line	3.35	1.22	36%	52%	2.12	63%	69%
Site 2: 18-inch line	4.07	1.24	31%	45%	2.10	52%	58%
Site 3: 18-inch line	4.30	1.36	32%	36%	2.10	49%	48%

ADWF = Average Dry Weather Flow

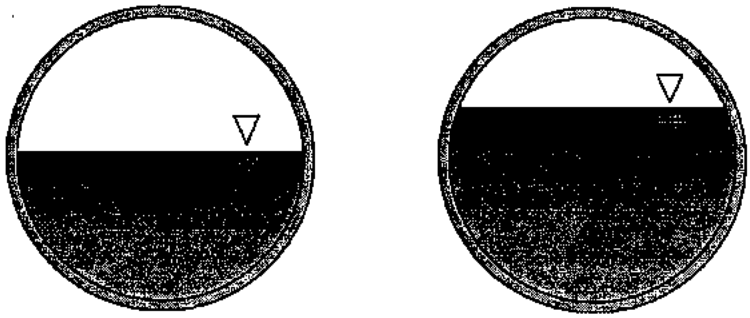


Figure 7. Site 1 Cross-Sectional View Snapshots

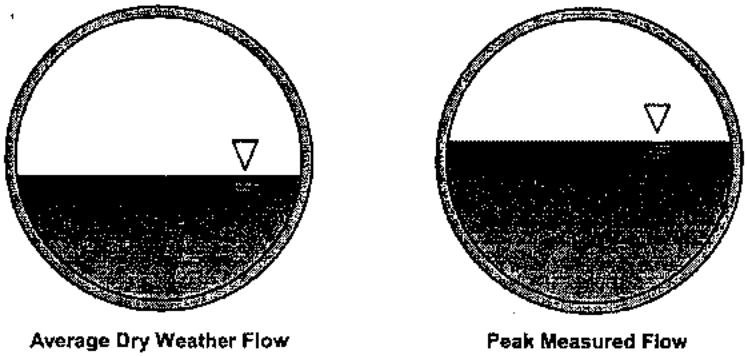


Figure 8. Site 2 Cross-Sectional View Snapshots

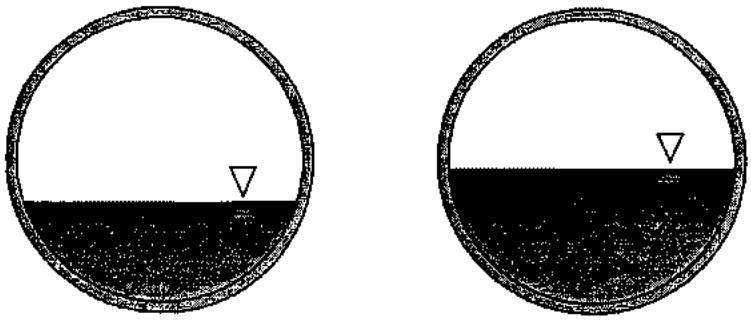


Figure 9. Site 3 Cross-Sectional View Snapshots

APPENDIX A

FLOW MONITORING SITES: GRAPHS AND FIGURES

Temporary Flow Monitoring Study

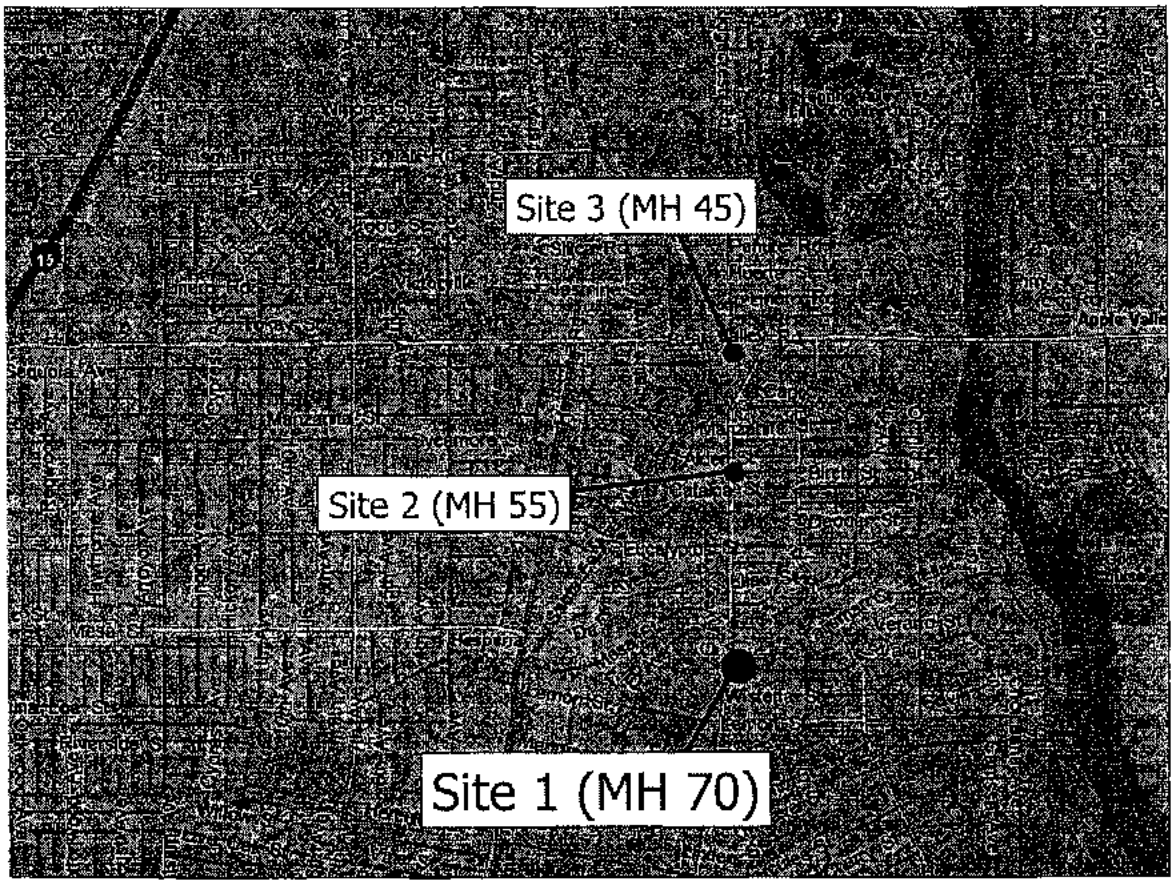
Sanitary Sewer Collection System

Monitoring Site: Site 1

Manhole Address: Manhole 70: I Avenue, 1 manhole north of Valencia Street

Size/Type of Line: 15-inch Pipe

Data Summary Report



V&A

	Site Information Report	**Monitoring Site:** Site 1

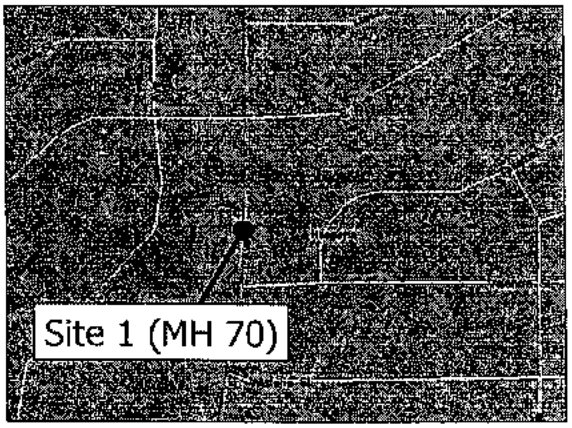
Location: Manhole 70: I Avenue, 1 manhole north of Valencia Street

Diameter: 15 inches

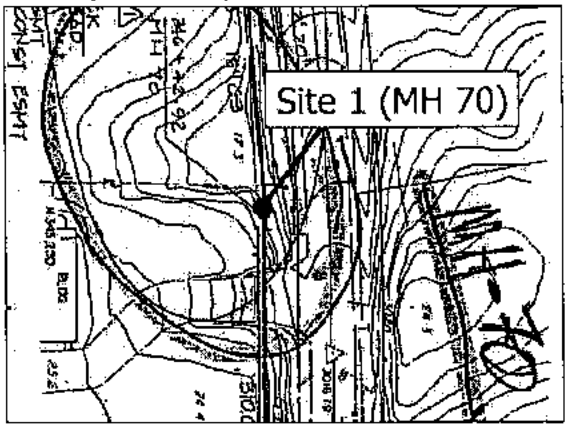
Average Dry Weather Flow: 1.216 *MGD*

Peak Measured Flow: 2.124 *MGD*

Street map:

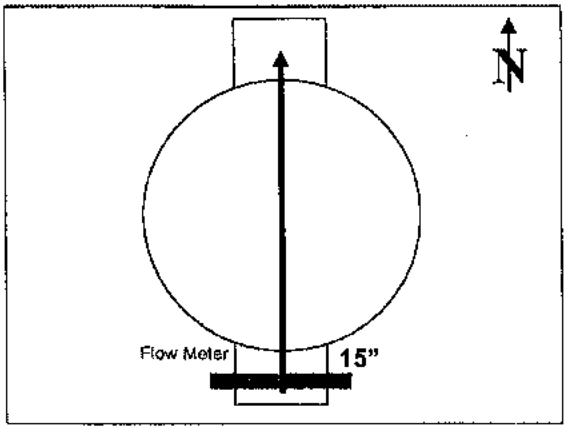


Sanitary sewer map:



Satellite Photo:

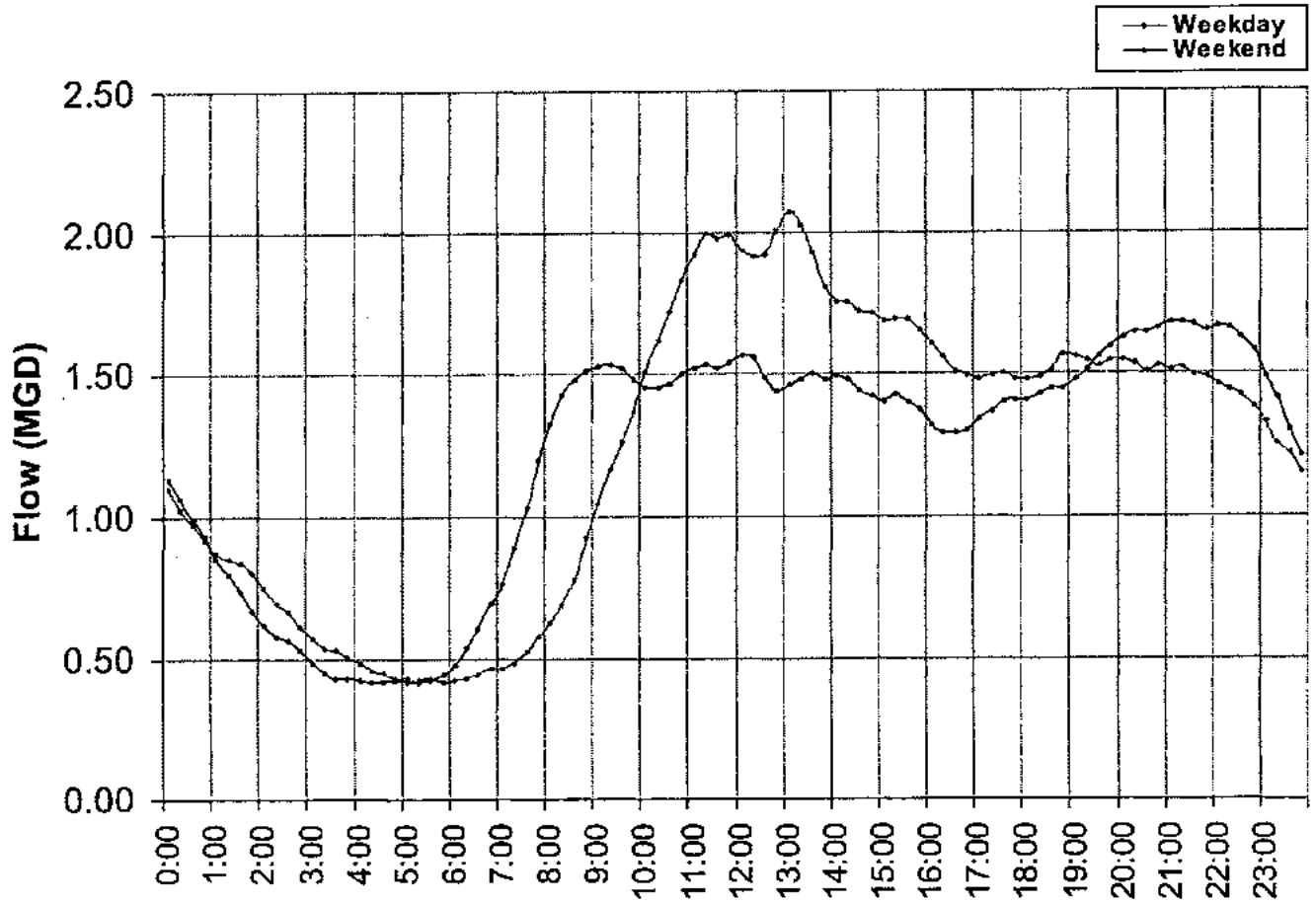
Flow sketch:



V&A

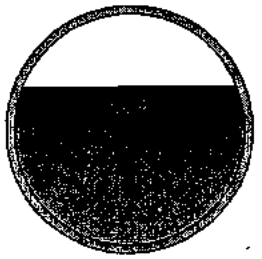
Average Dry Weather Flow

Monitoring Site:
Site 1



Peak Measured Flow:

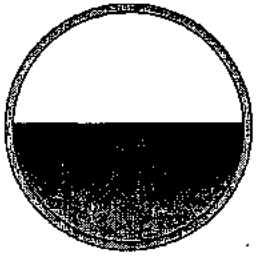
2.12 *MGD*



Peak measured flow shown in weekly graphs on following pages

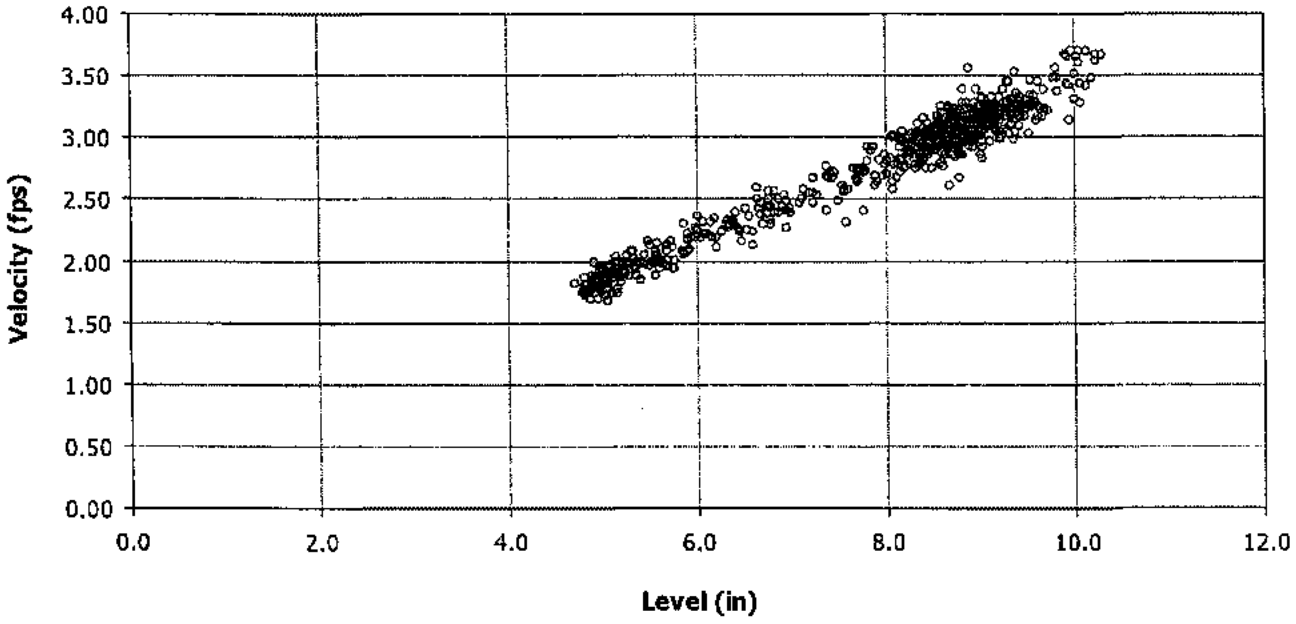
Average Dry Weather Flow:

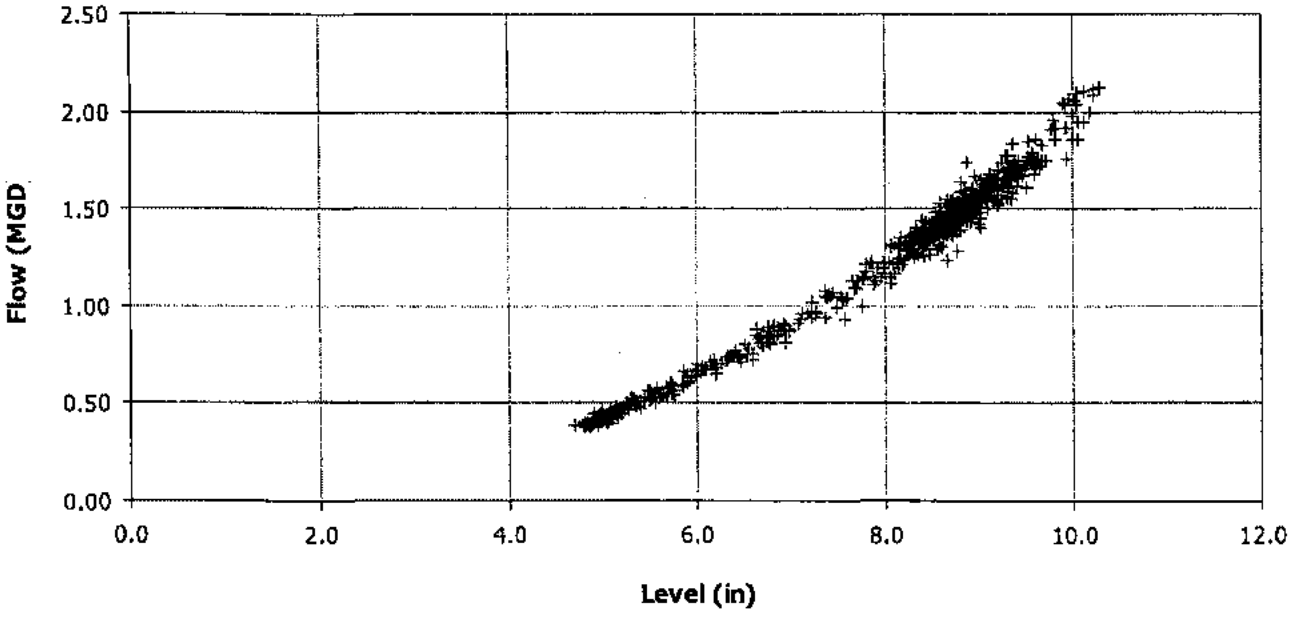
1.22 *MGD*



Scatter Plots (Flow, Velocity vs. Depth)

Monitoring Site: Site 1

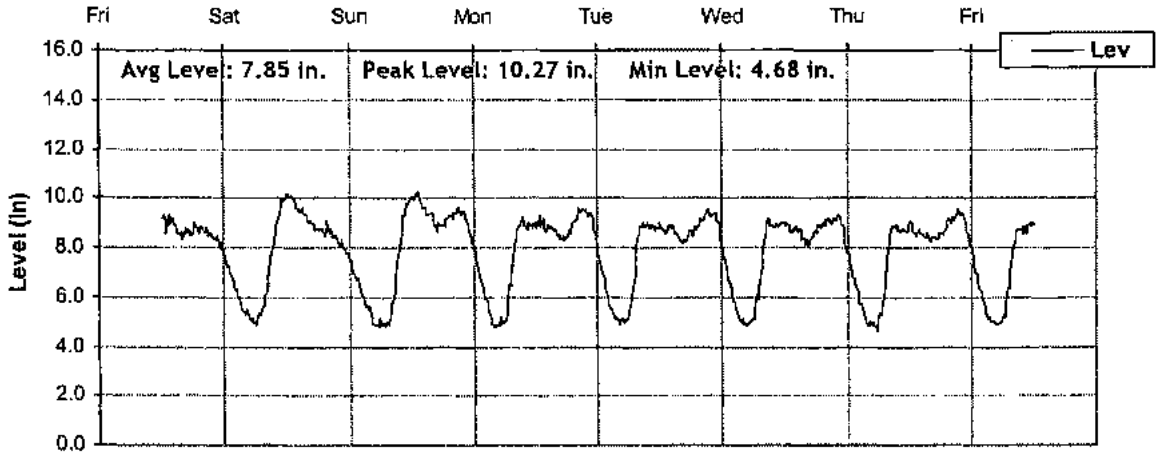


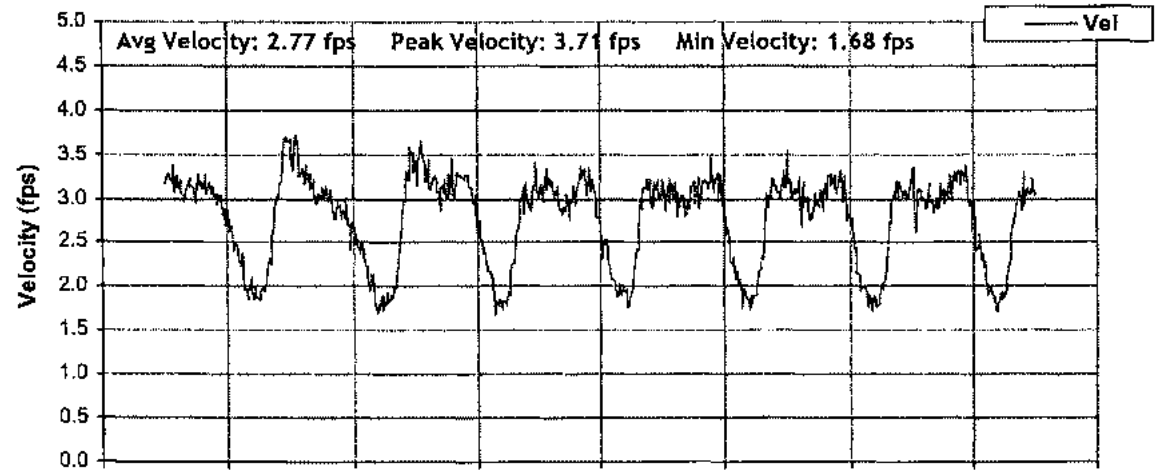


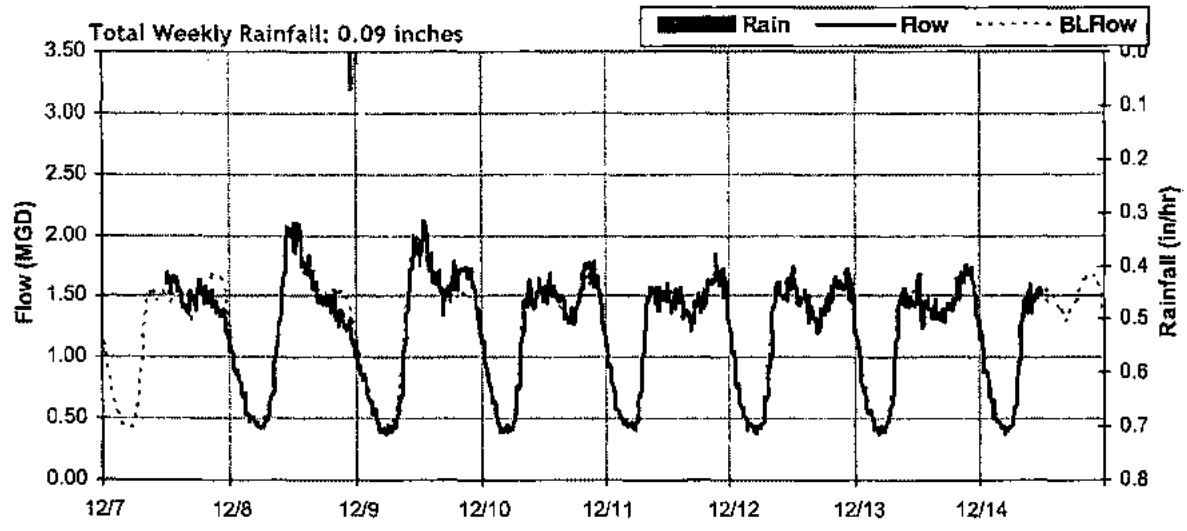
V&A

Level, Velocity and Flow
From 12/7/2007 to 12/14/2007

Monitoring Site:
Site 1







Avg Flow: 1.22 MGD Peak Flow: 2.12 MGD Min Flow: 0.38 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 12/7/2007 to 12/14/2007

Monitoring Site:

Site 1

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	7.93	2.79	1.24
Weekly Minimum:	4.85	1.75	0.40
Weekly Maximum:	10.09	3.67	2.05

	Friday 12/7/2007			Saturday 12/8/2007			Sunday 12/9/2007			Monday 12/10/2007			Tuesday 12/11/2007			Wednesday 12/12/2007			Thursday 12/13/2007			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00				7.33	2.64	1.02	7.24	2.56	0.97	7.60	2.81	1.05	7.47	2.52	0.99	7.50	2.58	1.02	7.42	2.65	1.04	0:00
1:00				6.79	2.47	0.86	6.64	2.42	0.82	6.58	2.35	0.79	6.56	2.38	0.80	6.43	2.28	0.74	6.50	2.22	0.73	1:00
2:00				6.18	2.29	0.71	6.03	2.22	0.66	5.77	2.17	0.61	5.63	2.08	0.56	5.61	2.08	0.56	5.70	1.99	0.55	2:00
3:00				5.52	1.95	0.51	5.57	2.06	0.55	5.00	1.85	0.43	5.22	1.97	0.48	5.06	1.89	0.44	5.01	1.88	0.44	3:00
4:00				5.31	2.00	0.50	4.99	1.75	0.40	4.88	1.80	0.40	5.03	1.95	0.46	4.85	1.82	0.40	4.92	1.81	0.41	4:00
5:00				5.03	1.90	0.44	4.93	1.82	0.41	5.03	1.83	0.43	5.09	1.86	0.44	5.04	1.88	0.44	4.87	1.82	0.41	5:00
6:00				5.12	1.93	0.46	4.90	1.84	0.41	5.75	2.08	0.59	5.71	2.12	0.59	5.69	2.07	0.57	5.53	2.04	0.54	6:00
7:00				5.65	2.09	0.57	5.09	1.91	0.45	7.26	2.45	0.94	7.44	2.63	1.04	7.00	2.46	0.90	7.32	2.56	0.99	7:00
8:00				6.70	2.45	0.84	6.04	2.12	0.64	8.74	2.97	1.42	8.85	3.04	1.48	8.77	3.00	1.44	8.73	3.01	1.44	8:00
9:00				8.08	2.98	1.30	7.72	2.75	1.14	9.00	2.99	1.48	8.91	3.15	1.55	8.89	3.19	1.56	8.82	3.12	1.51	9:00
10:00				9.17	3.33	1.69	9.29	3.18	1.64	8.86	2.96	1.44	8.82	3.03	1.47	8.87	3.05	1.49	8.69	3.03	1.44	10:00
11:00				9.95	3.67	2.05	9.91	3.47	1.93	8.93	3.18	1.56	8.79	3.09	1.49	9.00	3.20	1.59	8.73	3.08	1.47	11:00
12:00	9.04	3.24	1.62	10.09	3.53	2.00	10.04	3.37	1.90	8.99	3.05	1.51	8.82	3.04	1.47	8.91	3.24	1.59	8.88	3.08	1.51	12:00
13:00	9.12	3.21	1.62	9.87	3.52	1.95	10.05	3.53	2.00	8.91	3.22	1.58	8.71	3.11	1.48	8.67	3.07	1.46	8.60	3.06	1.44	13:00
14:00	8.91	3.18	1.56	9.49	3.28	1.73	9.55	3.24	1.72	8.84	3.13	1.52	8.78	3.01	1.45	8.74	3.02	1.45	8.52	2.97	1.38	14:00
15:00	8.55	3.02	1.41	9.41	3.30	1.73	9.38	3.20	1.67	8.76	3.06	1.47	8.48	3.01	1.39	8.44	3.02	1.39	8.45	3.02	1.39	15:00
16:00	8.60	3.16	1.49	9.04	3.12	1.56	8.94	3.05	1.50	8.45	2.87	1.32	8.26	2.92	1.30	8.13	2.85	1.25	8.40	2.94	1.34	16:00
17:00	8.55	3.07	1.43	8.82	3.01	1.46	8.94	3.14	1.55	8.40	2.91	1.33	8.55	3.07	1.43	8.55	2.96	1.38	8.43	2.97	1.36	17:00
18:00	8.87	3.22	1.57	8.73	3.07	1.47	9.02	3.08	1.53	8.58	3.02	1.42	8.69	3.10	1.48	8.78	2.97	1.43	8.59	3.04	1.43	18:00
19:00	8.74	3.13	1.50	8.72	3.06	1.46	9.28	3.21	1.65	9.06	3.08	1.54	8.98	3.06	1.52	8.96	3.11	1.54	8.98	3.09	1.53	19:00
20:00	8.66	3.13	1.48	8.59	2.85	1.34	9.42	3.27	1.71	9.50	3.31	1.75	9.23	3.16	1.62	9.08	3.22	1.62	9.14	3.20	1.62	20:00
21:00	8.50	3.07	1.42	8.39	2.90	1.32	9.42	3.24	1.70	9.53	3.23	1.71	9.42	3.25	1.71	9.11	3.16	1.59	9.45	3.27	1.72	21:00
22:00	8.38	2.99	1.36	8.15	2.87	1.26	9.15	3.16	1.60	9.33	3.14	1.63	9.30	3.18	1.64	9.16	3.15	1.60	9.23	3.25	1.66	22:00
23:00	8.03	2.83	1.22	7.85	2.63	1.11	8.44	3.01	1.38	8.64	2.85	1.35	8.65	3.03	1.44	8.46	2.94	1.36	8.38	2.90	1.32	23:00
Average:	8.66	3.10	1.47	7.83	2.78	1.22	7.92	2.77	1.25	7.93	2.75	1.22	7.89	2.78	1.22	7.82	2.76	1.20	7.80	2.75	1.19	Ave
Minimum:	8.03	2.83	1.22	5.03	1.90	0.44	4.90	1.75	0.40	4.88	1.80	0.40	5.03	1.86	0.44	4.85	1.82	0.40	4.87	1.81	0.41	Min
Maximum:	9.12	3.24	1.62	10.09	3.67	2.05	10.05	3.53	2.00	9.53	3.31	1.75	9.42	3.25	1.71	9.16	3.24	1.62	9.45	3.27	1.72	Max

Hourly Data: Depth, Velocity and Flow

From 12/14/2007 to 12/15/2007

Monitoring Site:

Site 1

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	6.87	2.47	0.93
Weekly Minimum:	4.96	1.81	0.41
Weekly Maximum:	8.94	3.12	1.54

	Friday 12/14/2007			Saturday 12/15/2007			Sunday 12/16/2007			Monday 12/17/2007			Tuesday 12/18/2007			Wednesday 12/19/2007			Thursday 12/20/2007			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	7.52	2.65	1.06																			
1:00	6.52	2.43	0.81																			
2:00	5.66	2.10	0.58																			
3:00	5.08	1.95	0.46																			
4:00	4.96	1.81	0.41																			
5:00	4.96	1.89	0.43																			
6:00	5.57	2.04	0.55																			
7:00	7.13	2.59	0.97																			
8:00	8.60	3.00	1.41																			
9:00	8.71	3.03	1.45																			
10:00	8.81	3.08	1.49																			
11:00	8.94	3.12	1.54																			
12:00																						
13:00																						
14:00																						
15:00																						
16:00																						
17:00																						
18:00																						
19:00																						
20:00																						
21:00																						
22:00																						
23:00																						
Average:	6.87	2.47	0.93																			Ave
Minimum:	4.96	1.81	0.41																			Min
Maximum:	8.94	3.12	1.54																			Max

Temporary Flow Monitoring Study

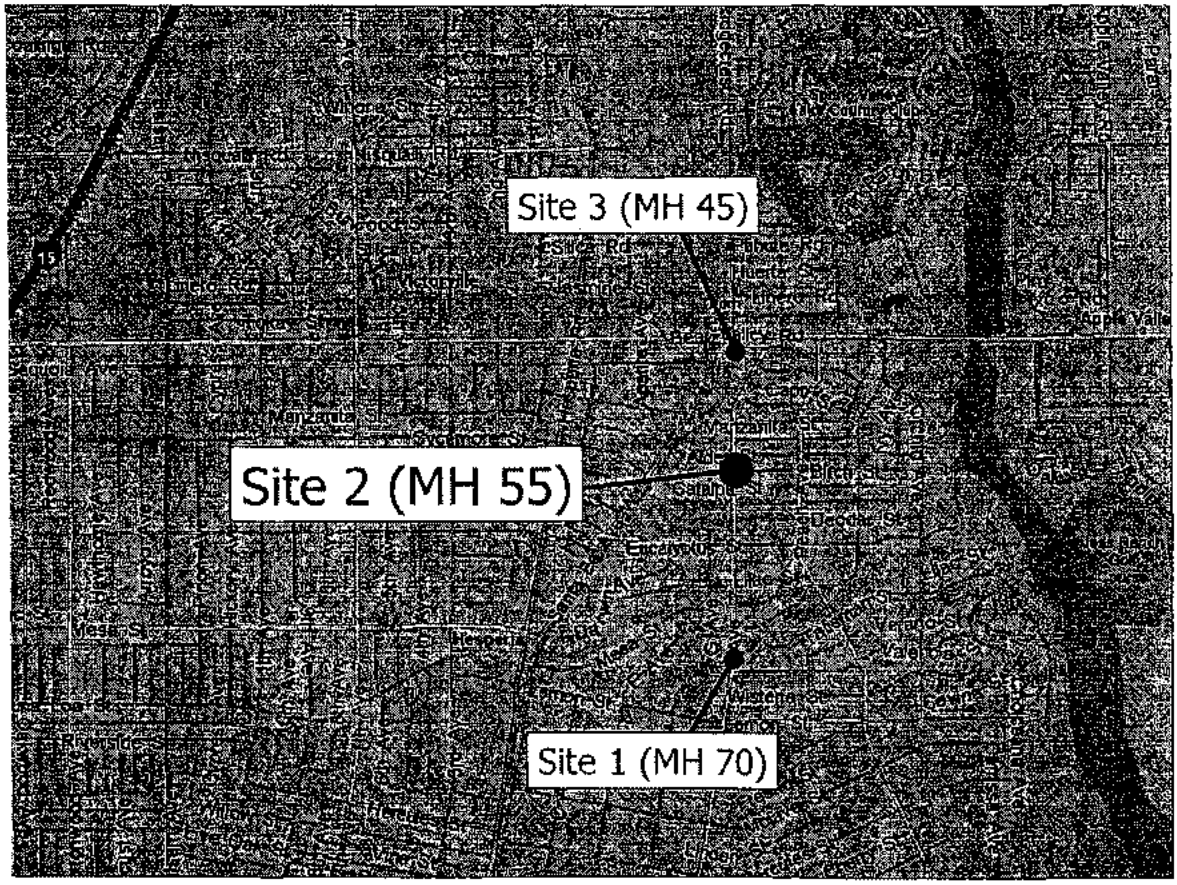
Sanitary Sewer Collection System

Monitoring Site: Site 2

Manhole Address: Manhole 55: Intersection of I Avenue and Birch Street

Size/Type of Line: 18-inch Pipe

Data Summary Report



V&A

	Site Information Report	**Monitoring Site:** Site 2

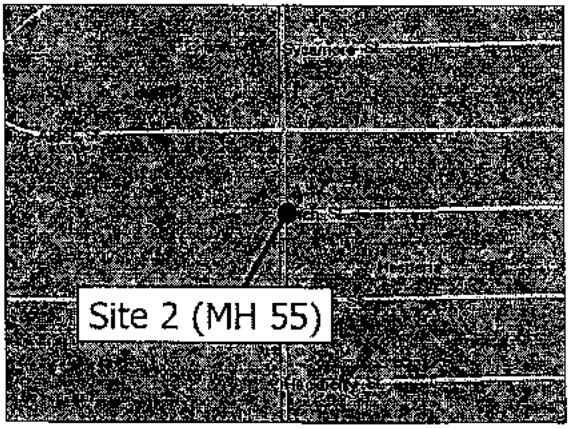
Location: Manhole 55: Intersection of I Avenue and Birch Street

Diameter: 18 inches

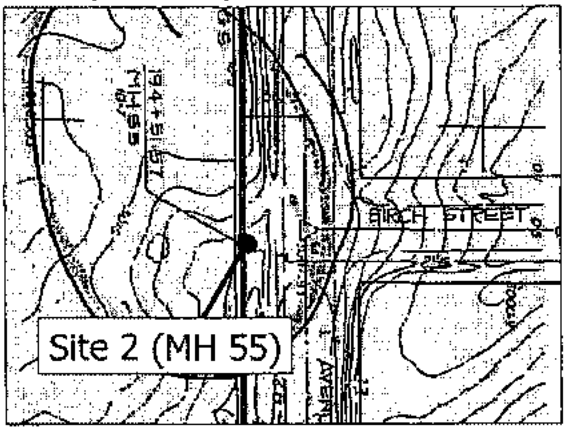
Average Dry Weather Flow: 1.242 *MGD*

Peak Measured Flow: 2.096 *MGD*

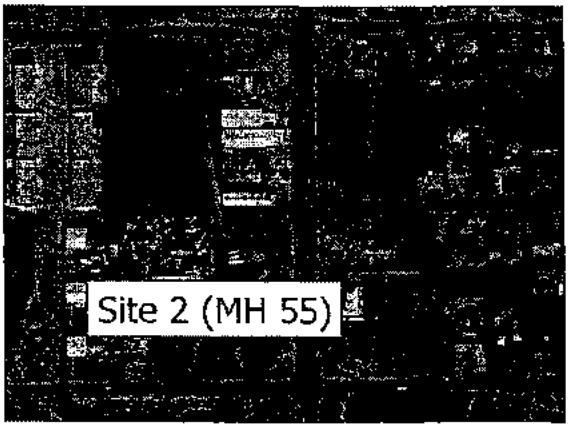
Street map:



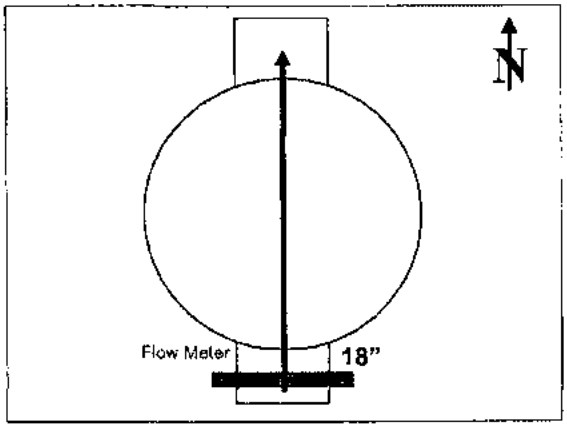
Sanitary sewer map:



Satellite Photo:



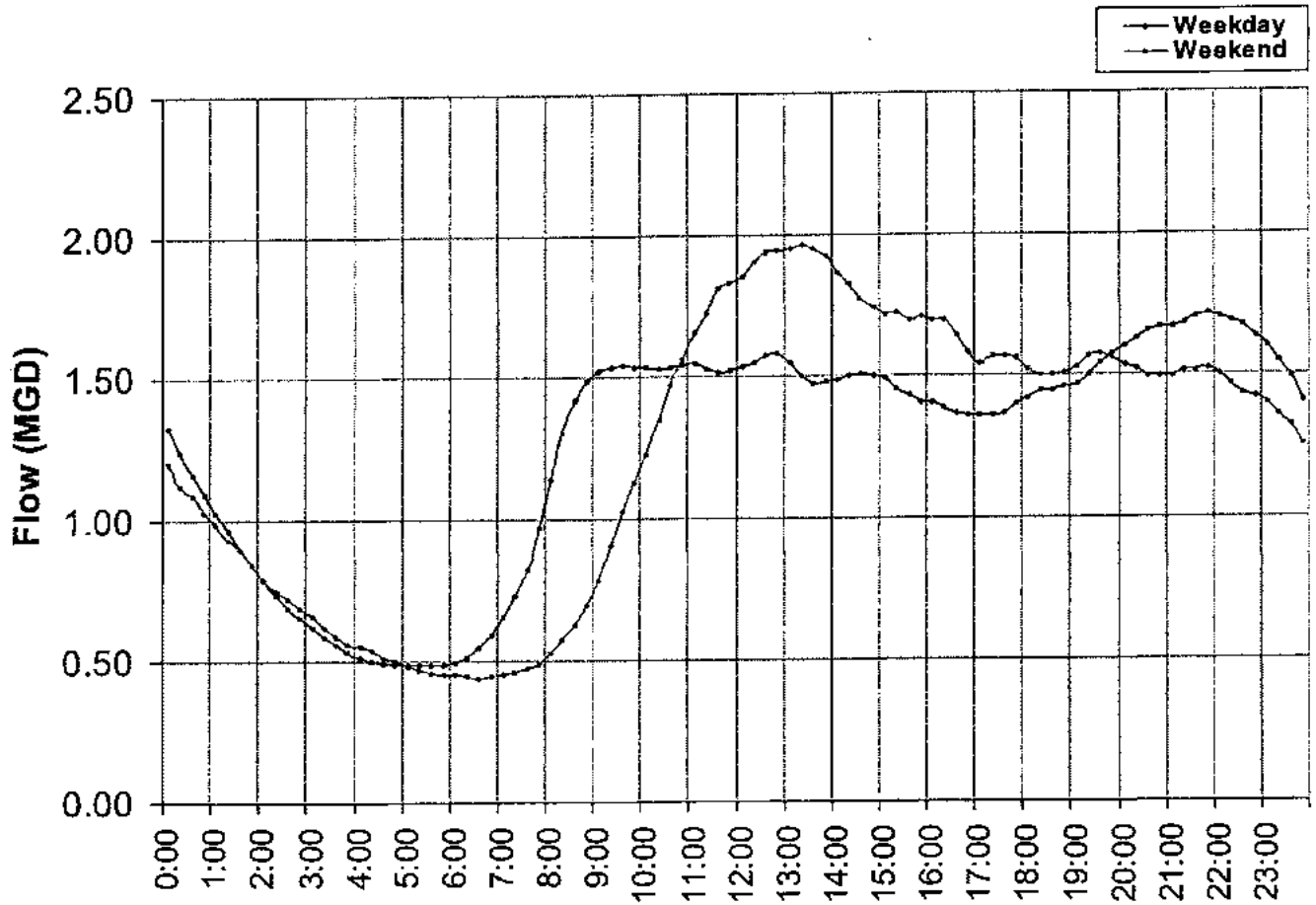
Flow sketch:



V&A

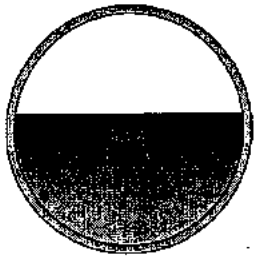
Average Dry Weather Flow

Monitoring Site:
Site 2



Peak Measured Flow:

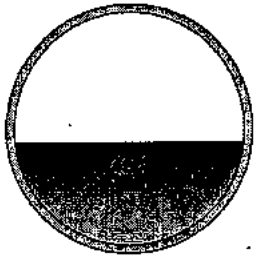
2.10 *MGD*



Peak measured flow shown in weekly graphs on following pages

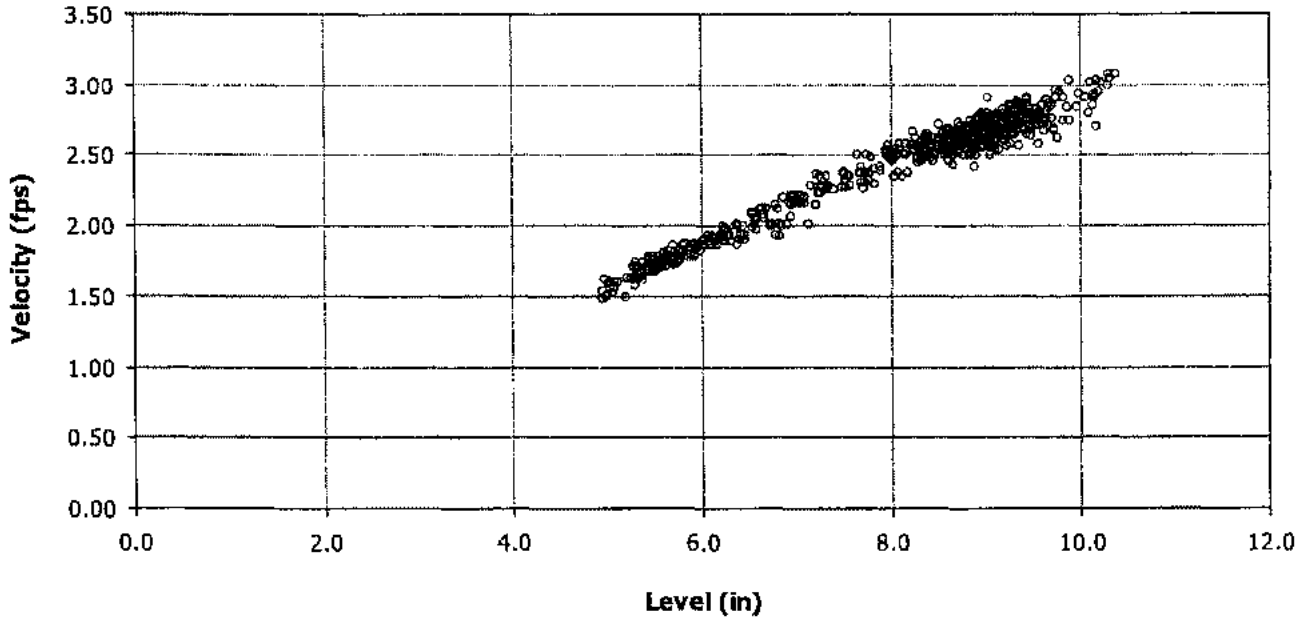
Average Dry Weather Flow:

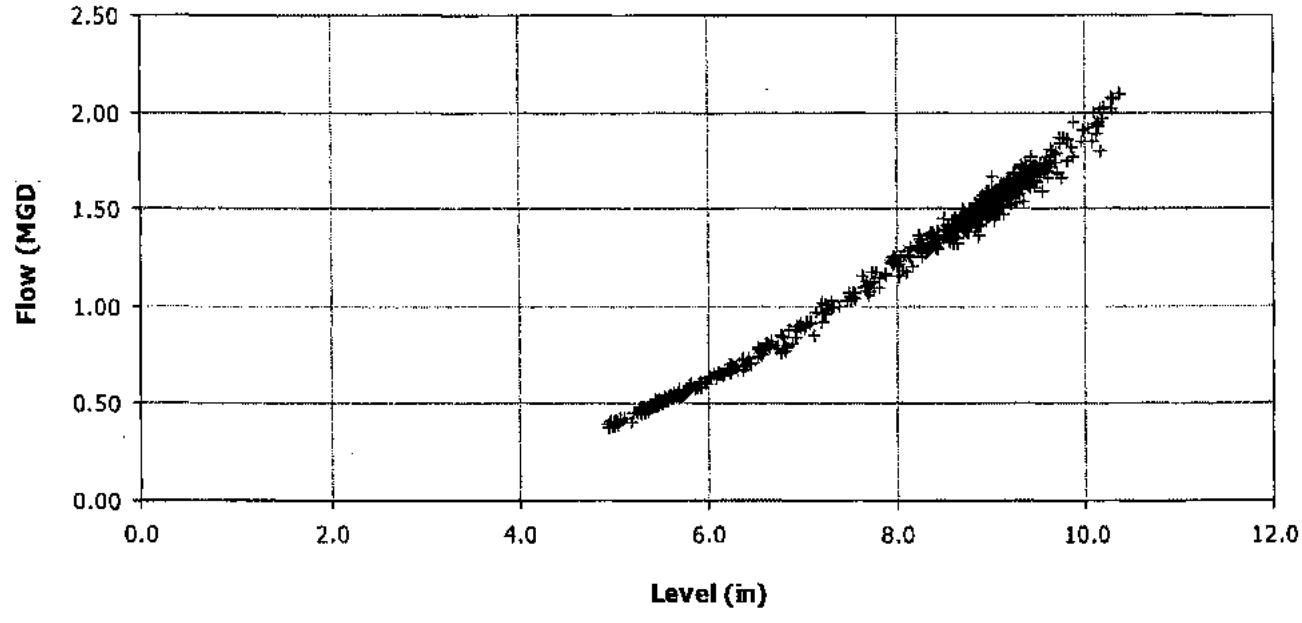
1.24 *MGD*



V&A

	Scatter Plots (Flow, Velocity vs. Depth)	**Monitoring Site:** Site 2

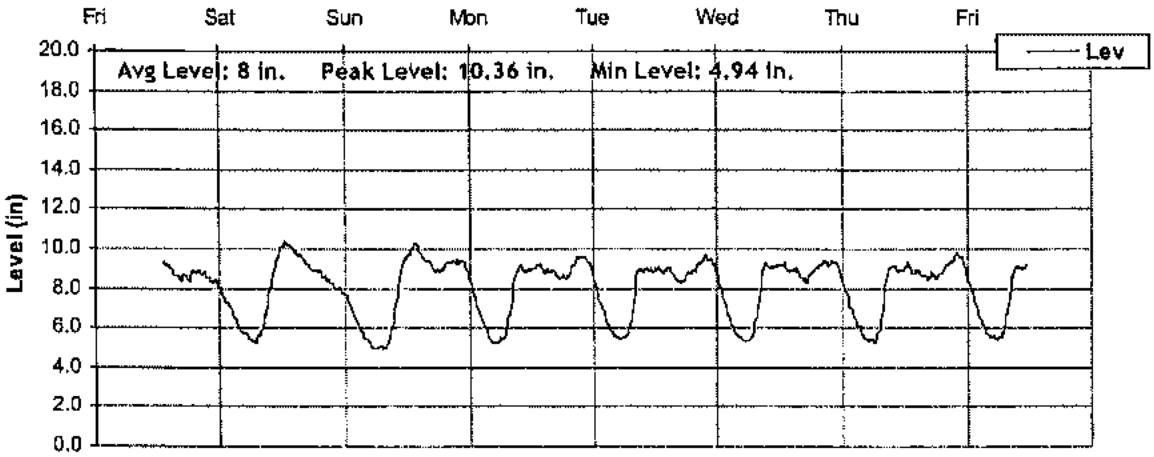


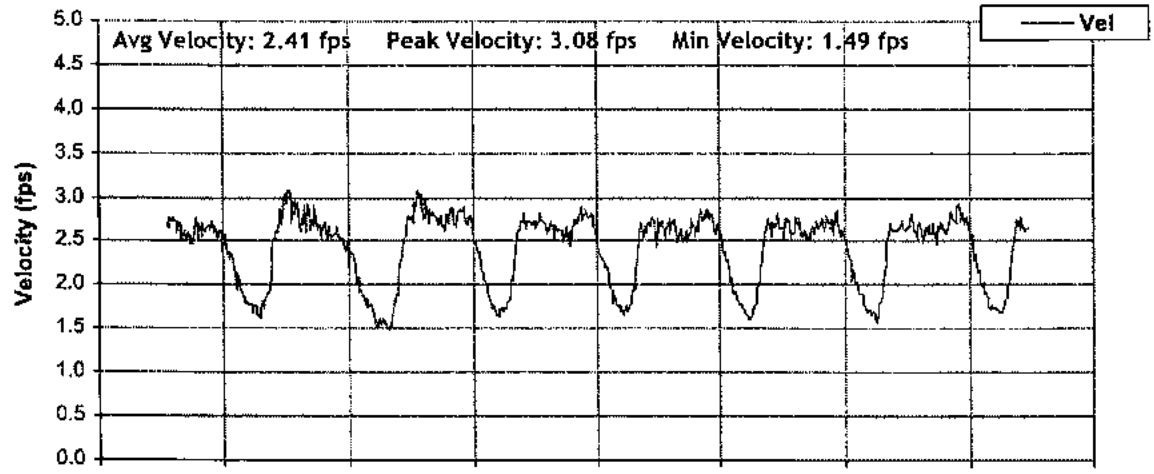


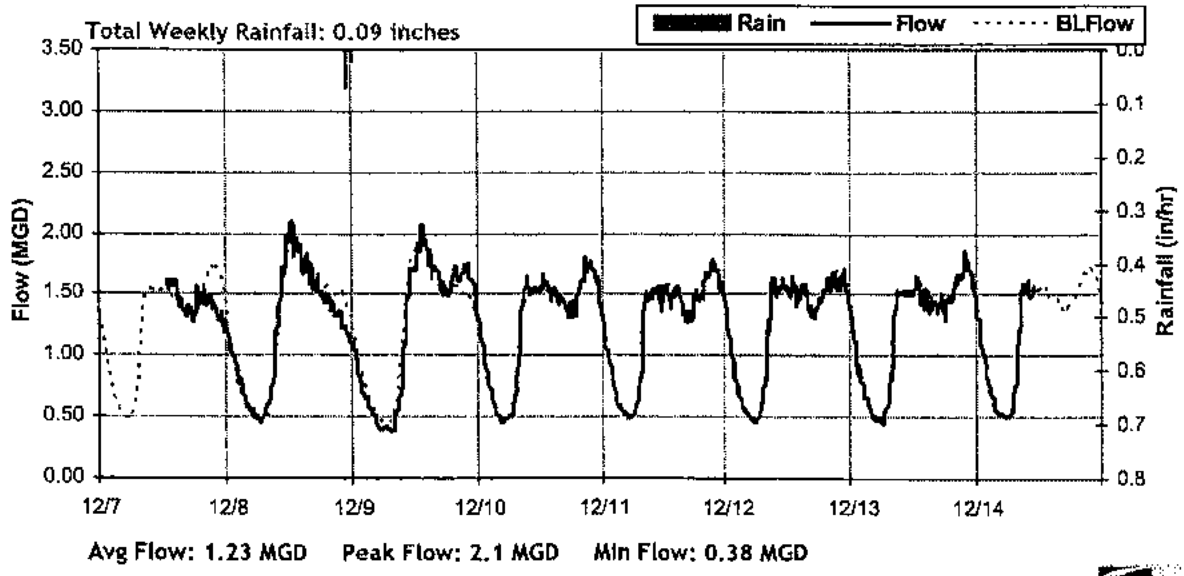
V&A

Level, Velocity and Flow
From 12/7/2007 to 12/14/2007

Monitoring Site:
Site 2







Avg Flow: 1.23 MGD Peak Flow: 2.1 MGD Min Flow: 0.38 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 12/7/2007 to 12/14/2007

Monitoring Site:

Site 2

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	8.06	2.43	1.25
Weekly Minimum:	5.00	1.51	0.39
Weekly Maximum:	10.24	3.02	2.03

	Friday 12/7/2007			Saturday 12/8/2007			Sunday 12/9/2007			Monday 12/10/2007			Tuesday 12/11/2007			Wednesday 12/12/2007			Thursday 12/13/2007			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00				7.69	2.45	1.14	7.54	2.35	1.06	8.03	2.47	1.22	7.95	2.38	1.16	8.14	2.48	1.25	7.95	2.43	1.18	0:00
1:00				7.19	2.29	0.97	6.80	2.13	0.84	7.11	2.26	0.95	7.13	2.23	0.94	7.17	2.19	0.93	7.13	2.12	0.89	1:00
2:00				6.73	2.08	0.81	6.22	1.91	0.67	6.36	2.00	0.72	6.34	2.01	0.72	6.34	1.96	0.70	6.44	1.95	0.72	2:00
3:00				6.13	1.90	0.65	5.65	1.79	0.55	5.70	1.78	0.55	5.78	1.81	0.57	5.74	1.81	0.57	5.92	1.83	0.60	3:00
4:00				5.73	1.81	0.56	5.31	1.72	0.49	5.26	1.67	0.46	5.55	1.74	0.52	5.47	1.72	0.51	5.44	1.70	0.49	4:00
5:00				5.53	1.75	0.52	5.00	1.57	0.41	5.35	1.73	0.49	5.51	1.71	0.51	5.34	1.64	0.46	5.39	1.67	0.48	5:00
6:00				5.31	1.67	0.47	5.02	1.58	0.41	5.48	1.77	0.52	5.71	1.78	0.55	5.54	1.73	0.52	5.58	1.72	0.52	6:00
7:00				5.63	1.77	0.54	5.00	1.51	0.39	6.55	2.05	0.77	6.64	2.09	0.80	6.55	2.05	0.77	6.54	2.03	0.77	7:00
8:00				6.35	1.91	0.69	5.55	1.68	0.51	8.29	2.58	1.32	8.64	2.60	1.41	8.29	2.49	1.29	8.58	2.61	1.40	8:00
9:00				7.69	2.42	1.13	6.70	2.02	0.79	9.06	2.74	1.58	8.96	2.61	1.48	9.21	2.68	1.58	9.09	2.62	1.51	9:00
10:00				8.92	2.72	1.54	8.41	2.45	1.29	8.89	2.71	1.52	8.97	2.71	1.54	9.09	2.70	1.56	8.97	2.66	1.51	10:00
11:00				9.89	2.87	1.85	9.46	2.75	1.67	9.00	2.69	1.53	8.96	2.66	1.51	9.18	2.70	1.58	8.95	2.65	1.50	11:00
12:00				10.24	3.02	2.03	9.83	2.82	1.80	9.08	2.74	1.58	9.00	2.68	1.53	9.18	2.67	1.56	9.19	2.72	1.60	12:00
13:00	9.19	2.71	1.59	10.13	2.85	1.89	10.21	2.99	2.00	9.13	2.73	1.58	8.83	2.62	1.46	8.94	2.64	1.49	8.80	2.61	1.45	13:00
14:00	9.05	2.75	1.58	9.86	2.81	1.80	9.77	2.88	1.83	8.89	2.64	1.48	9.00	2.69	1.53	8.96	2.67	1.51	8.88	2.66	1.49	14:00
15:00	8.61	2.62	1.41	9.65	2.74	1.71	9.45	2.80	1.70	8.84	2.64	1.47	8.69	2.61	1.43	8.83	2.65	1.48	8.64	2.60	1.41	15:00
16:00	8.50	2.57	1.36	9.35	2.78	1.66	9.27	2.79	1.66	8.75	2.62	1.44	8.37	2.54	1.32	8.48	2.57	1.36	8.54	2.61	1.39	16:00
17:00	8.53	2.52	1.34	9.03	2.77	1.59	8.91	2.74	1.54	8.53	2.57	1.37	8.42	2.56	1.34	8.48	2.59	1.37	8.62	2.59	1.40	17:00
18:00	8.70	2.63	1.44	8.89	2.64	1.48	8.94	2.69	1.52	8.53	2.55	1.36	8.76	2.67	1.47	8.93	2.65	1.49	8.71	2.68	1.46	18:00
19:00	8.83	2.65	1.48	8.76	2.67	1.47	9.27	2.78	1.65	8.97	2.70	1.53	8.93	2.63	1.49	9.15	2.72	1.58	8.96	2.63	1.49	19:00
20:00	8.72	2.63	1.44	8.49	2.59	1.37	9.37	2.74	1.64	9.41	2.80	1.69	9.27	2.79	1.65	9.29	2.70	1.61	9.28	2.76	1.64	20:00
21:00	8.58	2.67	1.43	8.29	2.60	1.34	9.33	2.84	1.70	9.57	2.80	1.73	9.54	2.81	1.73	9.26	2.68	1.58	9.56	2.81	1.73	21:00
22:00	8.34	2.58	1.33	8.01	2.55	1.25	9.39	2.77	1.67	9.46	2.78	1.69	9.42	2.74	1.66	9.34	2.77	1.66	9.63	2.77	1.72	22:00
23:00	8.21	2.56	1.30	7.86	2.44	1.17	8.84	2.73	1.53	9.02	2.66	1.52	9.07	2.63	1.52	8.97	2.59	1.47	9.01	2.71	1.55	23:00
Average:	8.66	2.62	1.43	7.97	2.42	1.23	7.88	2.38	1.22	8.05	2.44	1.25	8.06	2.43	1.24	8.08	2.42	1.25	8.07	2.42	1.25	Ave
Minimum:	8.21	2.52	1.30	5.31	1.67	0.47	5.00	1.51	0.39	5.26	1.67	0.46	5.51	1.71	0.51	5.34	1.64	0.46	5.39	1.67	0.48	Min
Maximum:	9.19	2.75	1.59	10.24	3.02	2.03	10.21	2.99	2.00	9.57	2.80	1.73	9.54	2.81	1.73	9.34	2.77	1.66	9.63	2.81	1.73	Max

V&A

Hourly Data: Depth, Velocity and Flow

From 12/14/2007 to 12/15/2007

Monitoring Site:

Site 2

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	7.24	2.19	0.99
Weekly Minimum:	5.50	1.71	0.51
Weekly Maximum:	9.22	2.71	1.57

	Friday 12/14/2007			Saturday 12/15/2007			Sunday 12/16/2007			Monday 12/17/2007			Tuesday 12/18/2007			Wednesday 12/19/2007			Thursday 12/20/2007			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	8.12	2.48	1.24																			
1:00	7.26	2.23	0.96																			
2:00	6.47	1.98	0.73																			
3:00	5.87	1.81	0.59																			
4:00	5.59	1.75	0.53																			
5:00	5.50	1.71	0.51																			
6:00	5.63	1.74	0.53																			
7:00	6.69	2.03	0.79																			
8:00	8.47	2.55	1.35																			
9:00	9.08	2.71	1.56																			
10:00	9.00	2.64	1.51																			
11:00	9.22	2.66	1.57																			
12:00																						
13:00																						
14:00																						
15:00																						
16:00																						
17:00																						
18:00																						
19:00																						
20:00																						
21:00																						
22:00																						
23:00																						
Average:	7.24	2.19	0.99																			Ave
Minimum:	5.50	1.71	0.51																			Min
Maximum:	9.22	2.71	1.57																			Max

Temporary Flow Monitoring Study

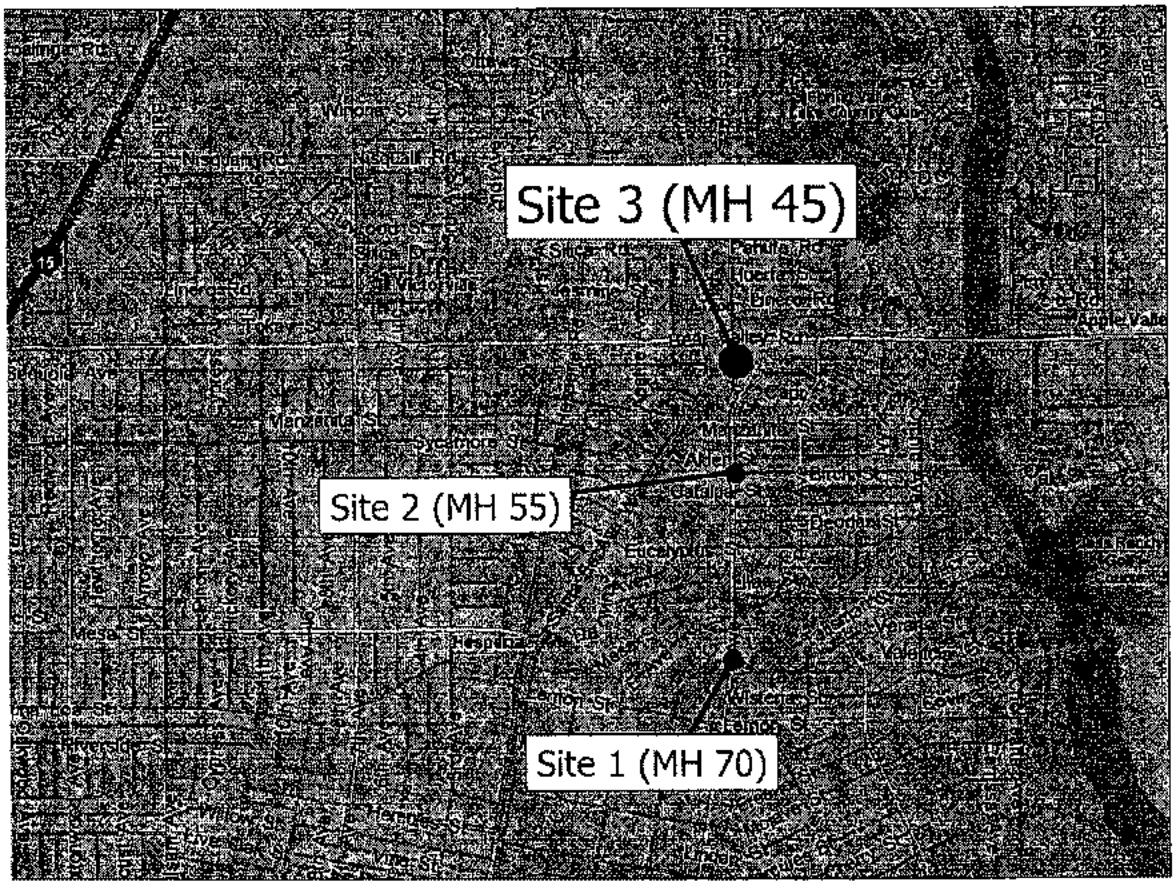
Sanitary Sewer Collection System

Monitoring Site: Site 3

Manhole Address: Manhole 45: Off the public right of way, west of I Avenue and south of Bear Valley Road

Size/Type of Line: 18-inch Pipe

Data Summary Report



V&A

	Site Information Report	**Monitoring Site:** Site 3

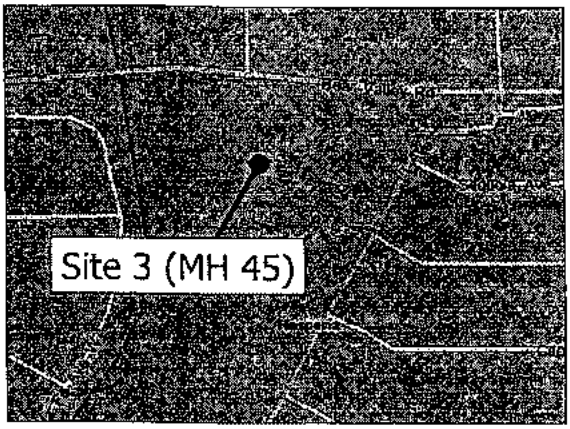
Location: Manhole 45: Off the public right of way, west of I Avenue and south of Bear Valley Road

Diameter: 18 inches

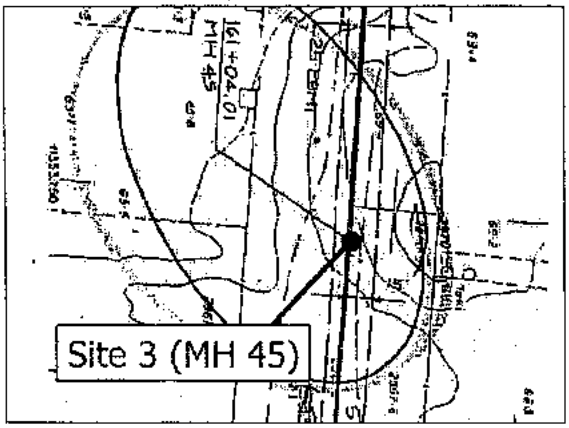
Average Dry Weather Flow: 1.359 *MGD*

Peak Measured Flow: 2.098 *MGD*

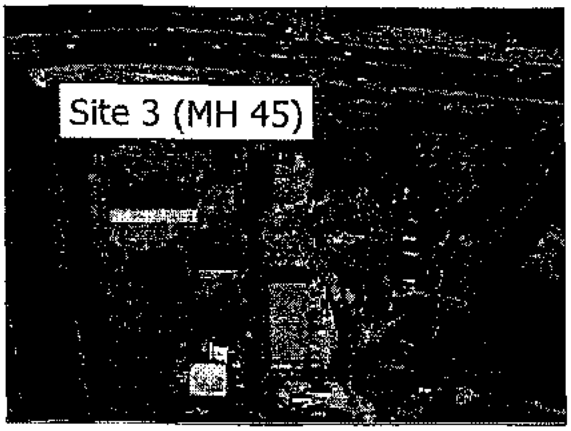
Street map:



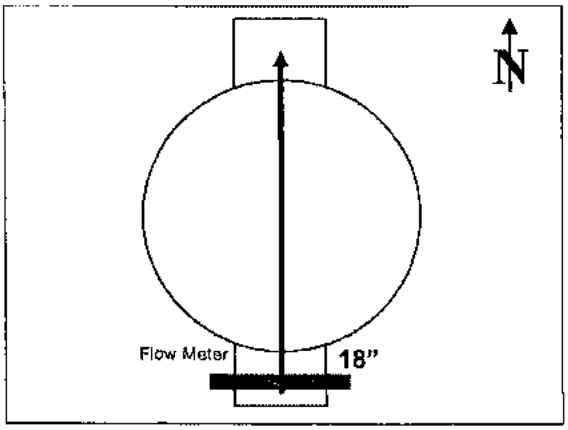
Sanitary sewer map:



Satellite Photo:



Flow sketch:



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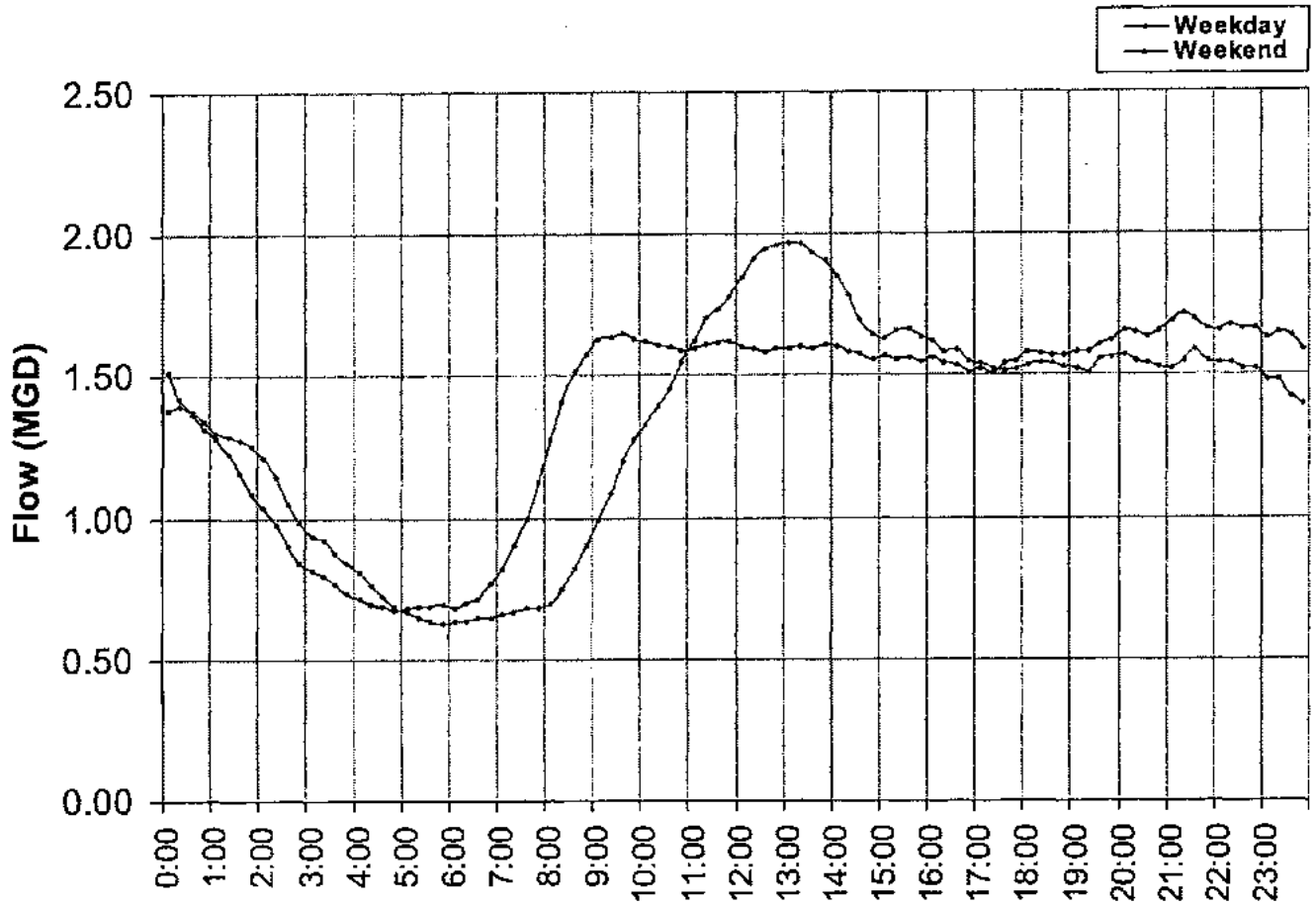
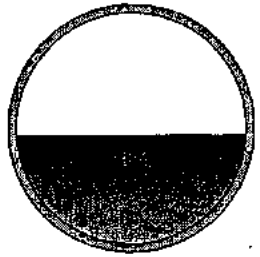
Average Dry Weather Flow

Monitoring Site:
Site 3



Peak Measured Flow:

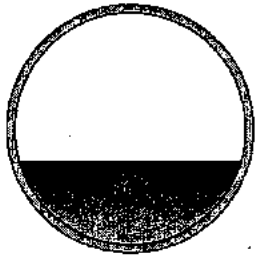
2.10 *MGD*



Peak measured flow shown in weekly graphs on following pages

Average Dry Weather Flow:

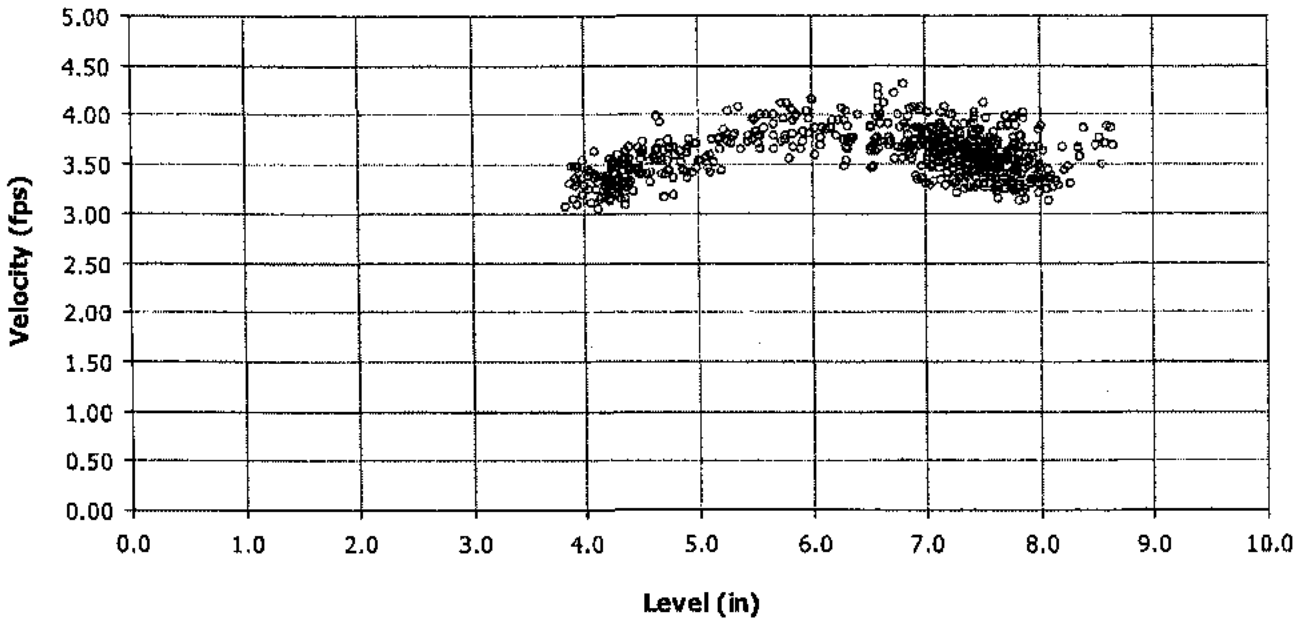
1.36 *MGD*

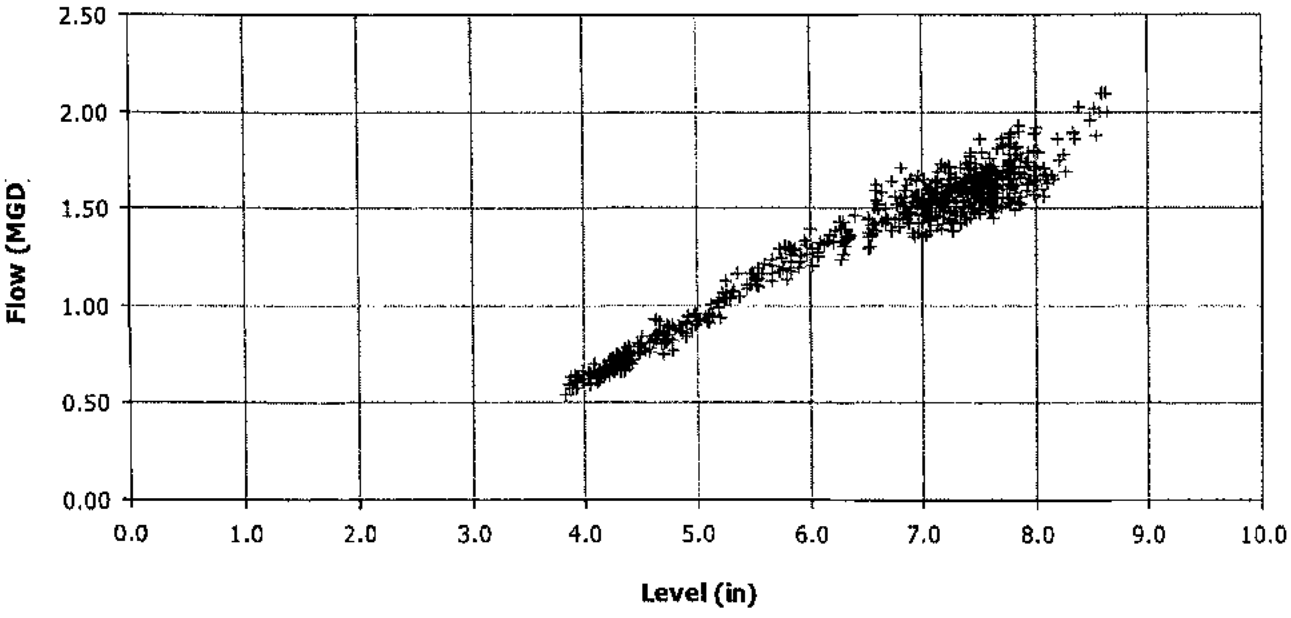


V&A

Scatter Plots (Flow, Velocity vs. Depth)

Monitoring Site:
Site 3

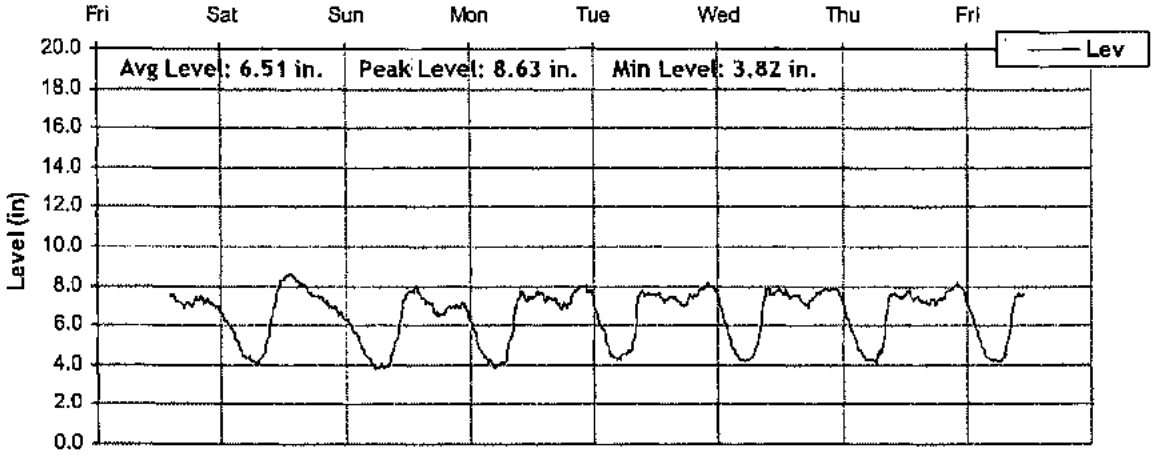


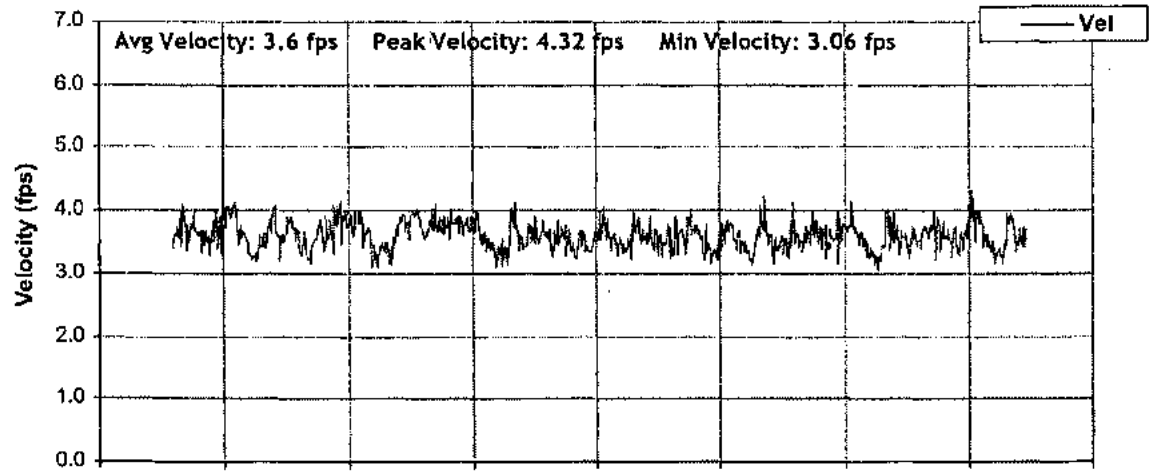


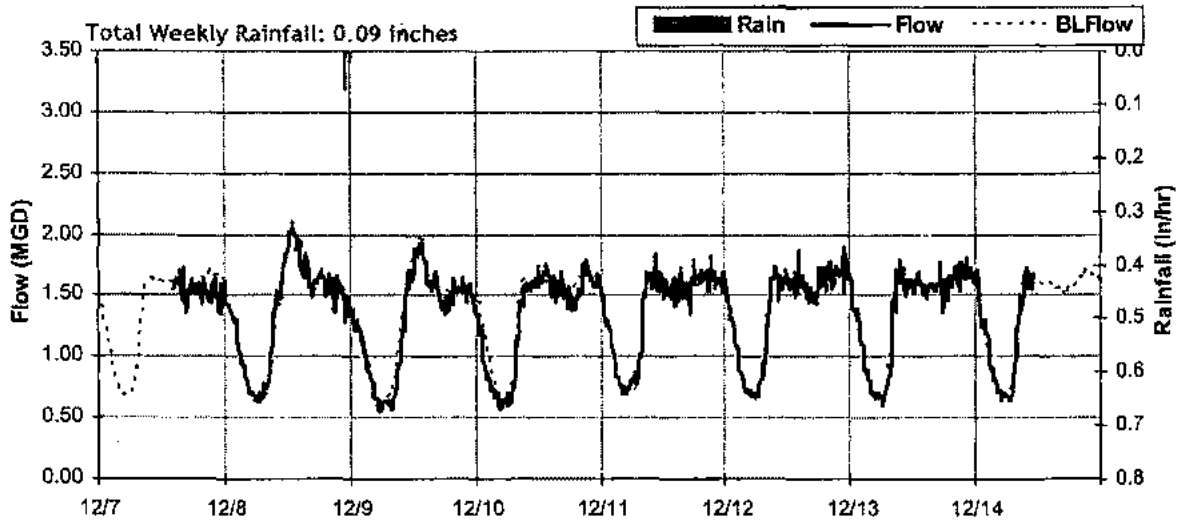
V&A

Level, Velocity and Flow
From 12/7/2007 to 12/14/2007

Monitoring Site:
Site 3







Avg Flow: 1.35 MGD Peak Flow: 2.1 MGD Min Flow: 0.55 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 12/7/2007 to 12/14/2007

Monitoring Site:

Site 3

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	6.57	3.60	1.37
Weekly Minimum:	3.91	3.17	0.60
Weekly Maximum:	8.58	3.98	2.01

	Friday 12/7/2007			Saturday 12/8/2007			Sunday 12/9/2007			Monday 12/10/2007			Tuesday 12/11/2007			Wednesday 12/12/2007			Thursday 12/13/2007			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00				6.43	3.91	1.43	6.22	3.77	1.32	5.97	3.83	1.27	6.65	3.69	1.42	6.93	3.58	1.45	6.66	3.72	1.43	0:00
1:00				6.00	3.98	1.32	5.76	3.93	1.24	5.15	3.70	1.00	5.88	3.84	1.24	6.00	3.74	1.25	5.92	3.83	1.26	1:00
2:00				5.51	3.79	1.13	5.32	3.73	1.06	4.55	3.47	0.79	5.19	3.60	0.98	5.15	3.65	0.98	5.23	3.59	0.99	2:00
3:00				4.96	3.65	0.94	4.70	3.66	0.87	4.21	3.45	0.70	4.51	3.55	0.80	4.56	3.50	0.80	4.67	3.55	0.83	3:00
4:00				4.43	3.49	0.76	4.33	3.40	0.72	4.00	3.29	0.62	4.33	3.46	0.73	4.28	3.47	0.72	4.27	3.31	0.69	4:00
5:00				4.32	3.27	0.69	3.94	3.25	0.60	3.99	3.35	0.63	4.48	3.37	0.75	4.26	3.30	0.68	4.26	3.30	0.68	5:00
6:00				4.13	3.35	0.66	3.92	3.41	0.63	4.09	3.30	0.64	4.68	3.47	0.82	4.42	3.31	0.72	4.32	3.17	0.67	6:00
7:00				4.26	3.49	0.72	3.91	3.36	0.61	4.92	3.77	0.96	5.08	3.79	1.00	5.00	3.74	0.97	4.92	3.51	0.89	7:00
8:00				4.83	3.67	0.91	4.16	3.36	0.67	6.51	3.73	1.38	7.06	3.69	1.53	6.53	3.84	1.44	6.72	3.81	1.48	8:00
9:00				6.09	3.90	1.33	4.98	3.68	0.95	7.48	3.49	1.57	7.62	3.54	1.63	7.81	3.56	1.69	7.58	3.66	1.67	9:00
10:00				7.22	3.52	1.50	6.15	3.90	1.35	7.45	3.55	1.58	7.61	3.61	1.66	7.63	3.40	1.57	7.53	3.58	1.62	10:00
11:00				8.13	3.57	1.79	7.38	3.71	1.63	7.41	3.62	1.60	7.57	3.50	1.60	7.76	3.46	1.63	7.47	3.59	1.61	11:00
12:00				8.46	3.80	2.01	7.73	3.94	1.85	7.54	3.62	1.64	7.56	3.49	1.59	7.66	3.47	1.61	7.68	3.36	1.56	12:00
13:00				8.58	3.71	1.99	7.89	3.94	1.90	7.64	3.70	1.71	7.27	3.56	1.53	7.57	3.44	1.57	7.42	3.60	1.60	13:00
14:00	7.51	3.54	1.60	8.32	3.53	1.82	7.57	3.66	1.67	7.39	3.61	1.60	7.40	3.41	1.51	7.50	3.75	1.69	7.41	3.49	1.55	14:00
15:00	7.23	3.68	1.58	8.13	3.42	1.71	7.24	3.72	1.60	7.38	3.47	1.53	7.42	3.54	1.57	7.47	3.51	1.57	7.22	3.71	1.59	15:00
16:00	7.03	3.77	1.56	7.90	3.22	1.55	7.10	3.87	1.62	7.26	3.59	1.55	7.15	3.63	1.54	7.14	3.55	1.50	7.17	3.67	1.55	16:00
17:00	7.16	3.67	1.55	7.58	3.53	1.61	6.61	3.76	1.43	6.96	3.67	1.50	7.07	3.67	1.53	7.06	3.70	1.54	7.26	3.63	1.57	17:00
18:00	7.12	3.73	1.56	7.46	3.74	1.67	6.56	3.73	1.41	7.01	3.49	1.43	7.45	3.78	1.69	7.42	3.64	1.62	7.26	3.65	1.57	18:00
19:00	7.33	3.58	1.56	7.37	3.60	1.58	6.85	3.80	1.51	7.33	3.38	1.47	7.48	3.69	1.65	7.65	3.57	1.65	7.43	3.63	1.61	19:00
20:00	7.25	3.54	1.52	7.09	3.67	1.53	6.94	3.82	1.55	7.77	3.46	1.63	7.80	3.43	1.62	7.82	3.53	1.68	7.79	3.48	1.65	20:00
21:00	7.25	3.53	1.52	6.94	3.80	1.54	7.02	3.82	1.58	7.94	3.50	1.70	7.98	3.49	1.70	7.78	3.55	1.68	7.93	3.57	1.73	21:00
22:00	7.00	3.63	1.49	6.72	3.83	1.49	7.00	3.74	1.54	7.86	3.36	1.61	7.99	3.30	1.61	7.87	3.55	1.70	8.04	3.44	1.70	22:00
23:00	6.86	3.80	1.52	6.50	3.90	1.45	6.68	3.79	1.46	7.62	3.54	1.63	7.76	3.42	1.61	7.59	3.71	1.70	7.63	3.61	1.66	23:00
Average:	7.17	3.65	1.55	6.56	3.64	1.38	6.08	3.70	1.28	6.48	3.54	1.32	6.71	3.56	1.39	6.70	3.56	1.39	6.66	3.56	1.38	Ave
Minimum:	6.86	3.53	1.49	4.13	3.22	0.66	3.91	3.25	0.60	3.99	3.29	0.62	4.33	3.30	0.73	4.26	3.30	0.68	4.26	3.17	0.67	Min
Maximum:	7.51	3.80	1.60	8.58	3.98	2.01	7.89	3.94	1.90	7.94	3.83	1.71	7.99	3.84	1.70	7.87	3.84	1.70	8.04	3.83	1.73	Max

V&A

Hourly Data: Depth, Velocity and Flow

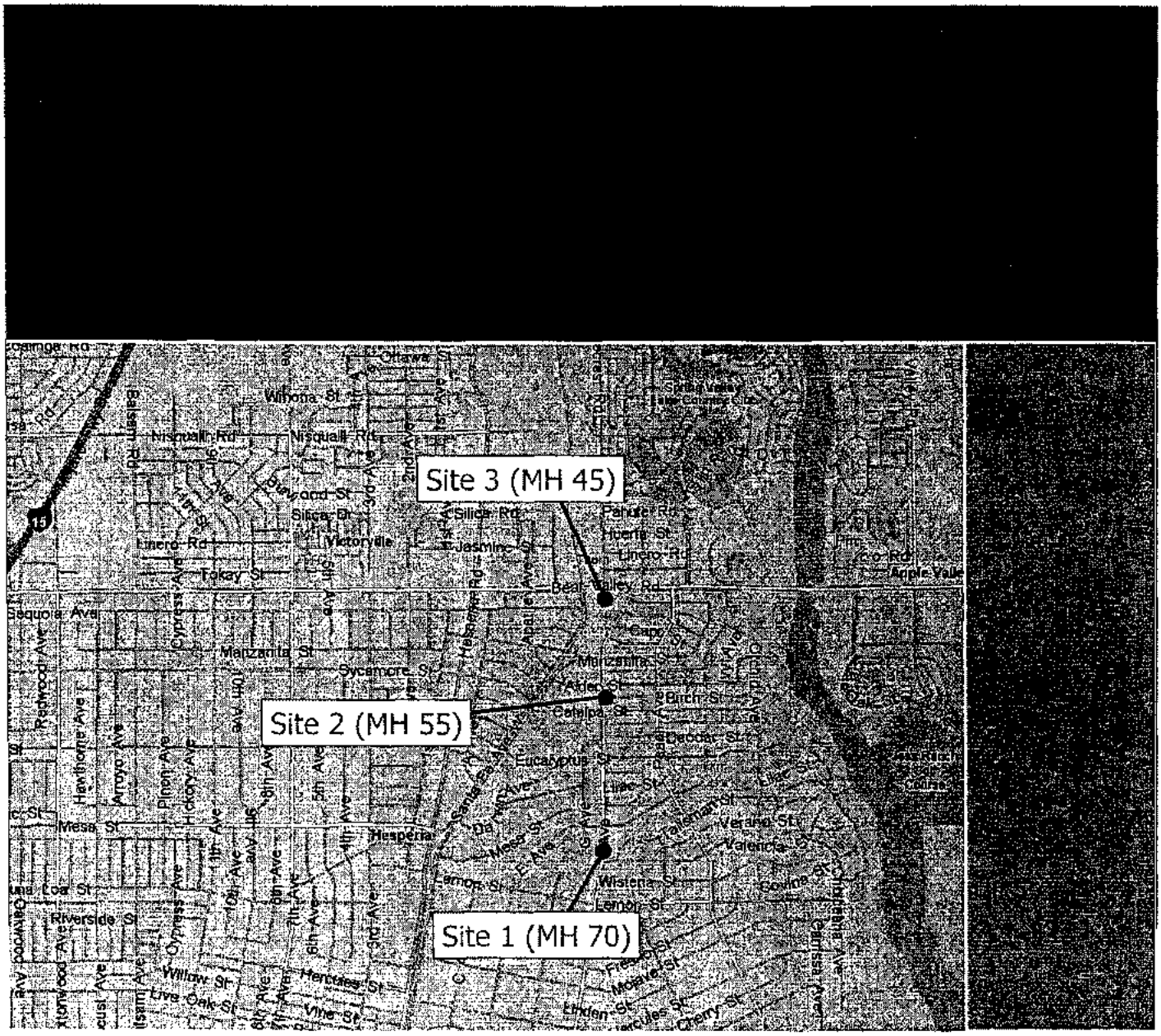
From 12/14/2007 to 12/15/2007

Monitoring Site:

Site 3

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	5.64	3.61	1.12
Weekly Minimum:	4.22	3.30	0.67
Weekly Maximum:	7.53	4.07	1.63

	Friday 12/14/2007			Saturday 12/15/2007			Sunday 12/16/2007			Monday 12/17/2007			Tuesday 12/18/2007			Wednesday 12/19/2007			Thursday 12/20/2007			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	6.82	4.07	1.61																			
1:00	6.00	3.75	1.25																			
2:00	5.23	3.75	1.04																			
3:00	4.60	3.52	0.81																			
4:00	4.27	3.35	0.69																			
5:00	4.22	3.32	0.68																			
6:00	4.23	3.30	0.67																			
7:00	4.93	3.78	0.96																			
8:00	6.66	3.69	1.41																			
9:00	7.53	3.59	1.63																			
10:00	7.52	3.57	1.61																			
11:00																						
12:00																						
13:00																						
14:00																						
15:00																						
16:00																						
17:00																						
18:00																						
19:00																						
20:00																						
21:00																						
22:00																						
23:00																						
Average:	5.64	3.61	1.12																			Ave
Minimum:	4.22	3.30	0.67																			Min
Maximum:	7.53	4.07	1.63																			Max



V&A

Oakland 1999 Harrison St., Suite 975, Oakland, CA 94612 Tel 510.903.6600 Fax 510.903.6601
San Diego 8291 Aero Place, Suite 110, San Diego, CA 92123 Tel 858.576.0226 Fax 858.576.0004
Houston One Riverway, Suite 1700, Houston, TX 77056 Tel 713.840.6490 Fax 713.840.6491
www.vaengineering.com

Temporary Flow Monitoring Study

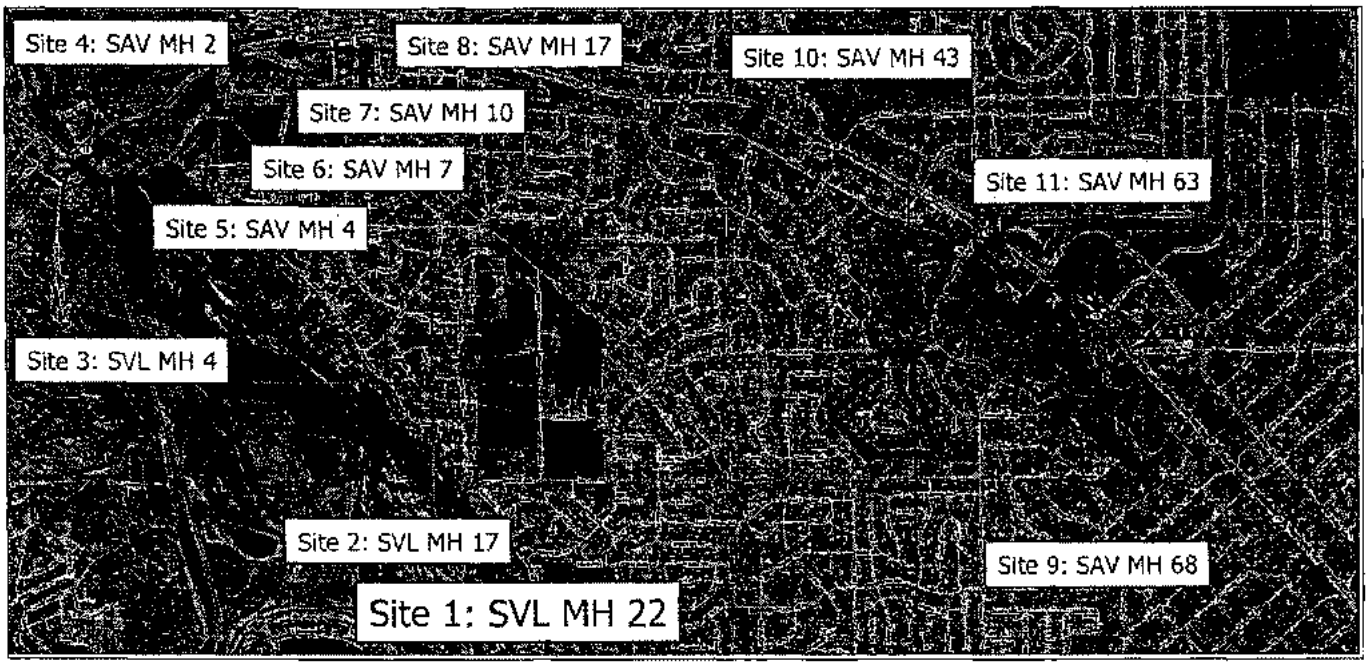
Sanitary Sewer Collection System

Monitoring Site: SVL MH 22

Manhole Address: 800 feet west of Park Entrance

Size/Type of Line: 21-inch Pipe

Data Summary Report



V&A

	Site Information Report	**Monitoring Site:** SVL MH 22

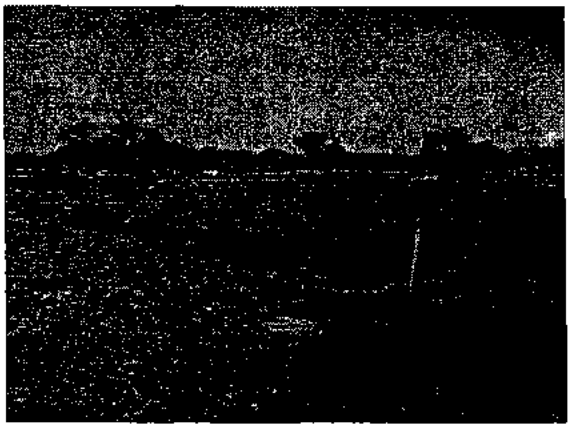
Location: 800 feet west of Park Entrance

Diameter: 21 inches

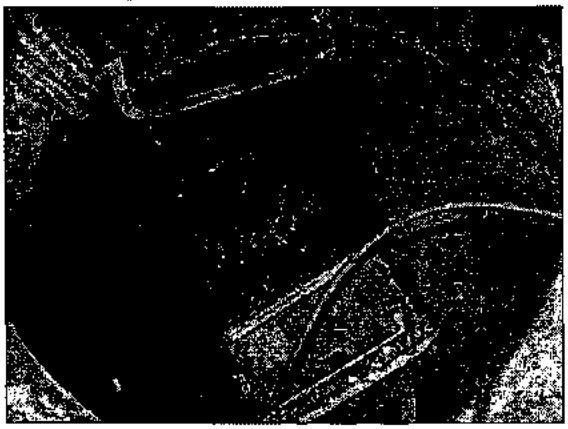
Average Dry Weather Flow: 0.890 *MGD*

Peak Measured Flow: 1.711 *MGD*

Street-level photo:



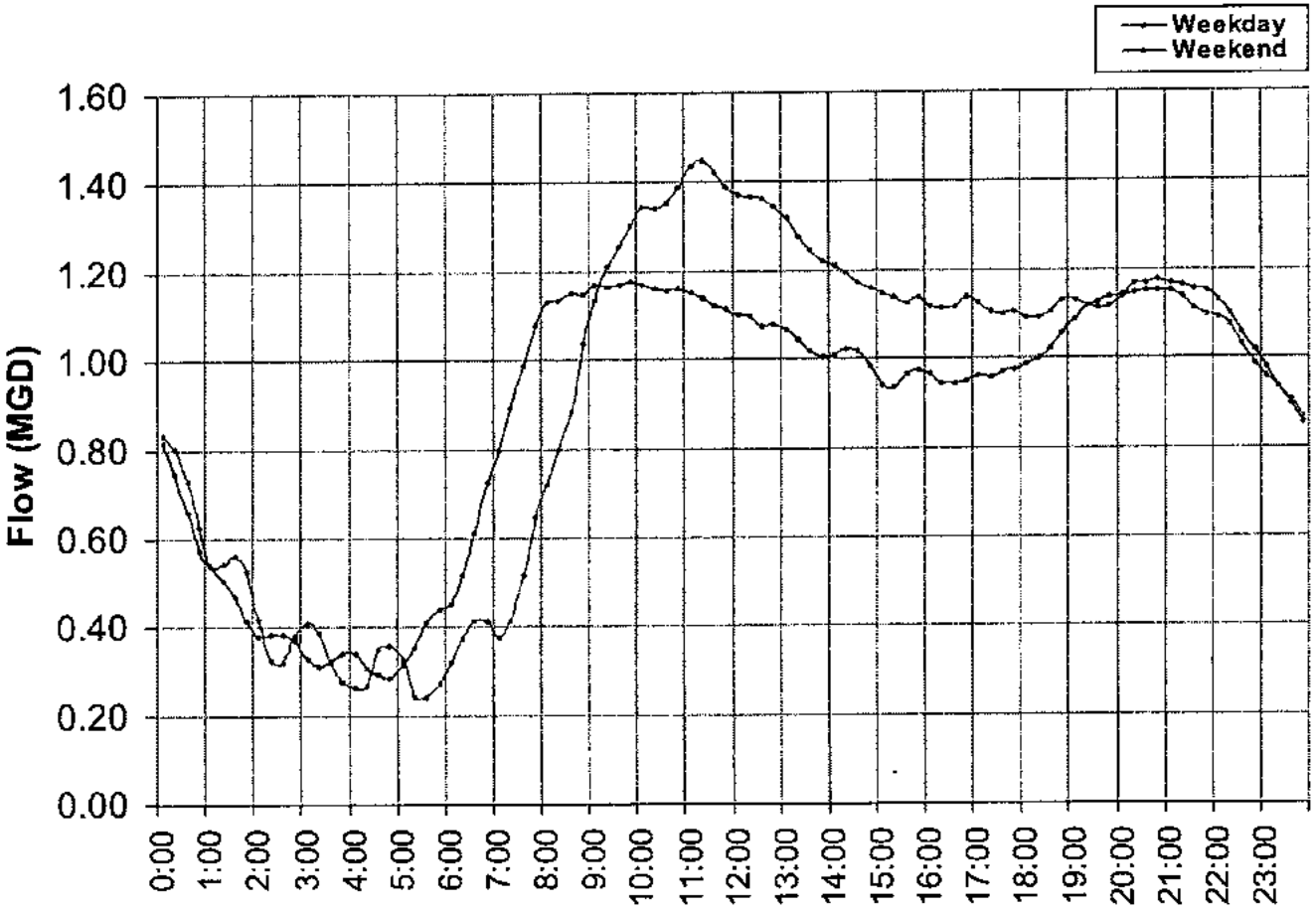
Plan view photo:



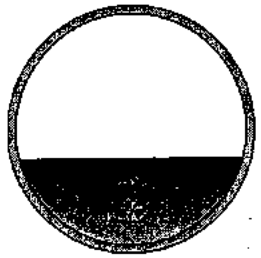
V&A

Average Dry Weather Flow

Monitoring Site:
SVL MH 22

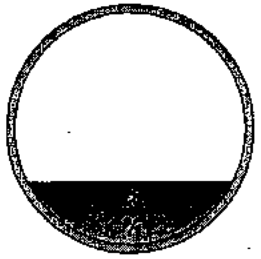


Peak Measured Flow:
1.71 *MGD*



Peak measured flow shown in weekly graphs on following pages

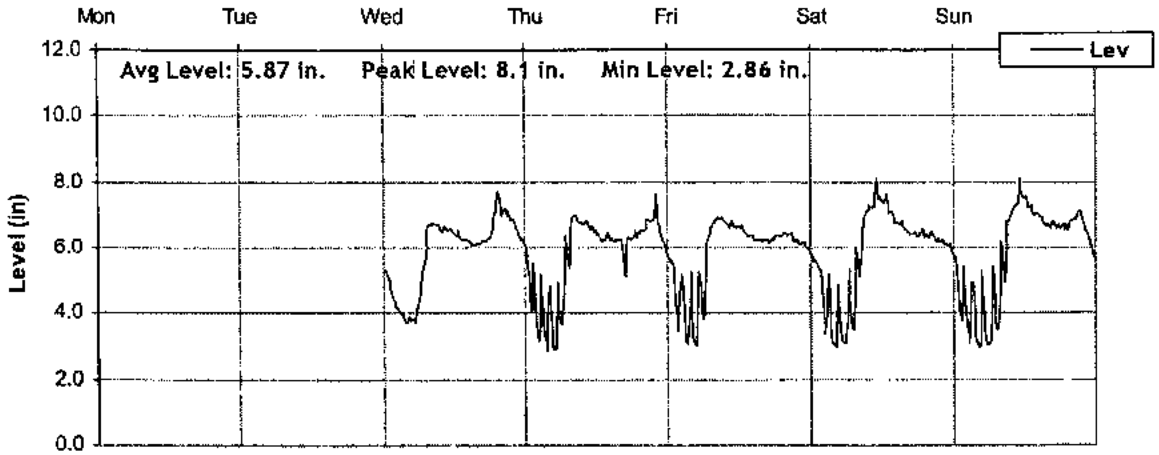
Average Dry Weather Flow:
0.89 *MGD*

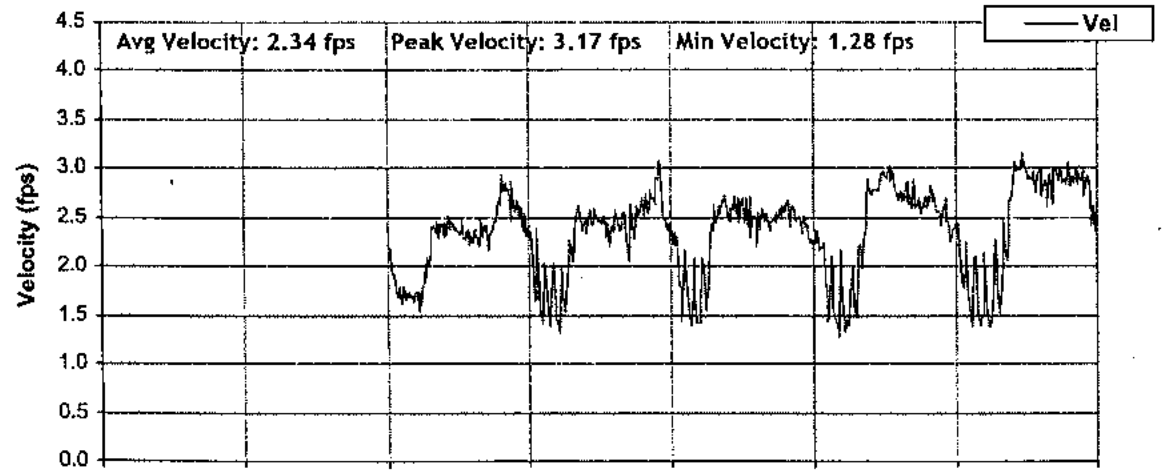


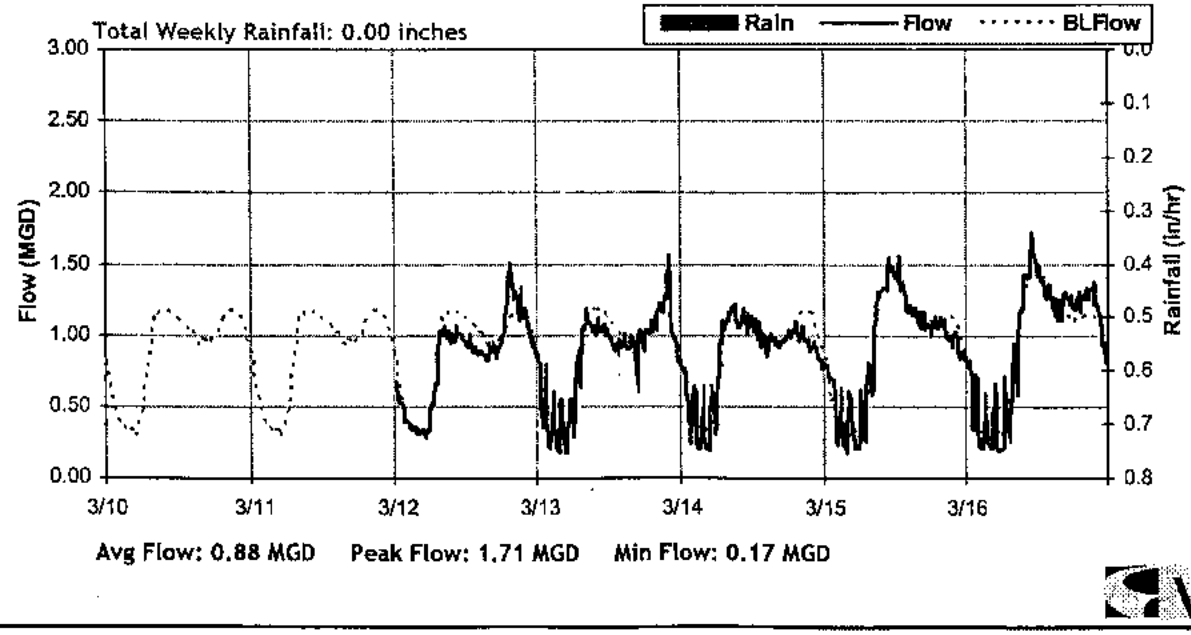
V&A

Level, Velocity and Flow
From 3/10/2008 to 3/17/2008

Monitoring Site:
SVL MH 22





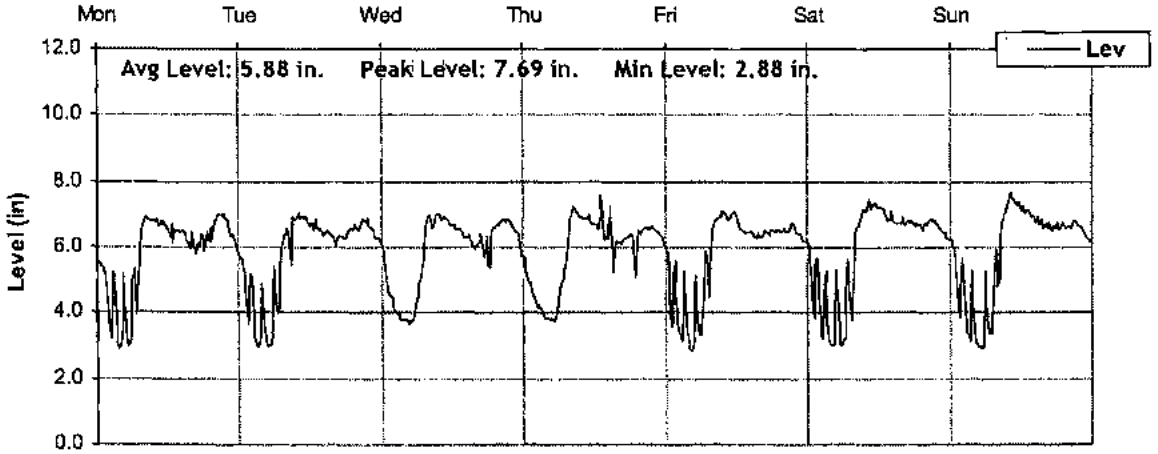


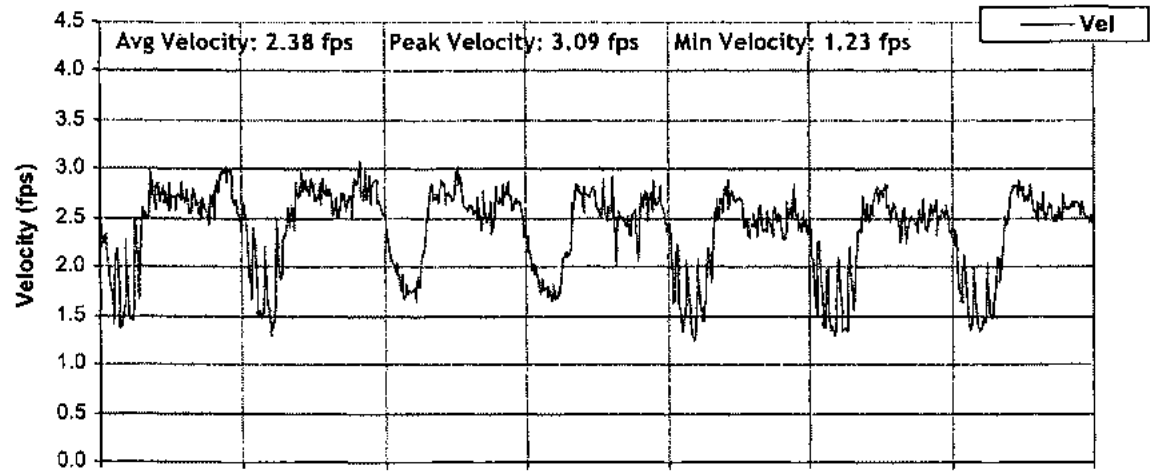
Avg Flow: 0.88 MGD Peak Flow: 1.71 MGD Min Flow: 0.17 MGD

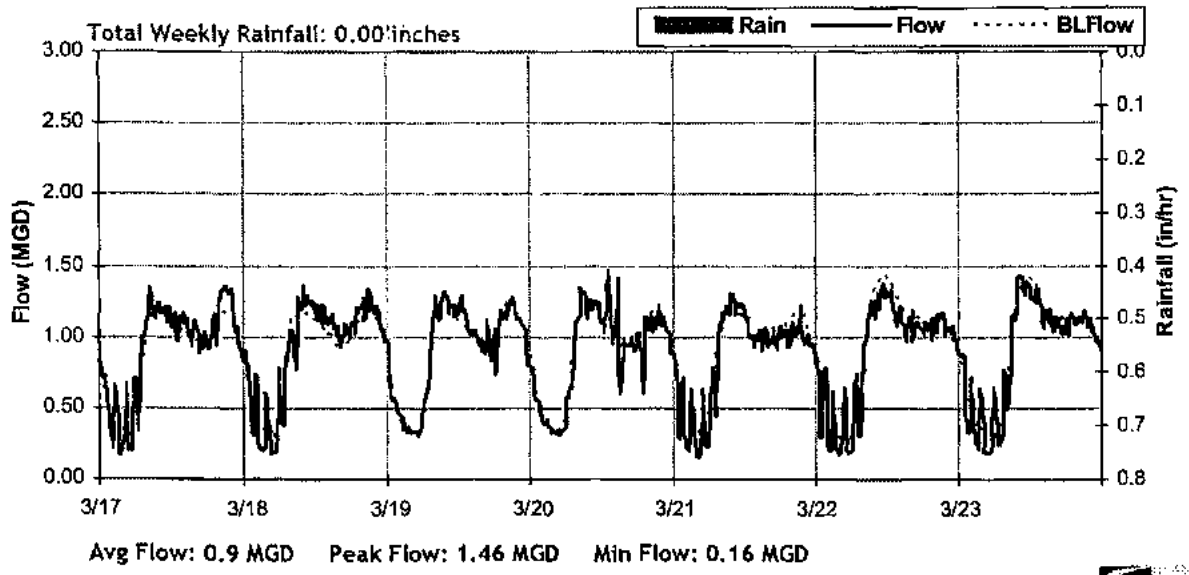
V&A

Level, Velocity and Flow
From 3/17/2008 to 3/24/2008

Monitoring Site:
SVL MH 22





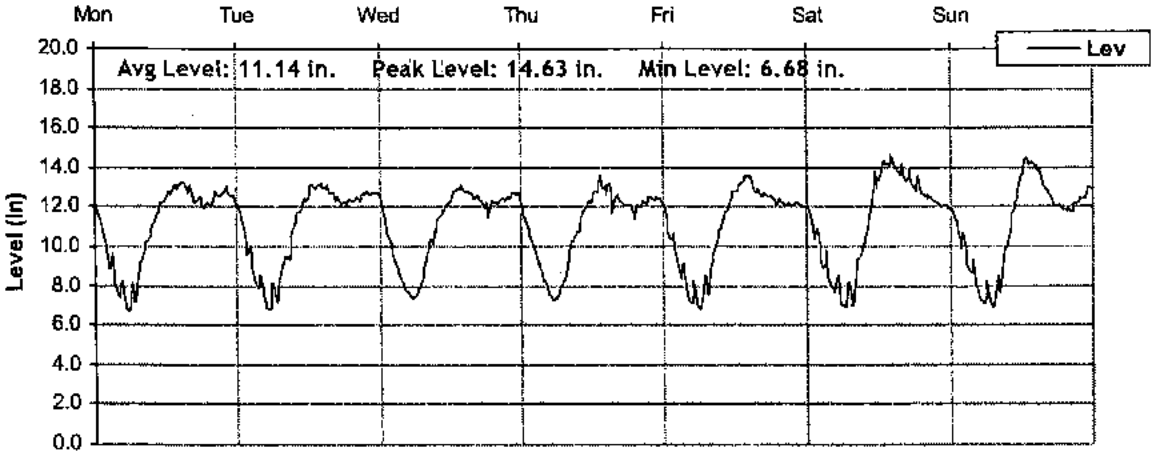


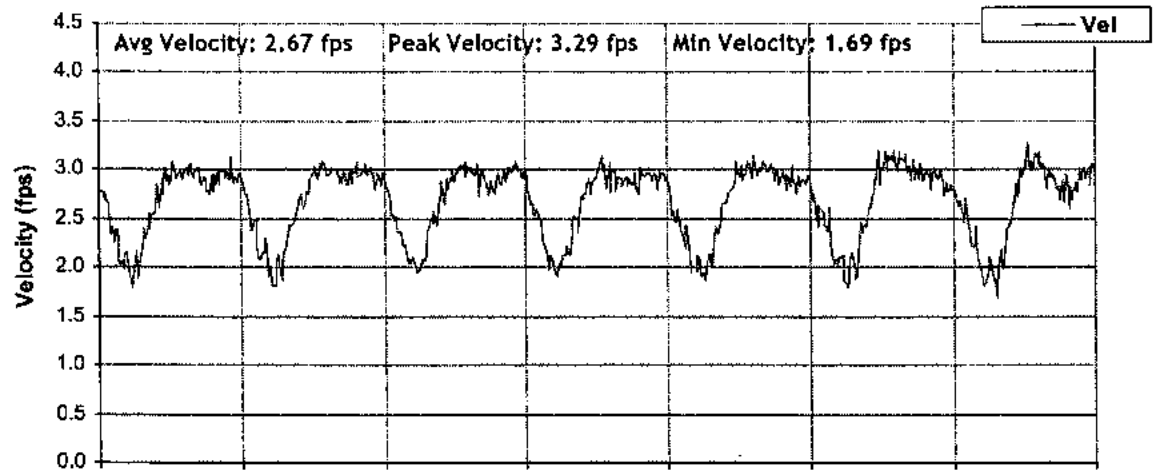
Avg Flow: 0.9 MGD Peak Flow: 1.46 MGD Min Flow: 0.16 MGD

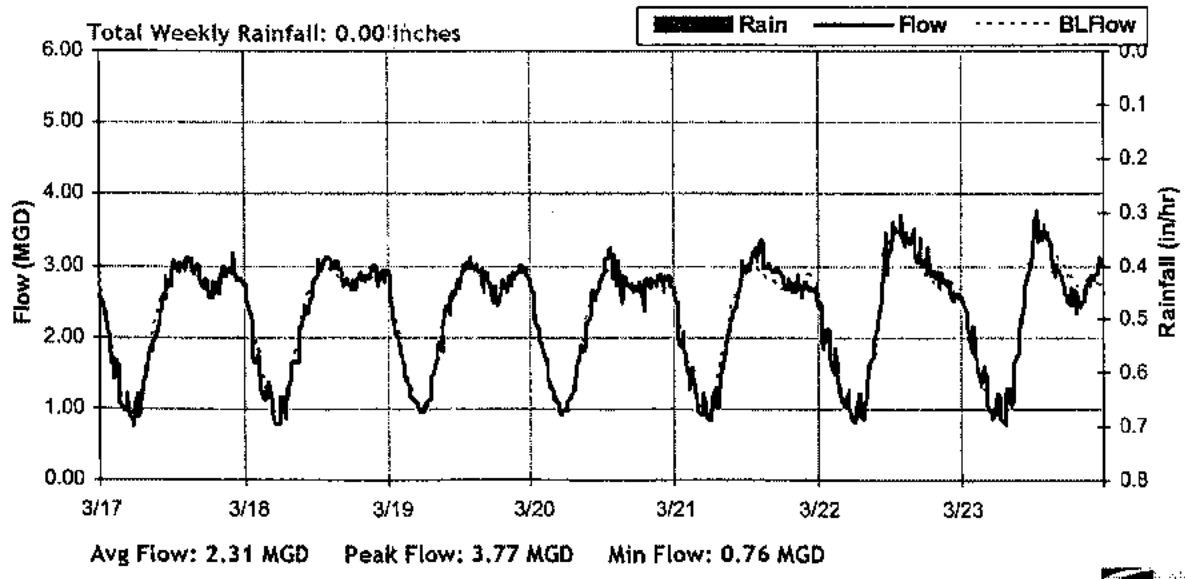
V&A

Level, Velocity and Flow
From 3/17/2008 to 3/24/2008

Monitoring Site:
SVL MH 17







Avg Flow: 2.31 MGD Peak Flow: 3.77 MGD Min Flow: 0.76 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 3/10/2008 to 3/17/2008

Monitoring Site:

SVL MH 17

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	11.11	2.68	2.31
Weekly Minimum:	7.08	1.85	0.87
Weekly Maximum:	14.04	3.18	3.50

	Monday 3/10/2008			Tuesday 3/11/2008			Wednesday 3/12/2008			Thursday 3/13/2008			Friday 3/14/2008			Saturday 3/15/2008			Sunday 3/16/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00							11.99	2.82	2.59	11.99	2.84	2.61	12.05	2.83	2.61	11.40	2.72	2.34	11.22	2.75	2.32	0:00
1:00							10.65	2.62	2.07	10.39	2.68	2.05	10.40	2.62	2.02	10.62	2.61	2.05	10.09	2.49	1.85	1:00
2:00							9.38	2.41	1.62	9.15	2.36	1.54	9.38	2.41	1.62	9.30	2.33	1.55	9.12	2.34	1.52	2:00
3:00							8.48	2.23	1.31	7.92	2.11	1.13	8.05	2.13	1.17	8.47	2.19	1.29	8.76	2.20	1.35	3:00
4:00							7.60	2.02	1.02	7.52	2.03	1.02	7.45	2.01	1.00	7.91	2.07	1.11	7.49	1.95	0.97	4:00
5:00							7.31	2.03	0.98	7.26	1.93	0.93	7.43	2.08	1.03	7.08	1.91	0.88	7.57	1.96	0.99	5:00
6:00							7.82	2.09	1.10	7.50	2.04	1.03	7.54	2.02	1.02	7.34	2.01	0.98	7.26	1.87	0.90	6:00
7:00							9.14	2.39	1.56	8.74	2.38	1.46	9.14	2.34	1.52	7.51	1.97	0.99	7.16	1.85	0.87	7:00
8:00							10.17	2.50	1.87	10.17	2.57	1.92	10.11	2.49	1.85	8.51	2.20	1.31	8.41	2.17	1.26	8:00
9:00							11.58	2.79	2.46	11.79	2.86	2.57	11.81	2.76	2.49	10.16	2.50	1.86	9.81	2.47	1.76	9:00
10:00							12.23	2.93	2.75	12.28	2.96	2.79	12.30	2.94	2.77	11.42	2.76	2.39	11.01	2.65	2.19	10:00
11:00							12.24	2.92	2.74	12.46	2.94	2.83	12.17	2.90	2.71	13.12	2.98	3.05	13.07	2.98	3.03	11:00
12:00							12.37	2.94	2.80	12.20	2.91	2.73	12.48	2.93	2.82	13.99	3.17	3.49	13.88	3.13	3.41	12:00
13:00							12.33	2.93	2.78	12.41	2.90	2.77	12.55	2.91	2.82	14.04	3.17	3.50	14.03	3.11	3.43	13:00
14:00							12.21	2.97	2.78	12.53	2.92	2.82	12.32	2.89	2.74	13.80	3.09	3.35	13.92	3.18	3.47	14:00
15:00							12.00	2.87	2.64	12.26	2.96	2.79	12.31	2.91	2.76	13.59	3.08	3.28	13.59	3.11	3.31	15:00
16:00							12.17	2.85	2.66	11.95	2.83	2.58	12.18	2.95	2.76	13.06	3.04	3.09	13.15	3.03	3.10	16:00
17:00							11.99	2.83	2.59	11.73	2.89	2.58	12.14	2.89	2.69	12.79	3.01	2.98	12.98	2.95	2.98	17:00
18:00							12.18	2.91	2.71	11.99	2.88	2.64	12.18	2.97	2.77	12.43	2.94	2.81	12.62	3.01	2.93	18:00
19:00							12.83	2.96	2.95	12.19	2.90	2.71	12.20	2.92	2.73	12.36	2.89	2.75	12.62	2.90	2.83	19:00
20:00							12.87	2.99	2.98	12.42	2.98	2.86	12.26	2.88	2.71	12.16	2.89	2.69	12.82	3.04	3.02	20:00
21:00							12.90	3.05	3.05	12.61	2.93	2.86	11.96	2.84	2.60	12.01	2.84	2.61	12.86	3.07	3.06	21:00
22:00							13.21	3.01	3.10	13.04	3.01	3.06	12.02	2.87	2.64	11.98	2.86	2.62	12.69	2.97	2.91	22:00
23:00							13.05	3.02	3.06	12.71	2.92	2.87	11.78	2.83	2.54	11.85	2.80	2.53	12.20	2.86	2.68	23:00
Average:							11.19	2.71	2.34	11.05	2.70	2.30	11.01	2.68	2.27	11.12	2.67	2.31	11.18	2.67	2.34	Ave
Minimum:							7.31	2.02	0.98	7.26	1.93	0.93	7.43	2.01	1.00	7.08	1.91	0.88	7.16	1.85	0.87	Min
Maximum:							13.21	3.05	3.10	13.04	3.01	3.06	12.55	2.97	2.82	14.04	3.17	3.50	14.03	3.18	3.47	Max

	Site Information Report	**Monitoring Site:** SVL MH 04

Location: Northwest end of cattle farm

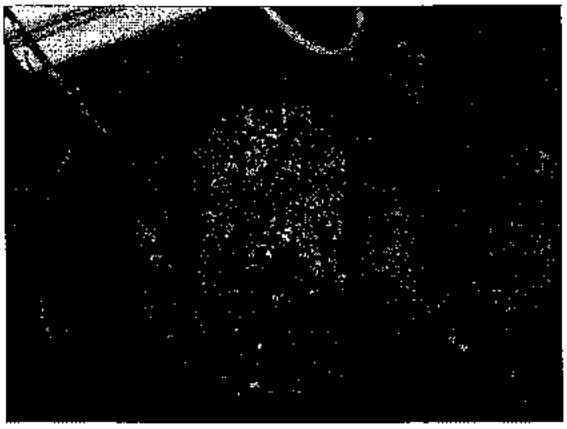
Diameter: 21 inches

Average Dry Weather Flow: 4.583 *MGD*

Peak Measured Flow: 6.578 *MGD*

Street-level photo:

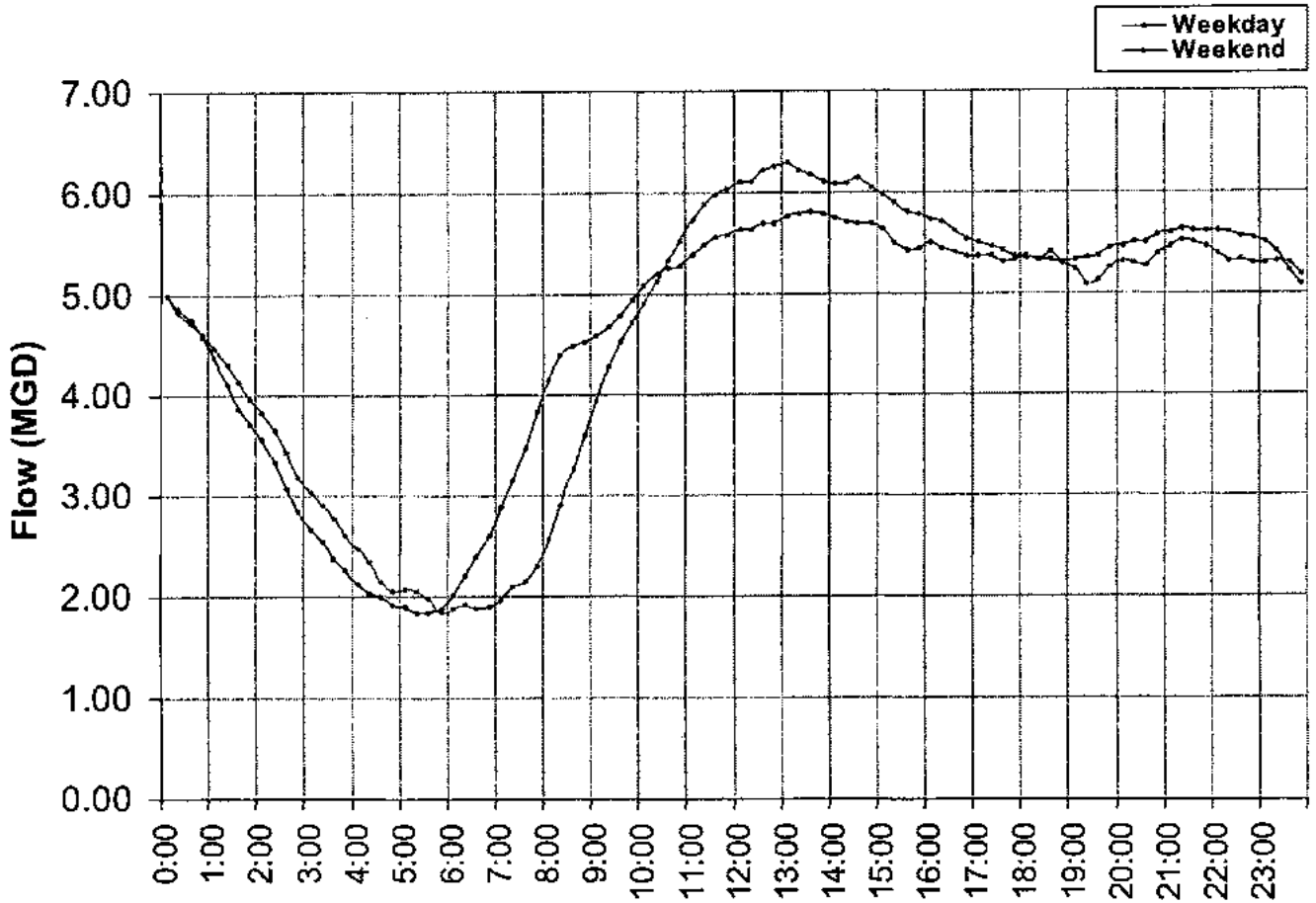
Plan view photo:



V&A

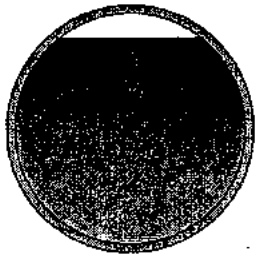
Average Dry Weather Flow

Monitoring Site:
SVL MH 04



Peak Measured Flow:

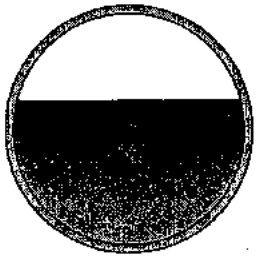
6.58 *MGD*



Peak measured flow shown in weekly graphs on following pages

Average Dry Weather Flow:

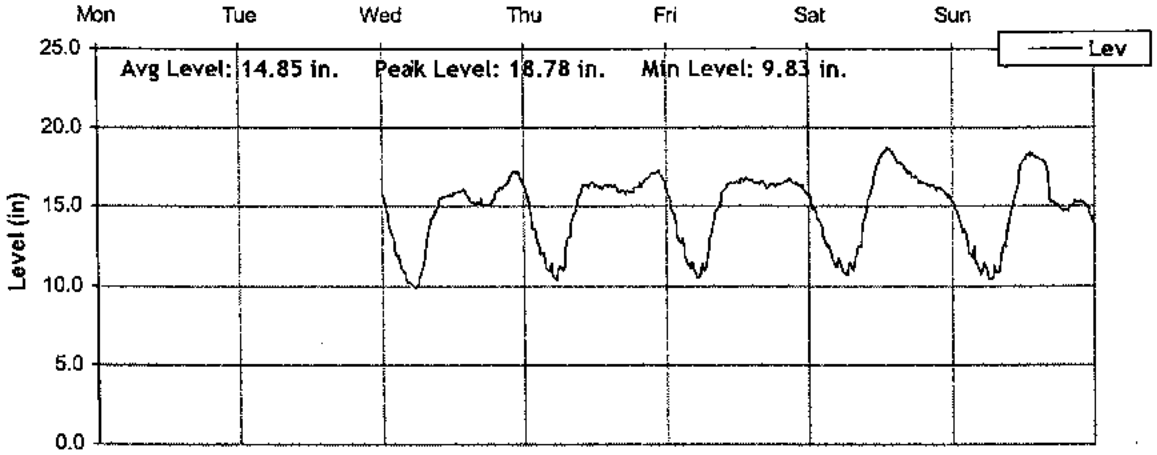
4.58 *MGD*

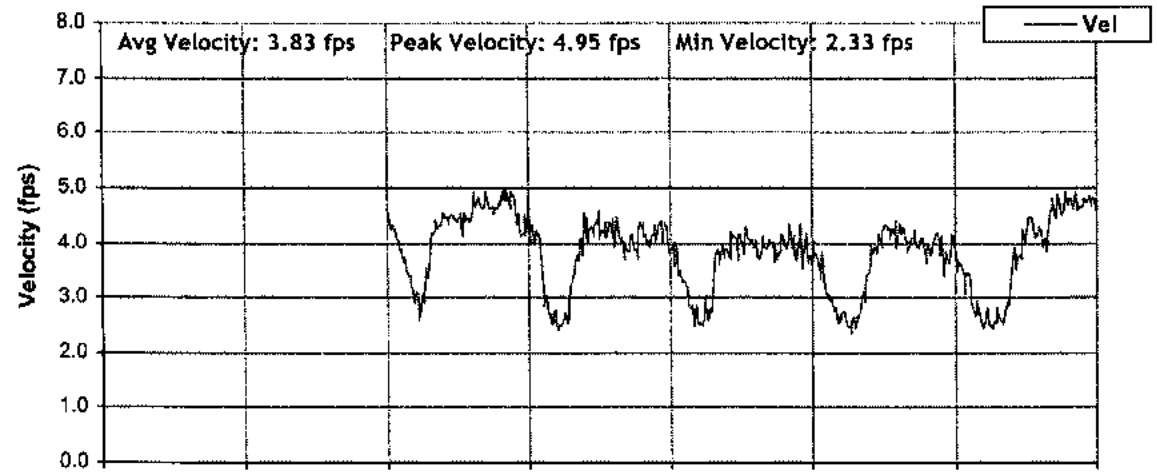


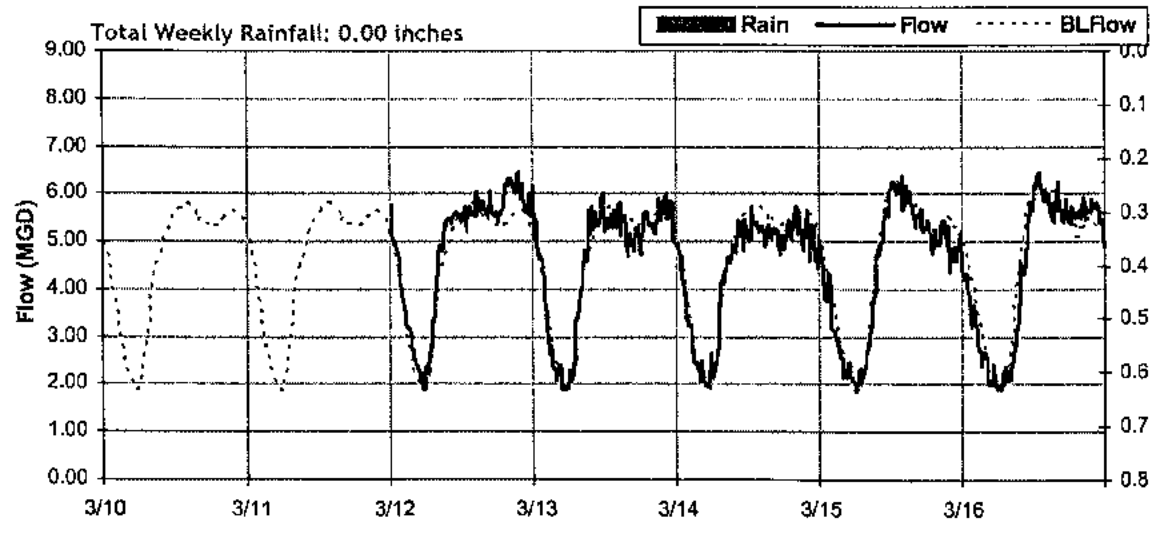
V&A

Level, Velocity and Flow
From 3/10/2008 to 3/17/2008

Monitoring Site:
SVL MH 04





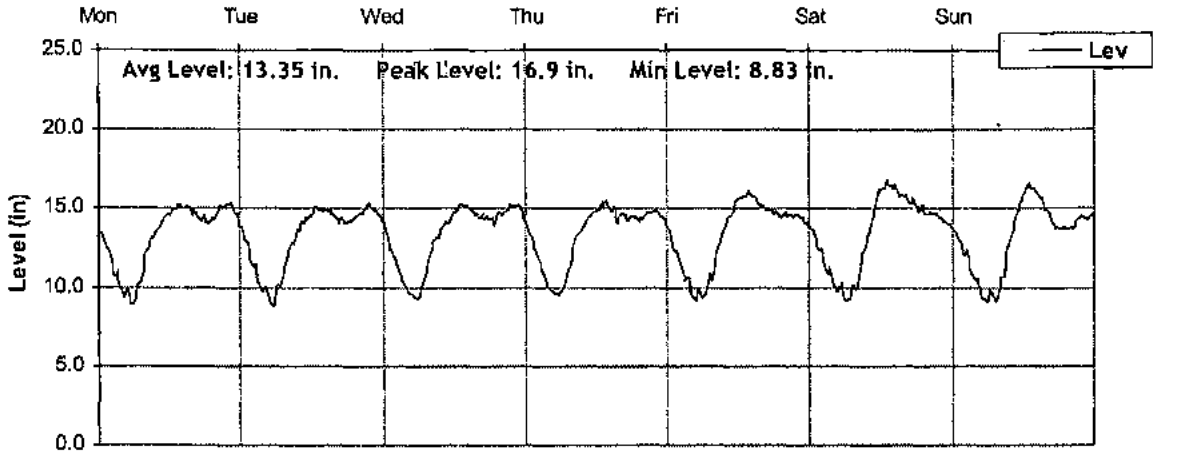


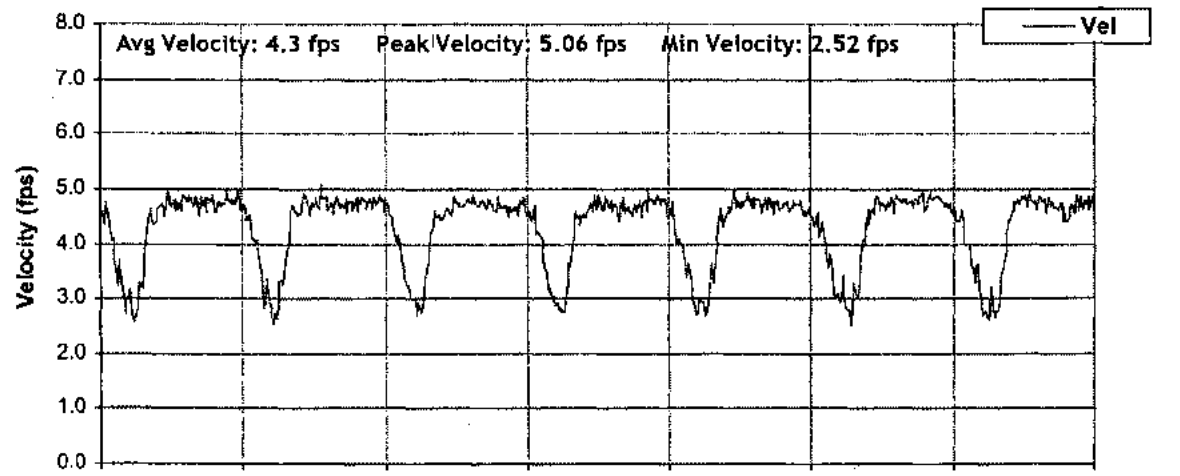
Avg Flow: 4.56 MGD Peak Flow: 6.47 MGD Min Flow: 1.86 MGD

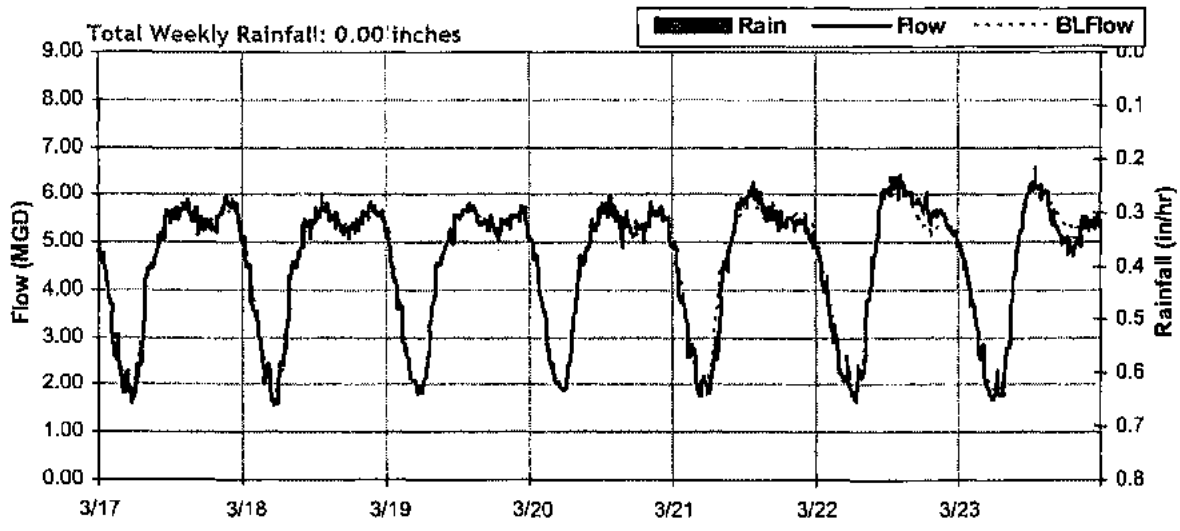
V&A

Level, Velocity and Flow
From 3/17/2008 to 3/24/2008

Monitoring Site:
SVL MH 04







Avg Flow: 4.58 MGD Peak Flow: 6.58 MGD Min Flow: 1.58 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 3/10/2008 to 3/17/2008

Monitoring Site:

SVL MH 04

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	14.85	3.83	4.56
Weekly Minimum:	9.95	2.51	1.96
Weekly Maximum:	18.58	4.81	6.29

	Monday 3/10/2008			Tuesday 3/11/2008			Wednesday 3/12/2008			Thursday 3/13/2008			Friday 3/14/2008			Saturday 3/15/2008			Sunday 3/16/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00							15.09	4.40	5.26	15.59	4.14	5.12	15.55	3.86	4.76	15.18	3.84	4.62	15.03	3.67	4.36	0:00
1:00							13.42	4.14	4.35	13.72	4.14	4.46	14.03	3.58	3.95	14.23	3.47	3.90	13.80	3.37	3.66	1:00
2:00							11.95	3.77	3.44	12.30	3.13	2.96	12.73	3.21	3.16	13.04	3.05	3.09	12.88	3.23	3.23	2:00
3:00							11.02	3.50	2.89	11.46	2.64	2.29	11.43	2.74	2.37	12.22	2.87	2.69	12.05	2.78	2.57	3:00
4:00							10.21	3.10	2.32	10.99	2.61	2.15	11.13	2.60	2.18	11.37	2.61	2.24	11.03	2.57	2.13	4:00
5:00							9.95	2.85	2.06	10.62	2.52	1.99	10.80	2.68	2.17	11.04	2.62	2.18	10.98	2.59	2.13	5:00
6:00							10.63	3.24	2.56	11.32	2.71	2.33	11.34	2.72	2.33	11.02	2.51	2.08	10.48	2.53	1.96	6:00
7:00							12.56	3.93	3.82	13.18	3.42	3.52	13.29	3.54	3.68	11.24	2.61	2.21	10.95	2.67	2.19	7:00
8:00							14.25	4.31	4.84	14.60	3.90	4.49	14.71	3.80	4.42	12.70	3.05	3.00	12.11	2.77	2.57	8:00
9:00							15.15	4.45	5.34	15.84	4.21	5.29	15.87	3.82	4.81	14.77	3.65	4.27	13.91	3.40	3.73	9:00
10:00							15.63	4.43	5.49	16.35	4.21	5.47	16.44	4.02	5.25	16.26	3.84	4.95	15.64	3.68	4.57	10:00
11:00							15.72	4.43	5.53	16.41	4.36	5.69	16.52	4.00	5.25	17.72	4.07	5.70	17.41	4.03	5.55	11:00
12:00							15.88	4.39	5.53	16.31	4.15	5.37	16.63	4.00	5.28	18.47	4.28	6.19	18.14	4.41	6.29	12:00
13:00							16.01	4.45	5.66	16.27	4.28	5.52	16.74	4.06	5.39	18.58	4.22	6.14	18.26	4.21	6.04	13:00
14:00							15.64	4.62	5.73	16.33	4.23	5.48	16.60	3.93	5.17	18.04	4.12	5.84	18.03	4.14	5.88	14:00
15:00							15.24	4.73	5.71	16.23	4.12	5.31	16.47	3.89	5.09	17.69	4.15	5.79	17.84	4.06	5.71	15:00
16:00							15.31	4.76	5.78	16.00	3.86	4.91	16.45	3.96	5.18	17.26	3.99	5.45	15.87	4.65	5.84	16:00
17:00							15.17	4.66	5.60	15.93	3.99	5.06	16.35	3.90	5.06	16.91	4.02	5.39	15.18	4.72	5.68	17:00
18:00							15.32	4.62	5.61	16.06	4.05	5.17	16.42	3.89	5.06	16.62	4.02	5.30	14.82	4.72	5.53	18:00
19:00							16.01	4.79	6.08	16.32	4.22	5.46	16.50	3.99	5.22	16.47	3.84	5.02	14.81	4.76	5.57	19:00
20:00							16.28	4.81	6.22	16.71	4.01	5.31	16.70	4.15	5.49	16.29	3.98	5.15	15.22	4.72	5.69	20:00
21:00							16.73	4.73	6.27	17.06	4.17	5.63	16.51	3.85	5.04	16.21	3.99	5.14	15.33	4.68	5.69	21:00
22:00							17.22	4.33	5.92	17.21	4.20	5.73	16.37	3.98	5.17	16.02	3.68	4.68	15.14	4.77	5.72	22:00
23:00							16.75	4.39	5.82	16.71	4.07	5.41	15.91	3.78	4.78	15.66	3.98	4.94	14.28	4.68	5.27	23:00
Average:							14.46	4.24	4.91	14.98	3.80	4.59	15.06	3.66	4.43	15.21	3.60	4.41	14.55	3.82	4.48	Ave
Minimum:							9.95	2.85	2.06	10.62	2.52	1.99	10.80	2.60	2.17	11.02	2.51	2.08	10.48	2.53	1.96	Min
Maximum:							17.22	4.81	6.27	17.21	4.36	5.73	16.74	4.15	5.49	18.58	4.28	6.19	18.26	4.77	6.29	Max

Hourly Data: Depth, Velocity and Flow

From 3/17/2008 to 3/24/2008

Monitoring Site:

SVL MH 04

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	13.35	4.30	4.58
Weekly Minimum:	8.95	2.61	1.65
Weekly Maximum:	16.58	4.89	6.25

	Monday 3/17/2008			Tuesday 3/18/2008			Wednesday 3/19/2008			Thursday 3/20/2008			Friday 3/21/2008			Saturday 3/22/2008			Sunday 3/23/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	13.32	4.56	4.74	13.32	4.57	4.75	13.59	4.64	4.94	13.62	4.52	4.82	13.50	4.61	4.87	13.67	4.45	4.77	13.54	4.51	4.78	0:00
1:00	12.42	4.37	4.18	12.12	4.20	3.90	12.16	4.17	3.89	12.46	4.32	4.15	12.37	4.09	3.89	12.57	4.33	4.21	12.61	4.36	4.25	1:00
2:00	10.94	3.63	2.98	11.12	3.90	3.26	11.15	3.86	3.24	11.36	3.88	3.33	11.20	3.78	3.19	11.53	3.92	3.43	11.89	3.98	3.61	2:00
3:00	10.30	3.39	2.58	9.90	3.08	2.22	10.17	3.26	2.43	10.26	3.23	2.44	10.42	3.44	2.65	10.84	3.56	2.89	10.62	3.50	2.76	3:00
4:00	9.58	2.97	2.05	9.61	2.97	2.06	9.58	2.98	2.06	9.73	2.93	2.06	9.39	2.83	1.91	9.92	3.03	2.19	10.03	3.15	2.32	4:00
5:00	9.06	2.69	1.73	8.95	2.61	1.65	9.32	2.80	1.86	9.56	2.79	1.92	9.55	2.94	2.02	9.89	3.09	2.23	9.16	2.68	1.75	5:00
6:00	9.93	3.13	2.27	10.09	3.31	2.44	10.11	3.22	2.39	10.27	3.19	2.42	9.67	2.88	2.02	9.20	2.71	1.78	9.46	2.88	1.96	6:00
7:00	11.33	3.82	3.29	11.45	3.95	3.44	11.65	4.05	3.60	11.61	3.90	3.44	10.79	3.51	2.82	10.02	3.14	2.30	9.46	2.91	1.98	7:00
8:00	12.68	4.52	4.43	12.66	4.61	4.51	12.94	4.53	4.55	13.19	4.48	4.61	12.30	4.29	4.06	11.21	3.76	3.20	10.89	3.63	2.96	8:00
9:00	13.37	4.51	4.71	13.40	4.56	4.77	13.58	4.47	4.75	13.71	4.49	4.83	13.41	4.40	4.62	12.76	4.39	4.34	12.80	4.43	4.40	9:00
10:00	14.04	4.63	5.11	14.12	4.80	5.33	14.11	4.61	5.12	14.38	4.63	5.25	14.42	4.63	5.27	14.27	4.60	5.18	14.20	4.73	5.29	10:00
11:00	14.62	4.79	5.54	14.48	4.68	5.34	14.53	4.75	5.45	14.75	4.69	5.47	15.28	4.78	5.78	15.81	4.76	5.97	15.45	4.79	5.87	11:00
12:00	14.90	4.72	5.57	14.96	4.73	5.59	15.06	4.70	5.61	15.18	4.76	5.72	15.70	4.72	5.88	16.43	4.72	6.15	16.27	4.84	6.25	12:00
13:00	15.16	4.68	5.62	14.93	4.89	5.78	15.21	4.75	5.72	15.34	4.70	5.72	15.89	4.85	6.13	16.58	4.75	6.25	16.27	4.78	6.18	13:00
14:00	15.07	4.85	5.79	14.94	4.72	5.58	15.02	4.81	5.72	15.00	4.70	5.59	15.82	4.74	5.95	16.29	4.77	6.17	15.87	4.78	6.02	14:00
15:00	14.85	4.76	5.59	14.72	4.72	5.50	14.63	4.69	5.42	14.58	4.57	5.26	15.33	4.69	5.70	15.83	4.78	6.01	15.16	4.72	5.67	15:00
16:00	14.69	4.71	5.47	14.27	4.71	5.29	14.51	4.72	5.41	14.66	4.67	5.42	15.05	4.71	5.61	15.61	4.77	5.91	14.54	4.75	5.45	16:00
17:00	14.43	4.74	5.40	14.18	4.70	5.25	14.37	4.73	5.36	14.35	4.59	5.19	14.91	4.71	5.56	15.47	4.76	5.84	13.87	4.63	5.05	17:00
18:00	14.22	4.82	5.40	14.25	4.69	5.27	14.29	4.67	5.25	14.54	4.67	5.36	14.72	4.68	5.45	15.04	4.85	5.78	13.75	4.63	4.99	18:00
19:00	14.48	4.64	5.31	14.51	4.73	5.42	14.66	4.69	5.44	14.30	4.67	5.27	14.62	4.70	5.43	14.75	4.68	5.46	13.75	4.47	4.81	19:00
20:00	15.07	4.71	5.62	14.80	4.77	5.58	14.83	4.64	5.45	14.70	4.79	5.56	14.59	4.67	5.39	14.68	4.84	5.61	13.79	4.64	5.02	20:00
21:00	15.22	4.85	5.85	15.21	4.73	5.70	15.17	4.62	5.55	14.83	4.77	5.59	14.62	4.72	5.46	14.61	4.85	5.60	14.45	4.79	5.46	21:00
22:00	15.16	4.77	5.73	14.92	4.77	5.63	15.22	4.67	5.63	14.71	4.80	5.58	14.53	4.67	5.36	14.25	4.72	5.30	14.36	4.75	5.38	22:00
23:00	14.36	4.72	5.35	14.46	4.76	5.43	14.63	4.67	5.40	14.35	4.67	5.29	14.10	4.55	5.05	14.01	4.67	5.14	14.50	4.74	5.42	23:00
Average:	13.30	4.33	4.60	13.22	4.34	4.57	13.35	4.32	4.59	13.39	4.31	4.60	13.42	4.27	4.59	13.55	4.29	4.65	13.20	4.25	4.49	Ave
Minimum:	9.06	2.69	1.73	8.95	2.61	1.65	9.32	2.80	1.86	9.56	2.79	1.92	9.39	2.83	1.91	9.20	2.71	1.78	9.16	2.68	1.75	Min
Maximum:	15.22	4.85	5.85	15.21	4.89	5.78	15.22	4.81	5.72	15.34	4.80	5.72	15.89	4.85	6.13	16.58	4.85	6.25	16.27	4.84	6.25	Max

Temporary Flow Monitoring Study

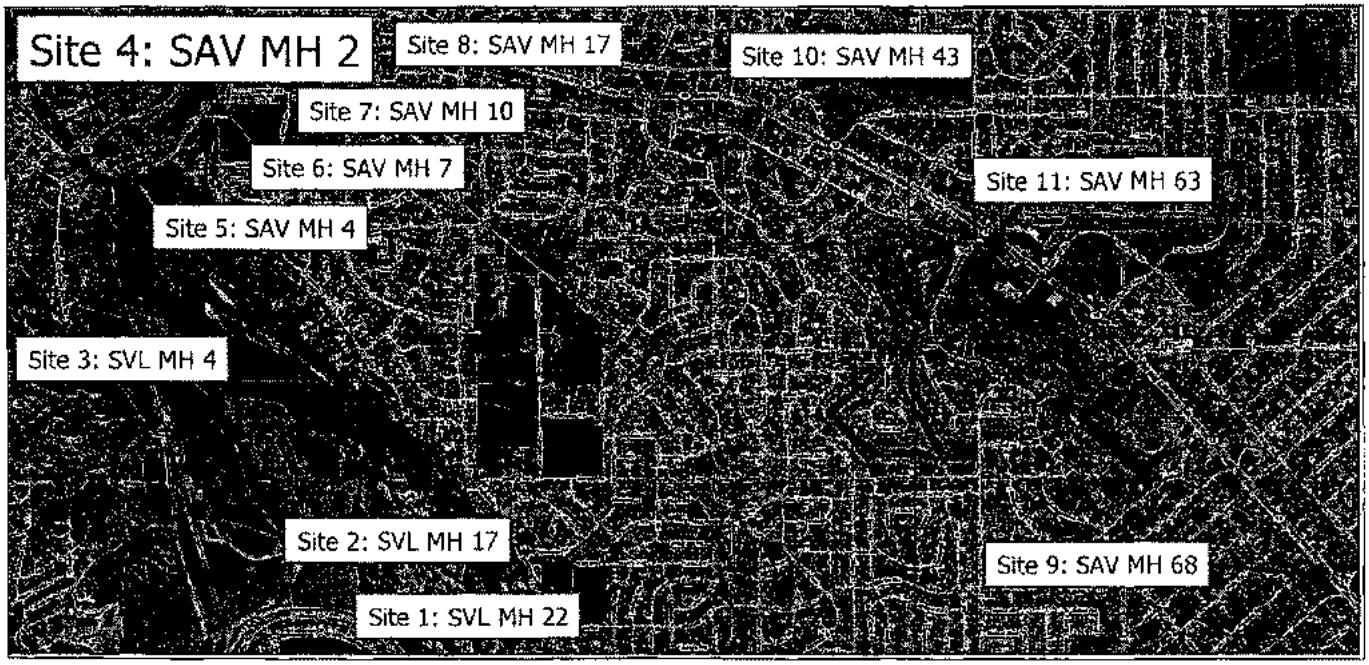
Sanitary Sewer Collection System

Monitoring Site: SAV MH 02

Manhole Address: Northwest corner of sand wash

Size/Type of Line: 16-inch Pipe

Data Summary Report



V&A

	Site Information Report	**Monitoring Site:** SAV MH 02

Location: Northwest corner of sand wash

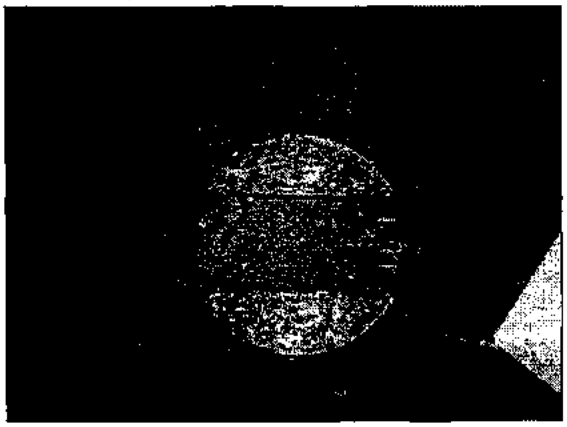
Diameter: 16 inches

Average Dry Weather Flow: 2.018 *MGD*

Peak Measured Flow: 3.763 *MGD*

Street-level photo:

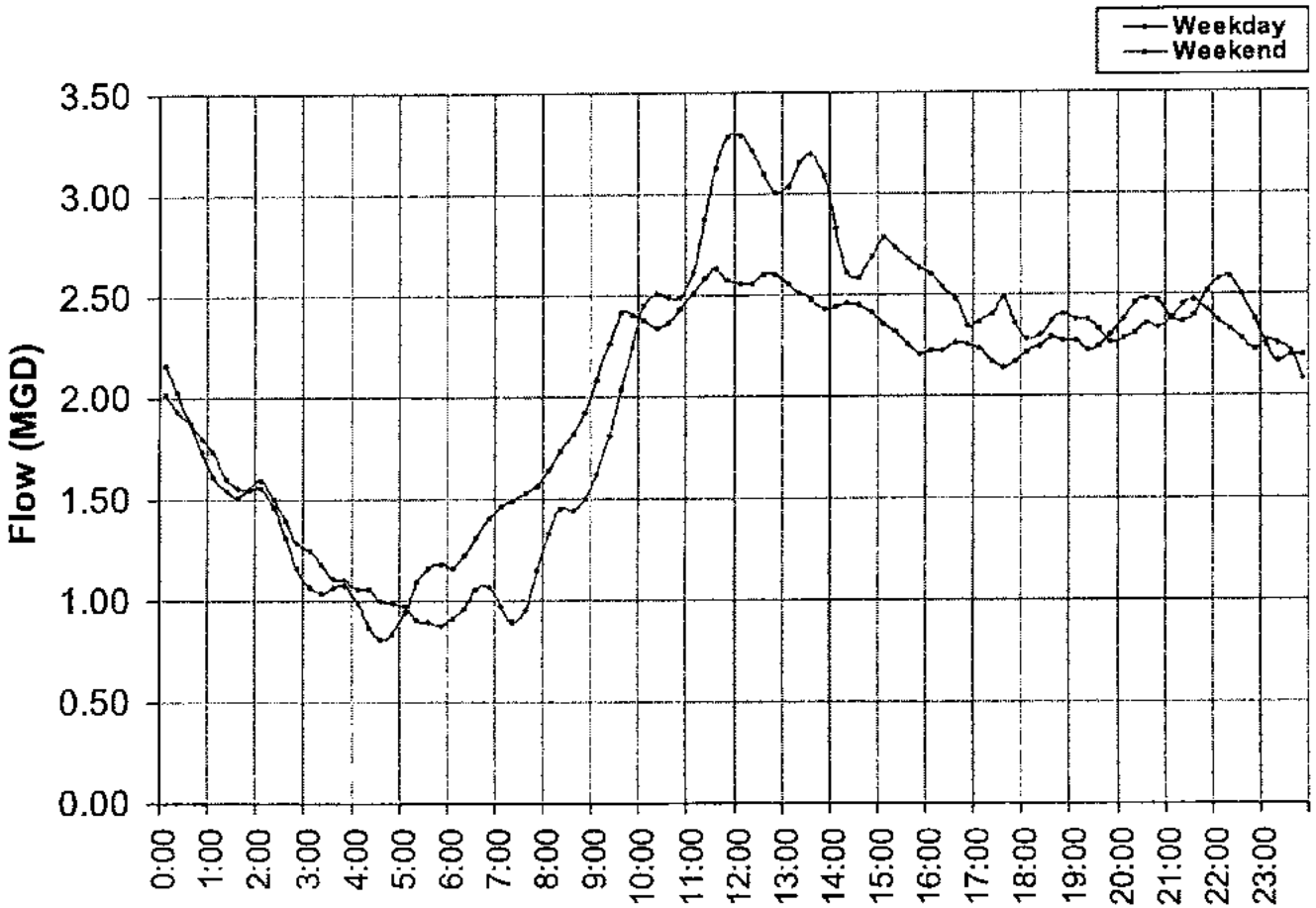
Plan view photo:



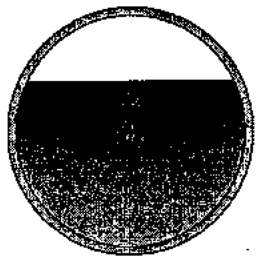
V&A

Average Dry Weather Flow

Monitoring Site:
SAV MH 02

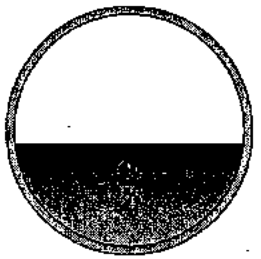


Peak Measured Flow:
3.76 *MGD*



Peak measured flow shown in weekly graphs on following pages

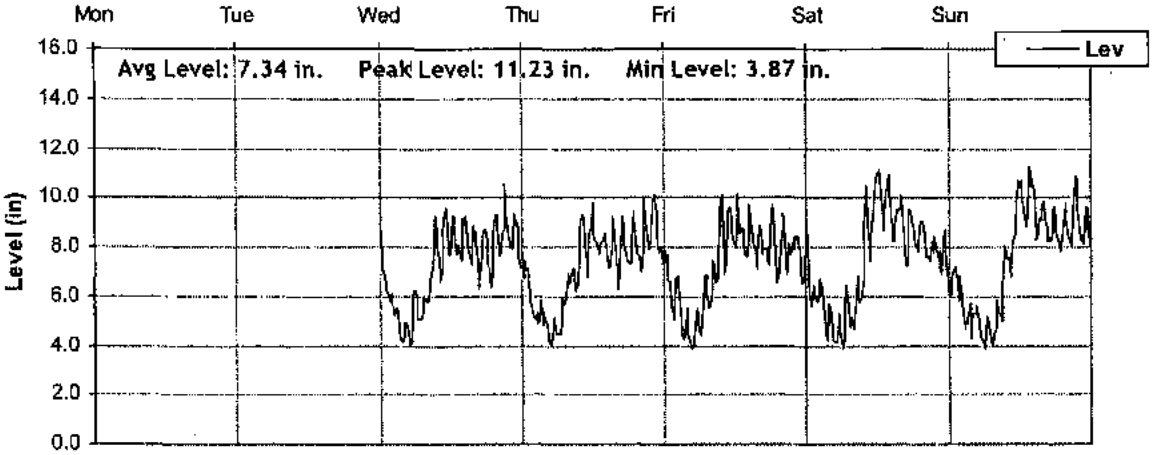
Average Dry Weather Flow:
2.02 *MGD*

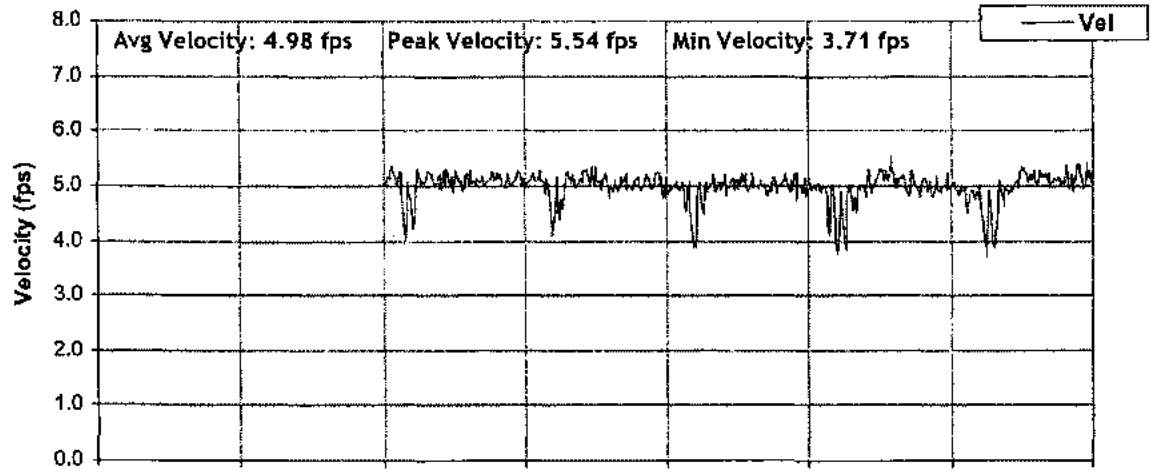


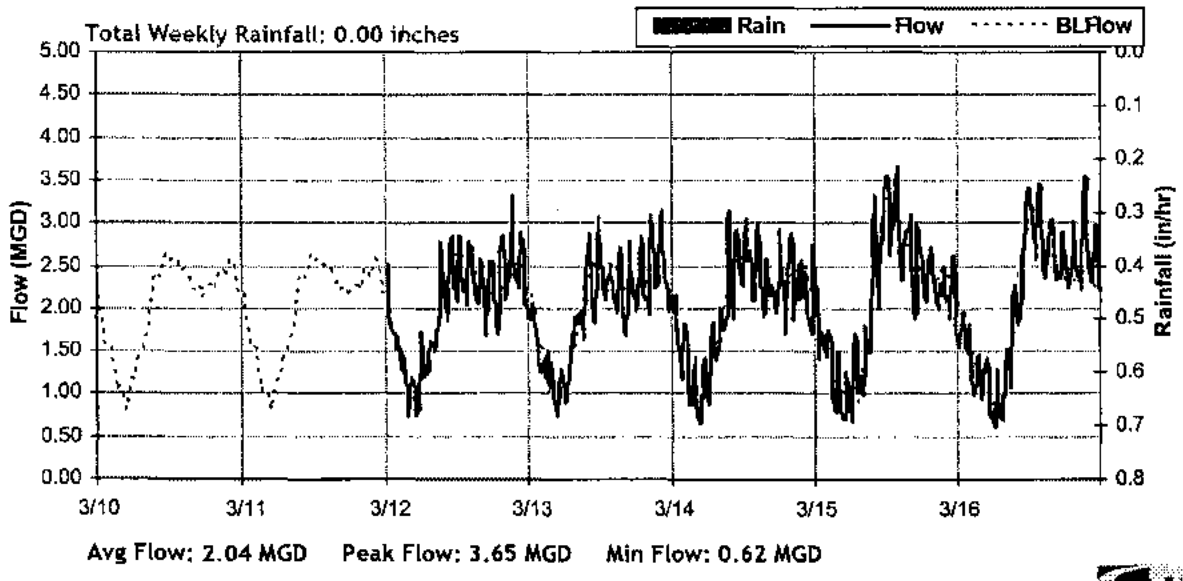
V&A

Level, Velocity and Flow
From 3/10/2008 to 3/17/2008

Monitoring Site:
SAV MH 02





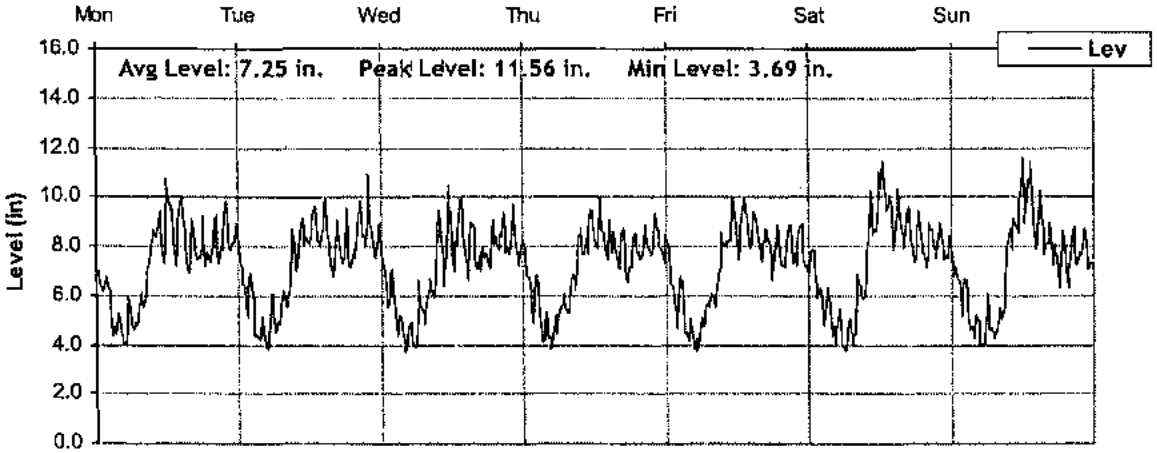


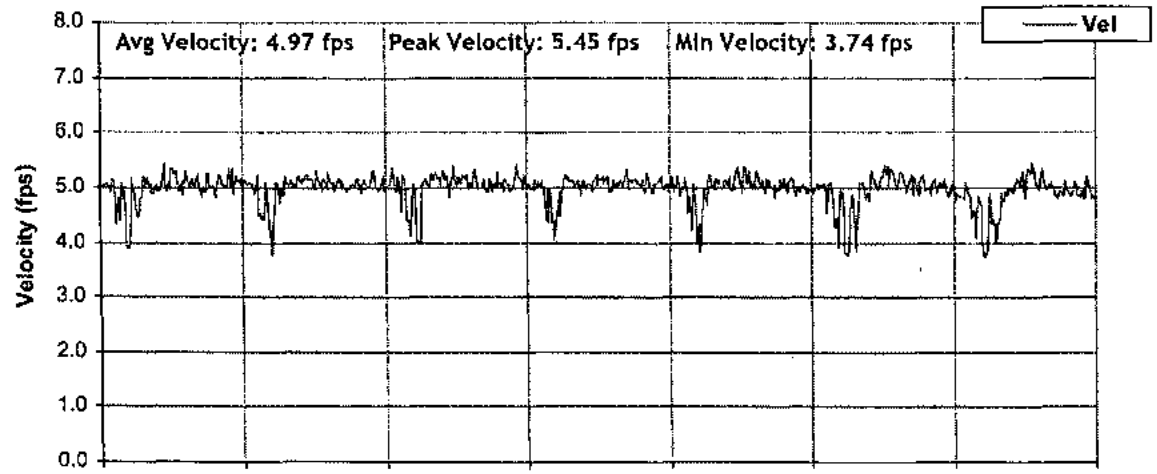
Avg Flow: 2.04 MGD Peak Flow: 3.65 MGD Min Flow: 0.62 MGD

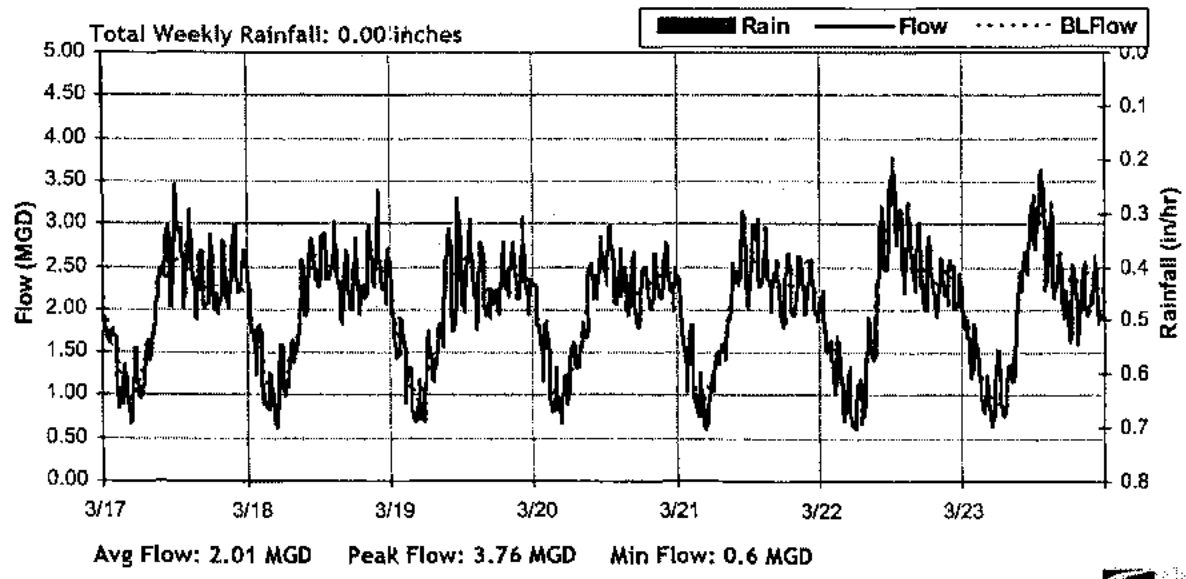
V&A

Level, Velocity and Flow
From 3/17/2008 to 3/24/2008

Monitoring Site:
SAV MH 02







Avg Flow: 2.01 MGD Peak Flow: 3.76 MGD Min Flow: 0.6 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 3/10/2008 to 3/17/2008

Monitoring Site:

SAV MH 02

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	7.34	4.98	2.04
Weekly Minimum:	4.14	4.14	0.77
Weekly Maximum:	10.23	5.30	3.23

	Monday 3/10/2008			Tuesday 3/11/2008			Wednesday 3/12/2008			Thursday 3/13/2008			Friday 3/14/2008			Saturday 3/15/2008			Sunday 3/16/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00							7.24	5.11	2.02	7.12	5.09	1.97	7.38	4.92	2.00	6.94	5.00	1.88	6.47	5.01	1.71	0:00
1:00							6.07	5.24	1.64	5.73	5.16	1.50	5.59	5.01	1.41	6.09	4.98	1.57	6.62	4.92	1.73	1:00
2:00							5.48	5.14	1.40	5.07	5.15	1.26	6.06	4.96	1.56	6.27	4.94	1.62	5.34	4.79	1.28	2:00
3:00							4.46	4.44	0.92	5.26	5.03	1.30	4.79	4.79	1.10	4.77	4.55	1.04	5.10	4.86	1.21	3:00
4:00							4.61	4.72	1.02	4.31	4.39	0.87	4.14	4.14	0.77	4.50	4.24	0.90	5.39	4.85	1.29	4:00
5:00							5.19	4.80	1.25	4.76	4.75	1.07	4.71	4.63	1.04	4.65	4.52	0.99	4.43	4.26	0.88	5:00
6:00							5.29	5.06	1.32	4.97	4.88	1.18	5.33	4.78	1.27	5.08	4.36	1.11	4.57	4.32	0.94	6:00
7:00							5.74	5.23	1.52	6.29	5.16	1.70	6.05	5.06	1.58	5.07	4.75	1.17	4.35	4.16	0.83	7:00
8:00							6.49	5.08	1.74	6.94	5.05	1.89	6.85	4.97	1.83	5.85	4.87	1.47	5.34	4.88	1.29	8:00
9:00							8.39	5.06	2.42	7.25	5.13	2.04	8.50	5.06	2.47	6.85	4.94	1.82	7.52	4.92	2.05	9:00
10:00							7.88	5.21	2.30	8.38	5.19	2.49	7.90	4.97	2.21	8.75	5.03	2.55	7.63	4.99	2.12	10:00
11:00							8.25	5.03	2.36	8.46	5.21	2.53	8.65	5.07	2.59	9.93	5.12	3.01	10.11	5.17	3.11	11:00
12:00							8.75	5.16	2.61	8.19	5.05	2.34	8.99	5.09	2.65	10.23	5.24	3.19	9.73	5.21	2.99	12:00
13:00							8.11	5.04	2.32	8.20	5.12	2.38	8.34	5.05	2.40	10.22	5.30	3.23	10.23	5.19	3.16	13:00
14:00							8.62	5.15	2.55	7.54	4.91	2.05	8.77	5.06	2.57	9.04	5.15	2.71	9.08	5.09	2.68	14:00
15:00							8.10	5.08	2.32	8.37	4.99	2.38	7.71	5.02	2.16	9.39	5.12	2.82	9.45	5.17	2.87	15:00
16:00							7.30	5.13	2.05	7.46	5.10	2.11	8.32	5.01	2.38	8.59	4.99	2.47	8.63	5.11	2.54	16:00
17:00							8.24	5.07	2.38	8.02	5.03	2.28	7.70	4.88	2.10	8.94	5.10	2.65	8.98	5.11	2.66	17:00
18:00							7.04	5.16	1.97	8.11	5.03	2.31	8.77	5.02	2.54	8.18	4.93	2.29	8.12	5.09	2.34	18:00
19:00							8.75	5.15	2.60	7.87	4.98	2.20	7.56	5.07	2.13	8.93	5.10	2.64	9.08	5.17	2.73	19:00
20:00							8.15	5.04	2.33	8.54	5.15	2.52	8.26	5.04	2.37	7.67	4.94	2.11	8.29	5.02	2.37	20:00
21:00							9.05	5.09	2.68	8.20	4.96	2.31	8.09	5.13	2.35	8.12	4.99	2.29	10.20	5.30	3.22	21:00
22:00							8.64	5.18	2.58	9.49	5.18	2.89	8.11	4.93	2.26	7.40	4.94	2.01	8.63	5.12	2.55	22:00
23:00							7.69	5.06	2.17	7.64	4.98	2.12	7.31	5.00	2.01	8.01	5.03	2.27	8.63	5.12	2.54	23:00
Average:							7.23	5.06	2.02	7.17	5.03	1.99	7.25	4.94	1.99	7.48	4.92	2.08	7.58	4.95	2.13	Ave
Minimum:							4.46	4.44	0.92	4.31	4.39	0.87	4.14	4.14	0.77	4.50	4.24	0.90	4.35	4.16	0.83	Min
Maximum:							9.05	5.24	2.68	9.49	5.21	2.89	8.99	5.13	2.65	10.23	5.30	3.23	10.23	5.30	3.22	Max

Hourly Data: Depth, Velocity and Flow

From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 02

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	7.25	4.97	2.01
Weekly Minimum:	3.96	4.05	0.71
Weekly Maximum:	10.58	5.31	3.36

	Monday 3/17/2008			Tuesday 3/18/2008			Wednesday 3/19/2008			Thursday 3/20/2008			Friday 3/21/2008			Saturday 3/22/2008			Sunday 3/23/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	6.62	5.02	1.77	6.86	5.09	1.88	6.86	5.05	1.86	7.34	5.02	2.03	7.42	5.04	2.07	7.73	4.97	2.14	7.21	4.87	1.92	0:00
1:00	6.39	5.05	1.70	6.03	5.03	1.56	6.34	5.12	1.70	5.74	5.05	1.47	5.42	5.02	1.36	6.08	5.00	1.57	6.08	4.82	1.52	1:00
2:00	5.18	4.85	1.24	5.18	4.81	1.24	5.27	5.04	1.31	5.83	5.03	1.50	6.00	4.98	1.55	5.39	4.90	1.32	6.26	4.92	1.61	2:00
3:00	4.77	4.74	1.08	4.66	4.74	1.05	4.68	4.79	1.07	4.64	4.69	1.03	4.53	4.67	0.99	5.60	4.83	1.38	4.53	4.35	0.92	3:00
4:00	4.08	4.06	0.74	4.05	4.18	0.75	4.36	4.61	0.93	4.15	4.29	0.80	4.37	4.53	0.92	4.55	4.40	0.94	4.79	4.59	1.05	4:00
5:00	5.49	4.95	1.36	5.49	4.93	1.36	3.96	4.05	0.71	4.87	4.75	1.11	4.36	4.47	0.91	4.46	4.24	0.89	4.57	4.08	0.90	5:00
6:00	4.78	4.67	1.06	4.79	4.88	1.11	5.76	5.11	1.49	5.73	5.17	1.50	5.17	4.99	1.27	4.43	4.36	0.90	4.93	4.45	1.06	6:00
7:00	5.80	5.12	1.51	5.79	5.11	1.50	5.42	5.08	1.37	5.46	5.12	1.39	5.82	5.06	1.50	4.30	4.24	0.83	4.71	4.40	0.99	7:00
8:00	6.70	4.96	1.77	6.70	5.08	1.82	6.24	5.19	1.69	6.54	5.08	1.76	6.20	5.07	1.64	5.42	5.06	1.71	5.38	4.86	1.30	8:00
9:00	8.34	5.00	2.38	7.88	5.13	2.27	8.27	5.18	2.44	8.16	5.02	2.33	7.96	5.07	2.27	6.63	4.81	1.70	7.79	4.92	2.14	9:00
10:00	8.87	5.19	2.67	8.57	5.20	2.56	7.37	5.07	2.06	7.88	5.01	2.21	8.18	5.05	2.35	9.16	5.18	2.76	8.69	5.07	2.54	10:00
11:00	8.62	5.07	2.52	8.22	5.11	2.38	9.26	5.23	2.83	9.02	5.12	2.69	9.37	5.28	2.90	9.56	5.08	2.86	9.99	5.06	2.99	11:00
12:00	9.59	5.29	2.98	9.21	5.16	2.77	7.65	5.13	2.19	8.49	5.14	2.50	8.43	5.20	2.51	10.58	5.31	3.36	9.85	5.24	3.05	12:00
13:00	8.11	4.99	2.29	8.25	5.06	2.37	9.26	5.20	2.81	8.73	5.09	2.56	9.42	5.14	2.84	9.64	5.23	2.97	10.26	5.29	3.23	13:00
14:00	9.29	5.12	2.78	9.25	5.11	2.76	7.27	5.02	2.00	8.08	5.01	2.29	8.43	5.11	2.47	8.83	5.13	2.62	8.80	5.11	2.60	14:00
15:00	7.62	5.04	2.14	7.46	5.03	2.07	8.60	5.12	2.53	7.96	5.07	2.27	8.49	5.08	2.47	9.19	5.18	2.78	8.40	5.02	2.41	15:00
16:00	8.30	5.02	2.38	8.39	5.09	2.44	7.25	5.05	2.01	7.93	5.13	2.30	8.13	5.05	2.33	8.87	5.09	2.62	8.37	5.04	2.41	16:00
17:00	7.98	5.03	2.27	7.46	4.96	2.04	7.65	4.99	2.13	7.14	5.08	1.98	7.67	4.98	2.13	7.93	5.03	2.24	7.67	4.84	2.07	17:00
18:00	7.72	5.08	2.19	8.06	5.03	2.29	7.99	5.11	2.30	8.05	5.12	2.33	8.13	5.03	2.32	8.56	5.09	2.51	7.63	5.01	2.13	18:00
19:00	8.05	5.01	2.29	7.79	5.07	2.21	8.03	5.02	2.28	7.62	5.00	2.12	7.43	5.00	2.05	7.64	4.98	2.12	7.14	4.88	1.90	19:00
20:00	8.07	5.07	2.31	9.10	5.06	2.68	8.71	5.10	2.56	8.40	5.13	2.46	8.38	5.12	2.45	8.45	5.04	2.44	8.19	4.99	2.32	20:00
21:00	8.92	5.13	2.65	9.12	5.11	2.71	7.92	5.01	2.23	7.80	5.01	2.18	7.73	4.93	2.13	7.89	5.00	2.22	7.52	4.88	2.04	21:00
22:00	8.14	5.12	2.37	8.46	5.06	2.45	8.86	5.28	2.71	8.68	5.11	2.56	8.58	5.02	2.47	8.35	5.02	2.39	7.94	4.99	2.23	22:00
23:00	8.58	5.11	2.52	8.32	5.04	2.39	7.72	5.04	2.17	7.86	5.01	2.21	7.31	4.95	1.99	7.78	4.94	2.15	7.19	4.82	1.89	23:00
Average:	7.33	4.99	2.04	7.29	5.00	2.03	7.11	5.02	1.97	7.17	5.01	1.98	7.20	4.99	1.99	7.42	4.92	2.06	7.24	4.85	1.97	Ave
Minimum:	4.08	4.06	0.74	4.05	4.18	0.75	3.96	4.05	0.71	4.15	4.29	0.80	4.36	4.47	0.91	4.30	4.24	0.83	4.53	4.08	0.90	Min
Maximum:	9.59	5.29	2.98	9.25	5.20	2.77	9.26	5.28	2.83	9.02	5.17	2.69	9.42	5.28	2.90	10.58	5.31	3.36	10.26	5.29	3.23	Max

Temporary Flow Monitoring Study

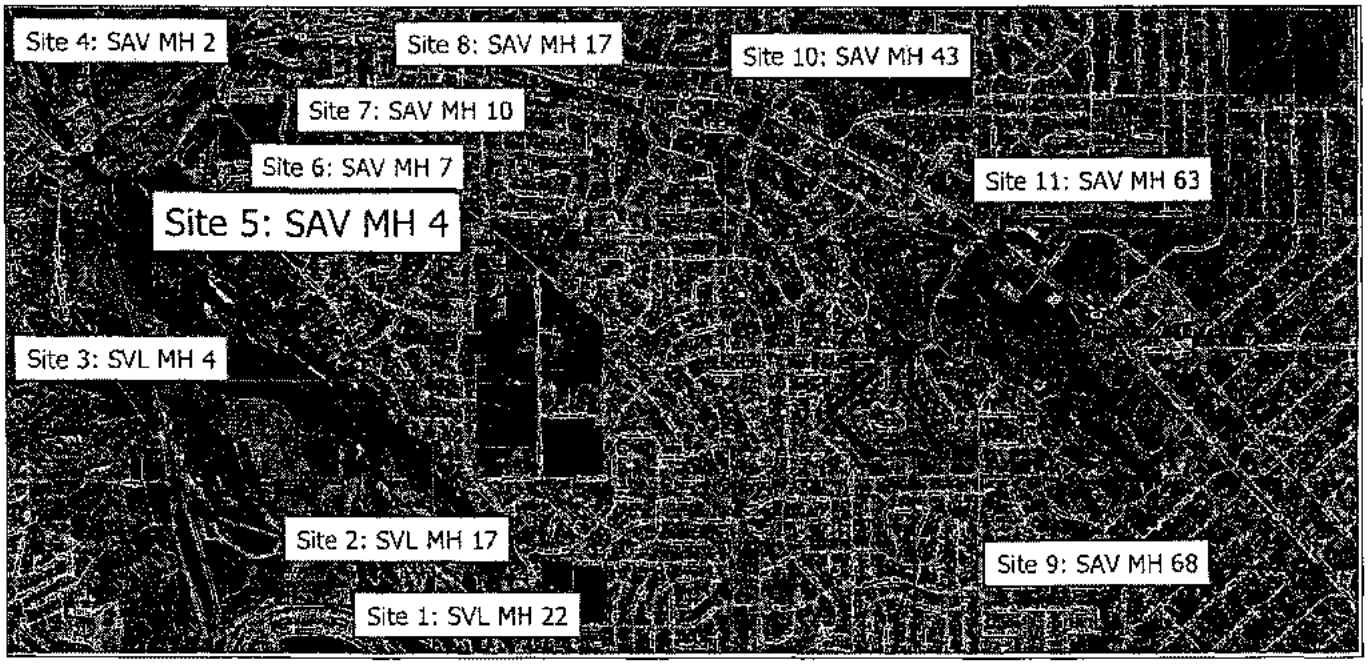
Sanitary Sewer Collection System

Monitoring Site: SAV MH 04 Lat

Manhole Address: West of school on dirt road

Size/Type of Line: 18-inch Pipe

Data Summary Report



	Site Information Report	**Monitoring Site:** SAV MH 04 Lat

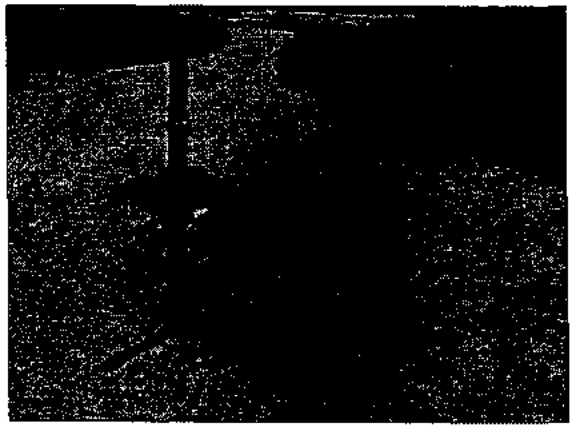
Location: West of school on dirt road

Diameter: 18 inches

Average Dry Weather Flow: 0.469 *MGD*

Peak Measured Flow: 1.348 *MGD*

Street-level photo:

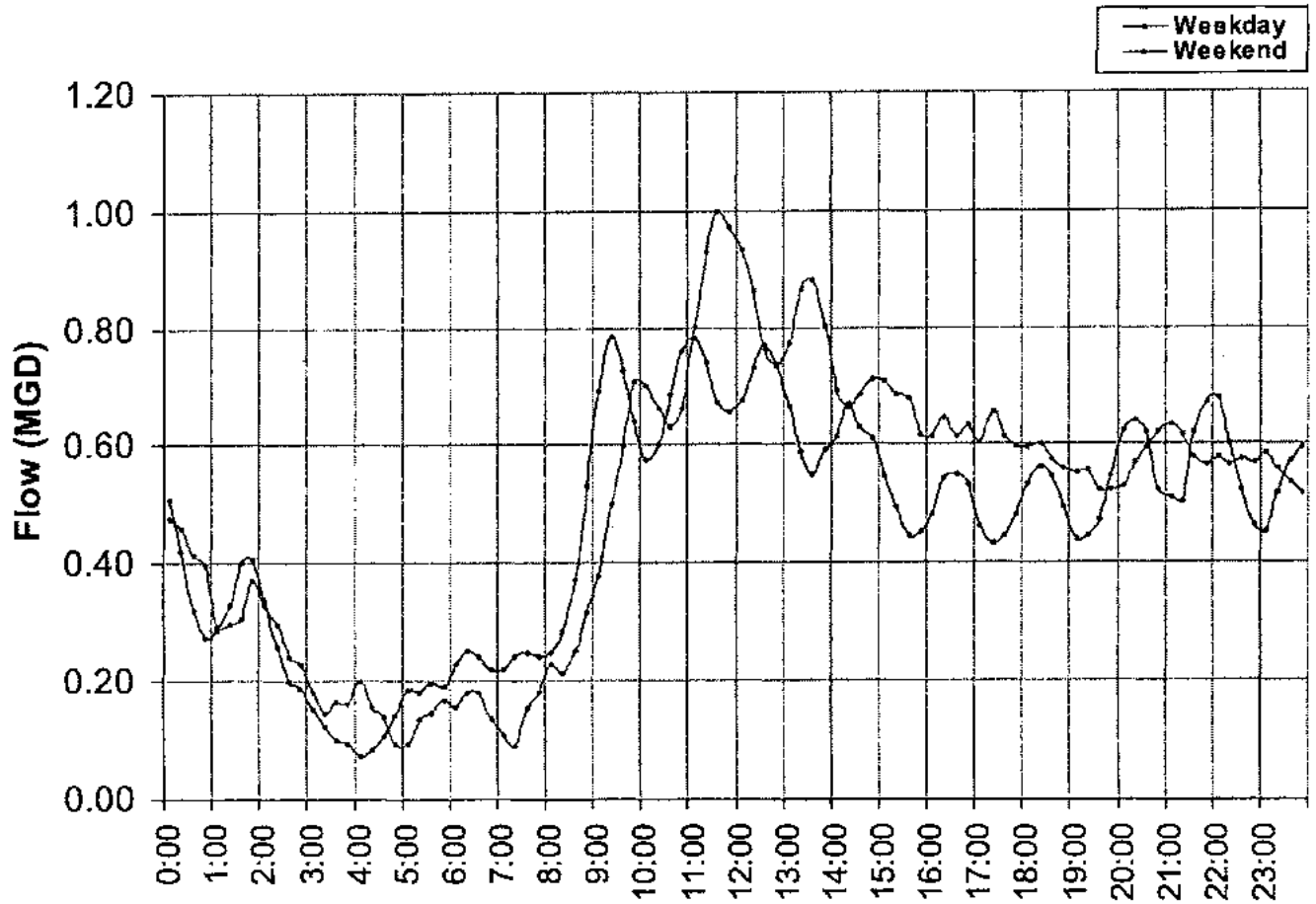


Plan view photo:

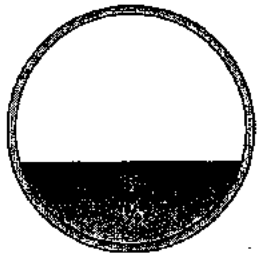
V&A

Average Dry Weather Flow

Monitoring Site:
SAV MH 04 Lat

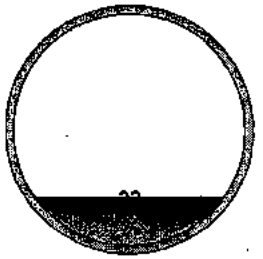


Peak Measured Flow:
1.35 *MGD*



Peak measured flow shown in weekly graphs on following pages

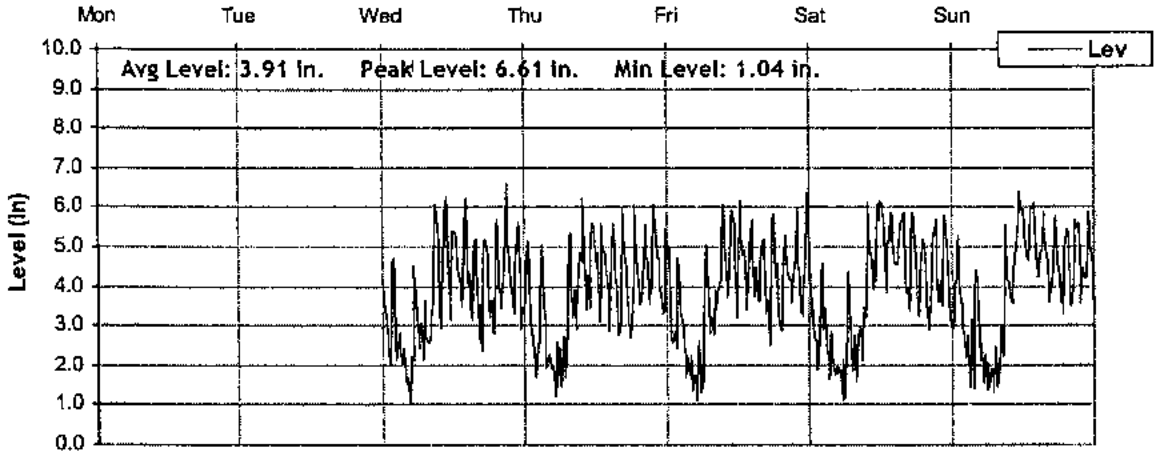
Average Dry Weather Flow:
0.47 *MGD*

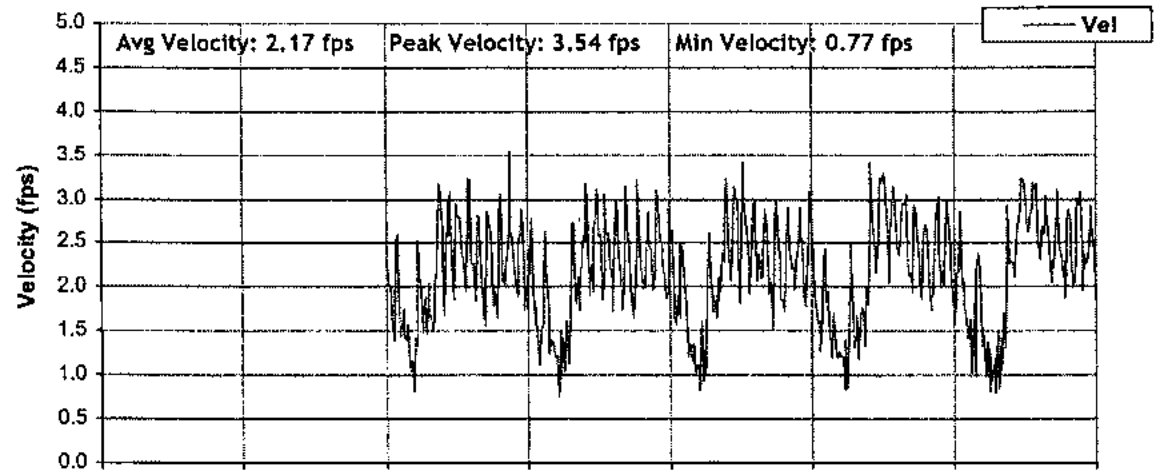


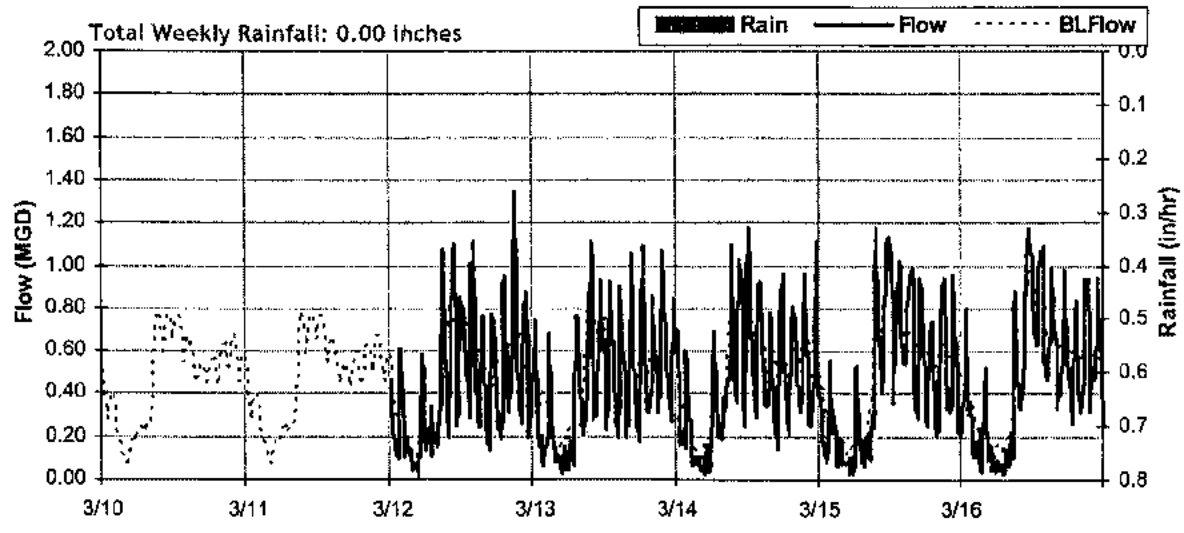
V&A

Level, Velocity and Flow
From 3/10/2008 to 3/17/2008

Monitoring Site:
SAV MH 04 Lat







Avg Flow: 0.46 MGD Peak Flow: 1.35 MGD Min Flow: 0.02 MGD

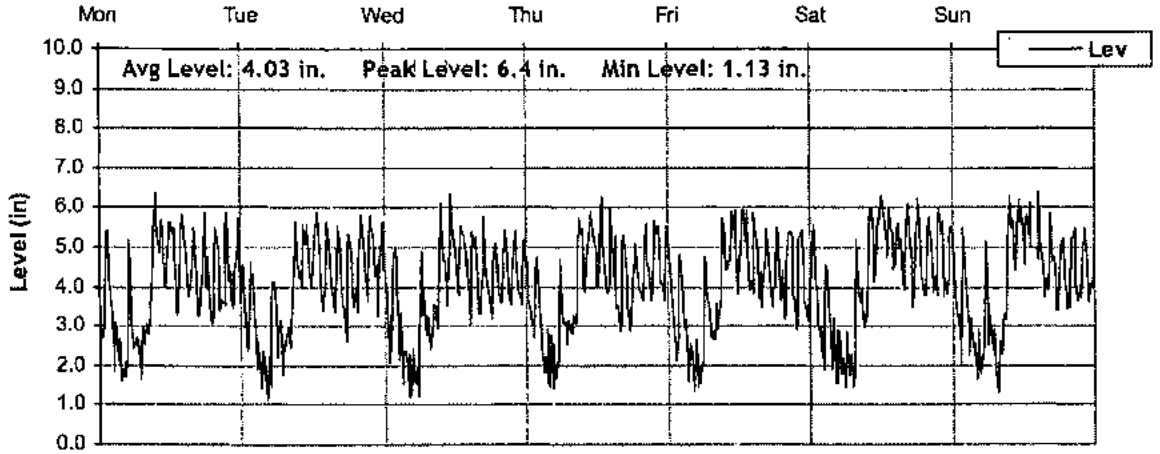
V&A

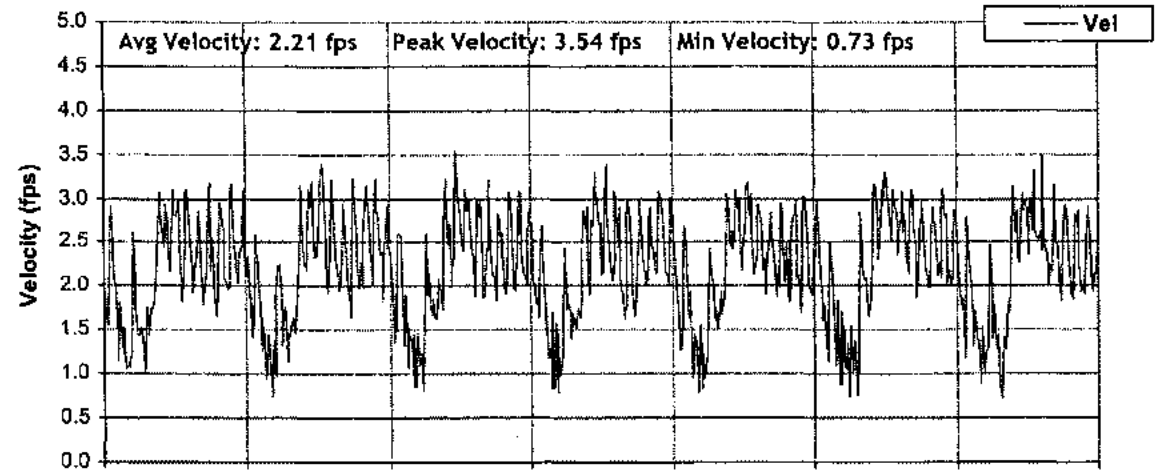
Level, Velocity and Flow

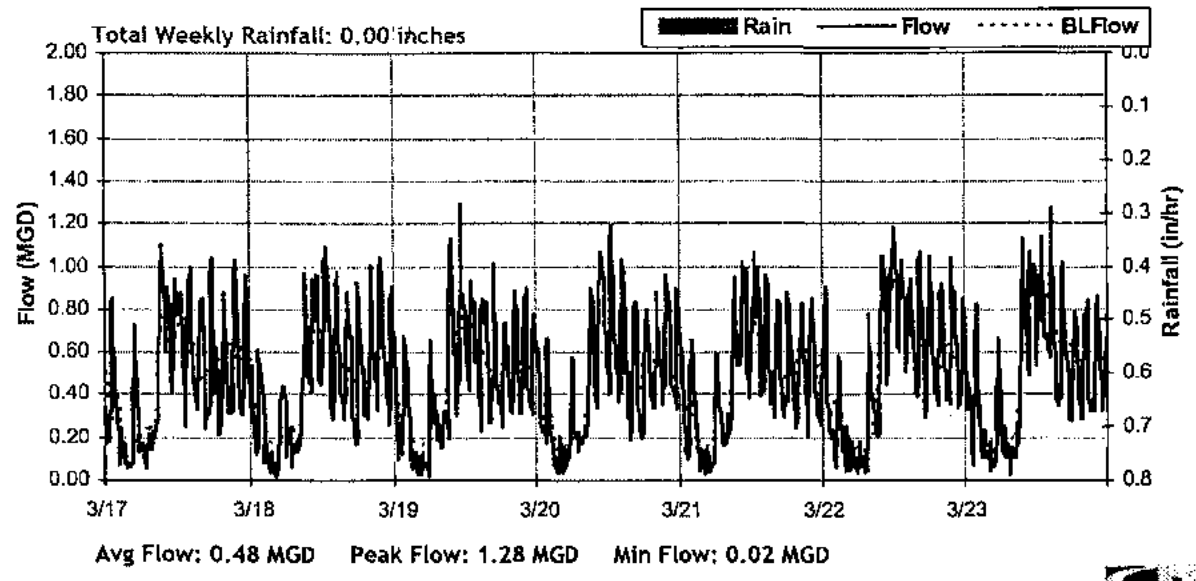
From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 04 Lat







Avg Flow: 0.48 MGD Peak Flow: 1.28 MGD Min Flow: 0.02 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 3/10/2008 to 3/17/2008

Monitoring Site:

SAV MH 04 Lat

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	3.91	2.17	0.46
Weekly Minimum:	1.54	1.07	0.06
Weekly Maximum:	6.07	3.13	1.06

	Monday 3/10/2008			Tuesday 3/11/2008			Wednesday 3/12/2008			Thursday 3/13/2008			Friday 3/14/2008			Saturday 3/15/2008			Sunday 3/16/2008			
Hour	Level (In)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (In)	Vel (fps)	Flow (MGD)	Hour
0:00							3.32	1.99	0.30	4.41	2.33	0.52	3.89	2.17	0.43	3.34	1.93	0.29	3.52	1.96	0.32	0:00
1:00							3.41	2.03	0.36	2.36	1.47	0.14	3.14	1.91	0.28	2.83	1.68	0.22	3.92	2.19	0.43	1:00
2:00							2.88	1.75	0.22	3.46	1.91	0.33	3.25	1.96	0.30	3.32	1.92	0.30	2.53	1.54	0.15	2:00
3:00							2.08	1.37	0.10	2.71	1.60	0.19	1.86	1.22	0.08	2.17	1.40	0.11	2.41	1.51	0.17	3:00
4:00							1.65	1.13	0.06	2.01	1.27	0.09	1.75	1.16	0.07	1.86	1.23	0.08	3.33	1.85	0.30	4:00
5:00							3.44	1.99	0.33	1.91	1.16	0.09	1.77	1.17	0.08	1.54	1.07	0.06	1.90	1.14	0.08	5:00
6:00							2.60	1.63	0.17	1.98	1.26	0.09	3.57	1.96	0.38	3.55	2.02	0.35	1.83	1.12	0.07	6:00
7:00							2.88	1.73	0.21	4.37	2.34	0.54	3.01	1.79	0.23	2.17	1.42	0.12	1.86	1.14	0.08	7:00
8:00							3.92	2.27	0.47	3.36	1.91	0.29	3.79	2.10	0.37	2.60	1.58	0.16	2.97	1.66	0.25	8:00
9:00							4.51	2.44	0.59	4.97	2.64	0.70	5.07	2.72	0.74	4.44	2.51	0.61	4.35	2.44	0.54	9:00
10:00							5.52	2.81	0.84	4.11	2.26	0.47	4.49	2.41	0.57	4.57	2.51	0.58	4.37	2.43	0.53	10:00
11:00							4.13	2.26	0.47	5.18	2.79	0.76	4.72	2.54	0.65	5.52	3.00	0.92	6.07	3.13	1.06	11:00
12:00							5.04	2.68	0.71	4.13	2.31	0.47	5.35	2.96	0.85	5.14	2.78	0.78	5.06	2.74	0.72	12:00
13:00							4.49	2.44	0.58	4.89	2.62	0.67	4.14	2.24	0.45	5.46	2.86	0.84	5.91	3.10	1.01	13:00
14:00							4.54	2.47	0.59	4.15	2.29	0.49	4.93	2.67	0.70	4.72	2.56	0.61	4.56	2.47	0.56	14:00
15:00							4.49	2.52	0.59	4.03	2.30	0.47	4.07	2.25	0.44	5.63	2.92	0.87	5.27	2.79	0.78	15:00
16:00							3.07	1.85	0.25	4.27	2.44	0.55	4.31	2.39	0.53	4.14	2.30	0.48	4.01	2.23	0.43	16:00
17:00							4.62	2.49	0.60	3.67	2.06	0.36	4.20	2.24	0.50	5.56	2.81	0.85	5.19	2.80	0.78	17:00
18:00							3.51	1.95	0.31	4.64	2.57	0.63	4.49	2.41	0.57	3.88	2.19	0.41	3.88	2.17	0.40	18:00
19:00							4.65	2.50	0.62	3.81	2.05	0.36	3.99	2.26	0.47	4.71	2.51	0.61	5.11	2.70	0.72	19:00
20:00							4.81	2.61	0.70	4.90	2.58	0.65	4.43	2.38	0.53	3.69	2.06	0.37	4.43	2.37	0.55	20:00
21:00							4.40	2.33	0.52	4.43	2.34	0.55	4.64	2.40	0.58	4.77	2.58	0.65	4.83	2.61	0.67	21:00
22:00							4.63	2.47	0.60	4.74	2.55	0.62	3.91	2.19	0.42	4.36	2.36	0.53	4.60	2.44	0.57	22:00
23:00							3.52	2.00	0.32	3.96	2.21	0.44	4.93	2.47	0.66	4.37	2.37	0.53	4.71	2.44	0.61	23:00
Average:							3.84	2.15	0.44	3.85	2.13	0.44	3.90	2.17	0.45	3.93	2.19	0.47	4.02	2.21	0.49	Ave
Minimum:							1.65	1.13	0.06	1.91	1.16	0.09	1.75	1.16	0.07	1.54	1.07	0.06	1.83	1.12	0.07	Min
Maximum:							5.52	2.81	0.84	5.18	2.79	0.76	5.35	2.96	0.85	5.56	3.00	0.92	6.07	3.13	1.06	Max

Hourly Data: Depth, Velocity and Flow

From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 04 Lat

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	4.03	2.21	0.48
Weekly Minimum:	1.83	1.08	0.07
Weekly Maximum:	5.81	3.20	0.95

	Monday 3/17/2008			Tuesday 3/18/2008			Wednesday 3/19/2008			Thursday 3/20/2008			Friday 3/21/2008			Saturday 3/22/2008			Sunday 3/23/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	3.40	1.94	0.31	3.46	1.88	0.31	3.36	1.94	0.31	3.68	2.14	0.37	4.22	2.30	0.49	4.79	2.59	0.65	4.12	2.15	0.44	0:00
1:00	4.58	2.43	0.58	4.07	2.26	0.45	4.15	2.30	0.50	3.77	2.16	0.40	2.86	1.62	0.20	2.92	1.66	0.21	3.90	2.08	0.44	1:00
2:00	2.46	1.44	0.14	2.50	1.53	0.15	2.88	1.67	0.24	2.63	1.60	0.18	3.71	2.10	0.39	3.47	1.89	0.33	3.47	1.86	0.32	2:00
3:00	2.03	1.23	0.09	1.90	1.18	0.08	2.03	1.30	0.10	2.03	1.18	0.10	2.42	1.43	0.14	2.88	1.65	0.21	2.64	1.45	0.15	3:00
4:00	2.75	1.52	0.24	2.03	1.25	0.11	1.88	1.22	0.08	2.10	1.21	0.10	1.98	1.14	0.09	2.22	1.26	0.12	2.10	1.13	0.09	4:00
5:00	3.09	1.70	0.24	3.46	1.93	0.32	2.09	1.28	0.12	3.03	1.64	0.25	1.99	1.15	0.08	1.83	1.08	0.07	3.46	1.78	0.32	5:00
6:00	2.29	1.33	0.12	2.60	1.53	0.16	3.74	2.11	0.38	2.96	1.66	0.21	3.66	2.02	0.36	2.17	1.26	0.10	2.67	1.45	0.16	6:00
7:00	2.78	1.61	0.18	2.63	1.52	0.16	2.82	1.70	0.20	2.97	1.60	0.20	2.79	1.64	0.19	2.69	1.48	0.24	2.15	1.11	0.10	7:00
8:00	3.44	1.95	0.30	3.95	2.14	0.43	3.34	1.94	0.29	3.61	1.91	0.32	3.31	1.83	0.27	3.74	2.08	0.36	2.82	1.54	0.18	8:00
9:00	5.70	2.83	0.88	4.65	2.52	0.61	5.37	2.93	0.85	5.14	2.62	0.72	5.22	2.79	0.78	3.62	2.00	0.34	5.07	2.54	0.71	9:00
10:00	5.14	2.64	0.72	5.05	2.85	0.77	4.13	2.31	0.46	4.96	2.66	0.71	4.93	2.66	0.69	5.35	2.86	0.83	5.11	2.56	0.70	10:00
11:00	4.87	2.67	0.68	4.64	2.60	0.62	5.56	3.15	0.95	5.36	2.87	0.82	5.05	2.68	0.72	5.42	2.85	0.84	5.81	2.96	0.95	11:00
12:00	5.29	2.81	0.79	5.47	3.20	0.94	4.46	2.61	0.59	5.03	2.70	0.75	5.43	2.90	0.85	5.71	2.96	0.93	5.30	2.70	0.77	12:00
13:00	4.35	2.35	0.53	3.85	2.27	0.41	5.02	2.73	0.72	4.38	2.40	0.53	4.94	2.67	0.70	5.39	2.85	0.83	5.29	2.78	0.79	13:00
14:00	4.88	2.62	0.68	5.15	2.90	0.79	4.40	2.45	0.56	4.94	2.69	0.70	4.82	2.60	0.66	5.06	2.71	0.72	5.29	2.75	0.79	14:00
15:00	4.38	2.32	0.51	3.80	2.13	0.38	4.36	2.45	0.55	3.77	2.11	0.40	4.17	2.29	0.47	4.58	2.47	0.58	4.18	2.23	0.45	15:00
16:00	4.21	2.24	0.48	4.77	2.56	0.64	4.41	2.49	0.57	4.60	2.59	0.63	4.87	2.60	0.66	5.35	2.78	0.80	4.99	2.69	0.72	16:00
17:00	4.72	2.56	0.65	3.66	2.19	0.41	3.81	2.13	0.38	3.44	1.94	0.30	4.01	2.17	0.42	4.40	2.28	0.51	3.91	2.10	0.39	17:00
18:00	3.87	2.08	0.39	4.33	2.41	0.53	4.35	2.43	0.54	4.66	2.66	0.63	4.87	2.56	0.66	5.45	2.65	0.79	4.99	2.79	0.72	18:00
19:00	4.50	2.51	0.59	4.24	2.44	0.52	4.10	2.23	0.45	3.79	2.12	0.37	3.69	2.08	0.36	4.27	2.19	0.47	3.72	2.02	0.35	19:00
20:00	3.89	2.18	0.41	4.84	2.68	0.68	4.72	2.62	0.65	4.98	2.67	0.70	5.18	2.76	0.75	5.08	2.62	0.71	5.04	2.67	0.71	20:00
21:00	4.77	2.64	0.68	5.10	2.78	0.77	4.31	2.42	0.53	4.31	2.43	0.54	3.69	2.07	0.36	4.89	2.59	0.68	3.84	1.98	0.35	21:00
22:00	3.99	2.26	0.43	4.36	2.34	0.52	4.38	2.42	0.54	4.84	2.57	0.65	5.10	2.78	0.75	4.75	2.46	0.61	4.76	2.48	0.62	22:00
23:00	4.80	2.56	0.65	4.88	2.63	0.67	4.43	2.51	0.56	4.68	2.50	0.62	3.58	2.08	0.34	4.72	2.42	0.60	4.25	2.28	0.48	23:00
Average:	4.01	2.18	0.47	3.97	2.24	0.48	3.92	2.22	0.46	3.98	2.19	0.47	4.02	2.20	0.47	4.20	2.23	0.52	4.12	2.17	0.49	Ave
Minimum:	2.03	1.23	0.09	1.90	1.18	0.08	1.88	1.22	0.08	2.03	1.18	0.10	1.98	1.14	0.08	1.83	1.08	0.07	2.10	1.11	0.09	Min
Maximum:	5.70	2.83	0.88	5.47	3.20	0.94	5.56	3.15	0.95	5.36	2.87	0.82	5.43	2.90	0.85	5.71	2.96	0.93	5.81	2.96	0.95	Max

Temporary Flow Monitoring Study

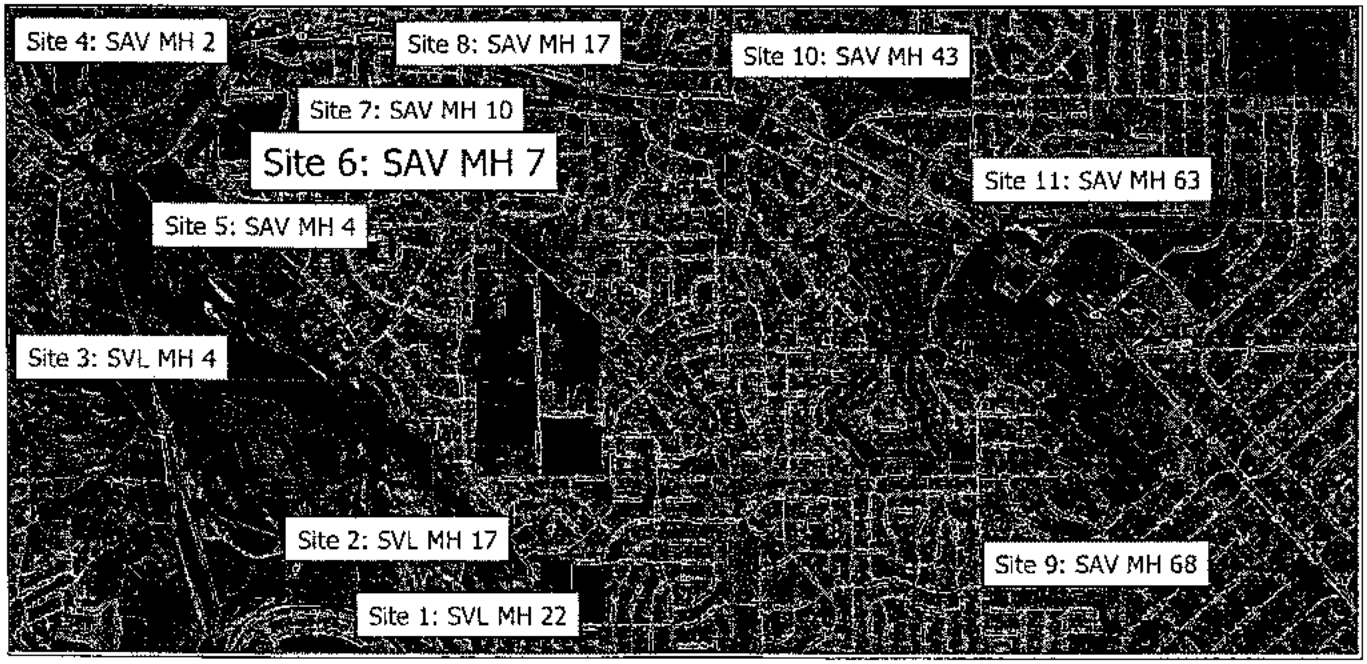
Sanitary Sewer Collection System

Monitoring Site: SAV MH 07

Manhole Address: Sand wash, 400 feet west of school

Size/Type of Line: 15-inch Pipe

Data Summary Report



V&A

	Site Information Report	**Monitoring Site:** SAV MH 07

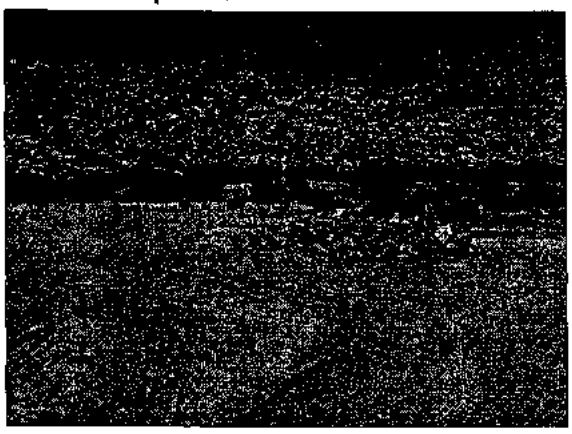
Location: Sand wash, 400 feet west of school

Diameter: 15 inches

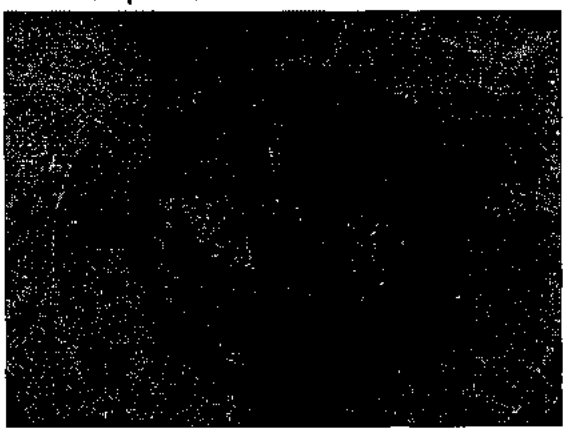
Average Dry Weather Flow: 1.485 *MGD*

Peak Measured Flow: 2.302 *MGD*

Street-level photo:



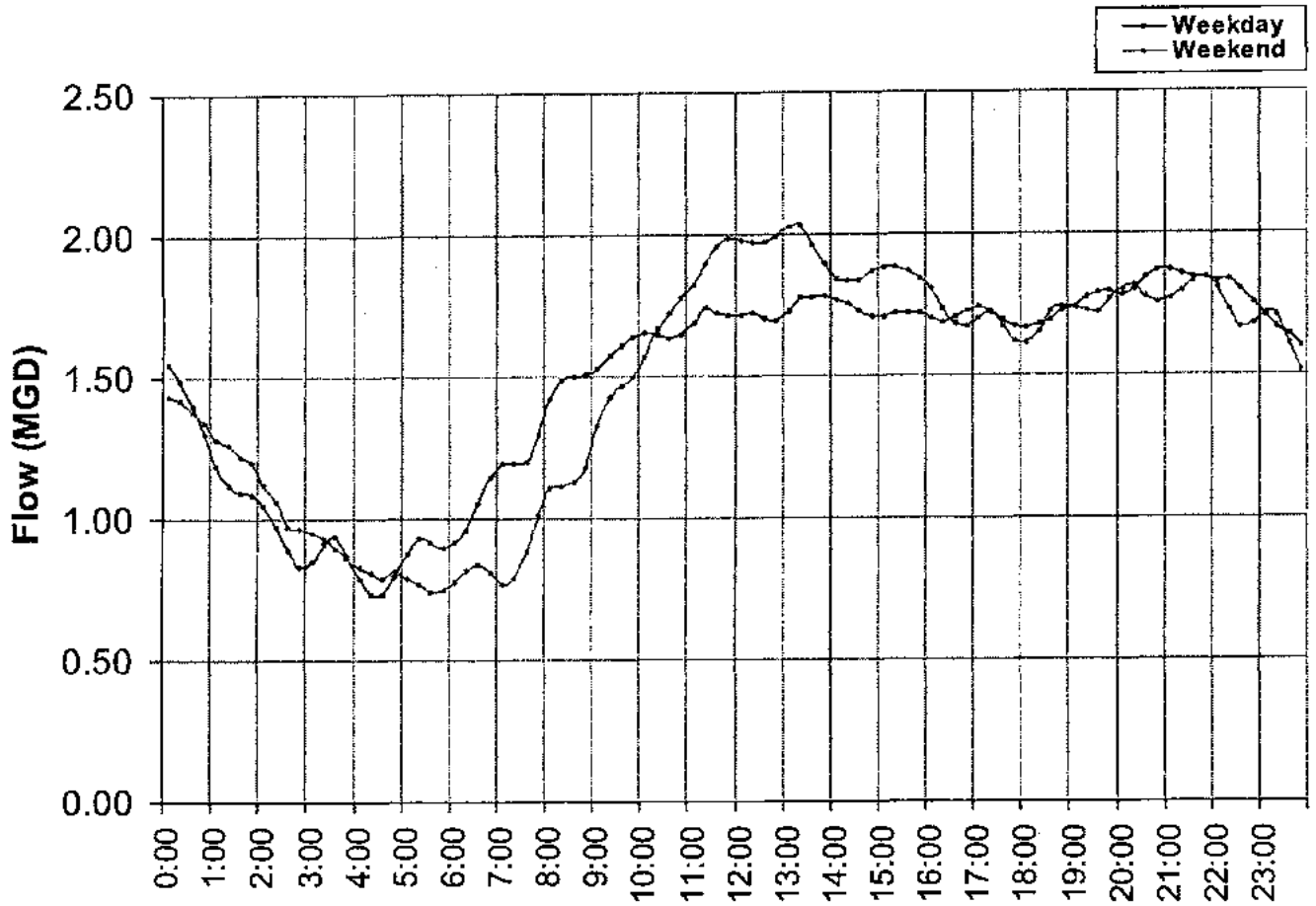
Plan view photo:



V&A

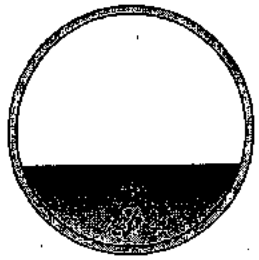
Average Dry Weather Flow

Monitoring Site:
SAV MH 07



Peak Measured Flow:

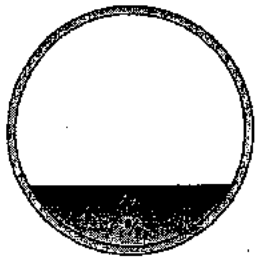
2.30 *MGD*



Peak measured flow shown in weekly graphs on following pages

Average Dry Weather Flow:

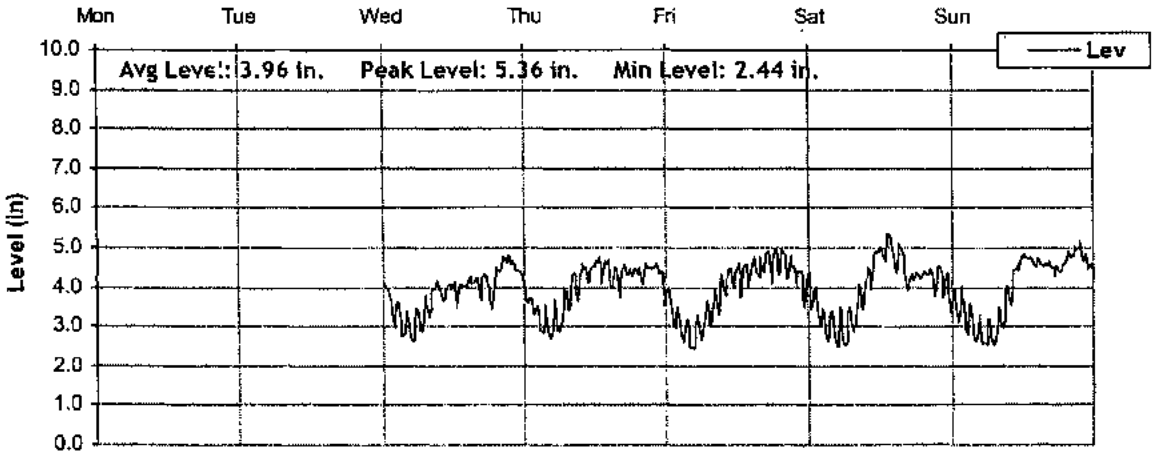
1.49 *MGD*

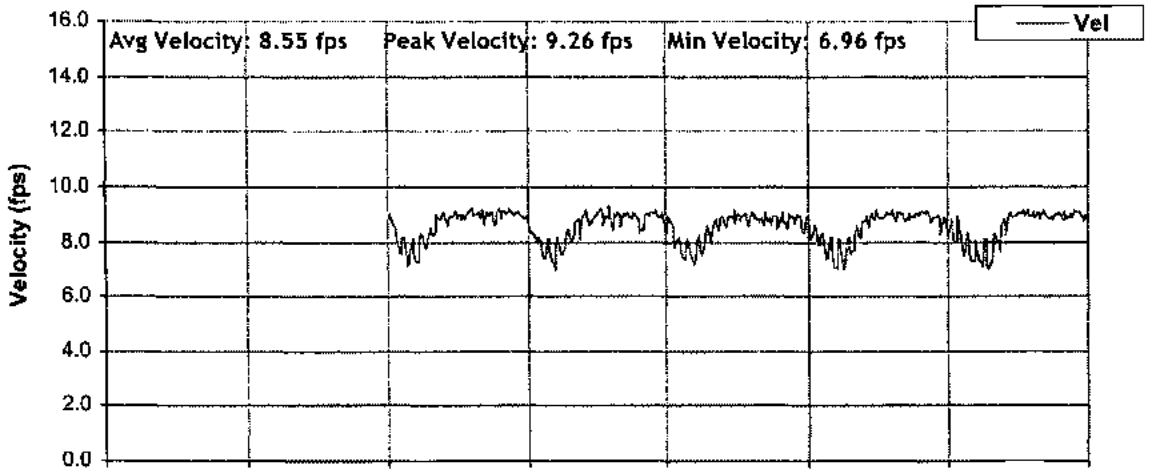


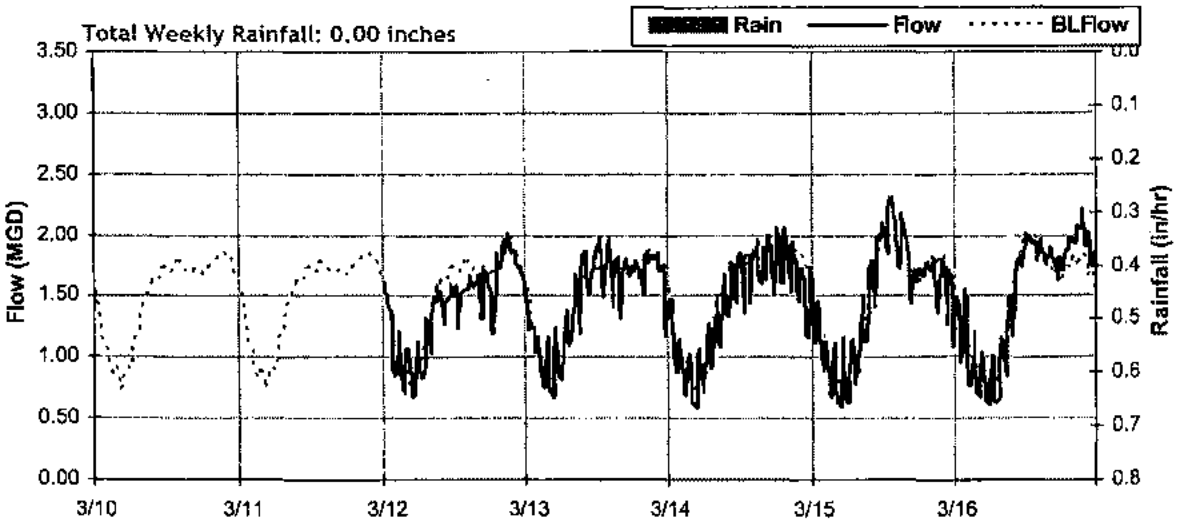
V&A

Level, Velocity and Flow
From 3/10/2008 to 3/17/2008

Monitoring Site:
SAV MH 07







Avg Flow: 1.46 MGD Peak Flow: 2.3 MGD Min Flow: 0.6 MGD

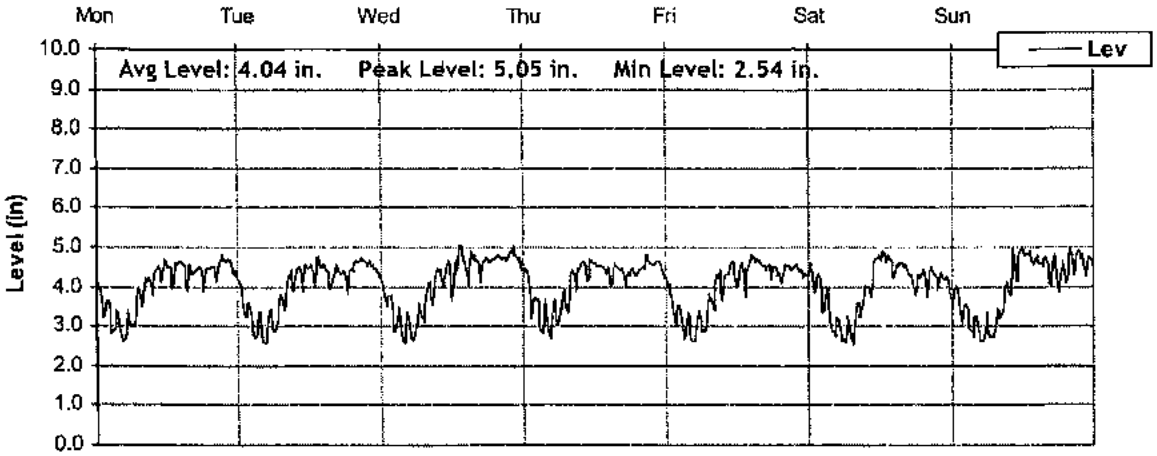
V&A

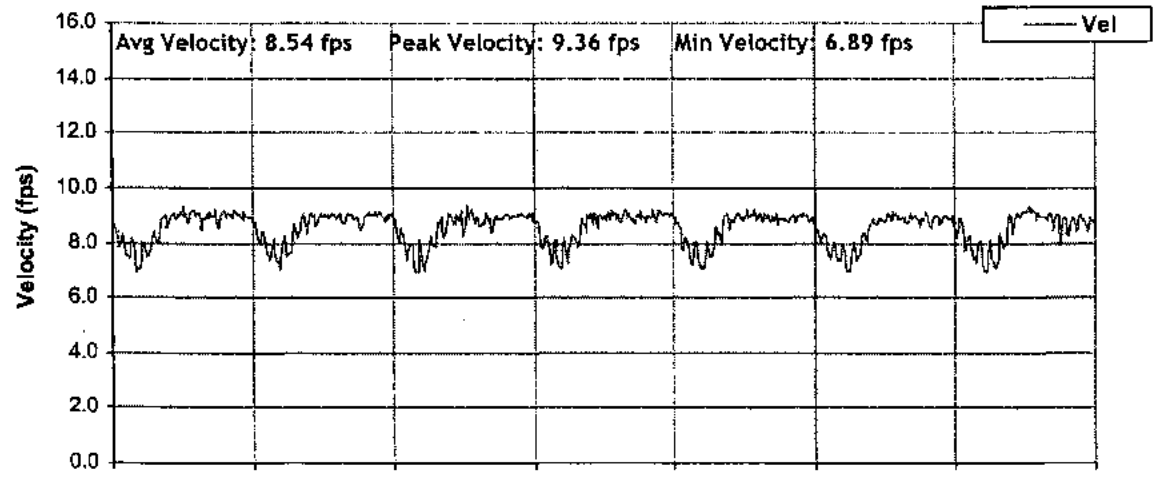
Level, Velocity and Flow

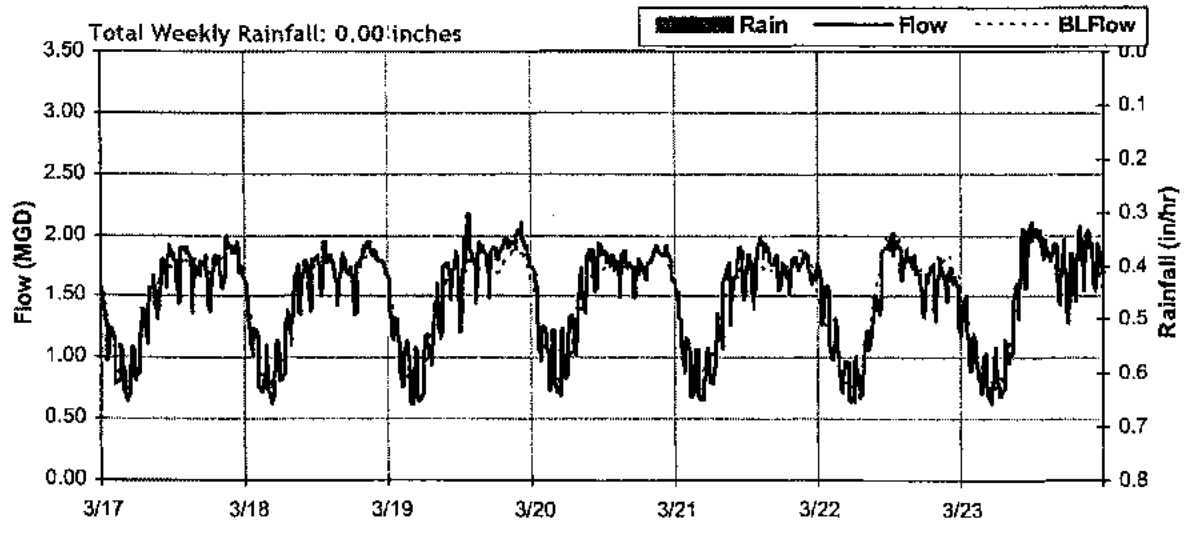
From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 07







Avg Flow: 1.5 MGD Peak Flow: 2.17 MGD Min Flow: 0.63 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 3/10/2008 to 3/17/2008

Monitoring Site:

SAV MH 07

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	3.96	8.55	1.46
Weekly Minimum:	2.47	7.19	0.62
Weekly Maximum:	5.19	9.11	2.20

	Monday 3/10/2008			Tuesday 3/11/2008			Wednesday 3/12/2008			Thursday 3/13/2008			Friday 3/14/2008			Saturday 3/15/2008			Sunday 3/16/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00							4.02	8.82	1.51	3.72	8.44	1.29	3.87	8.77	1.42	3.75	8.40	1.31	3.73	8.51	1.31	0:00
1:00							3.44	8.11	1.12	3.52	8.13	1.15	3.18	8.07	0.99	3.49	8.22	1.16	3.57	8.38	1.22	1:00
2:00							3.38	7.95	1.07	3.08	7.67	0.91	3.03	7.81	0.90	3.18	7.98	0.99	3.05	7.65	0.89	2:00
3:00							2.93	7.41	0.81	3.16	7.83	0.96	2.92	7.72	0.84	3.02	7.75	0.89	3.08	7.79	0.92	3:00
4:00							2.96	7.60	0.85	2.76	7.30	0.73	2.47	7.24	0.62	2.61	7.24	0.67	2.94	7.58	0.84	4:00
5:00							3.15	7.88	0.96	3.17	7.80	0.96	2.97	7.91	0.89	3.03	7.69	0.89	2.56	7.19	0.65	5:00
6:00							3.01	7.92	0.90	3.47	8.01	1.12	3.14	8.04	0.98	3.00	7.60	0.87	2.91	7.58	0.83	6:00
7:00							3.54	8.35	1.20	3.63	8.21	1.22	3.24	8.19	1.04	3.00	7.68	0.87	2.88	7.62	0.82	7:00
8:00							3.81	8.76	1.39	4.20	8.68	1.58	3.68	8.64	1.31	3.75	8.29	1.29	3.14	7.93	0.96	8:00
9:00							3.99	8.90	1.51	4.24	8.75	1.62	4.08	8.85	1.55	4.07	8.65	1.51	3.81	8.56	1.36	9:00
10:00							3.81	8.84	1.40	4.32	8.84	1.67	4.23	8.81	1.62	4.42	8.85	1.73	4.31	8.93	1.68	10:00
11:00							4.03	8.99	1.54	4.50	8.89	1.78	4.21	8.88	1.62	4.90	8.92	2.01	4.61	8.94	1.85	11:00
12:00							3.78	8.95	1.40	4.62	9.09	1.89	4.27	8.90	1.66	4.89	8.88	1.99	4.77	9.09	1.97	12:00
13:00							4.04	9.00	1.55	4.42	8.83	1.72	4.43	8.87	1.74	5.19	9.02	2.20	4.69	9.02	1.91	13:00
14:00							4.14	9.11	1.63	4.28	8.79	1.65	4.58	8.92	1.83	4.67	8.95	1.89	4.64	8.97	1.87	14:00
15:00							4.16	8.99	1.61	4.40	9.01	1.75	4.41	8.81	1.71	4.95	9.04	2.06	4.54	8.93	1.81	15:00
16:00							3.99	8.88	1.50	4.22	8.81	1.62	4.61	8.87	1.84	4.16	8.86	1.59	4.58	9.01	1.85	16:00
17:00							4.13	9.03	1.61	4.37	8.95	1.72	4.52	8.71	1.76	4.29	8.92	1.67	4.46	8.90	1.76	17:00
18:00							3.79	8.80	1.39	4.42	8.96	1.75	4.74	8.82	1.90	4.29	8.95	1.68	4.46	8.94	1.76	18:00
19:00							4.46	9.04	1.79	4.38	8.47	1.63	4.75	8.83	1.90	4.38	9.08	1.75	4.77	8.92	1.93	19:00
20:00							4.69	9.09	1.93	4.42	8.90	1.74	4.54	8.73	1.77	4.36	8.99	1.72	4.85	8.93	1.98	20:00
21:00							4.65	9.04	1.89	4.50	9.08	1.82	4.34	8.81	1.68	4.24	8.85	1.63	5.02	9.02	2.10	21:00
22:00							4.47	9.01	1.78	4.46	8.99	1.78	4.35	8.92	1.70	4.09	8.63	1.51	4.73	9.03	1.93	22:00
23:00							4.29	8.90	1.67	4.06	8.71	1.52	3.95	8.58	1.44	3.98	8.62	1.46	4.49	8.90	1.78	23:00
Average:							3.86	8.64	1.42	4.01	8.55	1.48	3.94	8.53	1.45	3.99	8.50	1.47	4.02	8.51	1.50	Ave
Minimum:							2.93	7.41	0.81	2.76	7.30	0.73	2.47	7.24	0.62	2.61	7.24	0.67	2.56	7.19	0.65	Min
Maximum:							4.69	9.11	1.93	4.62	9.09	1.89	4.75	8.92	1.90	5.19	9.08	2.20	5.02	9.09	2.10	Max

Hourly Data: Depth, Velocity and Flow

From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 07

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	4.04	8.54	1.50
Weekly Minimum:	2.59	7.08	0.66
Weekly Maximum:	4.88	9.17	2.01

	Monday 3/17/2008			Tuesday 3/18/2008			Wednesday 3/19/2008			Thursday 3/20/2008			Friday 3/21/2008			Saturday 3/22/2008			Sunday 3/23/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	3.90	8.45	1.39	3.89	8.57	1.40	3.85	8.47	1.37	4.34	8.69	1.65	4.04	8.75	1.51	4.32	8.31	1.58	3.83	8.61	1.38	0:00
1:00	3.45	8.04	1.11	3.43	8.19	1.12	3.65	8.28	1.24	3.53	7.97	1.13	3.31	8.06	1.05	4.20	8.23	1.50	3.34	8.06	1.07	1:00
2:00	3.00	7.62	0.86	2.94	7.64	0.84	3.08	7.64	0.90	3.29	7.72	1.00	3.24	7.79	0.99	3.59	7.66	1.12	3.38	8.03	1.08	2:00
3:00	3.15	7.78	0.95	3.11	7.86	0.94	2.90	7.34	0.80	3.33	7.73	1.02	3.00	7.62	0.87	3.42	7.70	1.06	2.93	7.48	0.82	3:00
4:00	2.66	7.08	0.67	2.59	7.25	0.66	2.98	7.51	0.85	2.92	7.30	0.80	2.69	7.17	0.69	3.00	7.63	0.86	2.92	7.53	0.83	4:00
5:00	3.18	7.81	0.96	3.18	7.88	0.97	2.76	7.34	0.74	3.22	7.69	0.97	3.08	7.66	0.90	2.76	7.18	0.72	2.88	7.39	0.80	5:00
6:00	3.28	7.84	1.01	3.12	7.74	0.93	3.40	8.04	1.08	3.68	8.13	1.23	2.95	7.59	0.84	2.94	7.58	0.84	2.78	7.23	0.73	6:00
7:00	3.66	8.17	1.22	3.62	8.34	1.23	3.63	8.33	1.25	3.73	8.20	1.27	3.71	8.39	1.28	2.75	7.61	0.76	3.13	7.78	0.94	7:00
8:00	4.18	8.84	1.60	4.19	8.84	1.61	3.85	8.49	1.37	4.16	8.65	1.55	3.99	8.68	1.48	3.48	8.21	1.15	3.41	8.08	1.10	8:00
9:00	4.06	8.75	1.52	4.13	8.71	1.55	4.43	8.96	1.76	4.55	8.89	1.81	4.05	8.71	1.51	3.88	8.65	1.41	3.94	8.66	1.44	9:00
10:00	4.37	8.97	1.72	4.30	8.89	1.67	4.18	8.83	1.60	4.38	8.81	1.70	4.39	8.90	1.72	4.10	8.74	1.54	4.59	8.95	1.84	10:00
11:00	4.52	9.04	1.82	4.41	8.91	1.73	4.35	8.80	1.69	4.65	8.96	1.87	4.37	8.94	1.72	4.75	8.81	1.90	4.71	9.05	1.93	11:00
12:00	4.33	8.99	1.71	4.37	8.92	1.71	4.39	8.98	1.74	4.55	9.00	1.83	4.41	9.02	1.75	4.77	8.92	1.93	4.80	9.17	2.01	12:00
13:00	4.48	9.07	1.81	4.60	9.02	1.86	4.88	8.99	2.01	4.45	9.00	1.77	4.26	9.07	1.68	4.69	8.99	1.91	4.73	9.06	1.94	13:00
14:00	4.60	9.02	1.86	4.51	9.00	1.81	4.30	8.74	1.64	4.27	8.85	1.65	4.72	8.96	1.91	4.40	8.93	1.73	4.67	8.98	1.89	14:00
15:00	4.22	8.72	1.60	4.12	8.76	1.55	4.77	8.82	1.91	4.52	9.05	1.82	4.65	8.91	1.86	4.55	8.81	1.79	4.65	8.91	1.86	15:00
16:00	4.39	9.00	1.74	4.44	9.01	1.77	4.39	8.62	1.67	4.40	8.92	1.73	4.50	8.89	1.78	4.44	8.97	1.76	4.30	8.81	1.66	16:00
17:00	4.40	8.98	1.74	4.35	8.91	1.70	4.67	8.89	1.87	4.18	8.85	1.60	4.36	8.84	1.69	4.08	8.83	1.55	4.59	8.83	1.82	17:00
18:00	4.27	8.89	1.66	4.12	8.68	1.54	4.65	8.87	1.85	4.41	8.98	1.74	4.43	8.85	1.73	4.23	8.97	1.65	4.33	8.69	1.66	18:00
19:00	4.49	9.02	1.80	4.53	9.01	1.82	4.75	8.99	1.94	4.41	8.87	1.73	4.31	8.84	1.66	4.21	8.71	1.59	4.37	8.56	1.65	19:00
20:00	4.35	9.01	1.72	4.67	9.06	1.91	4.74	8.95	1.92	4.60	8.98	1.85	4.52	8.89	1.79	4.36	8.94	1.71	4.56	8.69	1.78	20:00
21:00	4.70	9.03	1.92	4.60	9.01	1.86	4.78	9.04	1.97	4.59	9.09	1.87	4.50	8.96	1.79	4.16	8.83	1.58	4.82	8.90	1.96	21:00
22:00	4.65	8.96	1.87	4.55	8.89	1.81	4.86	8.94	1.99	4.63	9.06	1.89	4.43	8.97	1.75	4.25	8.91	1.65	4.55	8.68	1.77	22:00
23:00	4.32	8.94	1.69	4.37	8.95	1.72	4.56	8.96	1.83	4.36	8.97	1.71	4.28	8.83	1.65	4.06	8.78	1.53	4.65	8.74	1.83	23:00
Average:	4.02	8.58	1.50	4.00	8.58	1.49	4.12	8.53	1.54	4.13	8.60	1.55	4.01	8.55	1.48	3.97	8.45	1.45	4.03	8.45	1.49	Ave
Minimum:	2.66	7.08	0.67	2.59	7.25	0.66	2.76	7.34	0.74	2.92	7.30	0.80	2.69	7.17	0.69	2.75	7.18	0.72	2.78	7.23	0.73	Min
Maximum:	4.70	9.07	1.92	4.67	9.06	1.91	4.88	9.04	2.01	4.65	9.09	1.89	4.72	9.07	1.91	4.77	8.99	1.93	4.82	9.17	2.01	Max

Temporary Flow Monitoring Study

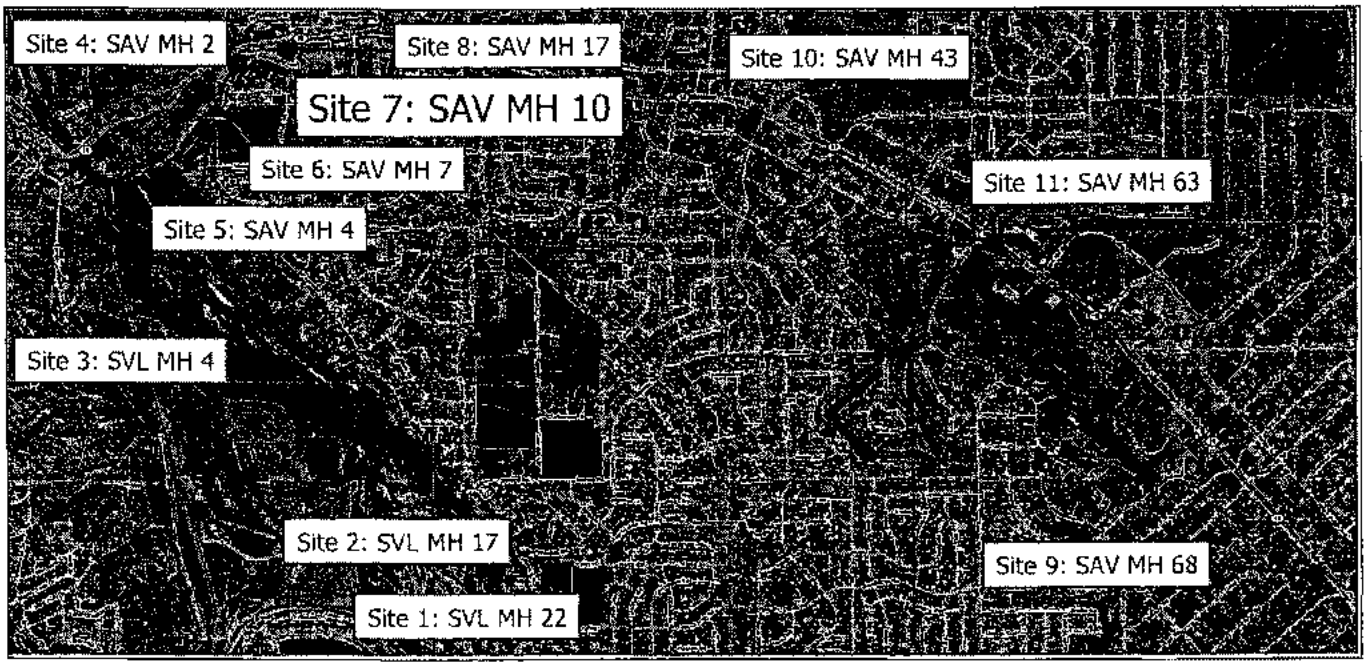
Sanitary Sewer Collection System

Monitoring Site: SAV MH 10

Manhole Address: Service road south of sand wash

Size/Type of Line: 15-inch Pipe

Data Summary Report



V&A

	Site Information Report	**Monitoring Site:** SAV MH 10

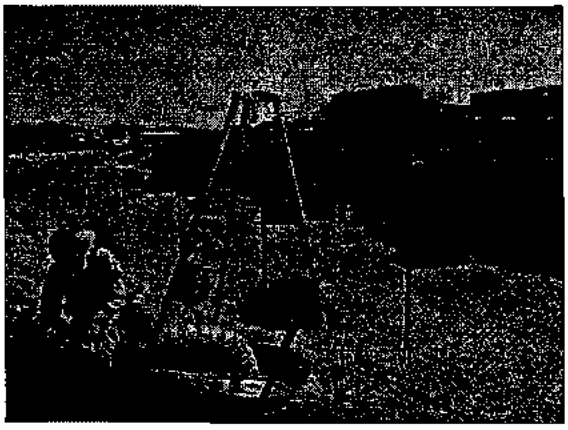
Location: Service road south of sand wash

Diameter: 15 inches

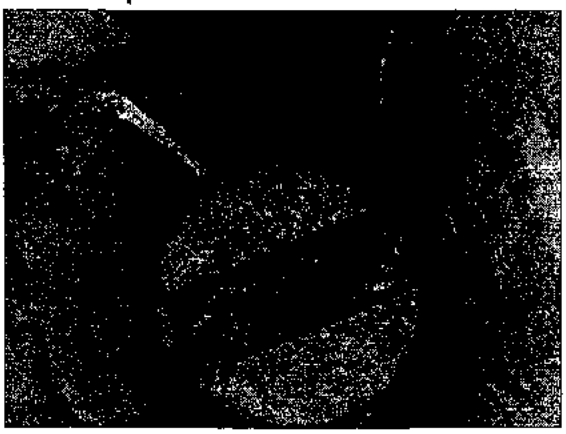
Average Dry Weather Flow: 1.327 *MGD*

Peak Measured Flow: 2.033 *MGD*

Street-level photo:



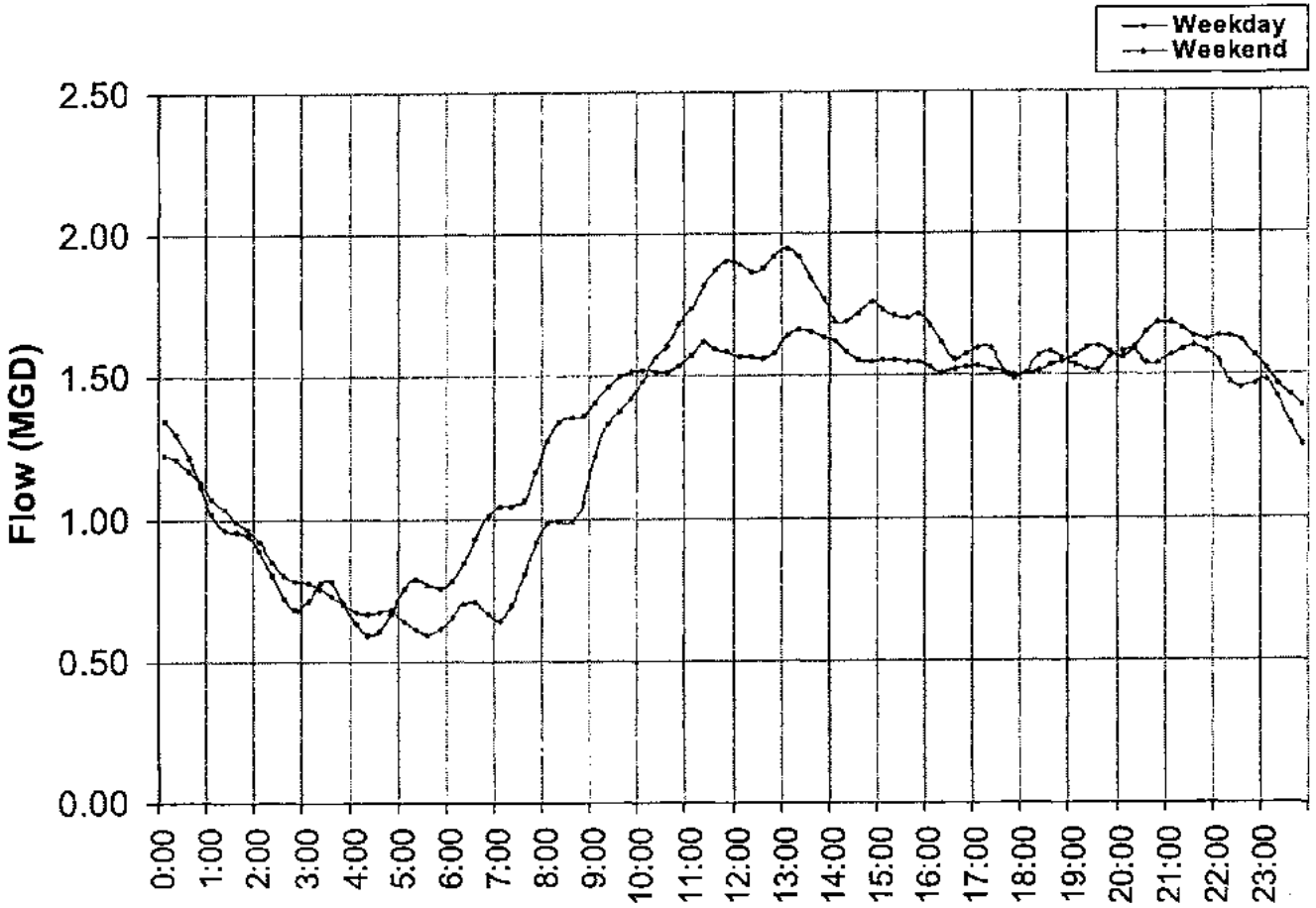
Plan view photo:



V&A

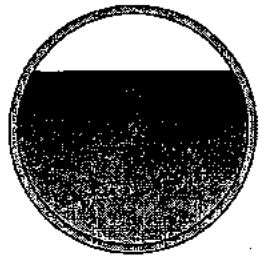
Average Dry Weather Flow

Monitoring Site:
SAV MH 10



Peak Measured Flow:

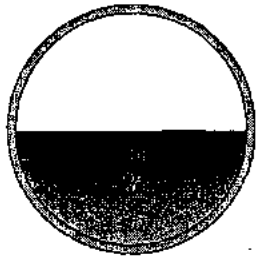
2.03 *MGD*



Peak measured flow shown in weekly graphs on following pages

Average Dry Weather Flow:

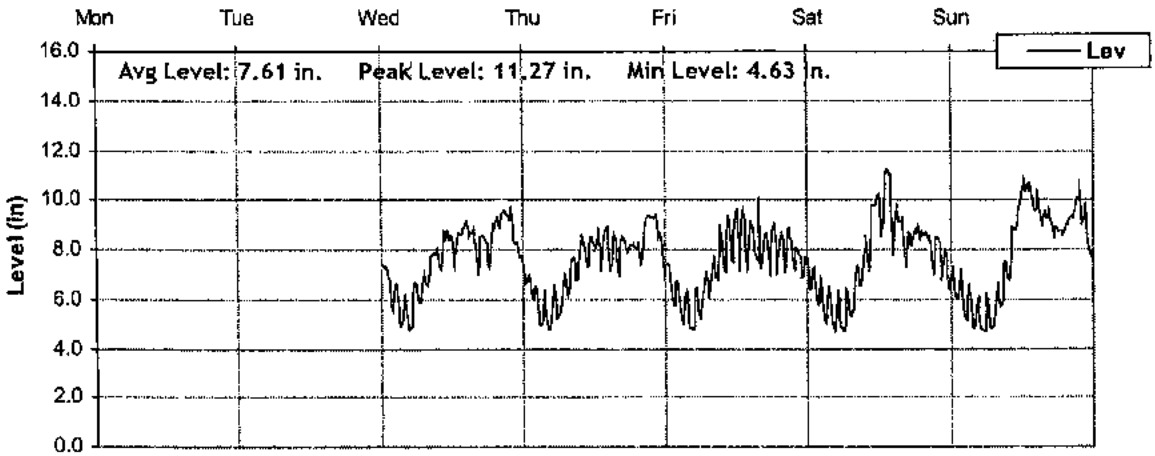
1.33 *MGD*

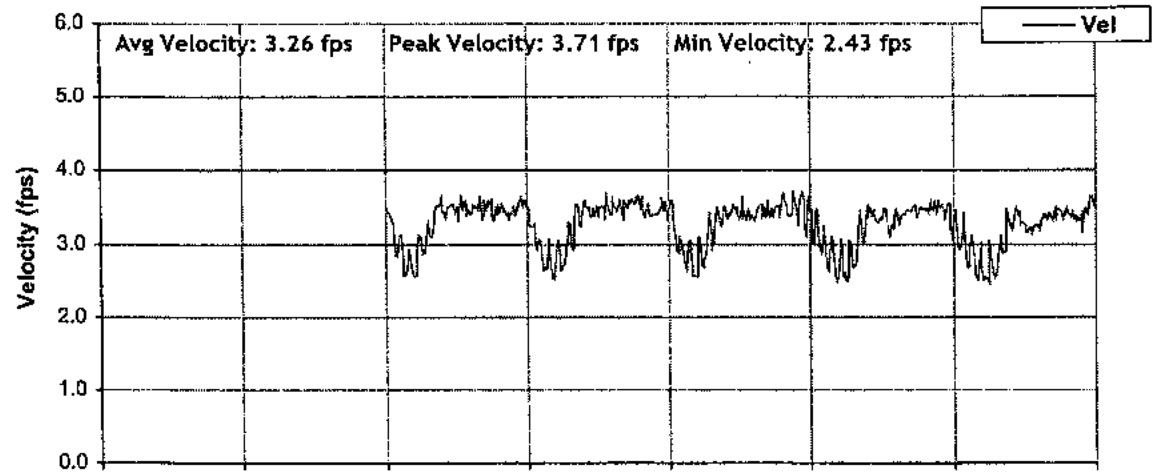


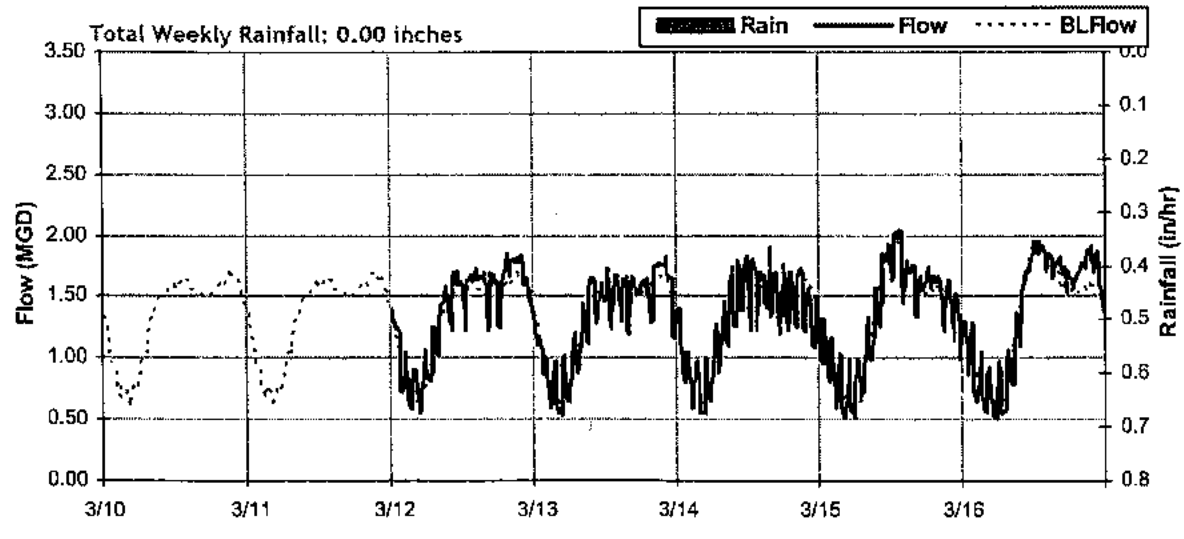
V&A

Level, Velocity and Flow
From 3/10/2008 to 3/17/2008

Monitoring Site:
SAV MH 10





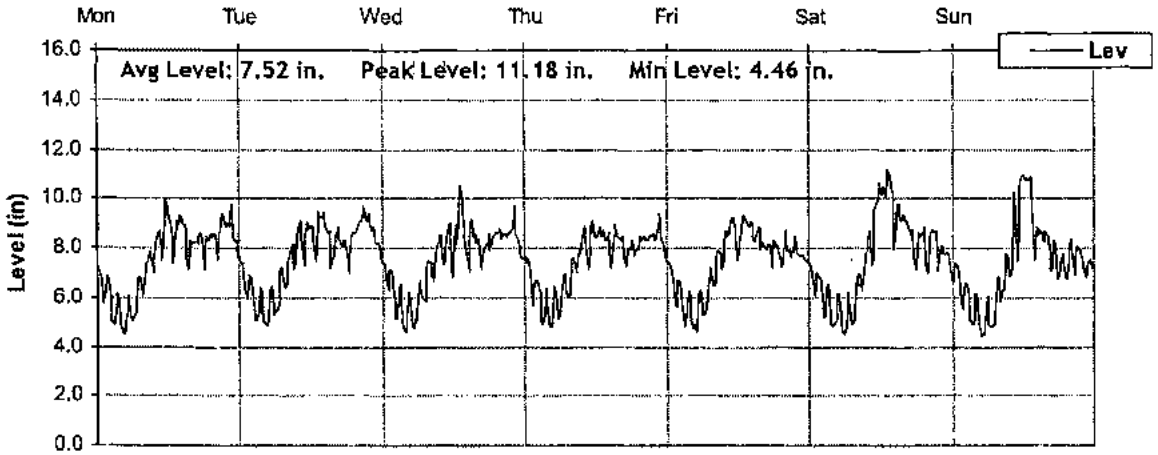


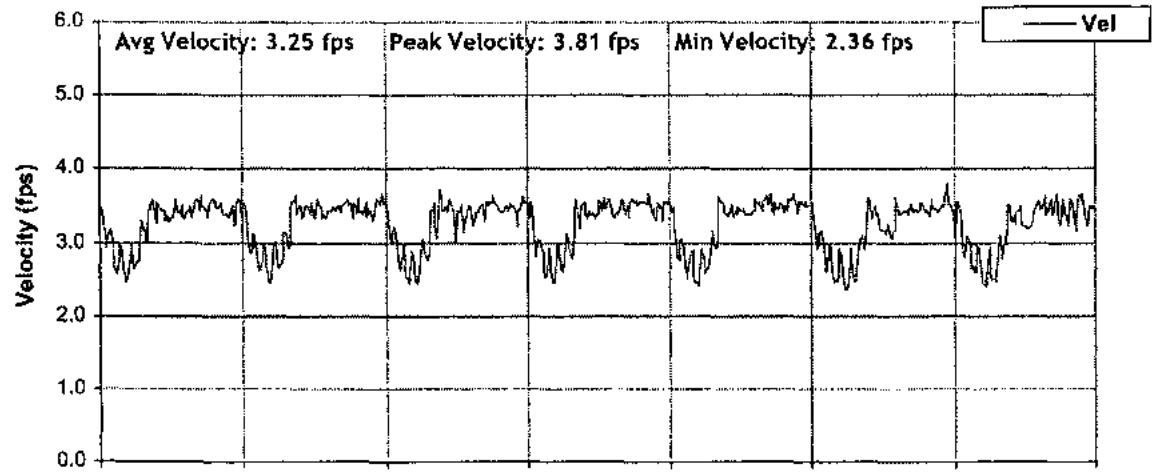
Avg Flow: 1.34 MGD Peak Flow: 2.03 MGD Min Flow: 0.51 MGD

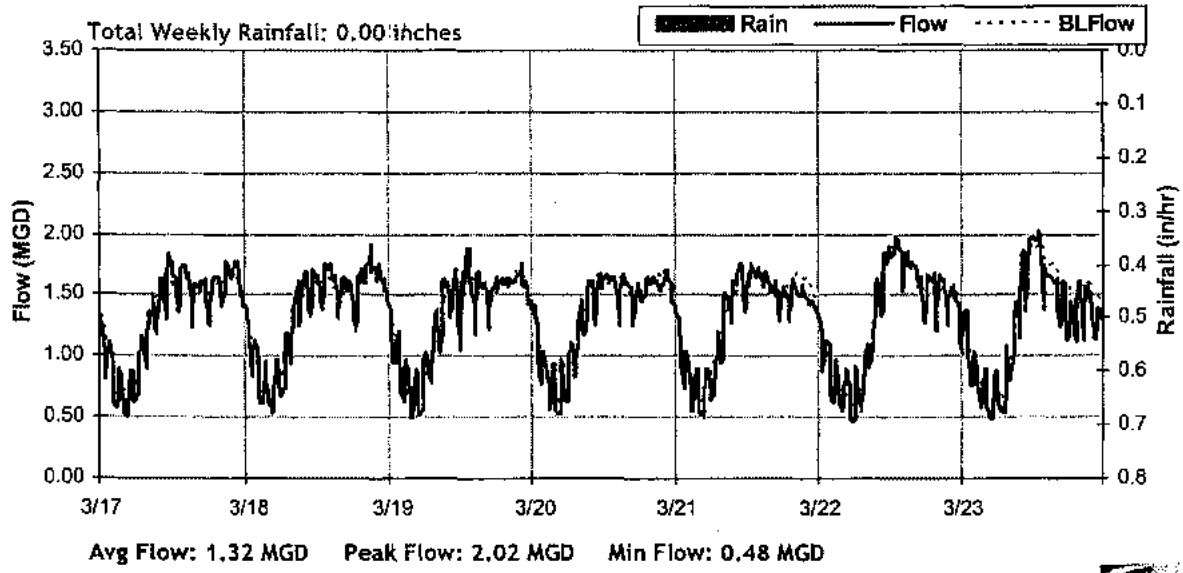
V&A

Level, Velocity and Flow
From 3/17/2008 to 3/24/2008

Monitoring Site:
SAV MH 10







Avg Flow: 1.32 MGD Peak Flow: 2.02 MGD Min Flow: 0.48 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 3/10/2008 to 3/17/2008

Monitoring Site:

SAV MH 10

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	7.61	3.26	1.34
Weekly Minimum:	4.68	2.50	0.53
Weekly Maximum:	11.09	3.62	2.01

Hour	Monday 3/10/2008			Tuesday 3/11/2008			Wednesday 3/12/2008			Thursday 3/13/2008			Friday 3/14/2008			Saturday 3/15/2008			Sunday 3/16/2008			Hour
	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	
0:00							7.32	3.43	1.32	6.84	3.30	1.16	7.33	3.49	1.35	6.84	3.24	1.15	6.91	3.29	1.18	0:00
1:00							6.23	3.06	0.97	6.41	3.08	1.00	6.15	2.99	0.92	6.47	3.11	1.03	6.60	3.18	1.08	1:00
2:00							6.11	2.94	0.90	5.44	2.76	0.72	5.73	2.83	0.80	6.20	2.98	0.93	5.50	2.80	0.74	2:00
3:00							5.33	2.68	0.68	5.71	2.86	0.80	5.70	2.84	0.79	5.71	2.87	0.81	5.61	2.80	0.77	3:00
4:00							5.32	2.70	0.69	5.04	2.63	0.62	4.79	2.54	0.55	4.91	2.54	0.57	5.48	2.74	0.73	4:00
5:00							6.10	2.93	0.90	5.69	2.79	0.78	5.83	2.89	0.83	5.47	2.76	0.73	4.68	2.50	0.53	5:00
6:00							6.02	2.91	0.87	6.39	3.00	0.98	6.31	3.05	0.98	5.57	2.76	0.76	5.39	2.75	0.71	6:00
7:00							6.89	3.20	1.14	6.51	3.07	1.01	6.56	3.09	1.03	5.42	2.70	0.70	5.62	2.80	0.77	7:00
8:00							7.60	3.43	1.39	7.39	3.43	1.34	7.24	3.41	1.29	6.91	3.21	1.15	5.89	2.91	0.84	8:00
9:00							7.79	3.51	1.46	7.88	3.46	1.47	8.25	3.42	1.53	7.71	3.33	1.38	7.16	3.32	1.24	9:00
10:00							8.18	3.46	1.53	7.79	3.44	1.43	8.45	3.45	1.59	8.37	3.43	1.56	8.55	3.41	1.59	10:00
11:00							8.57	3.50	1.64	8.27	3.43	1.54	8.32	3.43	1.54	9.97	3.32	1.86	9.64	3.31	1.78	11:00
12:00							7.76	3.47	1.44	8.24	3.49	1.56	8.35	3.44	1.56	9.60	3.39	1.81	10.63	3.20	1.92	12:00
13:00							8.66	3.49	1.65	8.14	3.49	1.53	8.57	3.40	1.59	11.09	3.20	2.01	10.35	3.20	1.86	13:00
14:00							8.83	3.46	1.68	7.85	3.51	1.47	8.84	3.35	1.63	9.12	3.35	1.68	9.84	3.25	1.79	14:00
15:00							8.65	3.50	1.66	8.27	3.48	1.56	8.26	3.48	1.55	9.27	3.37	1.73	9.26	3.38	1.74	15:00
16:00							7.82	3.49	1.46	7.97	3.49	1.50	8.02	3.51	1.52	8.23	3.45	1.53	9.38	3.37	1.76	16:00
17:00							8.42	3.54	1.62	8.09	3.59	1.56	7.84	3.40	1.43	8.41	3.48	1.59	8.82	3.44	1.67	17:00
18:00							8.01	3.40	1.47	8.19	3.62	1.60	8.28	3.48	1.57	8.71	3.46	1.65	8.68	3.40	1.62	18:00
19:00							9.00	3.48	1.73	7.94	3.48	1.48	8.21	3.59	1.59	8.65	3.46	1.64	8.99	3.42	1.69	19:00
20:00							9.34	3.41	1.77	8.69	3.47	1.65	7.99	3.41	1.46	8.28	3.53	1.58	9.33	3.37	1.75	20:00
21:00							9.44	3.43	1.81	9.34	3.40	1.77	7.83	3.52	1.48	8.01	3.49	1.51	10.20	3.31	1.90	21:00
22:00							8.45	3.56	1.64	8.98	3.51	1.74	7.89	3.60	1.52	7.50	3.44	1.37	9.07	3.48	1.74	22:00
23:00							7.86	3.55	1.45	7.75	3.44	1.43	7.26	3.36	1.28	7.22	3.34	1.27	7.89	3.57	1.51	23:00
Average:							7.64	3.31	1.37	7.45	3.30	1.32	7.41	3.29	1.31	7.65	3.22	1.33	7.89	3.17	1.37	Ave
Minimum:							5.32	2.68	0.68	5.04	2.63	0.62	4.79	2.54	0.55	4.91	2.54	0.57	4.68	2.50	0.53	Min
Maximum:							9.44	3.56	1.81	9.34	3.62	1.77	8.84	3.60	1.63	11.09	3.53	2.01	10.63	3.57	1.92	Max

Hourly Data: Depth, Velocity and Flow

From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 10

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	7.52	3.25	1.32
Weekly Minimum:	4.71	2.42	0.53
Weekly Maximum:	10.78	3.63	1.96

	Monday 3/17/2008			Tuesday 3/18/2008			Wednesday 3/19/2008			Thursday 3/20/2008			Friday 3/21/2008			Saturday 3/22/2008			Sunday 3/23/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	6.82	3.31	1.17	7.07	3.33	1.23	6.88	3.25	1.16	7.38	3.39	1.32	7.32	3.47	1.34	6.84	3.26	1.16	7.13	3.38	1.26	0:00
1:00	6.36	3.07	0.98	6.54	2.99	1.00	6.75	3.05	1.06	6.21	2.93	0.91	6.19	2.89	0.90	6.80	3.08	1.08	6.06	2.98	0.90	1:00
2:00	5.22	2.70	0.67	5.41	2.72	0.70	5.71	2.77	0.77	5.69	2.74	0.76	5.89	2.79	0.82	5.66	2.74	0.76	6.10	2.94	0.90	2:00
3:00	5.66	2.84	0.78	5.83	2.82	0.81	5.05	2.58	0.61	5.75	2.74	0.77	5.63	2.76	0.76	5.65	2.68	0.74	5.31	2.70	0.68	3:00
4:00	4.71	2.54	0.54	4.87	2.51	0.56	5.46	2.66	0.70	5.21	2.58	0.64	4.85	2.47	0.55	5.55	2.70	0.73	5.11	2.65	0.64	4:00
5:00	5.55	2.81	0.75	5.88	2.87	0.83	5.20	2.59	0.64	5.50	2.69	0.71	5.67	2.72	0.76	4.77	2.42	0.53	5.19	2.63	0.65	5:00
6:00	5.85	2.92	0.84	5.94	2.81	0.83	6.28	2.91	0.92	6.60	2.99	1.01	5.56	2.68	0.72	5.57	2.70	0.73	4.88	2.52	0.56	6:00
7:00	6.42	3.09	1.00	6.74	3.05	1.05	6.87	3.18	1.14	6.65	3.06	1.05	6.89	3.05	1.09	5.44	2.65	0.69	5.93	2.81	0.83	7:00
8:00	7.55	3.51	1.40	7.75	3.56	1.47	7.14	3.28	1.22	7.30	3.36	1.29	7.46	3.45	1.37	6.65	2.99	1.02	6.40	2.99	0.97	8:00
9:00	7.55	3.42	1.37	7.92	3.44	1.46	8.31	3.55	1.60	8.17	3.49	1.54	7.72	3.42	1.40	7.79	3.46	1.44	7.30	3.40	1.31	9:00
10:00	8.18	3.40	1.51	8.26	3.44	1.53	7.64	3.50	1.42	7.90	3.39	1.43	8.76	3.44	1.65	8.30	3.42	1.54	9.05	3.39	1.69	10:00
11:00	9.28	3.32	1.71	8.73	3.44	1.64	8.23	3.33	1.49	8.74	3.38	1.62	8.54	3.43	1.60	10.19	3.24	1.85	10.18	3.30	1.86	11:00
12:00	8.42	3.47	1.59	8.28	3.48	1.56	8.57	3.45	1.62	8.56	3.54	1.65	8.69	3.43	1.63	10.40	3.16	1.85	10.78	3.21	1.96	12:00
13:00	8.89	3.42	1.67	9.19	3.38	1.72	9.49	3.31	1.74	8.44	3.53	1.62	8.99	3.38	1.68	10.73	3.12	1.89	9.37	3.39	1.75	13:00
14:00	8.89	3.40	1.66	8.96	3.41	1.68	7.85	3.36	1.41	7.92	3.40	1.44	8.65	3.49	1.65	9.00	3.48	1.72	8.69	3.50	1.67	14:00
15:00	7.73	3.47	1.43	7.76	3.48	1.44	8.61	3.41	1.60	8.58	3.45	1.62	8.54	3.50	1.63	9.27	3.41	1.75	8.52	3.50	1.63	15:00
16:00	8.21	3.56	1.58	8.51	3.47	1.61	7.71	3.40	1.40	8.14	3.48	1.53	8.05	3.58	1.55	8.88	3.45	1.68	7.64	3.48	1.41	16:00
17:00	8.16	3.46	1.53	8.18	3.55	1.57	8.18	3.55	1.57	7.65	3.50	1.42	7.83	3.51	1.47	8.00	3.44	1.48	7.77	3.53	1.47	17:00
18:00	8.10	3.51	1.53	7.71	3.48	1.43	8.30	3.53	1.59	7.97	3.53	1.51	8.06	3.50	1.52	8.51	3.51	1.63	7.47	3.44	1.36	18:00
19:00	8.55	3.50	1.63	8.68	3.46	1.65	8.62	3.43	1.62	8.24	3.56	1.59	7.84	3.47	1.45	7.92	3.40	1.45	7.23	3.44	1.31	19:00
20:00	8.37	3.46	1.57	9.36	3.43	1.79	8.50	3.47	1.61	8.34	3.58	1.62	7.91	3.61	1.53	8.54	3.50	1.63	7.52	3.33	1.33	20:00
21:00	9.07	3.38	1.70	9.20	3.37	1.72	8.66	3.47	1.64	8.50	3.38	1.57	8.01	3.53	1.52	7.84	3.45	1.44	7.91	3.62	1.54	21:00
22:00	9.06	3.42	1.71	8.61	3.53	1.66	8.77	3.42	1.64	8.87	3.43	1.67	7.72	3.52	1.45	7.89	3.63	1.53	7.22	3.40	1.29	22:00
23:00	7.97	3.52	1.51	7.97	3.57	1.53	7.66	3.57	1.46	7.96	3.56	1.52	7.51	3.51	1.39	7.48	3.48	1.37	7.36	3.47	1.34	23:00
Average:	7.52	3.27	1.33	7.64	3.27	1.35	7.52	3.25	1.32	7.51	3.28	1.33	7.43	3.27	1.31	7.65	3.18	1.32	7.34	3.21	1.26	Ave
Minimum:	4.71	2.54	0.54	4.87	2.51	0.56	5.05	2.58	0.61	5.21	2.58	0.64	4.85	2.47	0.55	4.77	2.42	0.53	4.88	2.52	0.56	Min
Maximum:	9.28	3.56	1.71	9.36	3.57	1.79	9.49	3.57	1.74	8.87	3.58	1.67	8.99	3.61	1.68	10.73	3.63	1.89	10.78	3.62	1.96	Max

Temporary Flow Monitoring Study

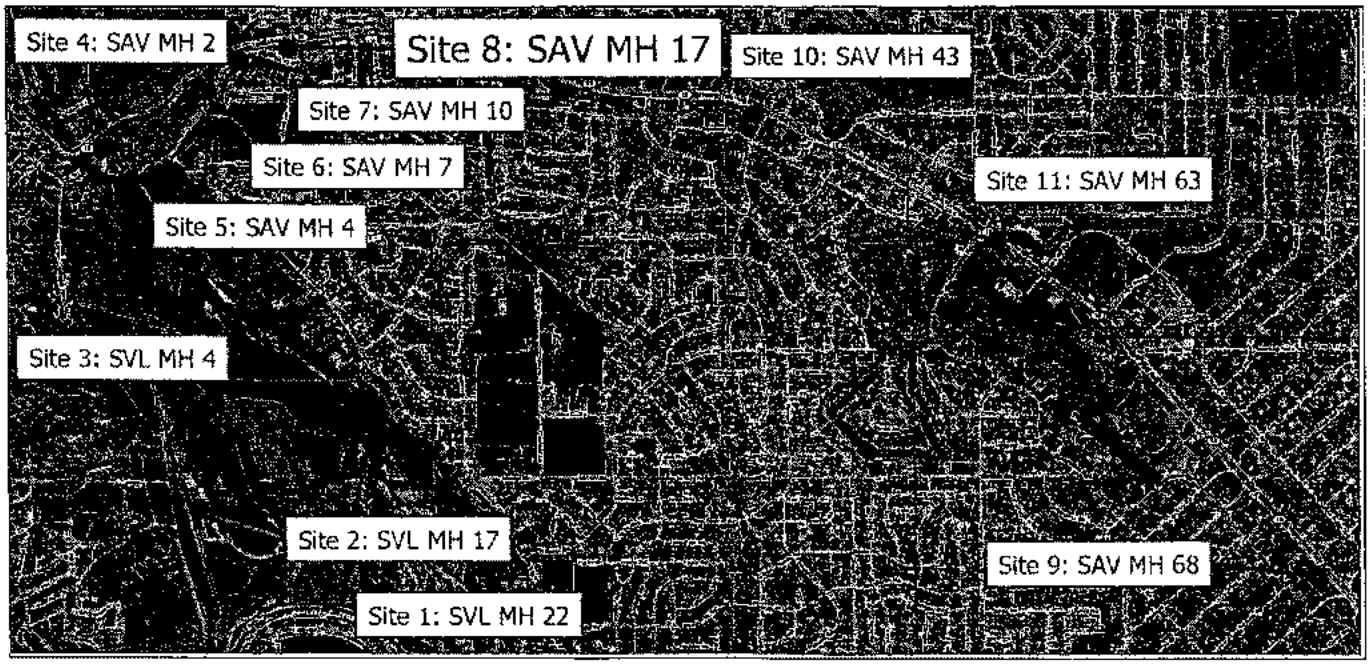
Sanitary Sewer Collection System

Monitoring Site: SAV MH 17

Manhole Address: Southwest corner of Apple Valley Road and Hwy 18

Size/Type of Line: 15-inch Pipe

Data Summary Report



V&A

	Site Information Report	**Monitoring Site:** SAV MH 17

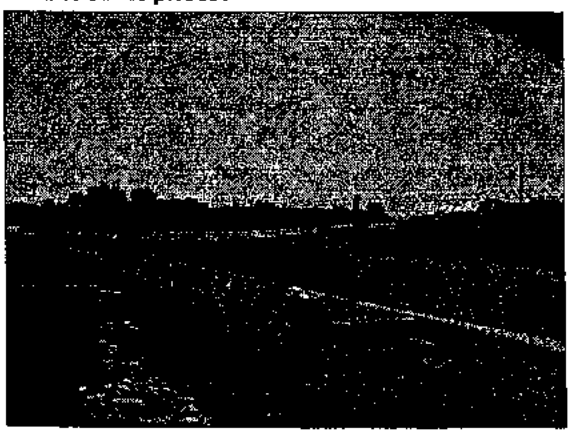
Location: Southwest corner of Apple Valley Road and Hwy 18

Diameter: 15 inches

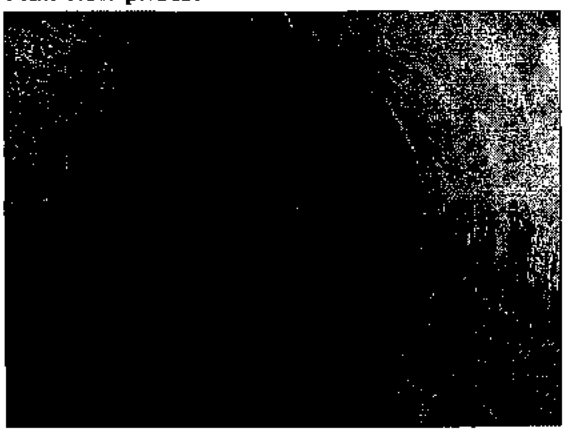
Average Dry Weather Flow: 1.190 *MGD*

Peak Measured Flow: 1.787 *MGD*

Street-level photo:



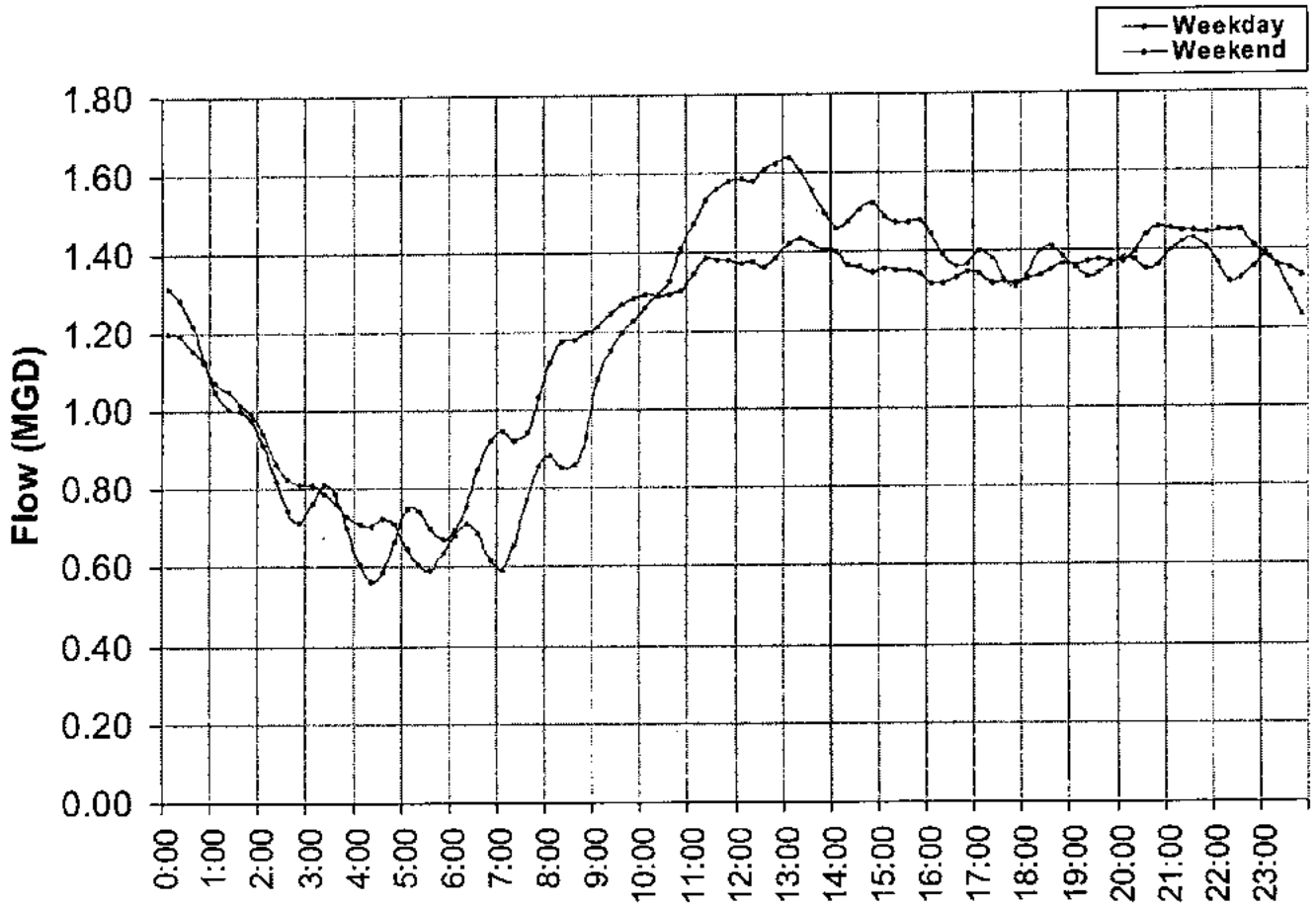
Plan view photo:



V&A

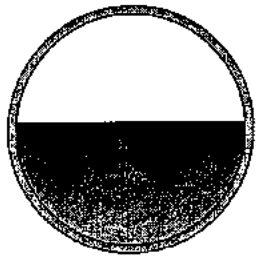
Average Dry Weather Flow

Monitoring Site:
SAV MH 17



Peak Measured Flow:

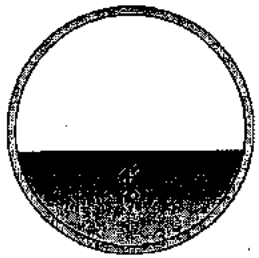
1.79 *MGD*



Peak measured flow shown in weekly graphs on following pages

Average Dry Weather Flow:

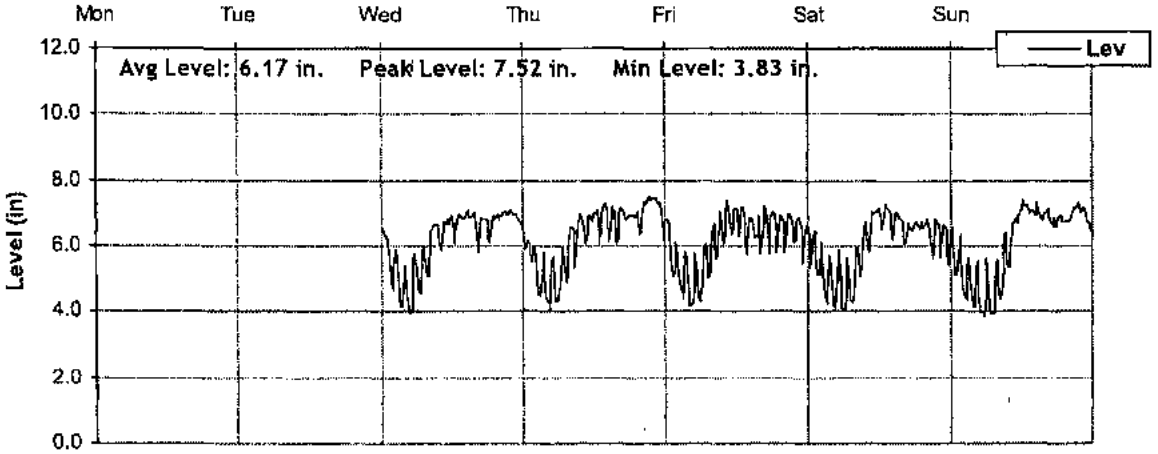
1.19 *MGD*

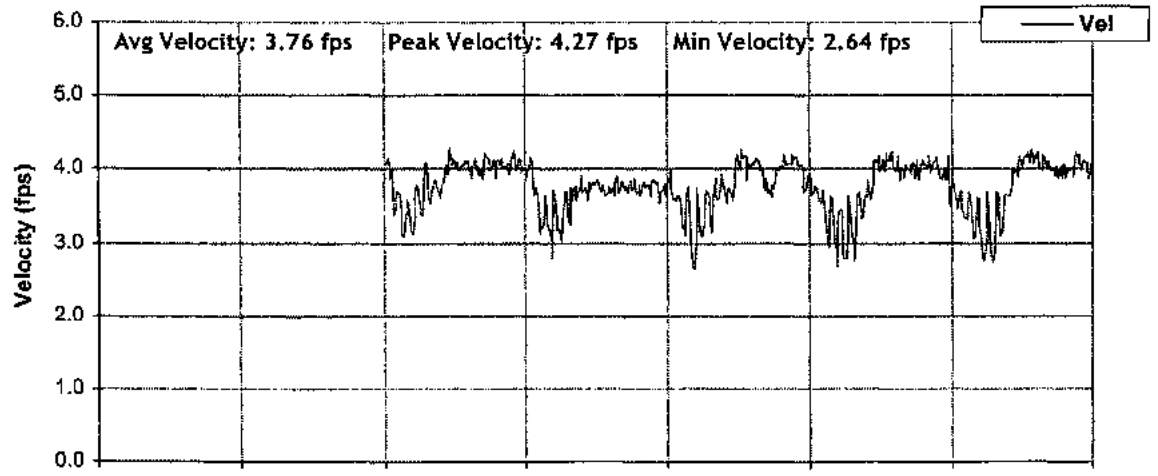


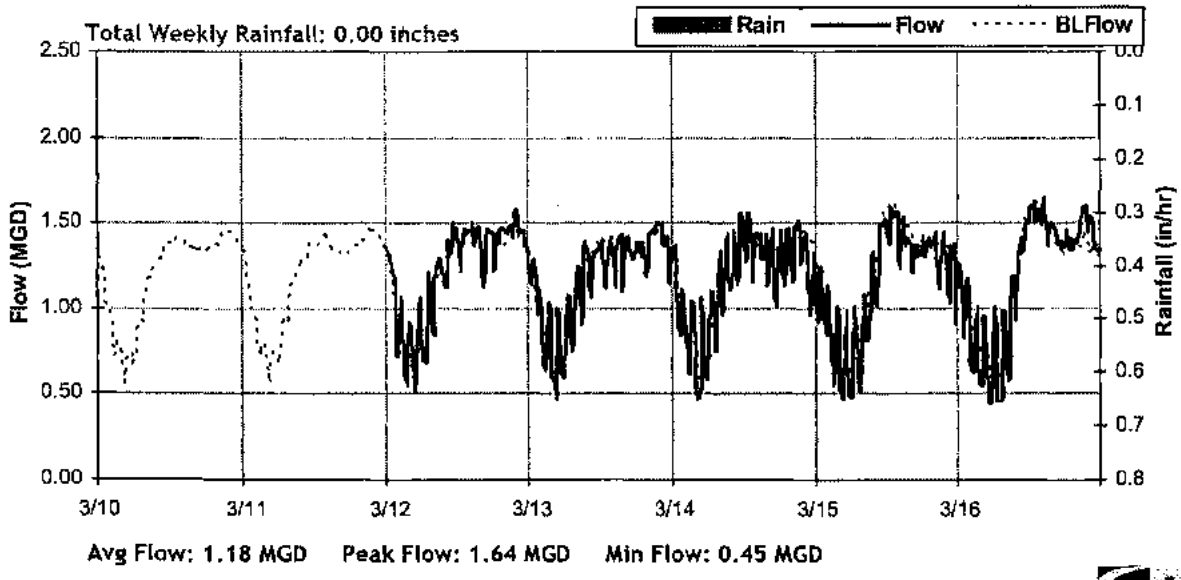
V&A

Level, Velocity and Flow
From 3/10/2008 to 3/17/2008

Monitoring Site:
SAV MH 17







Avg Flow: 1.18 MGD Peak Flow: 1.64 MGD Min Flow: 0.45 MGD

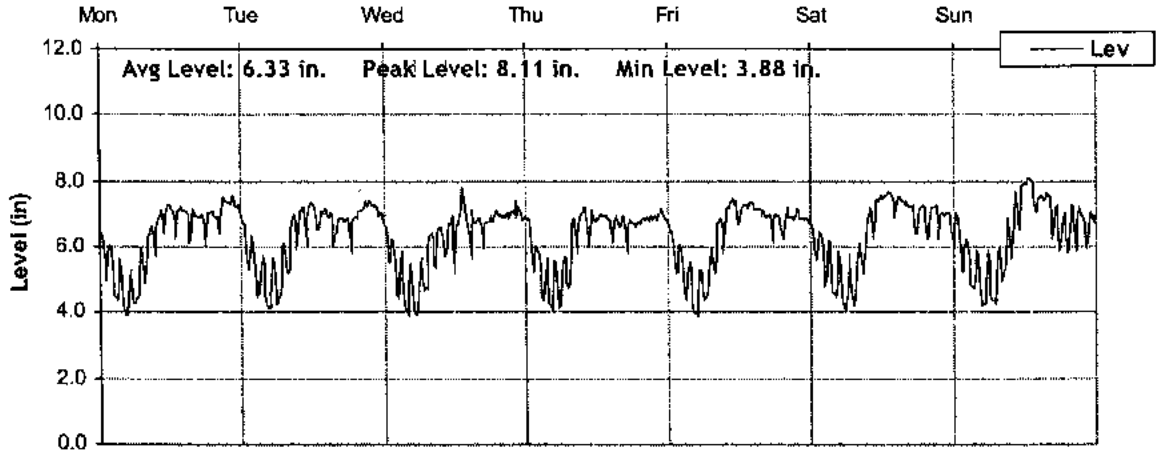
V&A

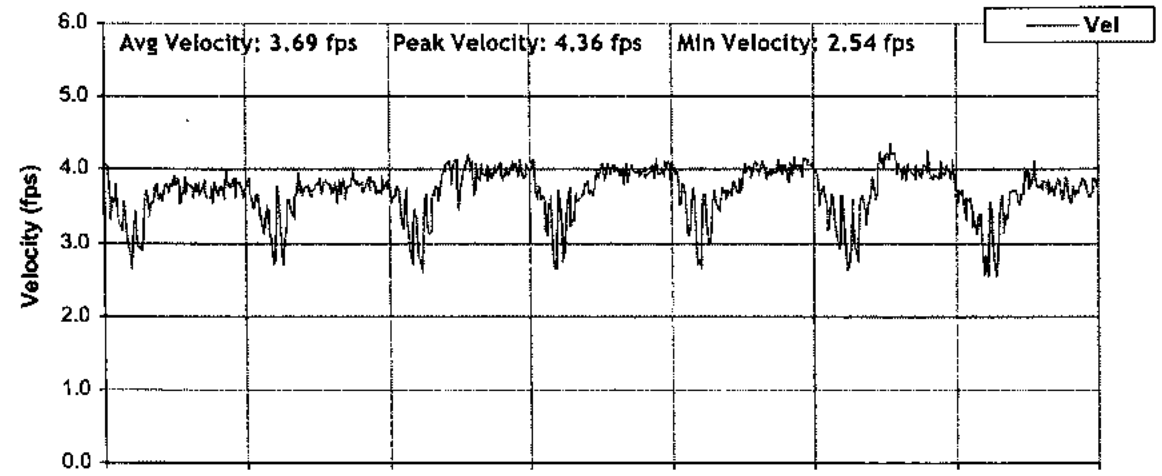
Level, Velocity and Flow

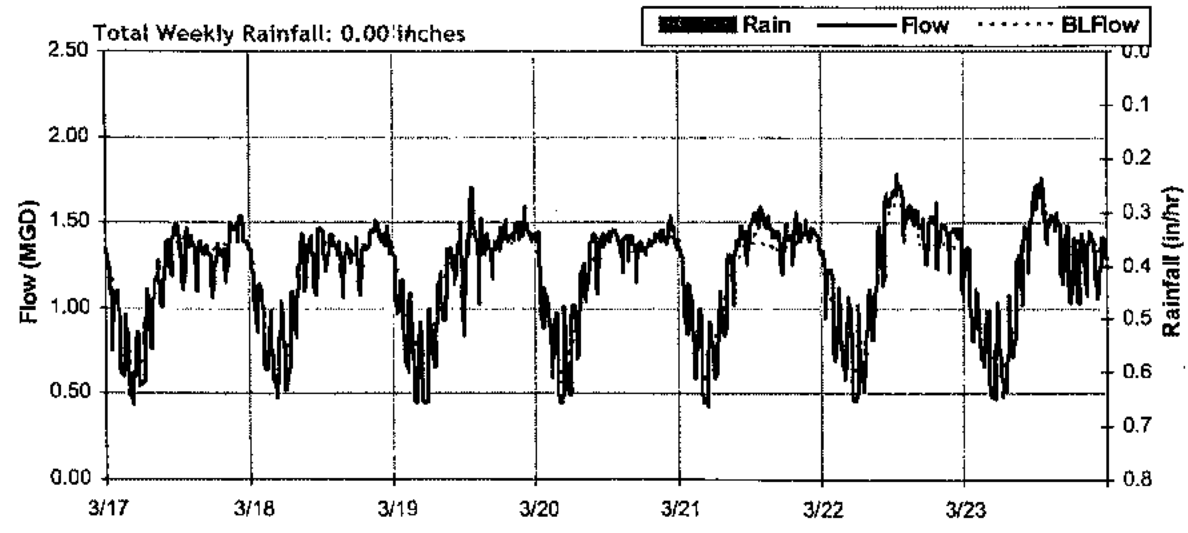
From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 17







Avg Flow: 1.2 MGD Peak Flow: 1.79 MGD Min Flow: 0.43 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 3/10/2008 to 3/17/2008

Monitoring Site:

SAV MH 17

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	6.17	3.76	1.18
Weekly Minimum:	4.07	2.84	0.51
Weekly Maximum:	7.46	4.19	1.60

	Monday 3/10/2008			Tuesday 3/11/2008			Wednesday 3/12/2008			Thursday 3/13/2008			Friday 3/14/2008			Saturday 3/15/2008			Sunday 3/16/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00							6.34	4.08	1.30	6.05	4.00	1.20	6.71	3.85	1.32	5.93	3.71	1.08	6.10	3.78	1.14	0:00
1:00							5.35	3.68	0.95	5.82	3.84	1.09	5.47	3.60	0.94	5.60	3.65	0.99	5.76	3.58	1.00	1:00
2:00							5.34	3.60	0.91	4.83	3.30	0.73	5.03	3.40	0.80	5.36	3.47	0.89	4.70	3.38	0.72	2:00
3:00							4.61	3.27	0.68	5.15	3.43	0.83	5.12	3.41	0.83	4.99	3.29	0.77	4.74	3.32	0.73	3:00
4:00							4.42	3.32	0.66	4.55	3.18	0.66	4.32	2.84	0.54	4.36	2.99	0.58	4.89	3.39	0.77	4:00
5:00							5.24	3.60	0.90	4.72	3.29	0.71	4.97	3.37	0.79	4.75	3.13	0.69	4.07	2.91	0.51	5:00
6:00							4.91	3.57	0.82	5.36	3.44	0.89	5.35	3.44	0.88	4.91	3.23	0.75	4.59	3.18	0.67	6:00
7:00							5.50	3.81	1.01	5.41	3.49	0.91	5.47	3.45	0.91	4.44	2.99	0.59	4.75	3.25	0.72	7:00
8:00							6.44	3.78	1.23	6.25	3.66	1.15	6.09	3.68	1.11	5.53	3.54	0.94	4.74	3.33	0.72	8:00
9:00							6.45	3.68	1.20	6.61	3.74	1.26	6.68	3.82	1.30	6.34	3.61	1.16	5.87	3.65	1.05	9:00
10:00							6.50	3.97	1.31	6.44	3.71	1.21	6.93	3.66	1.31	6.45	3.78	1.24	6.66	3.94	1.34	10:00
11:00							6.78	4.15	1.45	6.90	3.76	1.34	6.80	3.92	1.37	7.04	4.09	1.50	6.92	4.05	1.45	11:00
12:00							6.47	4.04	1.32	6.86	3.78	1.34	6.72	4.13	1.42	6.92	4.10	1.46	7.30	4.17	1.60	12:00
13:00							6.89	4.08	1.45	6.88	3.70	1.31	6.55	4.08	1.36	7.13	4.19	1.56	7.06	4.15	1.52	13:00
14:00							6.97	4.00	1.45	6.65	3.73	1.26	6.83	4.07	1.43	6.69	4.08	1.40	7.07	4.16	1.53	14:00
15:00							6.95	4.05	1.45	6.88	3.76	1.33	6.46	4.07	1.33	6.88	4.01	1.42	6.88	4.07	1.45	15:00
16:00							6.44	3.94	1.28	6.86	3.78	1.34	6.57	3.84	1.28	6.39	3.99	1.28	6.97	4.03	1.45	16:00
17:00							6.79	4.14	1.44	6.90	3.75	1.34	6.50	3.70	1.22	6.54	3.99	1.32	6.69	4.00	1.36	17:00
18:00							6.51	4.01	1.32	6.93	3.75	1.34	6.59	3.93	1.32	6.67	4.01	1.37	6.87	3.96	1.40	18:00
19:00							6.87	4.11	1.46	6.76	3.71	1.29	6.74	4.08	1.41	6.64	4.08	1.38	6.75	4.02	1.39	19:00
20:00							6.98	4.04	1.46	7.19	3.78	1.42	6.49	4.07	1.34	6.52	4.06	1.35	6.97	3.98	1.43	20:00
21:00							7.04	4.08	1.49	7.46	3.76	1.48	6.51	4.14	1.37	6.43	4.10	1.33	7.27	4.17	1.59	21:00
22:00							6.93	4.06	1.45	7.37	3.71	1.44	6.72	4.03	1.39	6.20	3.91	1.21	7.05	4.07	1.49	22:00
23:00							6.70	4.03	1.38	6.75	3.72	1.29	6.18	3.80	1.17	6.04	3.88	1.17	6.62	4.01	1.35	23:00
Average:							6.23	3.88	1.22	6.31	3.66	1.17	6.16	3.76	1.17	6.03	3.74	1.14	6.14	3.77	1.18	Ave
Minimum:							4.42	3.27	0.66	4.55	3.18	0.66	4.32	2.84	0.54	4.36	2.99	0.58	4.07	2.91	0.51	Min
Maximum:							7.04	4.15	1.49	7.46	4.00	1.48	6.93	4.14	1.43	7.13	4.19	1.56	7.30	4.17	1.60	Max

Hourly Data: Depth, Velocity and Flow

From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 17

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	6.33	3.69	1.20
Weekly Minimum:	4.04	2.76	0.49
Weekly Maximum:	8.04	4.24	1.70

	Monday 3/17/2008			Tuesday 3/18/2008			Wednesday 3/19/2008			Thursday 3/20/2008			Friday 3/21/2008			Saturday 3/22/2008			Sunday 3/23/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	6.05	3.94	1.19	6.31	3.75	1.19	6.07	3.65	1.10	6.60	3.99	1.34	6.50	4.01	1.32	6.16	3.85	1.18	6.76	3.62	1.26	0:00
1:00	5.66	3.57	0.98	5.97	3.58	1.06	5.76	3.64	1.03	5.63	3.65	0.99	5.55	3.71	0.99	6.33	3.70	1.18	5.69	3.52	0.98	1:00
2:00	4.61	3.27	0.68	4.78	3.27	0.71	5.11	3.45	0.83	4.99	3.37	0.79	5.19	3.41	0.85	5.27	3.39	0.85	5.68	3.46	0.96	2:00
3:00	5.06	3.32	0.79	5.26	3.34	0.83	4.28	2.99	0.57	5.06	3.40	0.81	5.08	3.46	0.83	5.21	3.39	0.84	5.14	3.25	0.78	3:00
4:00	4.14	2.88	0.52	4.27	2.85	0.53	4.73	3.21	0.70	4.56	3.00	0.63	4.04	2.85	0.49	5.21	3.31	0.82	4.81	2.92	0.65	4:00
5:00	4.74	3.16	0.69	4.95	3.34	0.78	4.36	2.91	0.57	4.45	3.06	0.61	4.80	3.37	0.75	4.23	2.76	0.51	4.98	3.10	0.73	5:00
6:00	4.96	3.20	0.75	4.98	3.17	0.74	5.07	3.36	0.80	5.40	3.50	0.90	4.69	3.22	0.69	5.10	3.19	0.77	4.40	2.82	0.55	6:00
7:00	5.24	3.49	0.86	5.51	3.44	0.91	5.87	3.56	1.03	5.65	3.47	0.96	5.64	3.60	0.98	4.74	3.06	0.67	5.31	3.31	0.85	7:00
8:00	6.49	3.68	1.21	6.75	3.74	1.30	5.89	3.71	1.08	6.37	3.61	1.16	6.52	3.61	1.20	5.56	3.45	0.93	5.49	3.39	0.90	8:00
9:00	6.29	3.62	1.14	6.59	3.73	1.25	6.47	4.03	1.32	7.01	3.79	1.38	6.49	3.68	1.21	6.75	3.70	1.29	6.35	3.71	1.19	9:00
10:00	6.76	3.75	1.30	6.73	3.71	1.28	6.17	3.97	1.22	6.64	3.70	1.25	7.29	3.75	1.43	6.88	3.77	1.34	7.29	3.60	1.38	10:00
11:00	7.19	3.83	1.44	7.22	3.76	1.42	6.21	3.92	1.23	6.91	3.92	1.40	7.11	3.74	1.39	7.48	4.12	1.63	7.79	3.84	1.60	11:00
12:00	6.78	3.75	1.31	6.83	3.79	1.33	6.77	3.90	1.35	6.91	3.97	1.42	7.15	4.00	1.49	7.57	4.24	1.70	8.04	3.83	1.66	12:00
13:00	7.13	3.73	1.39	7.06	3.82	1.40	7.31	4.09	1.57	6.90	4.02	1.43	7.26	3.98	1.51	7.53	4.17	1.66	7.55	3.90	1.56	13:00
14:00	7.08	3.77	1.39	7.00	3.74	1.36	6.41	3.90	1.27	6.60	4.00	1.34	7.21	4.04	1.52	7.28	4.00	1.53	7.54	3.80	1.52	14:00
15:00	6.63	3.73	1.26	6.43	3.67	1.19	6.79	3.94	1.37	6.78	3.92	1.36	7.07	4.04	1.49	7.39	3.98	1.55	7.53	3.76	1.50	15:00
16:00	6.92	3.74	1.34	6.88	3.74	1.33	6.46	3.94	1.28	6.72	3.98	1.37	6.96	3.95	1.42	7.28	3.97	1.51	6.82	3.71	1.30	16:00
17:00	6.64	3.64	1.23	6.81	3.82	1.34	6.80	3.99	1.39	6.50	4.01	1.32	6.68	3.97	1.36	6.82	3.95	1.39	6.76	3.79	1.32	17:00
18:00	6.84	3.71	1.30	6.44	3.81	1.24	6.90	4.03	1.44	6.67	3.96	1.35	6.92	4.03	1.44	7.21	4.00	1.51	6.78	3.79	1.32	18:00
19:00	6.95	3.70	1.33	6.99	3.76	1.36	6.96	3.94	1.42	6.79	3.97	1.38	6.68	4.01	1.37	6.75	4.02	1.39	6.46	3.68	1.20	19:00
20:00	6.98	3.77	1.36	7.25	3.83	1.45	6.95	4.01	1.44	6.85	4.01	1.42	6.90	4.03	1.43	7.21	3.91	1.47	6.50	3.69	1.22	20:00
21:00	7.37	3.82	1.48	7.32	3.78	1.45	6.98	4.01	1.45	6.90	4.01	1.43	7.00	4.02	1.46	6.81	3.96	1.38	7.03	3.83	1.40	21:00
22:00	7.40	3.78	1.47	7.23	3.75	1.42	7.15	4.01	1.50	7.03	3.99	1.46	6.87	4.09	1.45	7.01	4.01	1.46	6.51	3.68	1.21	22:00
23:00	7.15	3.69	1.38	6.93	3.78	1.35	6.88	4.01	1.42	6.88	4.03	1.43	6.79	4.04	1.41	6.77	3.99	1.39	6.87	3.83	1.35	23:00
Average:	6.29	3.60	1.16	6.35	3.62	1.18	6.18	3.76	1.18	6.28	3.76	1.21	6.35	3.77	1.23	6.44	3.74	1.25	6.42	3.58	1.18	Ave
Minimum:	4.14	2.88	0.52	4.27	2.85	0.53	4.28	2.91	0.57	4.45	3.00	0.61	4.04	2.85	0.49	4.23	2.76	0.51	4.40	2.82	0.55	Min
Maximum:	7.40	3.94	1.48	7.32	3.83	1.45	7.31	4.09	1.57	7.03	4.03	1.46	7.29	4.09	1.52	7.57	4.24	1.70	8.04	3.90	1.66	Max

Temporary Flow Monitoring Study

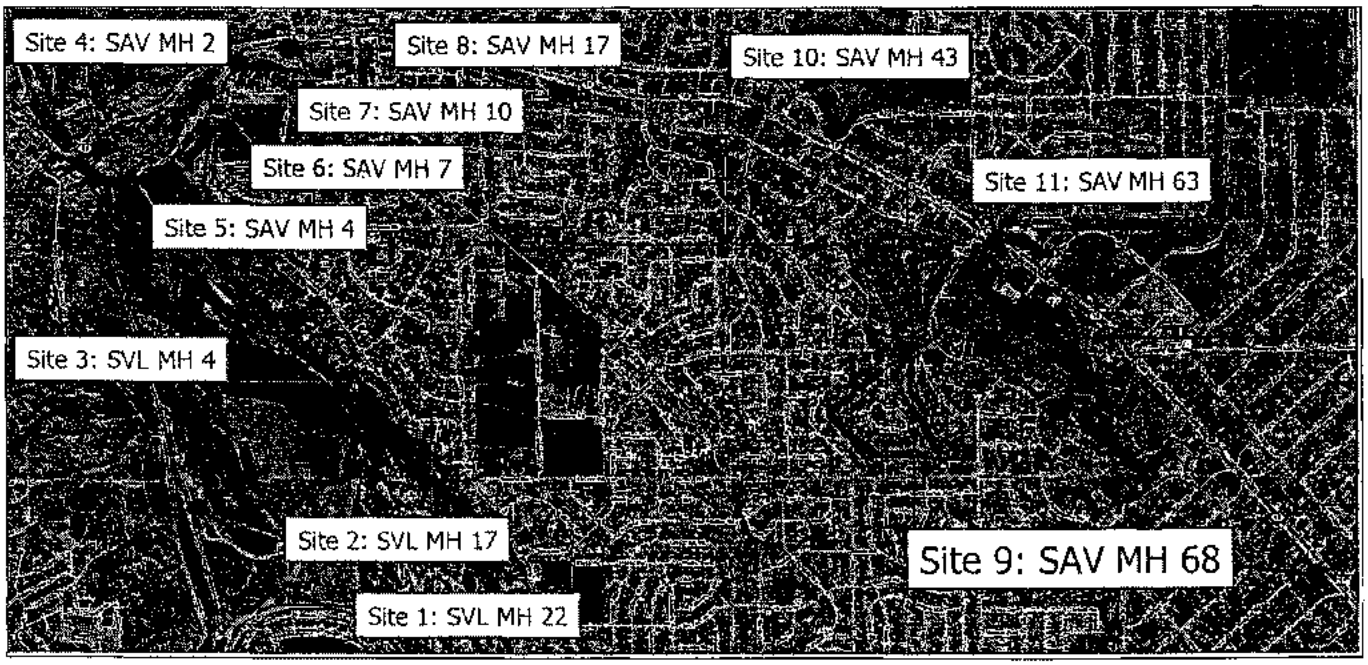
Sanitary Sewer Collection System

Monitoring Site: SAV MH 68

Manhole Address: Behind Albertson's

Size/Type of Line: 15-inch Pipe

Data Summary Report



V&A

	Site Information Report	**Monitoring Site:** SAV MH 68

Location: Behind Albertson's

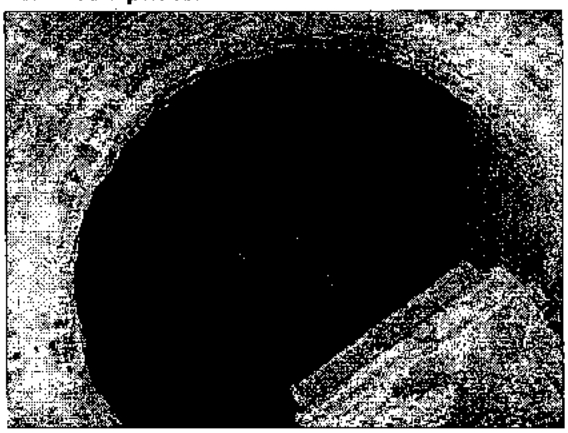
Diameter: 15 inches

Average Dry Weather Flow: 0.267 *MGD*

Peak Measured Flow: 0.572 *MGD*

Street-level photo:

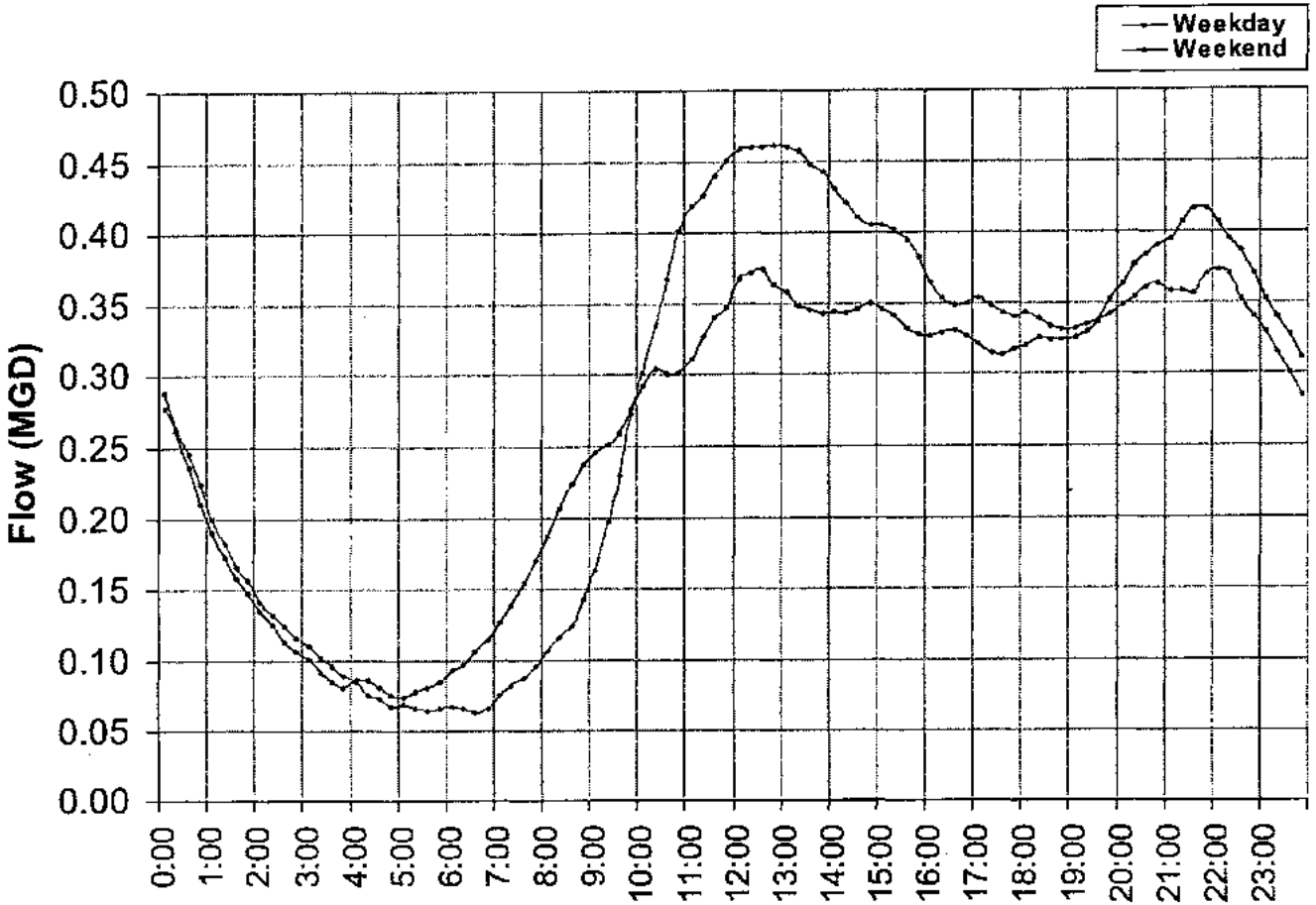
Plan view photo:



V&A

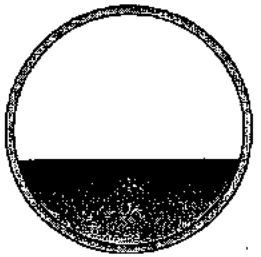
Average Dry Weather Flow

Monitoring Site:
SAV MH 68



Peak Measured Flow:

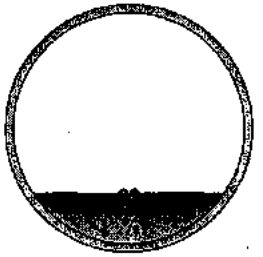
0.57 *MGD*



Peak measured flow shown in weekly graphs on following pages

Average Dry Weather Flow:

0.27 *MGD*

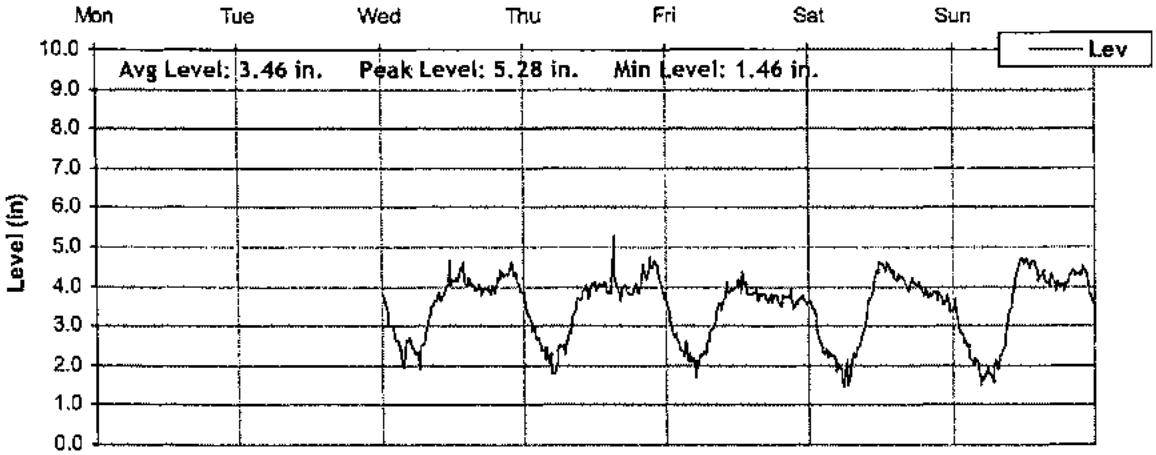


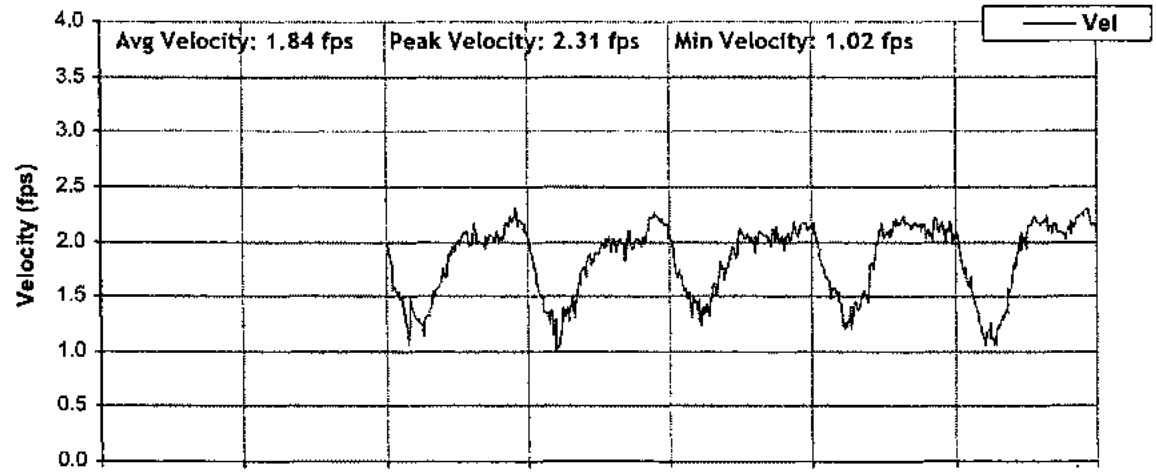
V&A

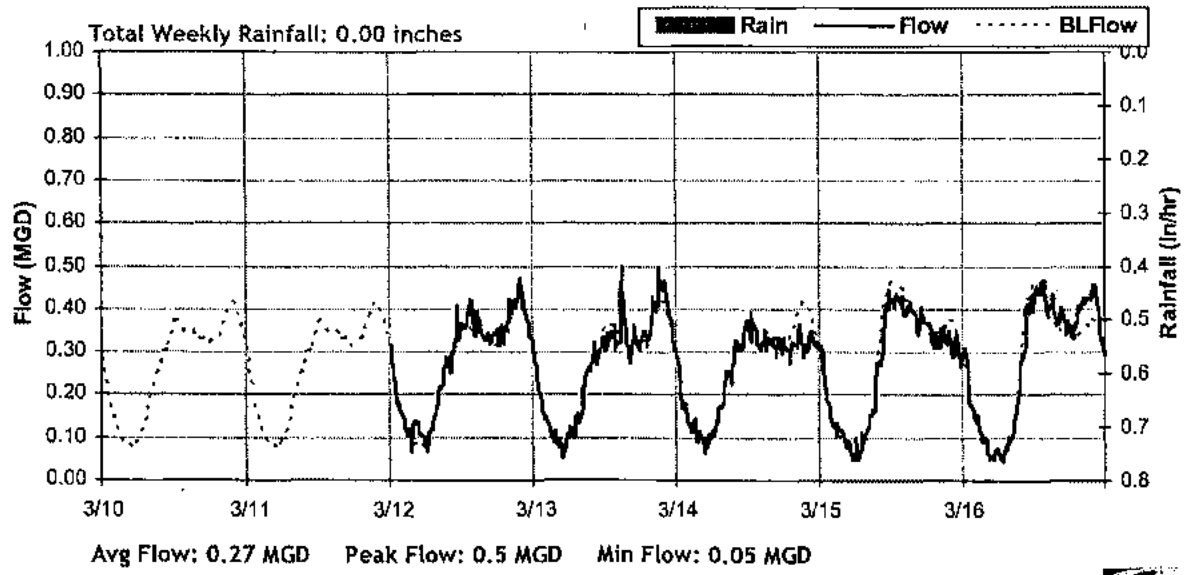
Level, Velocity and Flow

From 3/10/2008 to 3/17/2008

Monitoring Site:
SAV MH 68



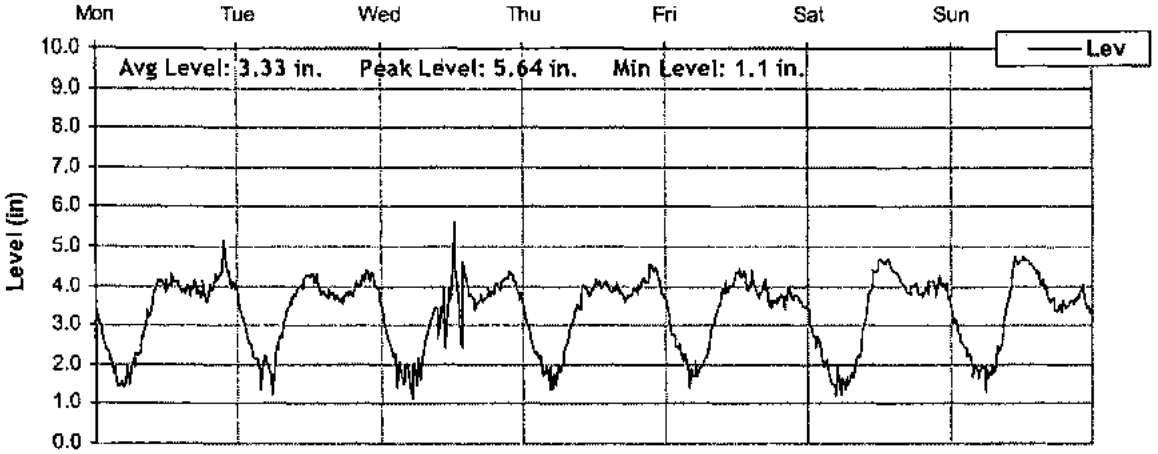


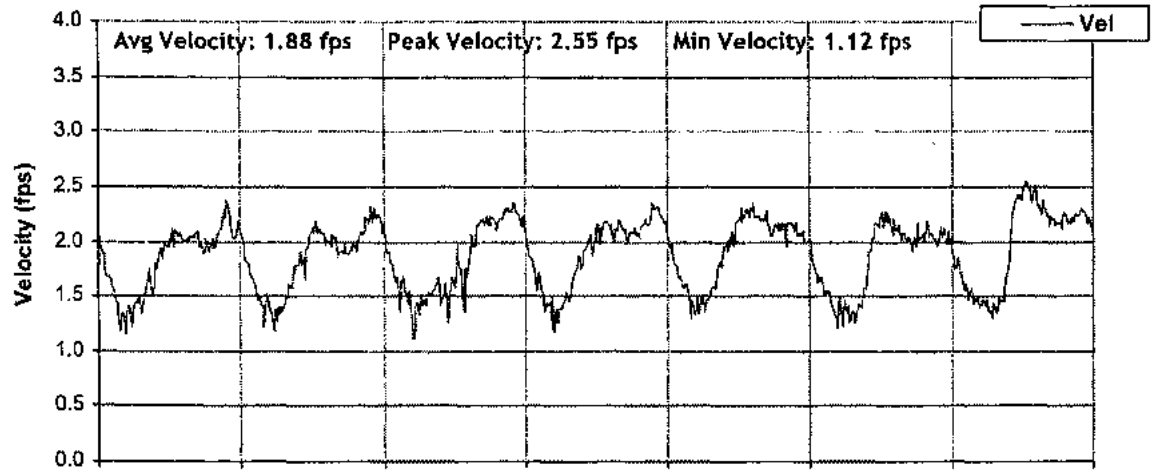


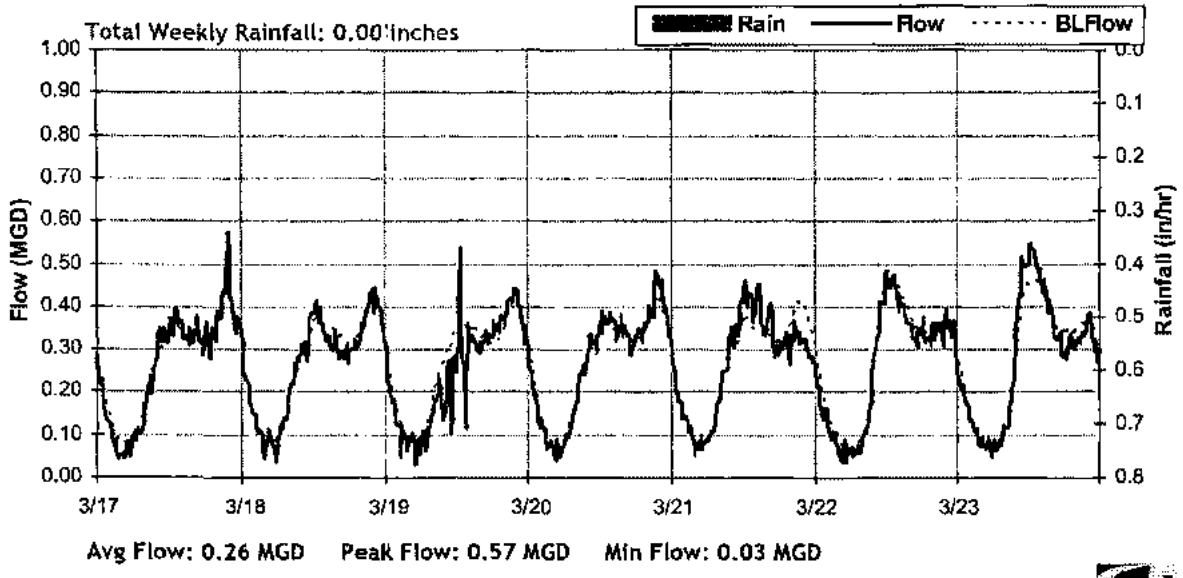
Avg Flow: 0.27 MGD Peak Flow: 0.5 MGD Min Flow: 0.05 MGD

V&A

	Level, Velocity and Flow From 3/17/2008 to 3/24/2008	**Monitoring Site:** SAV MH 68







Avg Flow: 0.26 MGD Peak Flow: 0.57 MGD Min Flow: 0.03 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 3/10/2008 to 3/17/2008

Monitoring Site:

SAV MH 68

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	3.46	1.84	0.27
Weekly Minimum:	1.71	1.09	0.05
Weekly Maximum:	4.60	2.25	0.45

	Monday 3/10/2008			Tuesday 3/11/2008			Wednesday 3/12/2008			Thursday 3/13/2008			Friday 3/14/2008			Saturday 3/15/2008			Sunday 3/16/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00							3.57	1.88	0.27	3.36	1.89	0.25	3.38	1.97	0.26	3.51	2.07	0.29	3.47	2.04	0.28	0:00
1:00							2.94	1.54	0.17	2.90	1.61	0.17	2.77	1.71	0.17	2.86	1.84	0.19	2.76	1.75	0.18	1:00
2:00							2.57	1.44	0.13	2.56	1.43	0.13	2.41	1.58	0.13	2.38	1.68	0.14	2.49	1.62	0.14	2:00
3:00							2.29	1.24	0.10	2.35	1.33	0.11	2.33	1.47	0.12	2.26	1.54	0.12	2.10	1.43	0.10	3:00
4:00							2.63	1.38	0.13	1.99	1.12	0.07	2.05	1.40	0.09	2.06	1.49	0.10	1.86	1.20	0.07	4:00
5:00							2.34	1.27	0.10	2.21	1.23	0.09	2.16	1.38	0.10	1.74	1.23	0.06	1.78	1.17	0.06	5:00
6:00							2.31	1.26	0.10	2.44	1.34	0.11	2.39	1.40	0.11	1.81	1.31	0.07	1.71	1.09	0.05	6:00
7:00							2.94	1.42	0.16	2.80	1.41	0.14	2.84	1.56	0.16	2.21	1.42	0.10	2.02	1.25	0.08	7:00
8:00							3.47	1.56	0.22	3.44	1.60	0.22	3.32	1.71	0.22	2.59	1.50	0.14	2.38	1.34	0.11	8:00
9:00							3.75	1.70	0.26	3.73	1.75	0.27	3.57	1.74	0.25	3.18	1.62	0.20	3.18	1.62	0.20	9:00
10:00							3.86	1.83	0.30	3.85	1.85	0.30	3.95	1.90	0.32	3.83	1.88	0.30	4.07	1.66	0.32	10:00
11:00							4.22	1.95	0.36	4.03	1.87	0.32	3.97	1.98	0.33	4.40	2.10	0.41	4.60	2.02	0.42	11:00
12:00							4.14	2.01	0.36	3.98	1.95	0.33	4.08	2.05	0.36	4.52	2.06	0.41	4.59	2.08	0.43	12:00
13:00							4.45	2.07	0.41	4.00	1.99	0.34	3.95	2.04	0.34	4.46	2.13	0.42	4.58	2.20	0.45	13:00
14:00							4.13	2.05	0.36	4.02	1.98	0.34	3.82	1.98	0.31	4.25	2.17	0.40	4.33	2.16	0.41	14:00
15:00							3.97	2.02	0.34	4.36	2.00	0.38	3.78	2.07	0.32	4.22	2.20	0.40	4.28	2.19	0.41	15:00
16:00							3.92	1.99	0.33	3.87	1.93	0.31	3.77	2.03	0.32	4.02	2.15	0.37	4.14	2.13	0.38	16:00
17:00							3.96	2.04	0.34	3.90	2.00	0.33	3.70	2.04	0.31	4.13	2.16	0.38	4.04	2.10	0.36	17:00
18:00							3.89	2.03	0.33	3.93	2.02	0.33	3.75	2.04	0.32	3.99	2.14	0.36	4.00	2.06	0.35	18:00
19:00							4.09	2.03	0.36	3.92	1.99	0.33	3.65	2.03	0.30	3.78	2.07	0.32	4.14	2.13	0.38	19:00
20:00							4.34	2.17	0.41	4.34	2.16	0.41	3.79	2.09	0.33	3.81	2.13	0.34	4.35	2.19	0.42	20:00
21:00							4.40	2.22	0.43	4.54	2.24	0.45	3.60	2.11	0.31	3.80	2.14	0.34	4.31	2.25	0.42	21:00
22:00							4.26	2.16	0.40	4.51	2.20	0.44	3.69	2.15	0.33	3.63	2.07	0.31	4.32	2.25	0.43	22:00
23:00							3.88	2.09	0.34	3.87	2.12	0.35	3.63	2.15	0.32	3.52	2.06	0.29	3.67	2.14	0.32	23:00
Average:							3.60	1.81	0.28	3.54	1.79	0.27	3.35	1.86	0.26	3.37	1.88	0.27	3.46	1.84	0.28	Ave
Minimum:							2.29	1.24	0.10	1.99	1.12	0.07	2.05	1.38	0.09	1.74	1.23	0.06	1.71	1.09	0.05	Min
Maximum:							4.45	2.22	0.43	4.54	2.24	0.45	4.08	2.15	0.36	4.52	2.20	0.42	4.60	2.25	0.45	Max

V&A

Hourly Data: Depth, Velocity and Flow

From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 68

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	3.33	1.88	0.26
Weekly Minimum:	1.48	1.29	0.05
Weekly Maximum:	4.75	2.52	0.54

	Monday 3/17/2008			Tuesday 3/18/2008			Wednesday 3/19/2008			Thursday 3/20/2008			Friday 3/21/2008			Saturday 3/22/2008			Sunday 3/23/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	3.13	1.97	0.24	3.29	1.92	0.25	3.12	1.97	0.24	3.13	1.91	0.23	3.32	1.97	0.26	3.03	1.84	0.21	3.21	1.81	0.23	0:00
1:00	2.52	1.70	0.15	2.76	1.74	0.17	2.49	1.74	0.15	2.54	1.72	0.15	2.69	1.76	0.17	2.61	1.66	0.15	2.80	1.74	0.18	1:00
2:00	2.06	1.55	0.10	2.29	1.57	0.12	1.99	1.59	0.10	2.20	1.61	0.12	2.33	1.62	0.13	2.15	1.56	0.11	2.40	1.54	0.13	2:00
3:00	1.64	1.33	0.06	1.84	1.38	0.08	1.73	1.59	0.08	1.81	1.42	0.08	2.02	1.50	0.10	1.85	1.48	0.08	2.05	1.50	0.10	3:00
4:00	1.52	1.30	0.05	2.11	1.43	0.10	1.77	1.37	0.07	1.61	1.33	0.06	1.67	1.40	0.07	1.52	1.33	0.06	1.84	1.44	0.08	4:00
5:00	1.82	1.35	0.07	1.70	1.29	0.07	1.64	1.34	0.07	1.70	1.36	0.07	1.90	1.45	0.09	1.48	1.36	0.06	1.76	1.43	0.08	5:00
6:00	2.15	1.46	0.10	2.23	1.36	0.10	2.01	1.48	0.09	2.03	1.47	0.09	2.10	1.44	0.10	1.54	1.33	0.06	1.79	1.37	0.07	6:00
7:00	2.50	1.43	0.13	2.90	1.46	0.16	2.55	1.49	0.13	2.63	1.53	0.14	2.65	1.55	0.15	1.80	1.32	0.07	2.05	1.40	0.09	7:00
8:00	3.17	1.66	0.20	3.47	1.64	0.23	3.17	1.57	0.19	3.21	1.75	0.22	3.26	1.70	0.22	2.29	1.43	0.11	2.48	1.47	0.13	8:00
9:00	3.63	1.67	0.25	3.75	1.80	0.28	3.10	1.54	0.18	3.48	1.83	0.26	3.72	1.88	0.29	3.20	1.71	0.21	3.45	1.74	0.24	9:00
10:00	4.10	1.89	0.33	3.97	1.79	0.30	3.33	1.51	0.20	3.93	1.98	0.33	3.97	2.00	0.34	4.05	2.02	0.35	4.36	2.30	0.44	10:00
11:00	4.04	1.97	0.34	4.22	2.01	0.37	3.70	1.62	0.25	3.85	1.98	0.32	4.15	2.11	0.38	4.44	2.16	0.43	4.61	2.41	0.50	11:00
12:00	4.07	2.05	0.36	4.23	2.12	0.39	4.75	1.79	0.39	4.07	2.10	0.37	4.30	2.23	0.42	4.62	2.22	0.46	4.69	2.52	0.54	12:00
13:00	4.11	2.07	0.37	4.07	2.09	0.36	3.28	1.56	0.21	4.04	2.16	0.37	4.16	2.27	0.41	4.56	2.16	0.44	4.58	2.44	0.50	13:00
14:00	3.90	2.02	0.33	3.81	2.00	0.32	4.04	1.90	0.32	3.96	2.10	0.35	4.16	2.31	0.41	4.38	2.13	0.41	4.38	2.38	0.46	14:00
15:00	3.87	2.03	0.33	3.82	2.02	0.32	3.64	2.06	0.30	3.94	2.13	0.35	3.82	2.22	0.35	4.16	2.08	0.37	4.05	2.31	0.40	15:00
16:00	4.01	2.03	0.35	3.70	1.90	0.29	3.66	2.19	0.33	3.84	2.13	0.34	4.00	2.21	0.38	3.92	2.02	0.33	3.71	2.21	0.34	16:00
17:00	3.81	1.94	0.31	3.66	1.92	0.29	3.69	2.17	0.33	3.68	2.04	0.31	3.61	2.08	0.31	3.96	1.97	0.33	3.54	2.19	0.31	17:00
18:00	3.82	1.97	0.31	3.83	1.94	0.31	3.84	2.20	0.35	3.84	2.08	0.33	3.62	2.14	0.31	3.92	2.06	0.34	3.44	2.17	0.30	18:00
19:00	3.97	2.00	0.34	3.90	1.97	0.32	3.99	2.17	0.37	3.92	2.09	0.35	3.64	2.09	0.31	3.84	2.08	0.33	3.52	2.22	0.31	19:00
20:00	4.23	2.13	0.39	4.13	2.13	0.38	4.10	2.27	0.40	4.16	2.17	0.39	3.82	2.17	0.34	4.04	2.05	0.35	3.58	2.19	0.32	20:00
21:00	4.63	2.29	0.48	4.31	2.24	0.42	4.28	2.30	0.43	4.37	2.28	0.44	3.75	2.12	0.33	3.92	2.00	0.33	3.73	2.25	0.35	21:00
22:00	4.20	2.11	0.38	4.23	2.23	0.41	4.09	2.27	0.40	4.35	2.29	0.44	3.68	2.07	0.31	4.08	2.09	0.37	3.75	2.25	0.35	22:00
23:00	4.01	2.13	0.36	3.85	2.17	0.35	3.69	2.14	0.32	3.86	2.18	0.35	3.46	2.01	0.28	3.86	2.02	0.33	3.41	2.15	0.29	23:00
Average:	3.37	1.83	0.26	3.42	1.84	0.27	3.23	1.82	0.25	3.34	1.90	0.27	3.32	1.93	0.27	3.30	1.84	0.26	3.30	1.98	0.28	Ave
Minimum:	1.52	1.30	0.05	1.70	1.29	0.07	1.64	1.34	0.07	1.61	1.33	0.06	1.67	1.40	0.07	1.48	1.32	0.06	1.76	1.37	0.07	Min
Maximum:	4.63	2.29	0.48	4.31	2.24	0.42	4.75	2.30	0.43	4.37	2.29	0.44	4.30	2.31	0.42	4.62	2.22	0.46	4.69	2.52	0.54	Max

Temporary Flow Monitoring Study

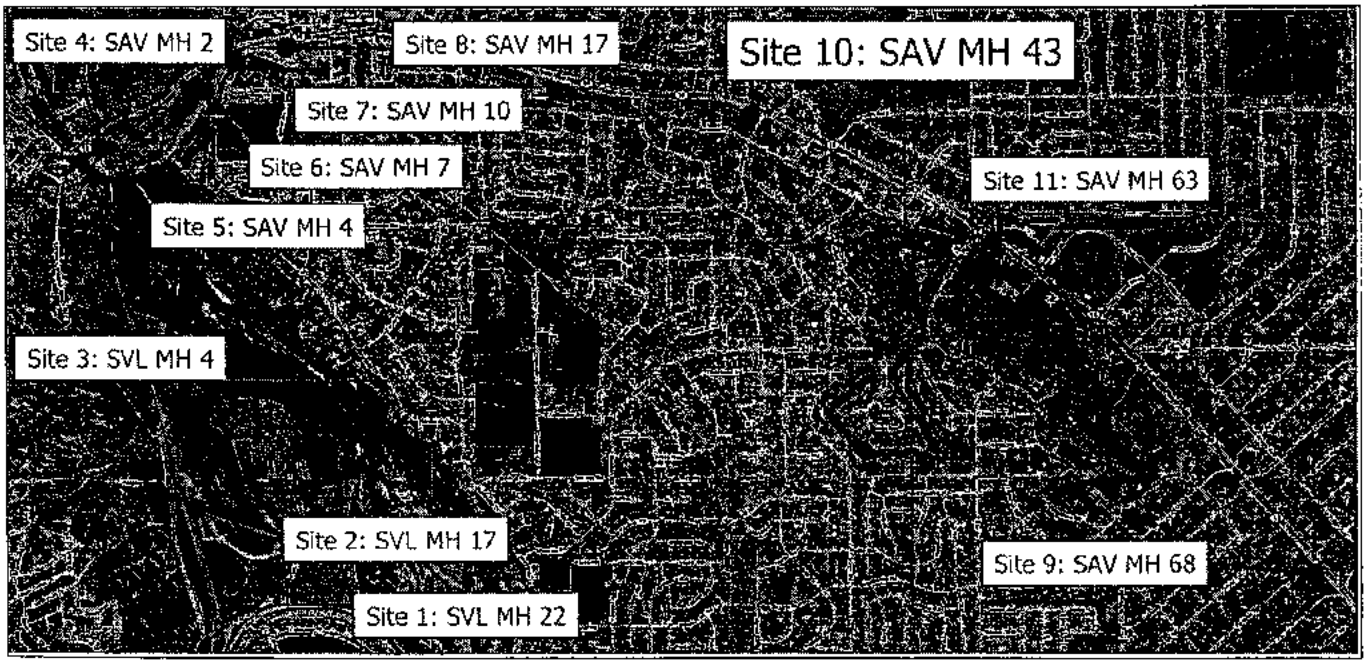
Sanitary Sewer Collection System

Monitoring Site: SAV MH 43

Manhole Address: On outer Hwy 18

Size/Type of Line: 12-inch Pipe

Data Summary Report



V&A

	Site Information Report	**Monitoring Site:** SAV MH 43

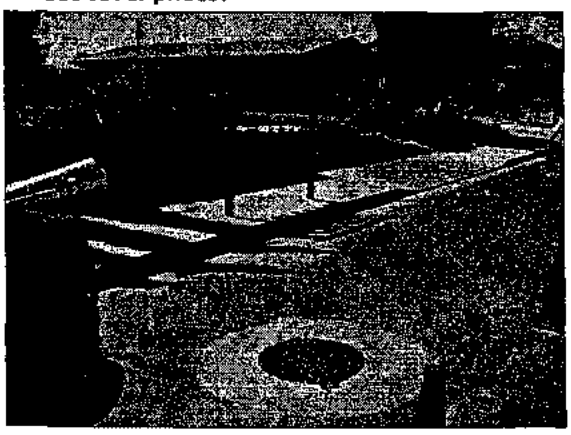
Location: On outer Hwy 18

Diameter: 12 inches

Average Dry Weather Flow: 1.036 *MGD*

Peak Measured Flow: 1.639 *MGD*

Street-level photo:

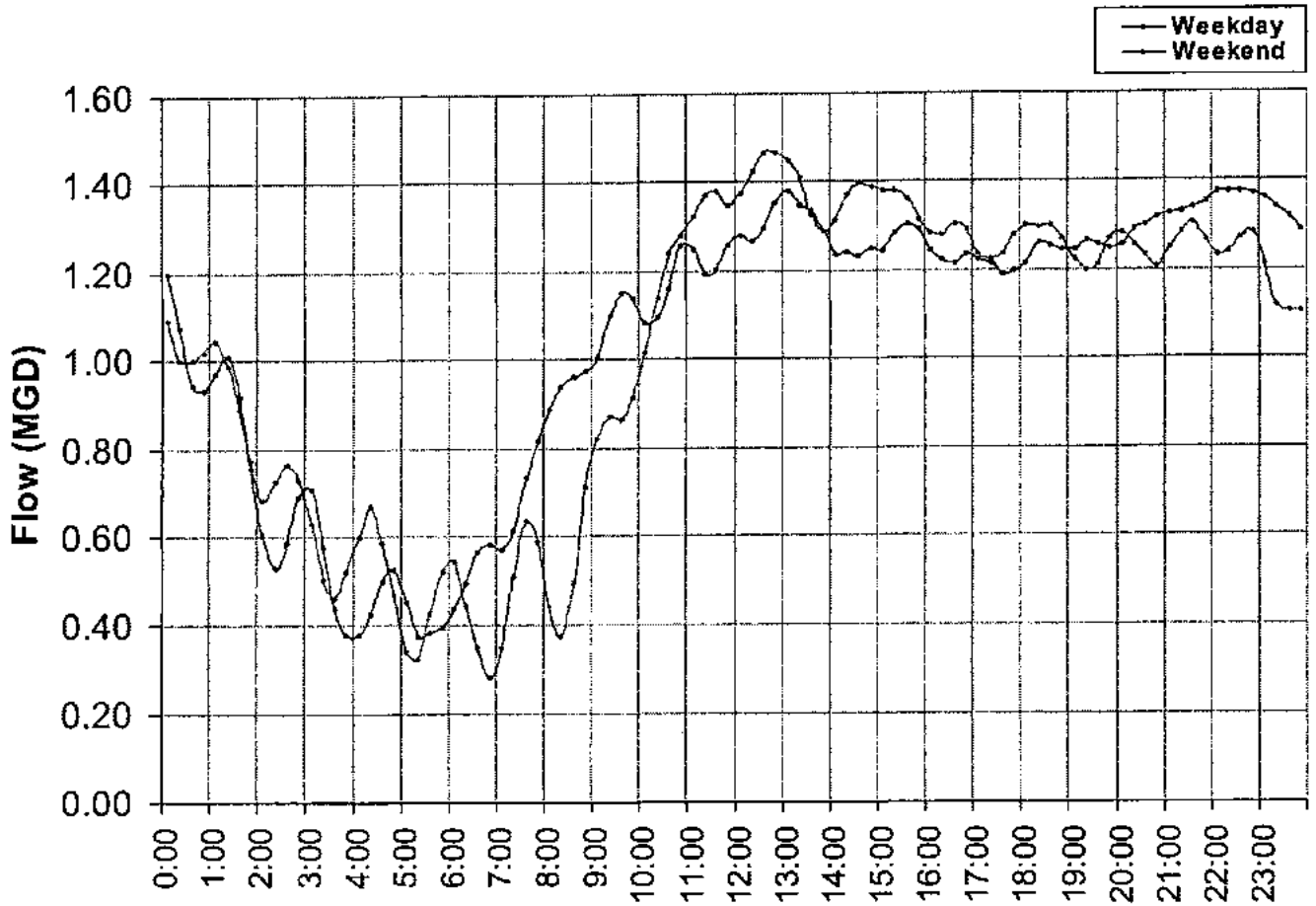


Plan view photo:

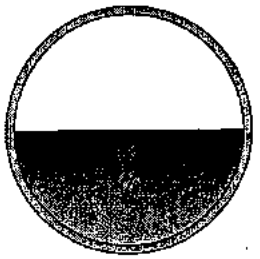
V&A

Average Dry Weather Flow

Monitoring Site:
SAV MH 43

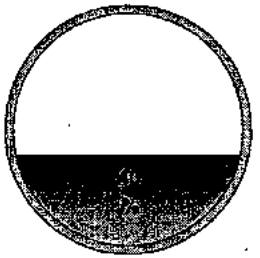


Peak Measured Flow:
1.64 *MGD*



Peak measured flow shown in weekly graphs on following pages

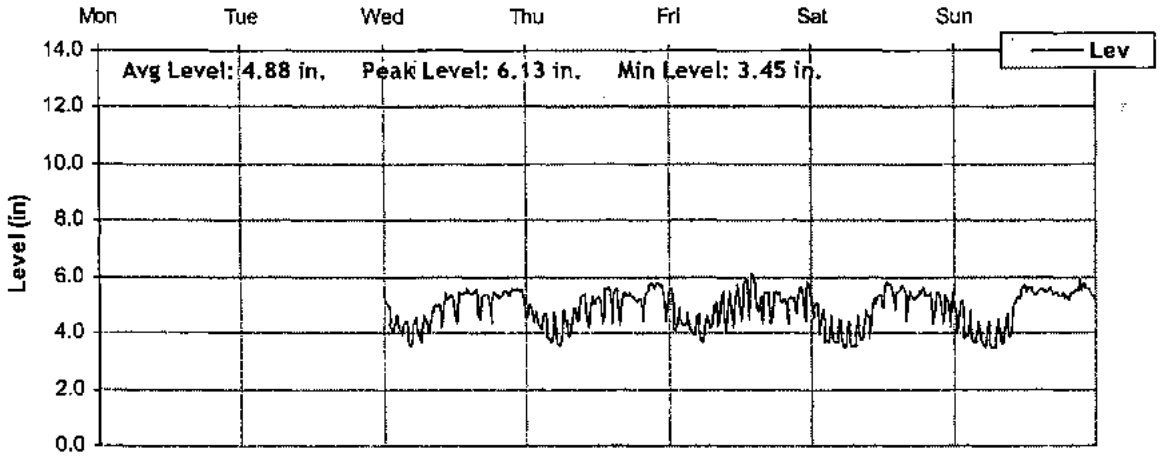
Average Dry Weather Flow:
1.04 *MGD*

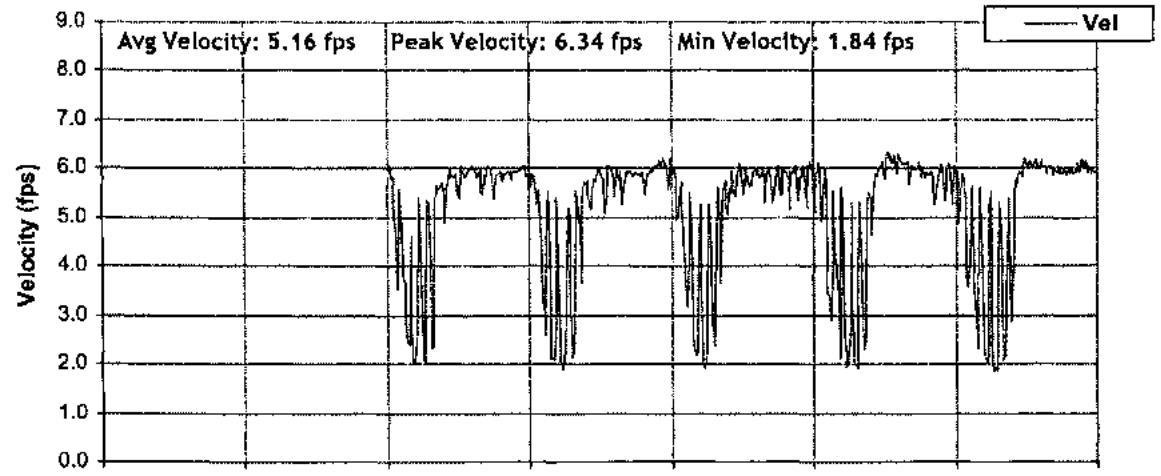


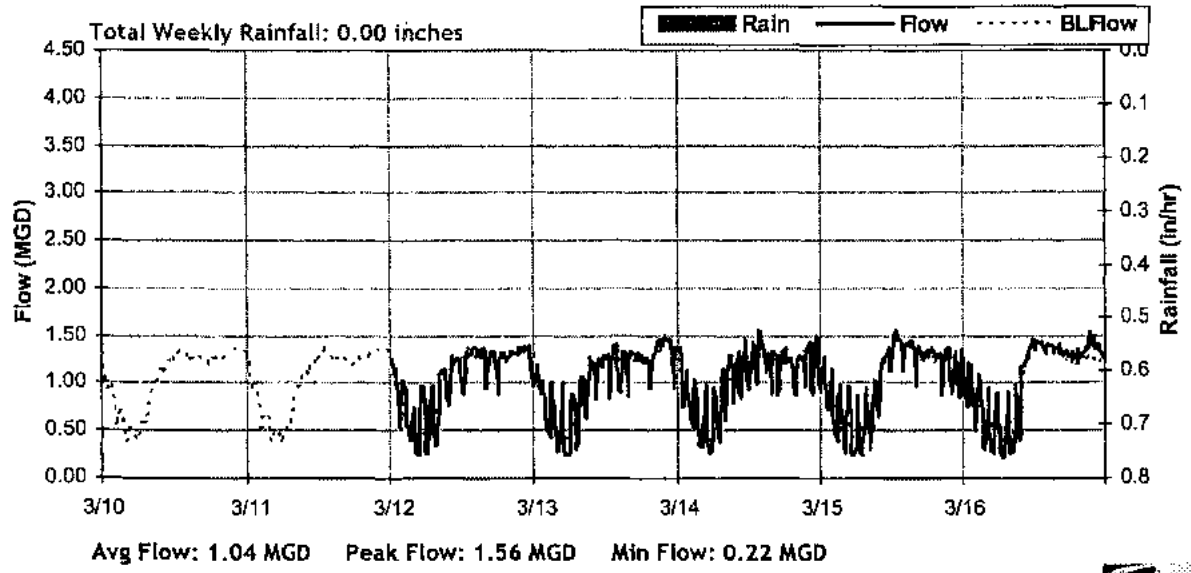
V&A

Level, Velocity and Flow
From 3/10/2008 to 3/17/2008

Monitoring Site:
SAV MH 43







Avg Flow: 1.04 MGD Peak Flow: 1.56 MGD Min Flow: 0.22 MGD

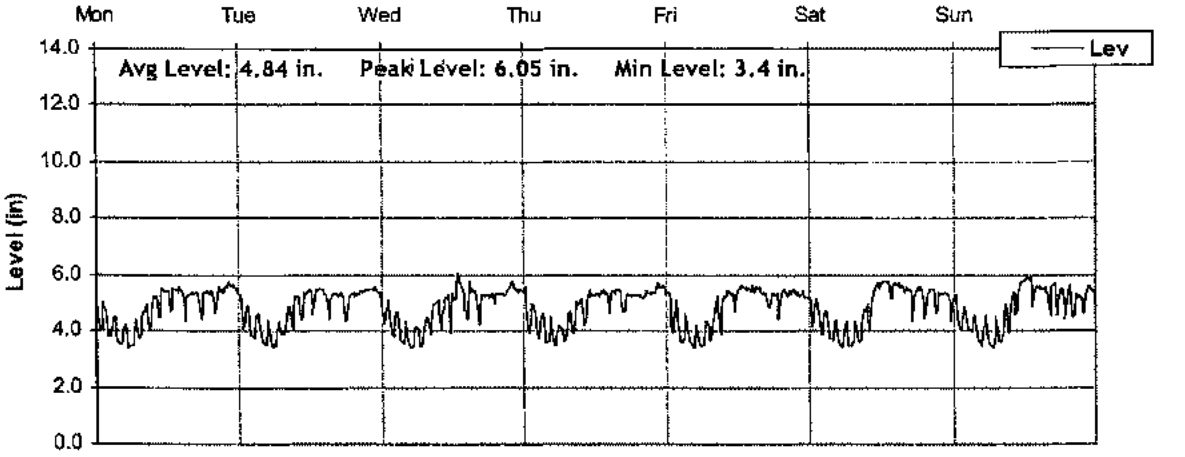
V&A

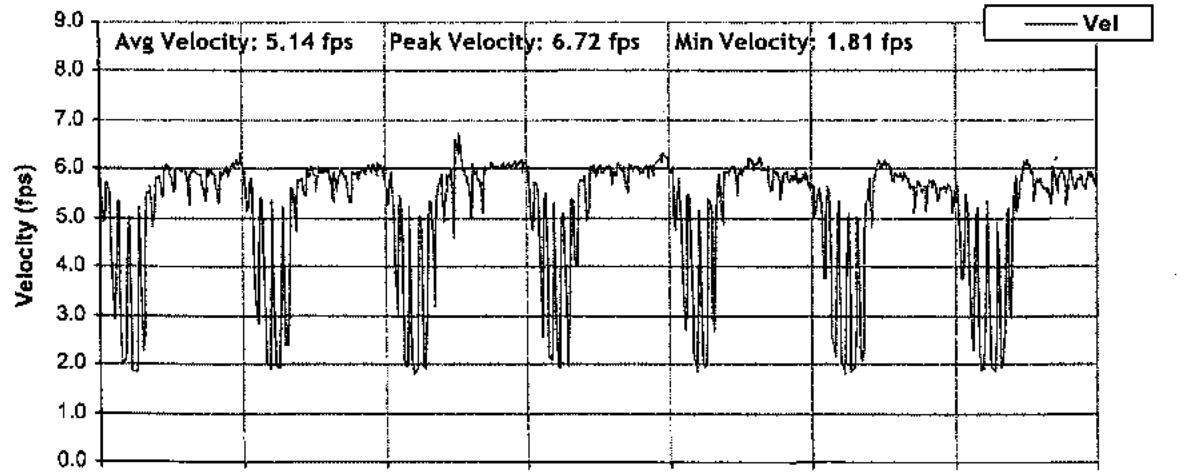
Level, Velocity and Flow

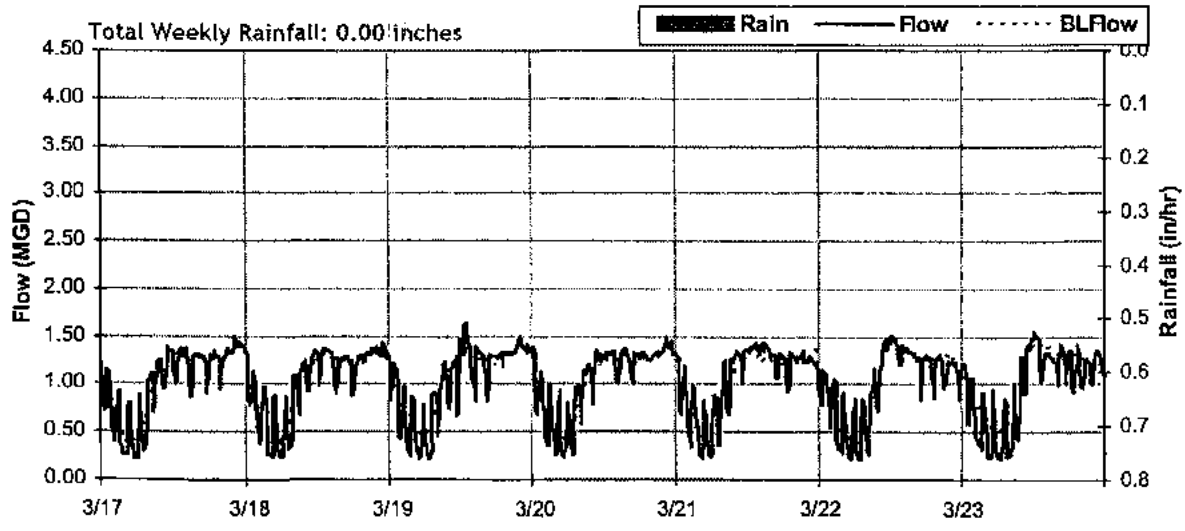
From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 43







Avg Flow: 1.03 MGD Peak Flow: 1.64 MGD Min Flow: 0.21 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 3/10/2008 to 3/17/2008

Monitoring Site:

SAV MH 43

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	4.88	5.16	1.04
Weekly Minimum:	3.50	1.97	0.24
Weekly Maximum:	5.69	6.14	1.45

	Monday 3/10/2008			Tuesday 3/11/2008			Wednesday 3/12/2008			Thursday 3/13/2008			Friday 3/14/2008			Saturday 3/15/2008			Sunday 3/16/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00							5.03	5.93	1.20	4.84	5.76	1.10	5.07	5.66	1.17	4.91	5.77	1.13	4.49	5.43	0.95	0:00
1:00							4.28	4.73	0.77	4.50	5.20	0.91	4.49	5.38	0.94	4.35	5.36	0.90	4.62	5.23	0.97	1:00
2:00							4.27	4.45	0.73	4.34	3.46	0.58	4.37	3.93	0.66	3.89	3.84	0.56	4.27	4.76	0.79	2:00
3:00							4.27	3.06	0.49	4.12	3.40	0.55	4.28	3.76	0.63	4.11	4.34	0.68	3.71	3.00	0.40	3:00
4:00							3.84	2.32	0.33	4.19	3.59	0.59	4.30	3.56	0.61	4.04	4.16	0.66	3.96	3.70	0.57	4:00
5:00							4.25	4.24	0.70	3.61	2.00	0.26	3.89	2.44	0.35	3.56	2.20	0.28	3.92	3.73	0.57	5:00
6:00							4.19	3.96	0.65	4.41	4.20	0.71	4.34	3.96	0.67	3.97	3.35	0.50	3.50	1.97	0.24	6:00
7:00							4.30	3.47	0.59	4.40	3.80	0.68	4.69	3.70	0.70	3.91	3.32	0.51	3.98	3.77	0.58	7:00
8:00							4.93	5.60	1.10	4.64	4.71	0.86	4.70	4.76	0.89	3.92	2.94	0.43	4.12	3.48	0.57	8:00
9:00							4.63	5.35	0.97	5.33	5.67	1.24	4.73	5.40	1.01	4.47	5.22	0.91	4.26	4.27	0.71	9:00
10:00							5.26	5.88	1.26	4.74	5.49	1.03	4.97	5.60	1.12	4.99	5.74	1.15	5.18	5.84	1.23	10:00
11:00							5.13	5.75	1.19	5.15	5.88	1.23	5.40	5.97	1.32	5.27	6.04	1.29	5.56	6.03	1.39	11:00
12:00							5.12	5.81	1.21	4.88	5.54	1.08	5.28	5.76	1.24	5.53	6.14	1.41	5.59	6.07	1.41	12:00
13:00							5.45	5.92	1.33	5.57	5.99	1.38	5.31	5.72	1.24	5.46	6.14	1.38	5.48	6.10	1.38	13:00
14:00							5.40	6.00	1.33	5.03	5.64	1.14	5.50	5.90	1.34	5.37	6.13	1.35	5.55	6.08	1.39	14:00
15:00							5.22	5.80	1.23	5.00	5.68	1.14	4.94	5.73	1.13	5.55	6.11	1.40	5.49	6.00	1.36	15:00
16:00							5.15	5.81	1.21	5.39	5.92	1.31	5.42	5.90	1.31	5.08	5.89	1.21	5.51	5.97	1.36	16:00
17:00							5.03	5.79	1.17	5.33	5.88	1.28	4.94	5.68	1.12	5.25	6.03	1.29	5.40	5.96	1.32	17:00
18:00							5.31	5.80	1.26	5.15	5.90	1.23	5.34	5.76	1.26	5.48	5.89	1.33	5.34	5.91	1.29	18:00
19:00							5.33	5.86	1.28	4.92	5.67	1.11	4.94	5.70	1.13	5.34	5.91	1.29	5.29	5.97	1.29	19:00
20:00							5.48	5.88	1.33	5.61	5.94	1.38	5.24	5.97	1.27	4.97	5.59	1.12	5.49	5.97	1.35	20:00
21:00							5.46	5.93	1.34	5.69	6.08	1.44	5.18	5.72	1.20	5.38	5.99	1.32	5.63	6.06	1.42	21:00
22:00							5.51	6.01	1.36	5.69	6.10	1.45	5.16	5.72	1.20	4.94	5.76	1.14	5.62	6.00	1.40	22:00
23:00							5.16	5.85	1.22	5.02	5.95	1.20	5.50	5.95	1.35	4.80	5.65	1.08	5.32	5.95	1.29	23:00
Average:							4.92	5.22	1.05	4.90	5.14	1.04	4.91	5.15	1.04	4.77	5.15	1.01	4.89	5.14	1.05	Ave
Minimum:							3.84	2.32	0.33	3.61	2.00	0.26	3.89	2.44	0.35	3.56	2.20	0.28	3.50	1.97	0.24	Min
Maximum:							5.51	6.01	1.36	5.69	6.10	1.45	5.50	5.97	1.35	5.55	6.14	1.41	5.63	6.10	1.42	Max

V&A

Hourly Data: Depth, Velocity and Flow

From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 43

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	4.84	5.14	1.03
Weekly Minimum:	3.54	2.00	0.26
Weekly Maximum:	5.87	6.48	1.50

	Monday 3/17/2008			Tuesday 3/18/2008			Wednesday 3/19/2008			Thursday 3/20/2008			Friday 3/21/2008			Saturday 3/22/2008			Sunday 3/23/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	4.37	5.38	0.91	4.48	5.42	0.95	4.70	5.64	1.04	4.74	5.46	1.04	5.00	5.81	1.17	4.66	5.34	0.98	5.07	5.39	1.11	0:00
1:00	4.60	5.23	0.96	4.60	5.23	0.96	4.25	4.43	0.74	4.75	5.61	1.05	4.64	5.44	1.00	4.58	5.04	0.92	4.48	4.62	0.82	1:00
2:00	4.03	3.69	0.56	3.95	3.62	0.54	4.30	4.32	0.73	4.00	3.67	0.56	3.80	3.59	0.50	4.44	4.98	0.86	4.19	3.56	0.58	2:00
3:00	3.87	3.27	0.49	3.96	3.38	0.52	3.78	2.83	0.41	3.97	3.40	0.53	4.12	4.66	0.74	3.77	2.70	0.37	4.30	4.21	0.70	3:00
4:00	3.85	3.30	0.48	3.92	3.54	0.54	3.68	2.77	0.39	4.03	3.72	0.58	3.69	2.57	0.36	4.10	4.17	0.66	3.59	2.00	0.26	4:00
5:00	3.54	2.06	0.26	3.57	2.27	0.29	3.92	3.63	0.54	3.73	2.86	0.41	3.75	3.35	0.48	3.60	2.41	0.32	4.04	3.41	0.53	5:00
6:00	4.08	3.98	0.63	4.02	3.88	0.60	3.63	2.36	0.31	3.83	3.21	0.46	3.92	3.68	0.56	3.74	3.03	0.43	3.57	2.11	0.27	6:00
7:00	4.17	3.68	0.60	4.12	3.35	0.54	4.37	5.16	0.86	4.45	4.80	0.84	4.01	3.94	0.60	3.96	3.67	0.56	3.96	3.27	0.50	7:00
8:00	4.63	5.39	0.98	4.53	5.25	0.93	4.51	4.66	0.84	4.45	4.84	0.85	4.79	5.57	1.06	3.80	2.81	0.40	4.31	3.76	0.66	8:00
9:00	4.95	5.63	1.12	5.08	5.70	1.17	4.71	5.51	1.03	5.01	5.77	1.16	4.71	5.57	1.04	4.71	5.50	1.02	4.55	4.22	0.78	9:00
10:00	4.94	5.69	1.13	4.82	5.68	1.09	4.96	5.73	1.14	4.81	5.57	1.07	5.39	5.99	1.32	4.97	5.57	1.12	5.03	5.51	1.12	10:00
11:00	5.45	6.02	1.35	5.38	5.95	1.31	4.69	5.45	1.03	5.25	5.95	1.27	5.07	5.78	1.18	5.58	6.09	1.41	5.74	6.00	1.44	11:00
12:00	5.09	5.76	1.19	5.06	5.80	1.18	5.49	6.48	1.47	5.34	5.99	1.31	5.56	5.98	1.38	5.76	6.13	1.48	5.87	6.08	1.50	12:00
13:00	5.47	5.99	1.35	5.50	5.97	1.35	5.35	5.89	1.29	5.35	6.04	1.32	5.51	6.14	1.40	5.44	5.92	1.32	5.32	5.70	1.24	13:00
14:00	5.08	5.75	1.18	5.25	5.91	1.26	5.07	5.64	1.16	5.07	5.80	1.18	5.47	6.09	1.37	5.66	5.88	1.39	5.54	5.74	1.31	14:00
15:00	5.26	5.90	1.26	4.99	5.66	1.13	5.41	5.86	1.30	5.42	6.05	1.35	5.53	6.11	1.40	5.53	5.88	1.34	5.46	5.57	1.25	15:00
16:00	5.35	5.91	1.29	5.29	5.92	1.27	4.90	5.70	1.12	4.94	5.81	1.15	5.32	6.00	1.30	5.47	5.73	1.29	5.14	5.78	1.20	16:00
17:00	4.85	5.61	1.08	5.02	5.73	1.16	5.27	6.03	1.29	5.30	6.03	1.30	5.11	5.77	1.19	5.04	5.50	1.12	5.01	5.72	1.15	17:00
18:00	5.38	5.93	1.31	5.04	5.71	1.16	5.18	6.06	1.27	5.30	6.05	1.31	5.10	5.74	1.19	5.51	5.63	1.28	5.07	5.69	1.17	18:00
19:00	5.13	5.63	1.17	5.30	5.87	1.27	5.29	6.07	1.31	5.22	5.95	1.26	5.29	5.86	1.27	4.87	5.55	1.08	5.35	5.88	1.29	19:00
20:00	5.36	5.90	1.29	5.38	5.96	1.31	5.31	6.08	1.32	5.31	6.00	1.30	5.33	5.82	1.27	5.48	5.69	1.29	4.87	5.71	1.11	20:00
21:00	5.50	5.98	1.36	5.47	6.02	1.36	5.55	6.10	1.40	5.33	6.02	1.31	5.38	5.81	1.28	5.02	5.54	1.11	5.07	5.77	1.18	21:00
22:00	5.67	6.12	1.44	5.51	6.03	1.37	5.49	6.11	1.38	5.57	6.21	1.43	5.33	5.80	1.26	5.35	5.61	1.23	5.24	5.78	1.24	22:00
23:00	5.42	6.19	1.38	5.35	6.00	1.31	5.43	6.10	1.36	5.48	6.19	1.40	5.17	5.76	1.20	4.87	5.41	1.05	5.29	5.79	1.25	23:00
Average:	4.83	5.16	1.03	4.82	5.16	1.02	4.80	5.19	1.03	4.86	5.29	1.06	4.87	5.28	1.06	4.83	4.99	1.00	4.83	4.89	0.98	Ave
Minimum:	3.54	2.06	0.26	3.57	2.27	0.29	3.63	2.36	0.31	3.73	2.86	0.41	3.69	2.57	0.36	3.60	2.41	0.32	3.57	2.00	0.26	Min
Maximum:	5.67	6.19	1.44	5.51	6.03	1.37	5.55	6.48	1.47	5.57	6.21	1.43	5.56	6.14	1.40	5.76	6.13	1.48	5.87	6.08	1.50	Max

Temporary Flow Monitoring Study

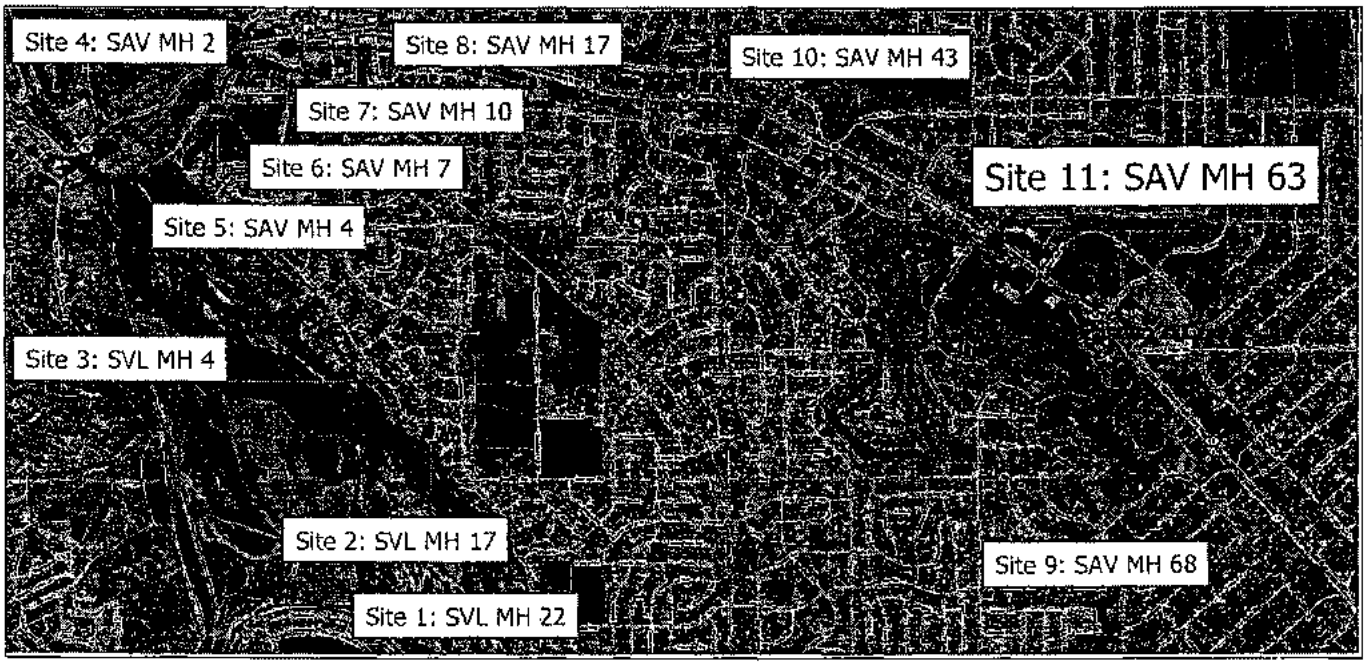
Sanitary Sewer Collection System

Monitoring Site: SAV MH 63 Lat

Manhole Address: Southeast corner of Hwy 18 and Rancheries Road

Size/Type of Line: 12-inch Pipe

Data Summary Report



V&A

	Site Information Report	**Monitoring Site:** SAV MH 63 Lat

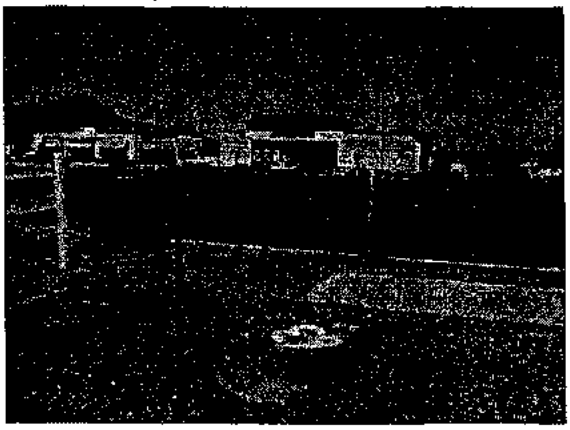
Location: Southeast corner of Hwy 18 and Rancheries Road

Diameter: 12 inches

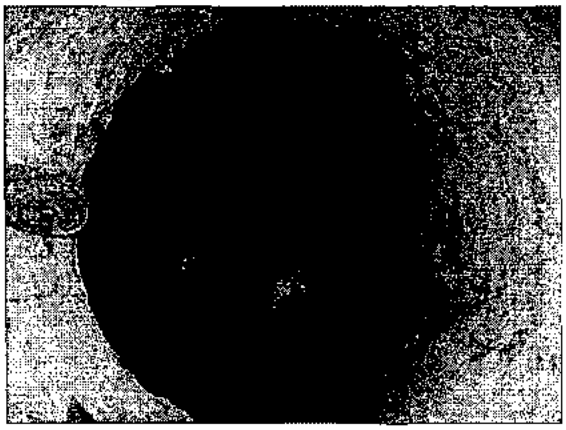
Average Dry Weather Flow: 0.284 *MGD*

Peak Measured Flow: 0.547 *MGD*

Street-level photo:



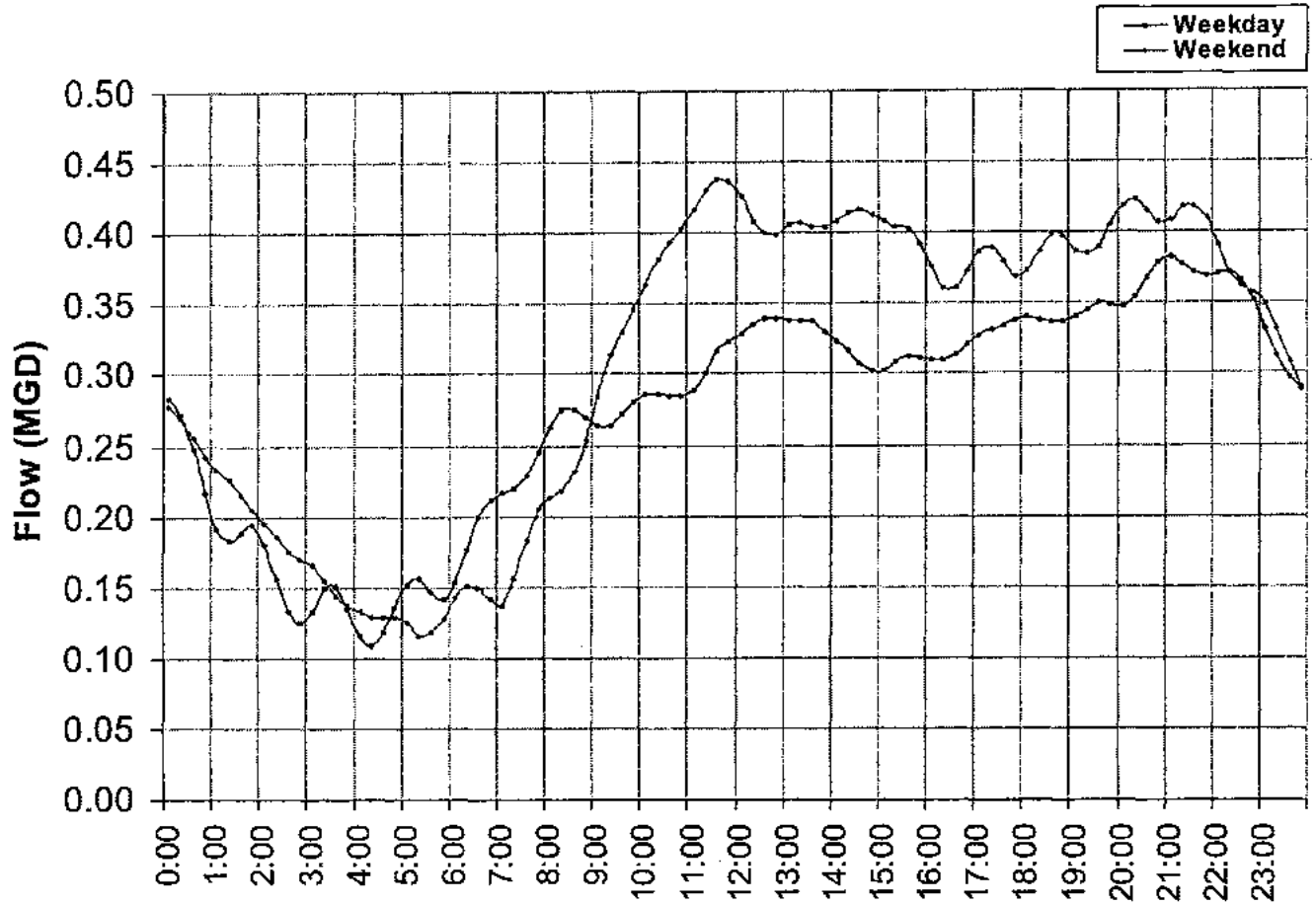
Plan view photo:



V&A

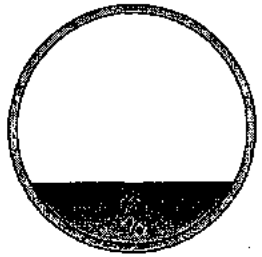
Average Dry Weather Flow

Monitoring Site:
SAV MH 63 Lat



Peak Measured Flow:

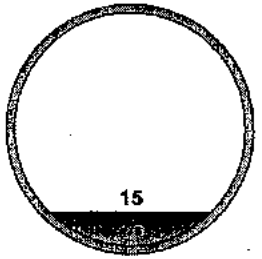
0.55 *MGD*



Peak measured flow shown in weekly graphs on following pages

Average Dry Weather Flow:

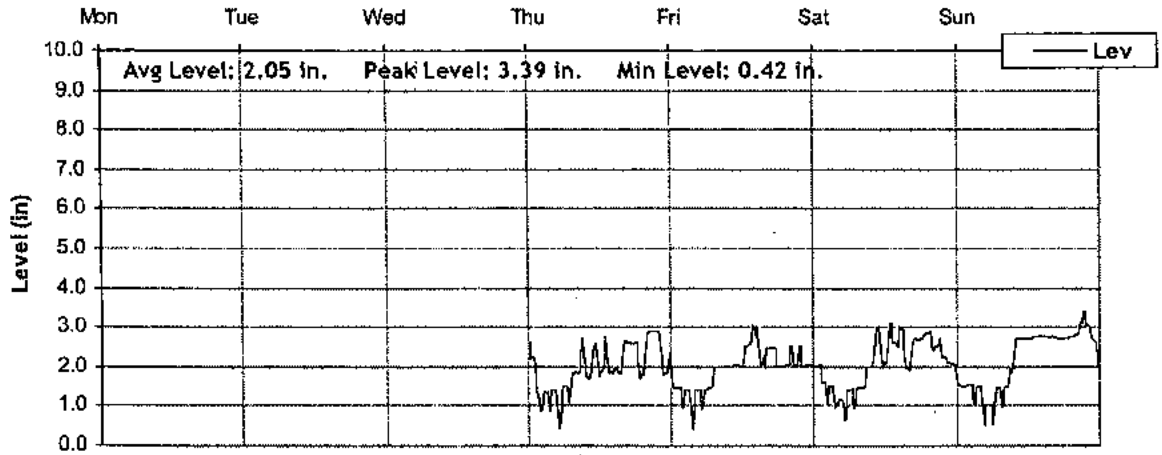
0.28 *MGD*

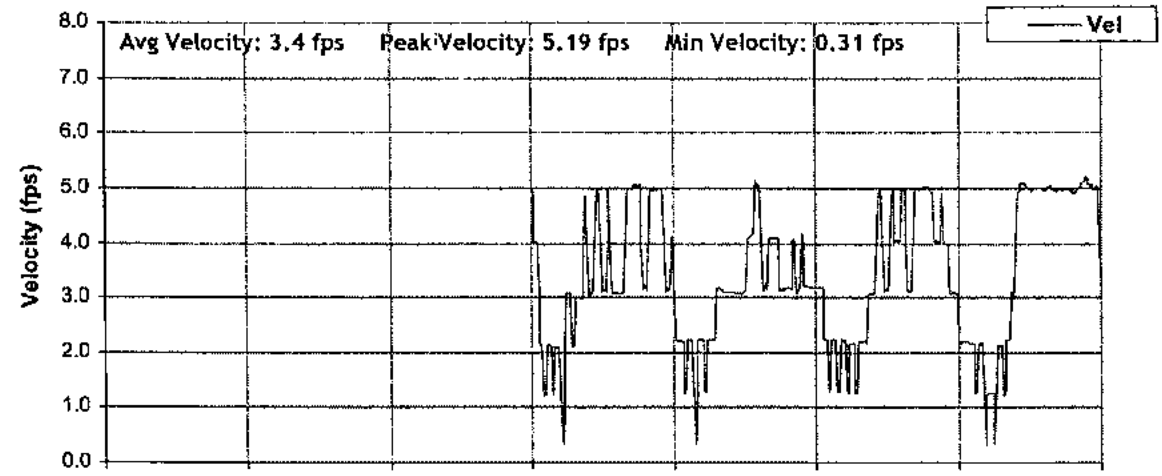


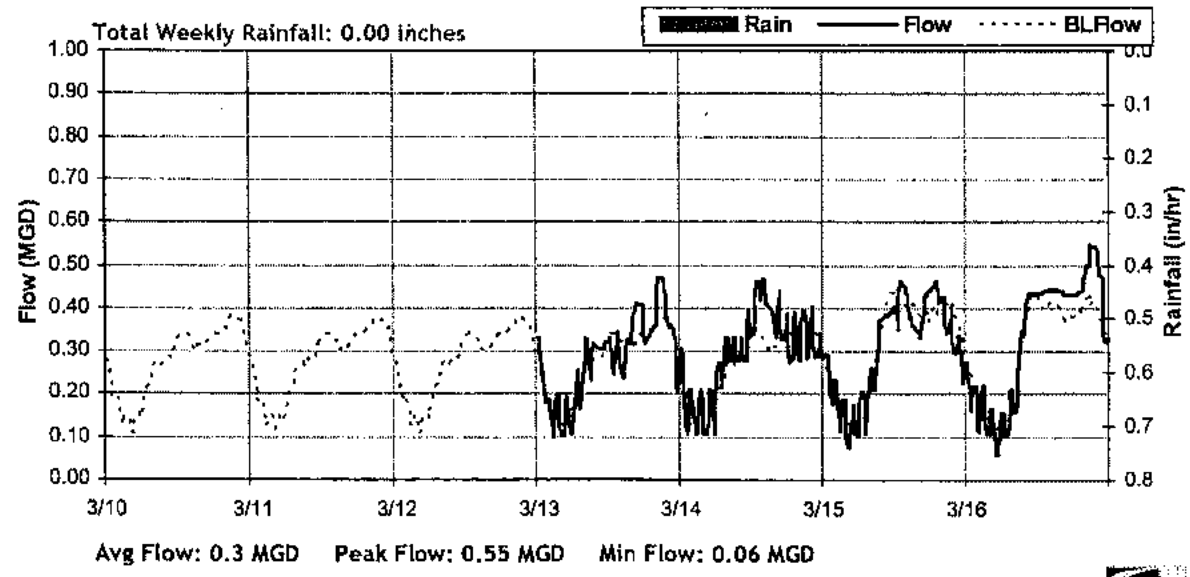
V&A

Level, Velocity and Flow
From 3/10/2008 to 3/17/2008

Monitoring Site:
SAV MH 63 Lat





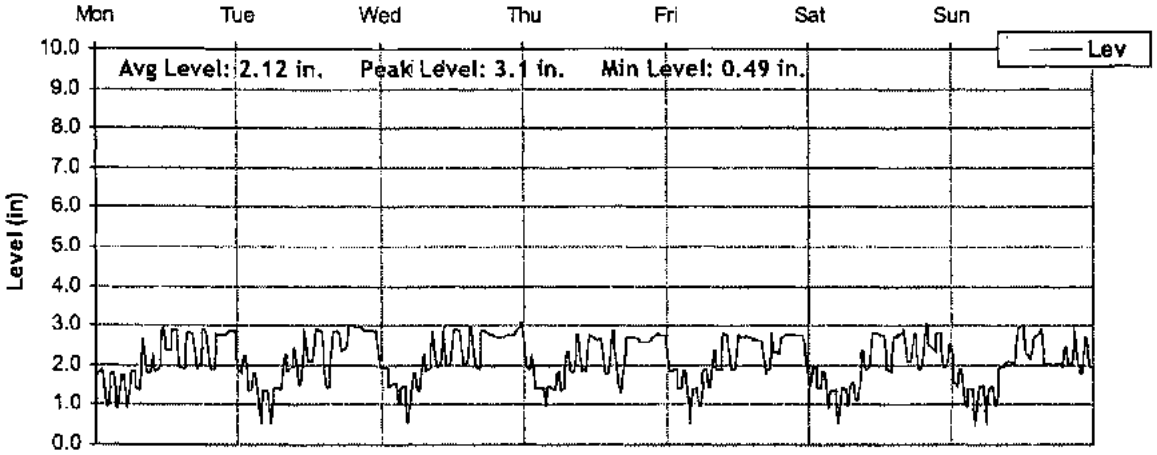


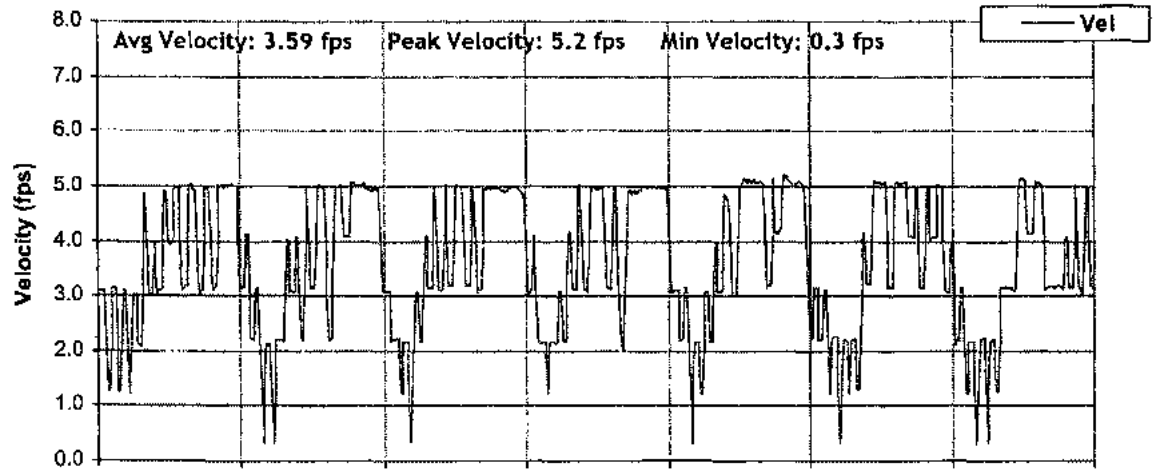
Avg Flow: 0.3 MGD Peak Flow: 0.55 MGD Min Flow: 0.06 MGD

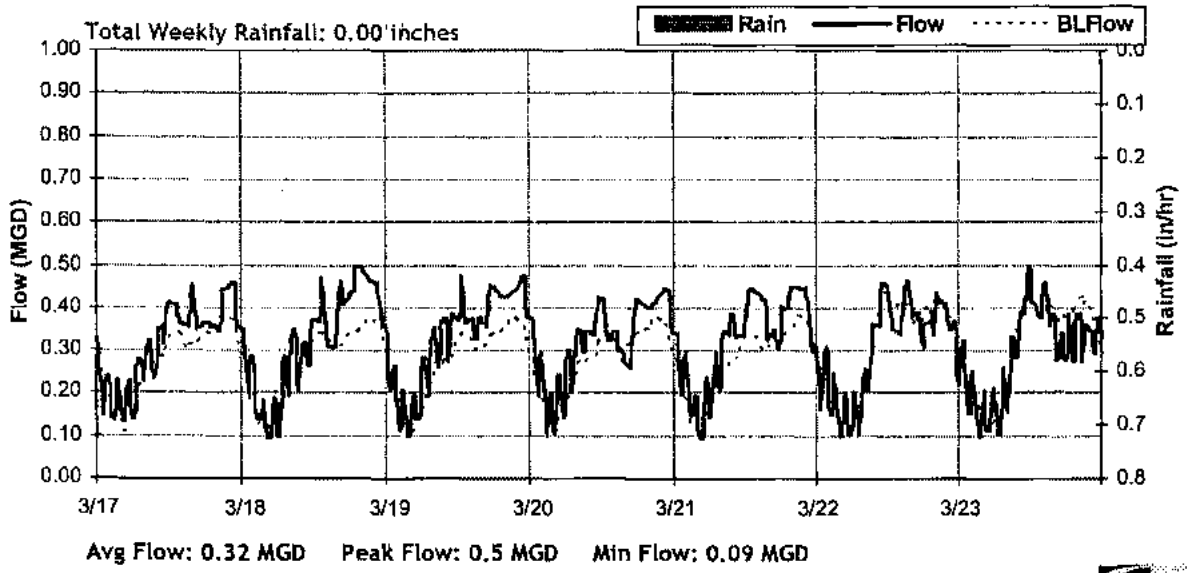
V&A

Level, Velocity and Flow
From 3/17/2008 to 3/24/2008

Monitoring Site:
SAV MH 63 Lat







Avg Flow: 0.32 MGD Peak Flow: 0.5 MGD Min Flow: 0.09 MGD

V&A

Hourly Data: Depth, Velocity and Flow

From 3/10/2008 to 3/17/2008

Monitoring Site:

SAV MH 63 Lat

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	2.05	3.40	0.30
Weekly Minimum:	0.93	1.24	0.07
Weekly Maximum:	3.22	5.14	0.54

	Monday 3/10/2008			Tuesday 3/11/2008			Wednesday 3/12/2008			Thursday 3/13/2008			Friday 3/14/2008			Saturday 3/15/2008			Sunday 3/16/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00										2.32	4.24	0.31	1.57	2.45	0.26	2.01	3.18	0.29	1.52	2.17	0.23	0:00
1:00										1.32	2.14	0.20	1.33	1.97	0.16	1.70	2.48	0.22	1.50	2.18	0.21	1:00
2:00										1.26	1.91	0.13	1.31	1.99	0.15	1.26	1.76	0.19	1.43	1.94	0.17	2:00
3:00										1.15	1.67	0.18	0.93	1.27	0.16	1.25	1.76	0.17	1.39	1.93	0.15	3:00
4:00										1.31	1.88	0.11	1.42	2.23	0.12	1.15	2.25	0.10	1.01	1.24	0.14	4:00
5:00										1.01	1.69	0.14	1.19	1.75	0.17	1.11	1.72	0.14	1.04	1.26	0.07	5:00
6:00										1.32	2.59	0.18	1.45	2.23	0.23	1.20	1.71	0.17	1.10	1.46	0.13	6:00
7:00										1.74	2.80	0.20	1.99	3.16	0.26	1.45	2.19	0.16	1.23	1.71	0.17	7:00
8:00										1.95	3.23	0.31	2.00	3.11	0.29	1.72	2.62	0.24	1.60	2.44	0.19	8:00
9:00										2.13	3.73	0.29	2.00	3.11	0.30	2.00	3.07	0.33	2.20	3.70	0.33	9:00
10:00										2.00	3.81	0.31	2.02	3.09	0.31	2.86	4.69	0.38	2.73	5.05	0.42	10:00
11:00										2.26	4.29	0.31	2.03	3.10	0.32	2.19	3.36	0.39	2.71	5.02	0.43	11:00
12:00										1.98	3.34	0.32	2.41	3.85	0.36	2.74	4.28	0.39	2.75	4.97	0.43	12:00
13:00										2.19	3.79	0.31	2.68	4.41	0.45	2.58	4.03	0.45	2.77	4.99	0.44	13:00
14:00										1.89	3.08	0.25	2.79	4.76	0.44	2.84	4.74	0.41	2.77	4.99	0.44	14:00
15:00										1.92	3.33	0.31	2.09	3.19	0.39	2.07	3.35	0.35	2.75	5.00	0.44	15:00
16:00										2.63	4.97	0.37	2.49	4.09	0.39	2.38	4.30	0.34	2.75	4.96	0.43	16:00
17:00										2.59	5.03	0.41	2.35	3.84	0.34	2.70	4.99	0.43	2.71	4.97	0.43	17:00
18:00										2.28	4.34	0.34	1.99	3.15	0.32	2.80	5.02	0.45	2.73	4.98	0.43	18:00
19:00										1.96	3.40	0.35	2.03	3.16	0.34	2.77	4.72	0.43	2.79	4.92	0.44	19:00
20:00										2.89	4.97	0.43	2.27	3.58	0.32	2.49	4.03	0.40	2.96	5.05	0.51	20:00
21:00										2.91	4.98	0.46	2.28	3.65	0.32	2.34	4.21	0.37	3.22	5.14	0.54	21:00
22:00										2.24	3.82	0.36	2.02	3.20	0.35	2.12	3.32	0.31	2.87	5.02	0.49	22:00
23:00										2.07	3.64	0.27	2.02	3.19	0.31	2.05	3.08	0.27	2.30	4.32	0.34	23:00
Average:										1.97	3.44	0.28	1.94	3.06	0.29	2.07	3.37	0.31	2.20	3.72	0.33	Ave
Minimum:										1.01	1.67	0.11	0.93	1.27	0.12	1.11	1.71	0.10	1.01	1.24	0.07	Min
Maximum:										2.91	5.03	0.46	2.79	4.76	0.45	2.86	5.02	0.45	3.22	5.14	0.54	Max

Hourly Data: Depth, Velocity and Flow

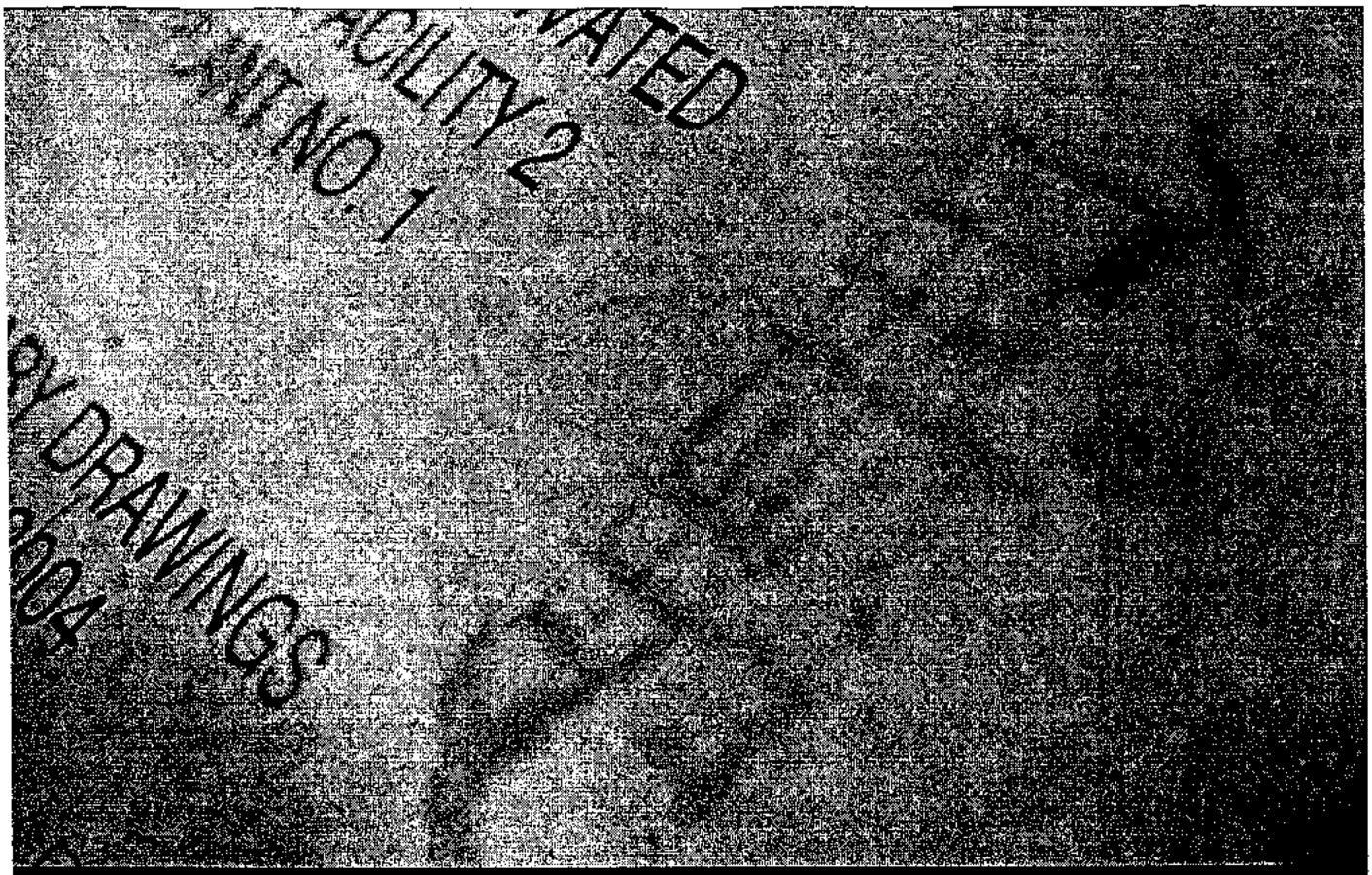
From 3/17/2008 to 3/24/2008

Monitoring Site:

SAV MH 63 Lat

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	2.12	3.59	0.32
Weekly Minimum:	0.93	1.25	0.09
Weekly Maximum:	2.99	5.11	0.50

	Monday 3/17/2008			Tuesday 3/18/2008			Wednesday 3/19/2008			Thursday 3/20/2008			Friday 3/21/2008			Saturday 3/22/2008			Sunday 3/23/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	1.83	3.11	0.26	1.93	3.40	0.31	1.95	3.08	0.25	1.97	3.08	0.36	1.96	3.32	0.33	1.75	2.70	0.24	1.92	2.83	0.28	0:00
1:00	1.31	1.96	0.20	1.70	2.93	0.25	1.50	2.20	0.23	1.97	3.37	0.25	1.78	2.88	0.22	1.56	2.45	0.26	1.78	2.90	0.20	1:00
2:00	1.68	2.91	0.15	1.69	2.90	0.17	1.30	1.75	0.17	1.42	2.15	0.17	1.63	2.68	0.22	1.73	2.88	0.17	1.19	1.71	0.20	2:00
3:00	1.15	1.71	0.21	0.93	1.25	0.16	1.45	2.18	0.11	1.21	1.70	0.18	1.18	1.73	0.17	1.14	1.75	0.17	1.31	1.94	0.11	3:00
4:00	1.65	2.87	0.15	1.38	2.13	0.09	0.97	1.26	0.17	1.43	2.15	0.17	1.29	1.93	0.11	1.06	1.54	0.14	1.09	1.49	0.15	4:00
5:00	1.27	1.91	0.19	0.95	1.25	0.14	1.70	2.84	0.17	1.71	2.85	0.19	1.19	1.68	0.19	1.32	1.95	0.12	1.12	1.51	0.15	5:00
6:00	1.61	2.58	0.21	1.40	2.20	0.17	1.71	2.90	0.25	1.52	2.44	0.27	1.78	2.85	0.18	1.19	1.71	0.18	1.33	1.95	0.12	6:00
7:00	2.03	3.47	0.25	1.95	3.32	0.24	1.97	3.38	0.31	2.09	3.66	0.28	1.82	2.85	0.26	1.45	1.98	0.14	1.23	1.73	0.21	7:00
8:00	1.92	3.27	0.31	1.90	3.09	0.32	2.40	4.06	0.31	2.19	3.82	0.33	2.02	3.31	0.31	1.70	2.71	0.23	1.96	3.14	0.25	8:00
9:00	2.06	3.50	0.26	2.07	3.37	0.26	1.97	3.11	0.37	2.19	3.85	0.33	2.46	4.18	0.35	2.01	3.45	0.32	2.06	3.14	0.30	9:00
10:00	2.05	3.35	0.35	1.84	2.91	0.30	2.47	4.09	0.33	2.20	3.78	0.34	2.44	4.09	0.35	2.47	4.39	0.37	2.13	3.36	0.37	10:00
11:00	2.66	4.44	0.37	2.43	3.83	0.33	2.10	3.42	0.38	2.71	4.95	0.41	2.00	3.29	0.34	2.80	5.07	0.46	2.96	5.10	0.45	11:00
12:00	2.49	4.24	0.41	2.39	3.89	0.37	2.91	5.01	0.42	2.66	4.97	0.41	2.72	5.04	0.40	2.68	4.82	0.39	2.56	4.60	0.41	12:00
13:00	2.76	4.73	0.39	2.88	4.99	0.42	2.33	3.88	0.37	2.12	3.84	0.33	2.74	5.11	0.44	1.86	3.16	0.35	2.33	4.37	0.38	13:00
14:00	1.92	3.15	0.36	1.82	2.90	0.31	2.41	3.86	0.36	2.24	3.83	0.33	2.67	5.10	0.43	2.62	4.82	0.38	2.77	5.07	0.43	14:00
15:00	2.71	4.78	0.39	2.15	3.62	0.32	2.36	3.79	0.36	2.17	3.57	0.29	2.63	5.08	0.41	2.80	5.05	0.45	2.34	3.83	0.37	15:00
16:00	2.47	4.21	0.36	2.83	5.02	0.42	2.27	3.82	0.36	1.61	2.70	0.26	2.11	3.87	0.33	2.42	4.58	0.38	2.02	3.18	0.29	16:00
17:00	2.10	3.32	0.36	2.39	4.09	0.42	2.64	4.95	0.44	2.67	4.85	0.37	2.23	3.92	0.33	2.36	4.29	0.36	2.01	3.17	0.31	17:00
18:00	2.75	4.76	0.36	2.87	4.81	0.45	2.76	4.95	0.44	2.70	4.89	0.41	2.32	4.16	0.39	2.23	3.83	0.35	1.99	3.15	0.33	18:00
19:00	1.89	3.15	0.35	2.99	5.03	0.50	2.71	4.93	0.43	2.61	4.95	0.40	2.62	4.92	0.41	2.42	3.83	0.37	2.23	3.62	0.32	19:00
20:00	2.67	4.79	0.38	2.92	5.02	0.48	2.73	4.91	0.43	2.57	4.98	0.40	2.77	5.08	0.45	2.62	4.28	0.42	2.38	3.87	0.35	20:00
21:00	2.76	5.00	0.45	2.86	4.92	0.46	2.78	4.98	0.44	2.69	4.99	0.42	2.76	5.05	0.45	2.58	4.54	0.41	2.07	3.36	0.35	21:00
22:00	2.83	5.01	0.45	2.87	4.95	0.45	2.83	4.96	0.46	2.79	4.97	0.44	2.78	5.03	0.43	2.51	4.29	0.37	2.37	4.24	0.32	22:00
23:00	2.49	4.29	0.37	2.27	3.81	0.36	2.92	4.64	0.42	2.77	4.94	0.40	2.16	3.59	0.31	2.15	3.29	0.33	2.07	3.40	0.35	23:00
Average:	2.13	3.60	0.31	2.14	3.57	0.32	2.22	3.71	0.33	2.17	3.80	0.32	2.17	3.78	0.33	2.06	3.47	0.31	1.97	3.19	0.29	Ave
Minimum:	1.15	1.71	0.15	0.93	1.25	0.09	0.97	1.26	0.11	1.21	1.70	0.17	1.18	1.68	0.11	1.06	1.54	0.12	1.09	1.49	0.11	Min
Maximum:	2.83	5.01	0.45	2.99	5.03	0.50	2.92	5.01	0.46	2.79	4.99	0.44	2.78	5.11	0.45	2.80	5.07	0.46	2.96	5.10	0.45	Max



Victor Valley Wastewater Reclamation Authority

Sanitary Sewer Flow Monitoring at Three Locations

February, 2008

V&A

SANITARY SEWER FLOW MONITORING
AND
CAPACITY ANALYSIS

VICTOR VALLEY WASTEWATER RECLAMATION AUTHORITY

Prepared For:

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February 2008

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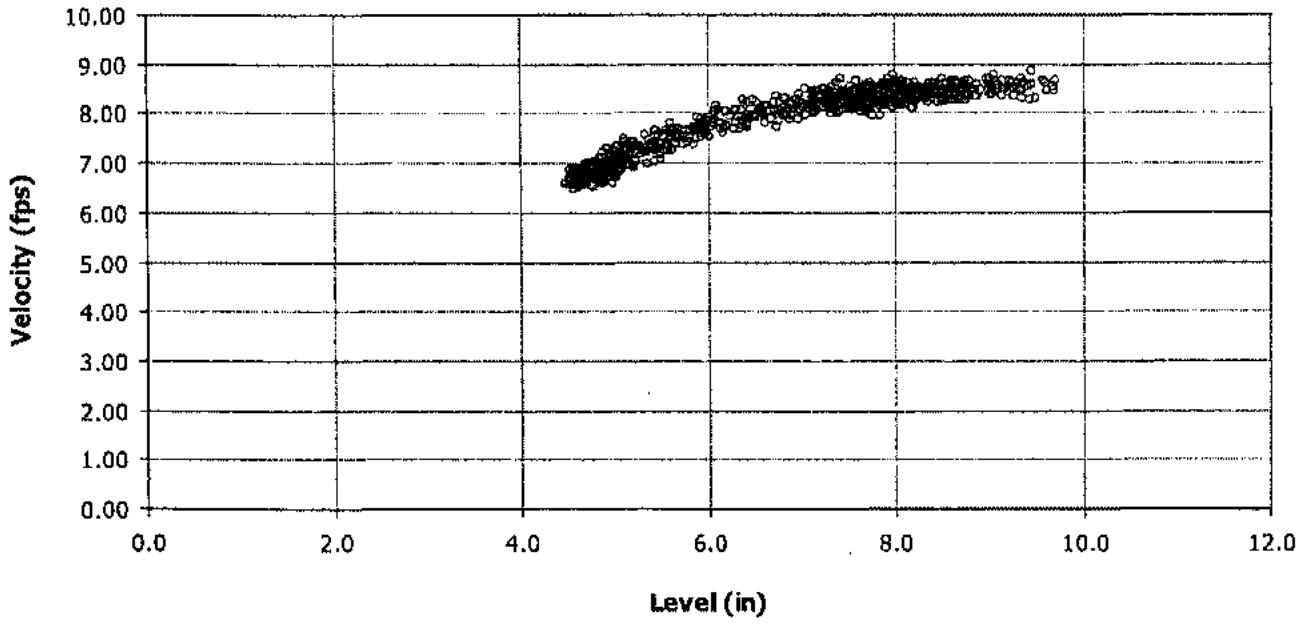
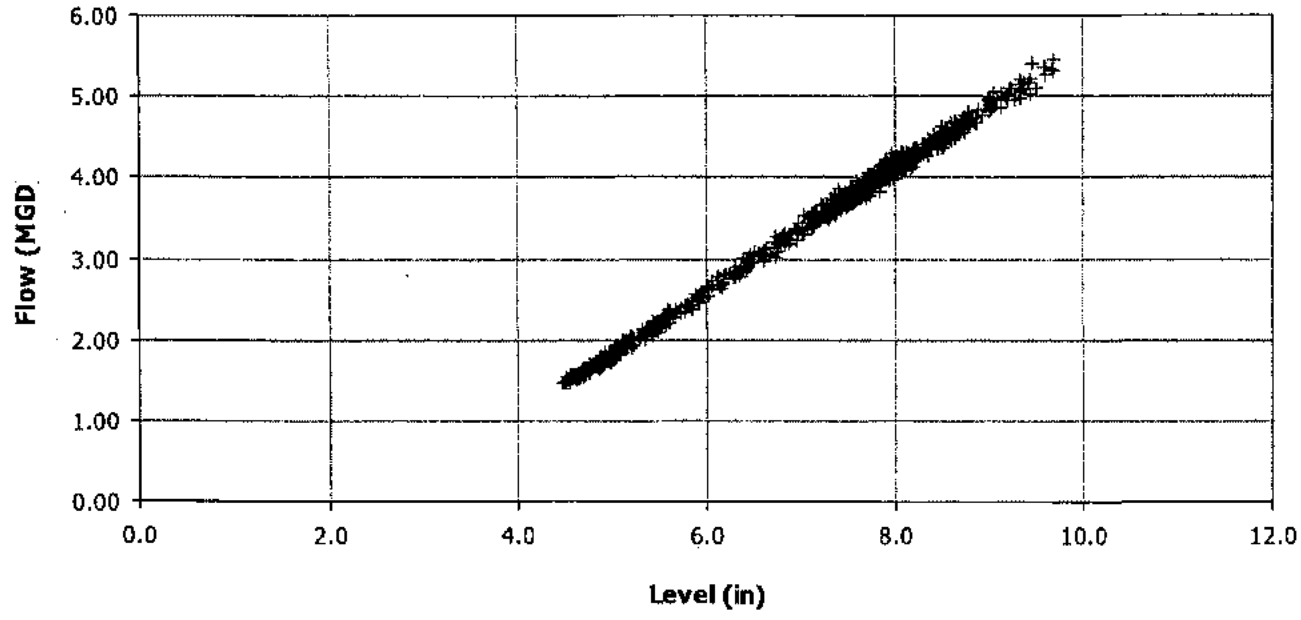
TABLES

FIGURES

APPENDIX A – Flow Monitoring Sites: Graphs, Tables and Figures

Victor Valley Wastewater	**Scatter Plots (Flow, Velocity vs. Depth)**	**Monitoring Site:** VSD3





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Hourly Data: Depth, Velocity and Flow

From 1/4/2008 to 1/11/2008

Monitoring Site:

VSD3

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	7.07	8.02	3.41
Weekly Minimum:	4.56	6.61	1.55
Weekly Maximum:	9.45	8.71	5.29

	Friday 1/4/2008			Saturday 1/5/2008			Sunday 1/6/2008			Monday 1/7/2008			Tuesday 1/8/2008			Wednesday 1/9/2008			Thursday 1/10/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	6.47	8.11	3.00	8.40	8.57	4.48	6.45	8.06	2.97	7.11	8.14	3.41	6.97	8.02	3.28	6.62	7.95	3.03	6.59	7.85	2.97	0:00
1:00	5.76	7.75	2.44	8.51	8.49	4.51	5.98	7.72	2.56	6.19	7.87	2.74	5.91	7.58	2.48	5.76	7.64	2.41	5.77	7.51	2.38	1:00
2:00	5.07	7.30	1.93	8.18	8.41	4.24	5.51	7.55	2.24	5.45	7.38	2.15	5.28	7.24	2.02	5.08	7.02	1.86	5.11	6.98	1.86	2:00
3:00	4.86	7.03	1.75	8.13	8.33	4.17	5.08	7.11	1.88	5.06	6.97	1.84	4.96	6.94	1.78	4.82	6.80	1.67	4.72	6.62	1.58	3:00
4:00	4.62	6.84	1.58	7.97	8.50	4.14	4.78	6.89	1.67	4.84	6.75	1.67	4.77	6.84	1.66	4.71	6.62	1.57	4.66	6.61	1.55	4:00
5:00	4.68	6.87	1.62	7.90	8.46	4.08	4.67	6.75	1.59	4.82	6.99	1.72	5.00	6.96	1.80	4.95	6.97	1.78	4.92	6.84	1.73	5:00
6:00	5.00	7.22	1.87	7.66	8.36	3.88	4.66	6.72	1.58	5.87	7.58	2.45	5.77	7.56	2.40	5.66	7.43	2.29	5.73	7.40	2.32	6:00
7:00	5.50	7.59	2.24	7.64	8.31	3.83	4.91	6.89	1.74	6.94	8.20	3.34	7.09	8.23	3.44	6.87	8.09	3.25	7.04	8.05	3.33	7:00
8:00	6.26	8.04	2.84	7.63	8.34	3.84	5.70	7.67	2.39	7.99	8.52	4.17	7.87	8.40	4.03	7.97	8.27	4.03	8.13	8.33	4.16	8:00
9:00	6.95	8.24	3.35	7.34	8.37	3.66	6.64	8.26	3.17	8.02	8.57	4.22	7.87	8.36	4.02	7.99	8.28	4.05	8.12	8.27	4.14	9:00
10:00	7.39	8.31	3.67	6.92	8.22	3.32	7.72	8.37	3.92	8.02	8.53	4.20	7.75	8.44	3.97	7.84	8.38	4.00	8.02	8.29	4.08	10:00
11:00	7.91	8.46	4.09	6.28	8.15	2.89	8.72	8.51	4.67	8.12	8.42	4.21	7.77	8.40	3.96	7.94	8.38	4.07	7.93	8.28	4.01	11:00
12:00	8.08	8.44	4.19	5.74	7.78	2.44	9.18	8.56	5.01	7.91	8.43	4.08	7.84	8.38	4.00	7.80	8.38	3.98	7.86	8.24	3.95	12:00
13:00	8.08	8.50	4.23	5.27	7.45	2.07	8.59	8.46	4.54	8.00	8.51	4.17	7.78	8.44	3.99	7.65	8.31	3.84	7.70	8.22	3.84	13:00
14:00	8.09	8.39	4.18	4.92	7.17	1.81	8.63	8.61	4.66	7.86	8.47	4.06	7.60	8.40	3.85	7.56	8.23	3.75	7.57	8.19	3.73	14:00
15:00	7.86	8.43	4.04	4.59	6.90	1.58	8.37	8.52	4.43	7.49	8.48	3.81	7.43	8.23	3.66	7.57	8.21	3.74	7.43	8.14	3.62	15:00
16:00	7.67	8.38	3.88	4.56	6.85	1.56	8.04	8.46	4.17	7.36	8.45	3.71	7.39	8.23	3.63	7.48	8.28	3.71	7.44	8.23	3.67	16:00
17:00	7.75	8.33	3.91	4.68	6.93	1.63	7.99	8.46	4.14	7.47	8.44	3.78	7.57	8.36	3.81	7.70	8.27	3.85	7.60	8.22	3.77	17:00
18:00	7.60	8.34	3.82	4.90	7.17	1.81	7.96	8.63	4.20	7.69	8.44	3.92	7.95	8.41	4.09	8.04	8.35	4.12	7.92	8.34	4.04	18:00
19:00	7.53	8.38	3.80	5.36	7.58	2.16	8.32	8.39	4.33	7.97	8.60	4.20	8.46	8.49	4.48	8.36	8.38	4.35	8.18	8.36	4.22	19:00
20:00	7.52	8.38	3.78	6.28	8.08	2.87	8.77	8.57	4.73	8.43	8.58	4.50	8.81	8.51	4.73	8.61	8.38	4.52	8.64	8.33	4.51	20:00
21:00	7.19	8.40	3.57	7.12	8.34	3.51	9.45	8.71	5.29	8.98	8.55	4.87	8.69	8.42	4.60	8.75	8.54	4.70	8.60	8.50	4.58	21:00
22:00	7.02	8.30	3.42	7.90	8.41	4.06	8.99	8.54	4.87	8.89	8.50	4.78	8.47	8.50	4.49	8.46	8.36	4.41	8.21	8.34	4.23	22:00
23:00	6.71	8.20	3.18	8.35	8.51	4.41	8.02	8.36	4.11	7.99	8.35	4.09	7.59	8.30	3.80	7.61	8.24	3.78	7.48	8.26	3.71	23:00
Average:	6.73	8.01	3.18	6.76	7.98	3.21	7.21	8.03	3.54	7.27	8.15	3.59	7.19	8.07	3.50	7.16	7.99	3.45	7.14	7.93	3.42	Ave
Minimum:	4.62	6.84	1.58	4.56	6.85	1.56	4.66	6.72	1.58	4.82	6.75	1.67	4.77	6.84	1.66	4.71	6.62	1.57	4.66	6.61	1.55	Min
Maximum:	8.09	8.50	4.23	8.51	8.57	4.51	9.45	8.71	5.29	8.98	8.60	4.87	8.81	8.51	4.73	8.75	8.54	4.70	8.64	8.50	4.58	Max

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Hourly Data: Depth, Velocity and Flow

From 1/11/2008 to 1/18/2008

Monitoring Site:

VSD3

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	7.15	7.95	3.45
Weekly Minimum:	4.54	6.61	1.50
Weekly Maximum:	9.59	8.58	5.26

	Friday 1/11/2008			Saturday 1/12/2008			Sunday 1/13/2008			Monday 1/14/2008			Tuesday 1/15/2008			Wednesday 1/16/2008			Thursday 1/17/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	6.50	7.89	2.93	6.91	7.94	3.20	6.56	7.91	2.97													0:00
1:00	5.66	7.54	2.32	6.14	7.66	2.64	5.88	7.62	2.47													1:00
2:00	5.05	7.12	1.87	5.63	7.28	2.23	5.33	7.28	2.06													2:00
3:00	4.67	6.74	1.58	5.19	6.93	1.89	4.97	7.04	1.81													3:00
4:00	4.64	6.65	1.55	4.91	6.74	1.70	4.58	6.65	1.52													4:00
5:00	4.75	6.82	1.64	4.86	6.65	1.65	4.54	6.61	1.50													5:00
6:00	5.28	7.30	2.04	5.03	6.77	1.77	4.59	6.67	1.53													6:00
7:00	6.46	7.93	2.93	5.45	7.17	2.10	4.87	7.02	1.75													7:00
8:00	7.96	8.42	4.10	6.56	7.83	2.96	5.92	7.69	2.52													8:00
9:00	8.01	8.41	4.13	8.10	8.28	4.13	7.40	8.38	3.71													9:00
10:00	8.09	8.45	4.20	8.96	8.36	4.74	8.66	8.47	4.61													10:00
11:00	7.91	8.42	4.07	9.55	8.52	5.24	9.26	8.56	5.07													11:00
12:00	7.91	8.30	4.01	9.59	8.50	5.26	9.06	8.58	4.94													12:00
13:00	7.72	8.36	3.91	9.34	8.48	5.08	8.90	8.54	4.81													13:00
14:00	7.70	8.25	3.85	8.92	8.50	4.80	8.62	8.51	4.59													14:00
15:00	7.57	8.21	3.74	8.53	8.40	4.48	8.32	8.40	4.33													15:00
16:00	7.30	8.17	3.55	8.23	8.32	4.24	8.10	8.36	4.17													16:00
17:00	7.35	8.23	3.61	7.93	8.24	4.00	7.95	8.42	4.10													17:00
18:00	7.64	8.30	3.83	7.83	8.28	3.94	8.18	8.29	4.19													18:00
19:00	7.79	8.39	3.98	7.73	8.28	3.88	8.47	8.53	4.50													19:00
20:00	8.07	8.40	4.17	7.57	8.30	3.78	8.65	8.36	4.53													20:00
21:00	8.05	8.34	4.12	7.55	8.36	3.80	8.44	8.53	4.49													21:00
22:00	7.82	8.18	3.89	7.66	8.31	3.85	7.91	8.46	4.09													22:00
23:00	7.56	8.10	3.69	7.06	8.08	3.35	7.14	8.29	3.50													23:00
Average:	6.98	7.95	3.32	7.30	7.92	3.53	7.18	7.96	3.49													Ave
Minimum:	4.64	6.65	1.55	4.86	6.65	1.65	4.54	6.61	1.50													Min
Maximum:	8.09	8.45	4.20	9.59	8.52	5.26	9.26	8.58	5.07													Max

Temporary Flow Monitoring Study

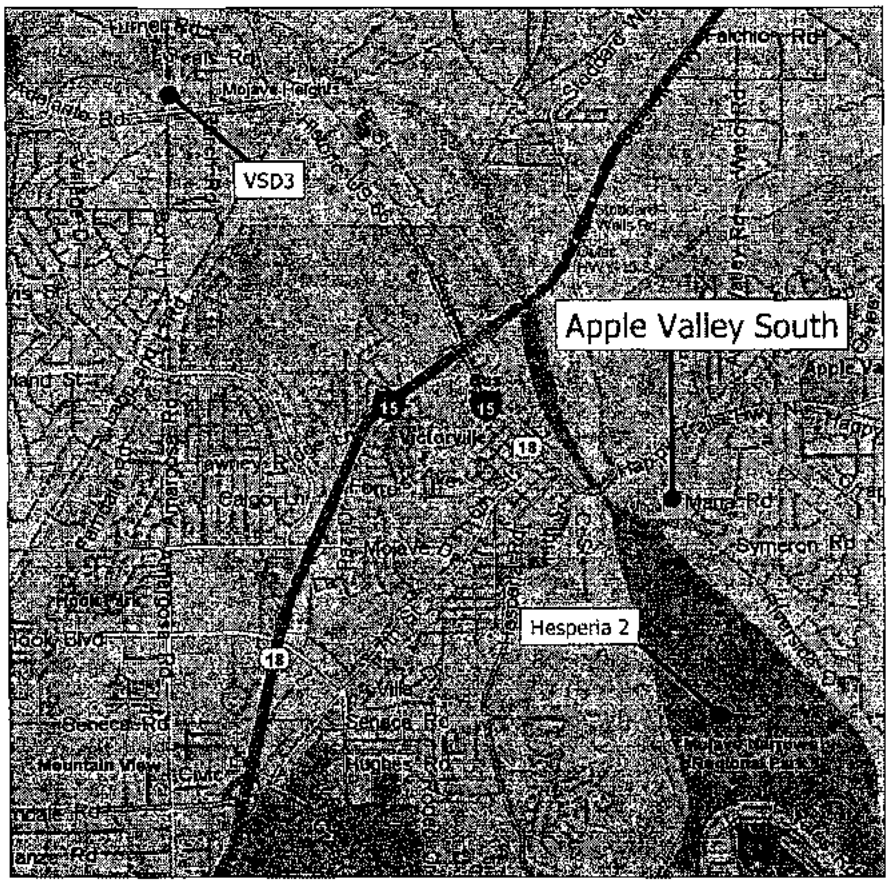
Sanitary Sewer Collection System

Monitoring Site: Apple Valley South

Manhole Address: West of Mana Road

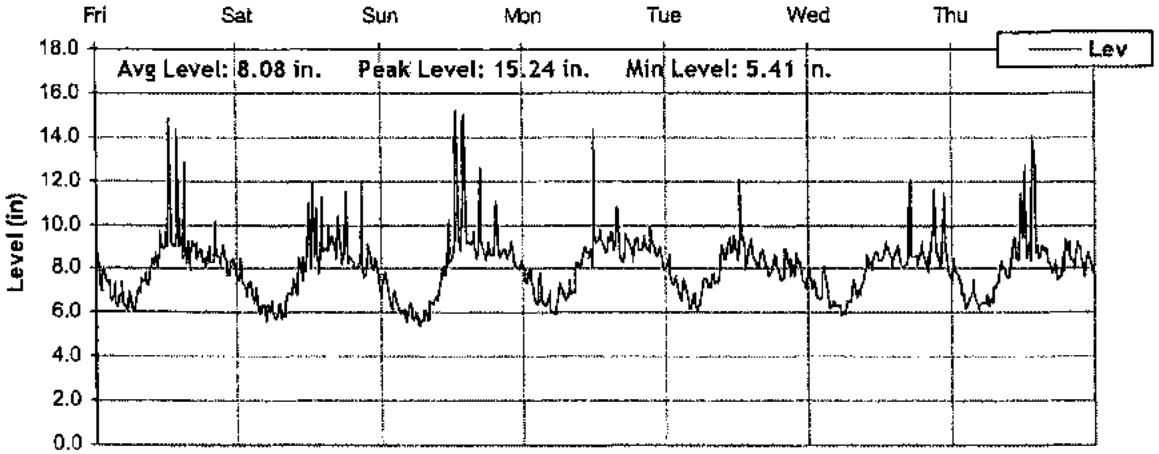
Size/Type of Line: 15-inch Pipe

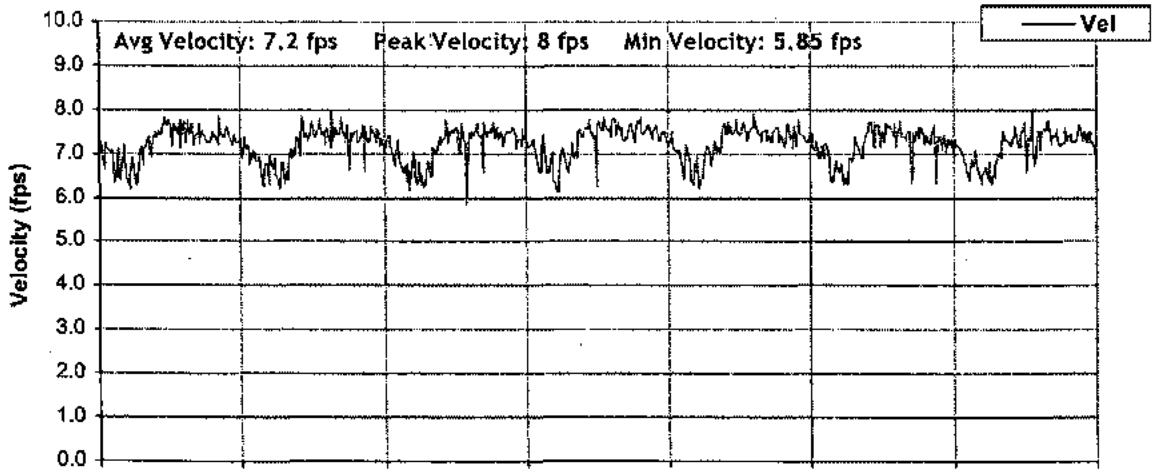
Data Summary Report

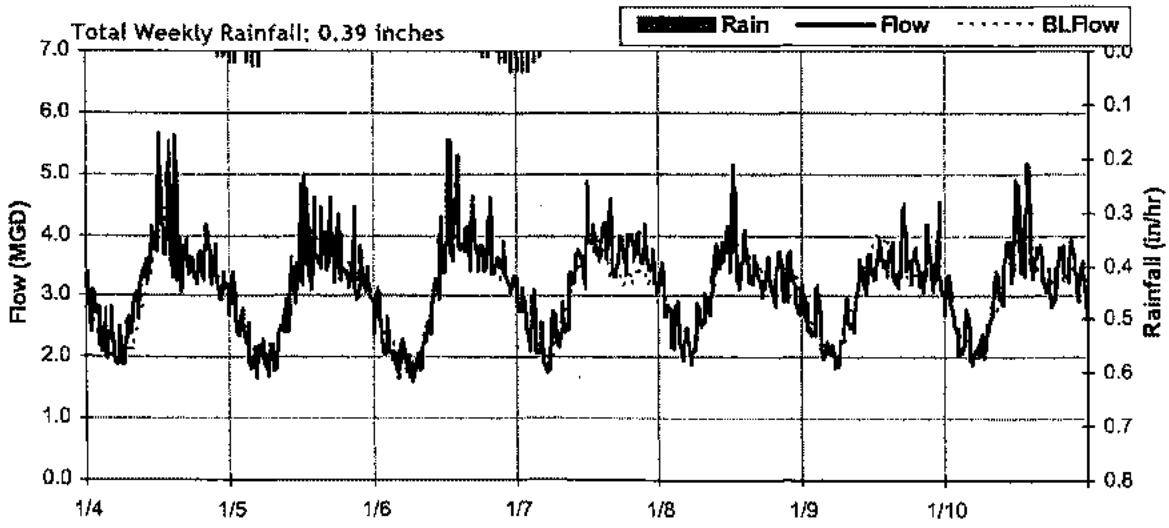


Level, Velocity and Flow
From 1/4/2008 to 1/11/2008

Monitoring Site:
Apple Valley South







Avg Flow: 3.14 MGD Peak Flow: 5.66 MGD Min Flow: 1.6 MGD

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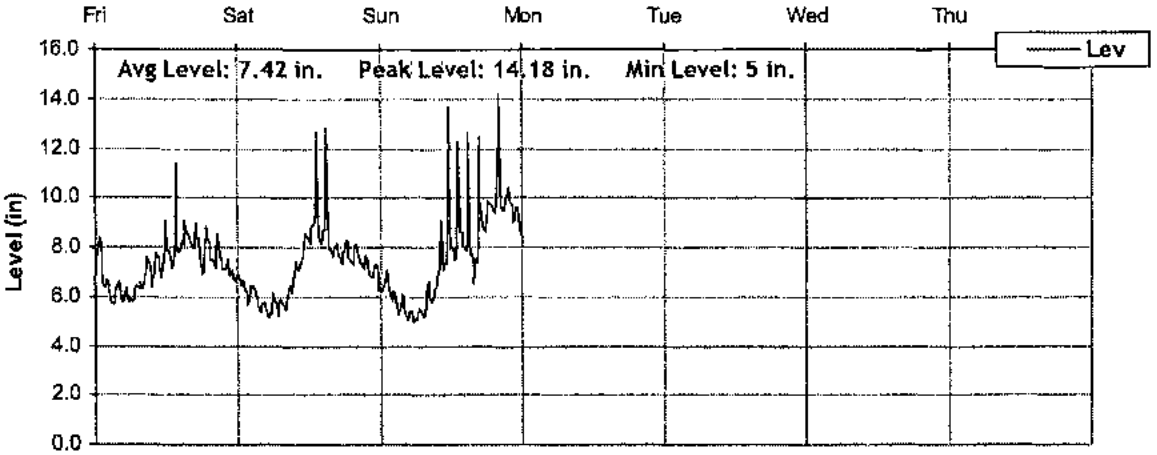
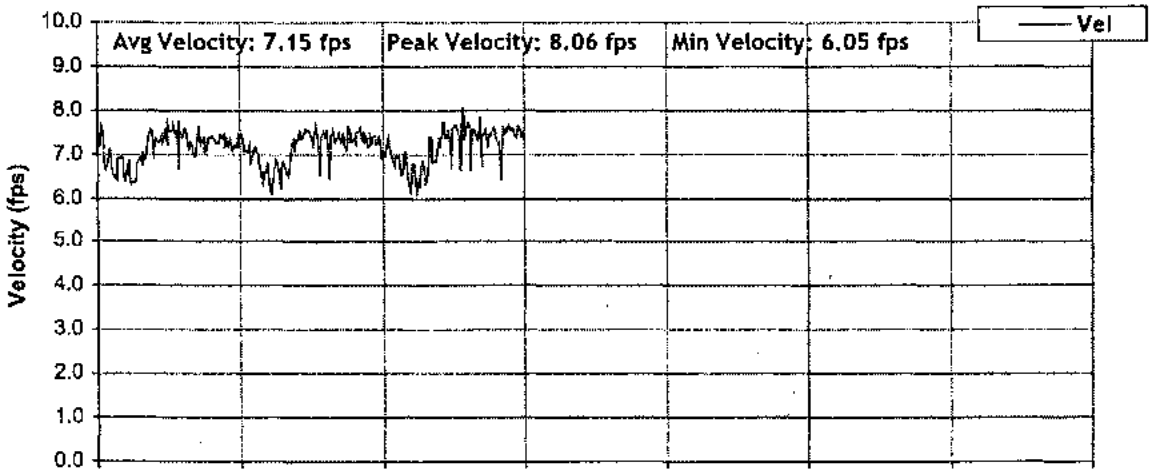
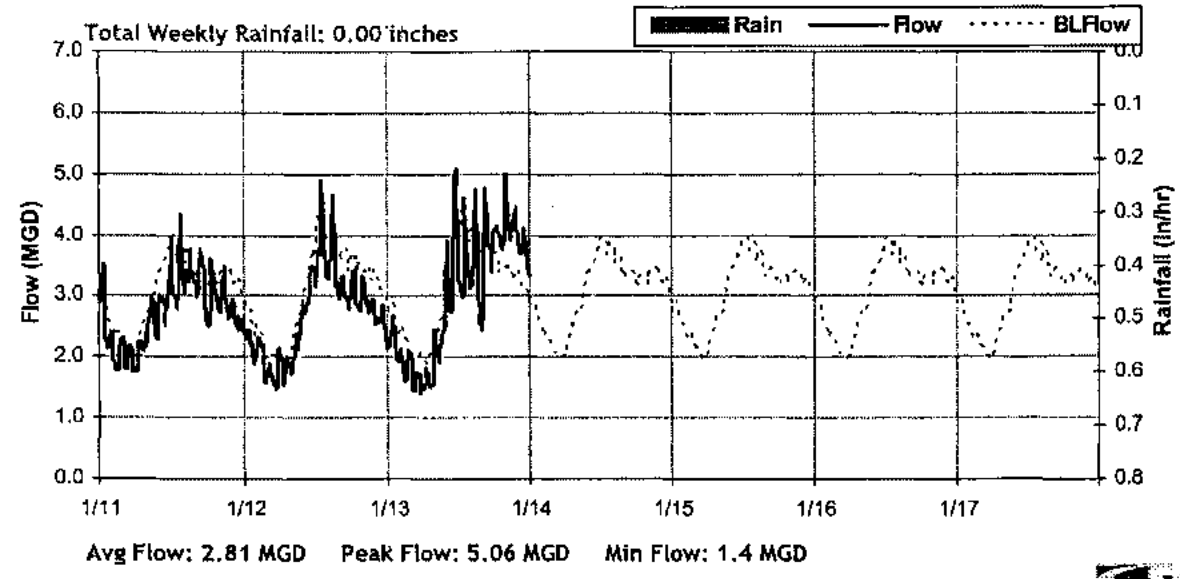
Level, Velocity and Flow
From 1/11/2008 to 1/18/2008

Monitoring Site:
Apple Valley South







Avg Flow: 2.81 MGD Peak Flow: 5.06 MGD Min Flow: 1.4 MGD

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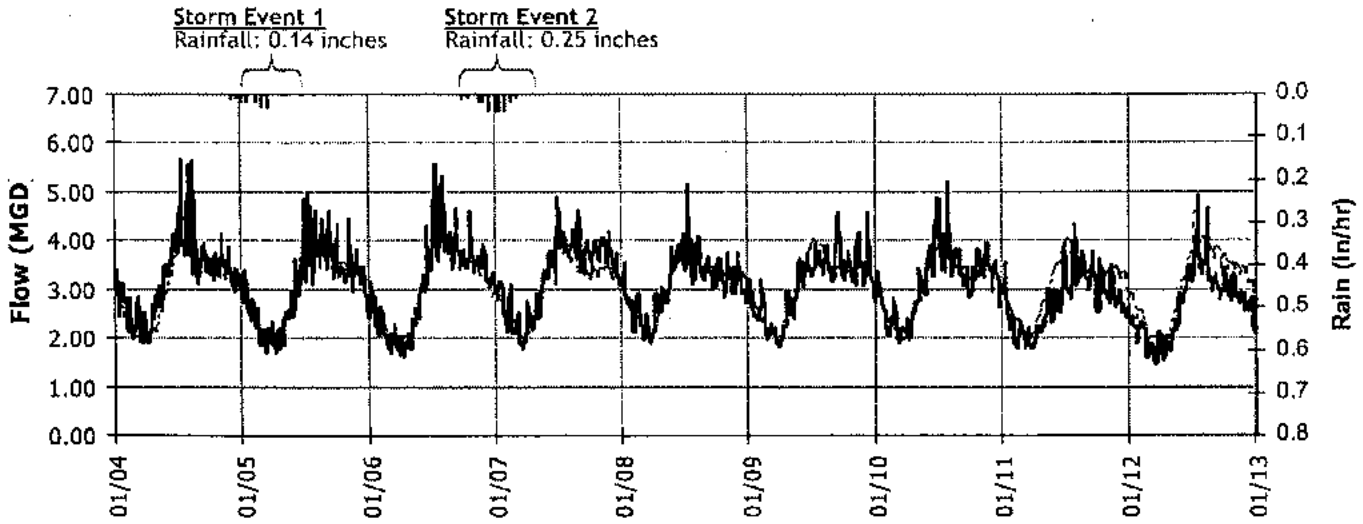
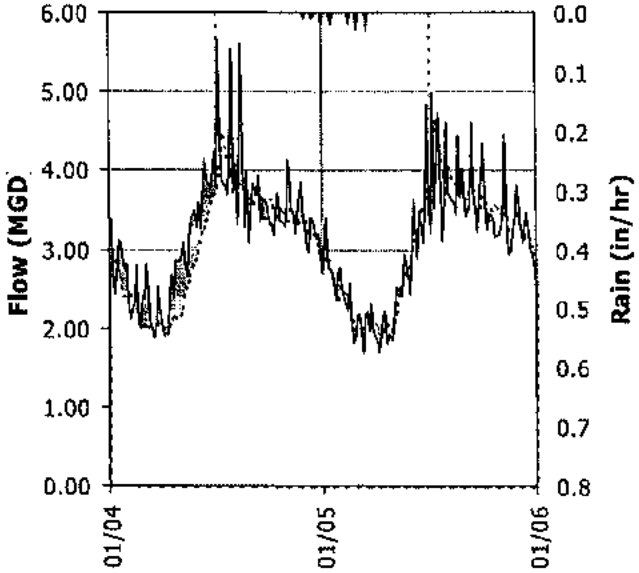
I/I Summary

Monitoring Site:
Apple Valley South

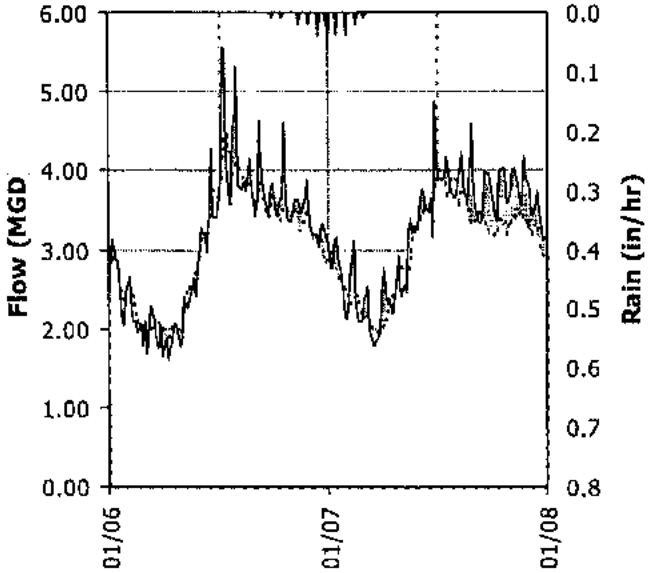
Baseline, Realtime, and I/I Flows over Monitoring Period:



Storm Event #1 Detail I/I Graph



Storm Event #2 Detail I/I Graph



Storm Event #1 I/I Analysis

Rainfall:	0.14	*inches*
Peak Flow:	2.70	*MGD*
Peak I/I Rate:	0.00	*MGD*
PF:	0.89	
Peak Level:	7.44	*inches*
d/D Ratio:	0.50	
Total I/I:	0	*gallons*

Storm Event #2 I/I Analysis

Rainfall:	0.25	*inches*
Peak Flow:	3.07	*MGD*
Peak I/I Rate:	0.00	*MGD*
PF:	1.01	
Peak Level:	7.99	*inches*
d/D Ratio:	0.53	
Total I/I:	0	*gallons*

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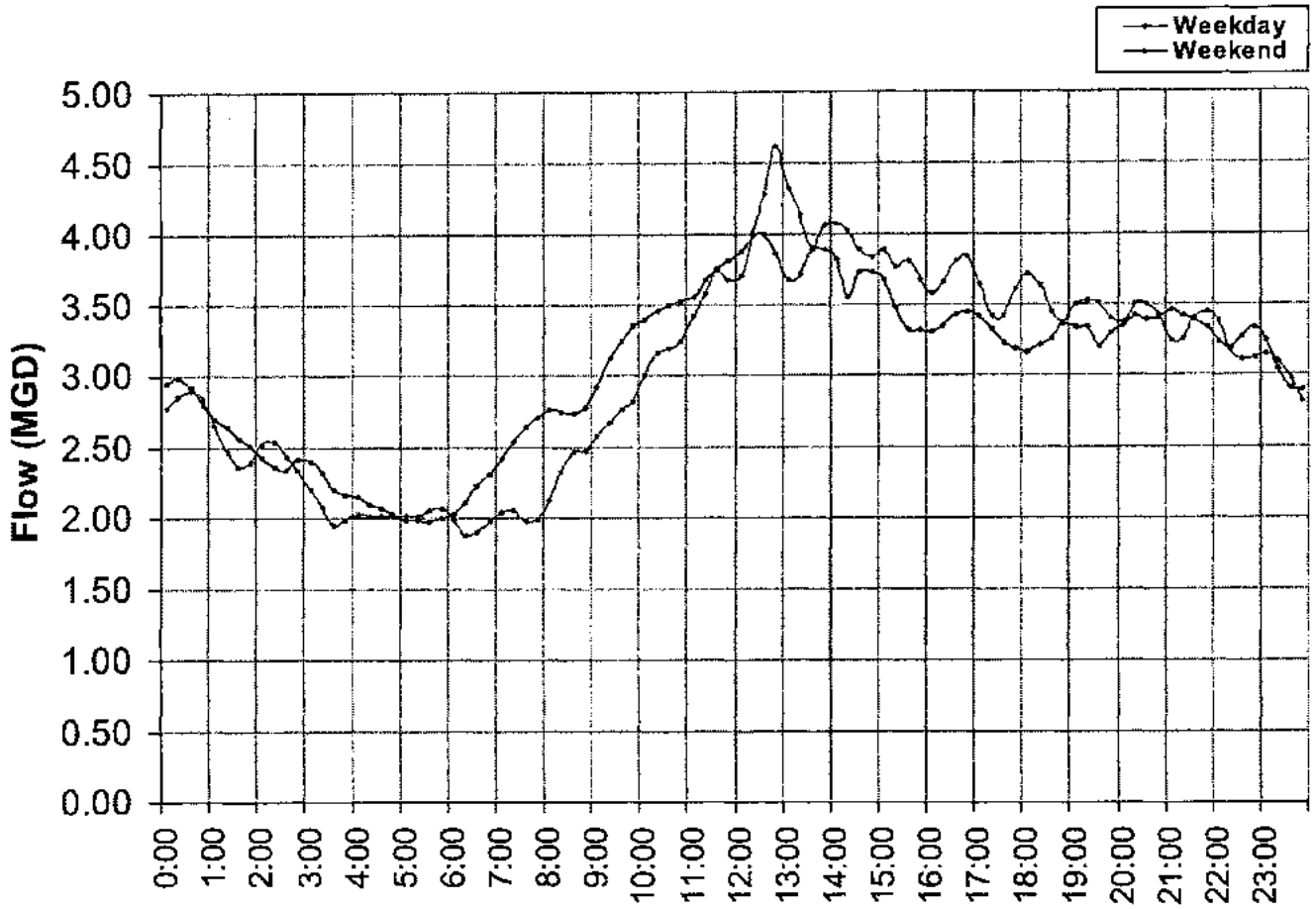
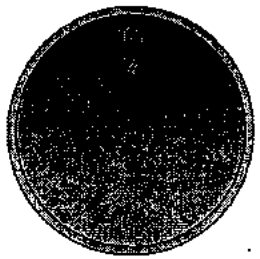
Average Dry Weather Flow

Monitoring Site:
Apple Valley South

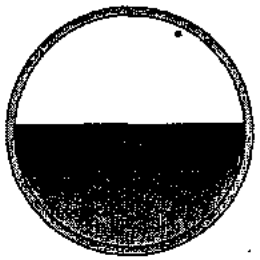


Peak Measured Flow:
5.66 *MGD*



Peak measured flow shown in weekly graphs on following pages

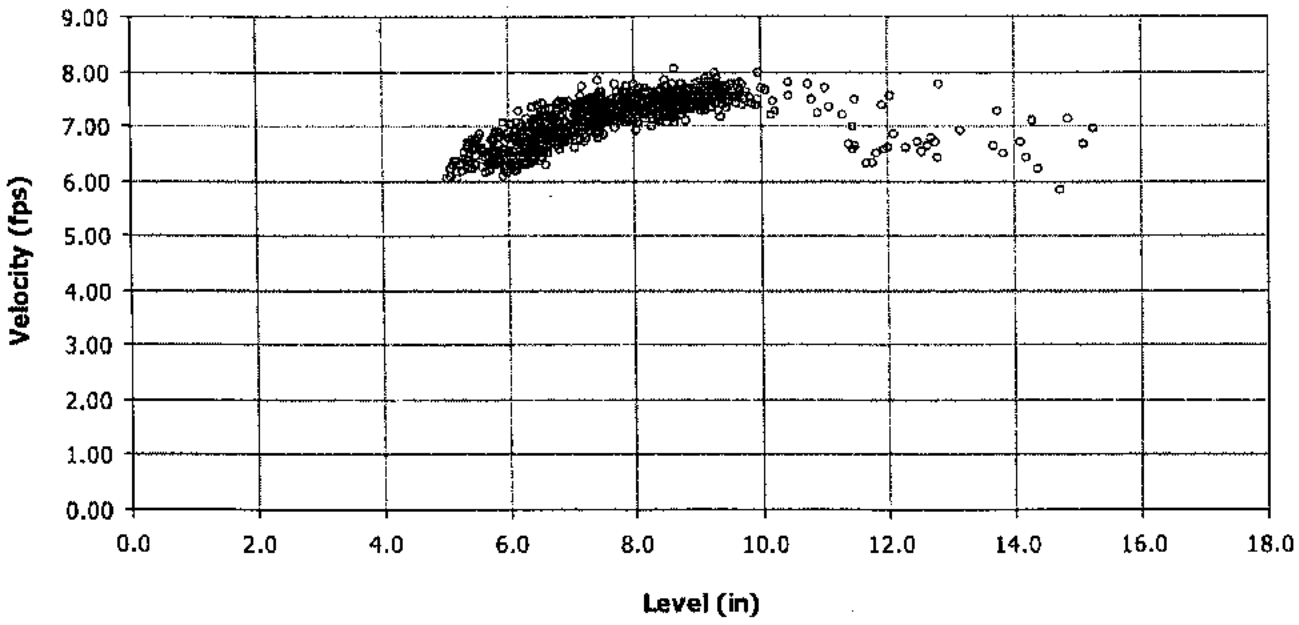
Average Dry Weather Flow:
3.05 *MGD*

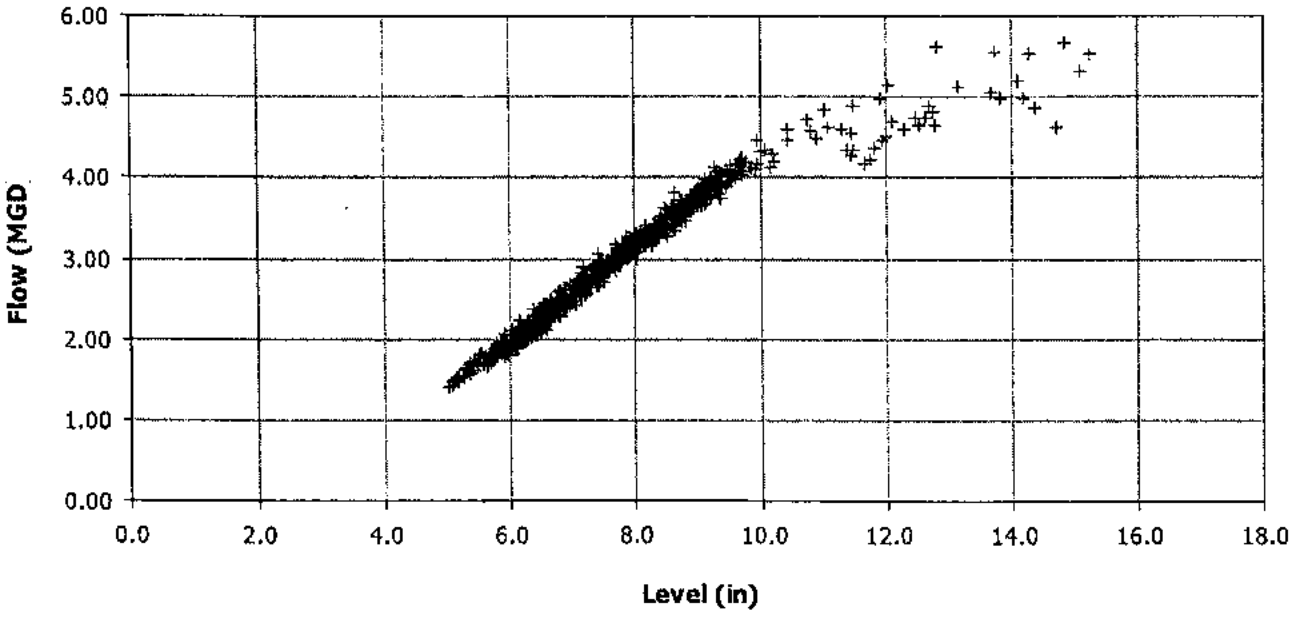


V&A

Scatter Plots (Flow, Velocity vs. Depth)

Monitoring Site:
Apple Valley South





V&A

Hourly Data: Depth, Velocity and Flow

From 1/4/2008 to 1/11/2008

Monitoring Site:

Apple Valley South

	Level (In)	Vel (fps)	Flow (MGD)
Weekly Average:	8.08	7.20	3.14
Weekly Minimum:	5.61	6.35	1.72
Weekly Maximum:	11.75	7.75	4.66

	Friday 1/4/2008			Saturday 1/5/2008			Sunday 1/6/2008			Monday 1/7/2008			Tuesday 1/8/2008			Wednesday 1/9/2008			Thursday 1/10/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (In)	Vel (fps)	Flow (MGD)	Level (In)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	7.75	6.99	2.90	9.05	7.60	3.80	7.34	7.25	2.80	7.69	7.17	2.93	8.18	7.31	3.23	7.58	7.24	2.91	7.98	7.14	3.06	0:00
1:00	7.70	7.13	2.92	9.48	7.42	3.89	6.64	6.95	2.36	7.34	7.10	2.74	7.42	7.04	2.75	6.75	7.02	2.43	7.32	6.97	2.68	1:00
2:00	6.91	6.72	2.40	9.36	7.49	3.91	6.61	6.98	2.36	6.96	6.92	2.51	7.02	6.83	2.50	7.52	7.10	2.83	6.50	6.52	2.15	2:00
3:00	6.72	6.70	2.32	9.19	7.51	3.83	6.03	6.59	1.97	6.37	6.65	2.13	7.02	6.85	2.51	6.58	6.54	2.19	7.01	6.91	2.52	3:00
4:00	6.74	6.70	2.32	8.63	7.45	3.52	6.11	6.63	2.02	6.43	6.66	2.17	6.54	6.60	2.20	6.34	6.68	2.13	6.33	6.46	2.06	4:00
5:00	6.47	6.57	2.15	9.25	7.21	3.65	5.92	6.58	1.92	6.16	6.40	1.97	6.34	6.45	2.06	6.08	6.47	1.95	6.46	6.53	2.13	5:00
6:00	6.27	6.51	2.05	8.22	7.40	3.29	5.61	6.35	1.72	7.02	6.88	2.51	7.27	6.95	2.66	6.35	6.70	2.14	6.56	6.52	2.18	6:00
7:00	7.28	7.05	2.69	9.16	7.30	3.63	5.90	6.67	1.93	7.00	6.92	2.52	7.35	6.94	2.68	7.20	7.19	2.71	7.27	6.89	2.63	7:00
8:00	7.49	7.19	2.85	8.21	7.38	3.28	6.29	6.93	2.19	7.18	7.07	2.66	7.48	7.06	2.79	6.94	7.01	2.52	8.06	7.33	3.18	8:00
9:00	8.26	7.41	3.32	8.27	7.44	3.33	6.80	7.26	2.54	8.18	7.43	3.29	8.52	7.52	3.50	8.01	7.50	3.23	7.82	7.26	3.04	9:00
10:00	8.83	7.56	3.67	7.83	7.31	3.06	7.80	7.46	3.11	8.75	7.57	3.64	8.92	7.56	3.71	8.22	7.51	3.35	8.99	7.42	3.68	10:00
11:00	9.19	7.75	3.95	7.80	7.16	2.99	8.81	7.50	3.63	9.95	7.11	3.79	9.10	7.57	3.81	8.59	7.42	3.49	9.43	7.47	3.91	11:00
12:00	10.80	7.50	4.42	7.11	6.97	2.58	11.75	7.36	4.66	9.34	7.60	3.95	9.78	7.55	4.11	8.66	7.51	3.57	10.45	6.99	4.04	12:00
13:00	10.48	7.48	4.30	6.93	6.92	2.48	10.98	7.03	4.18	9.21	7.64	3.90	8.59	7.44	3.49	8.74	7.55	3.62	11.22	7.26	4.45	13:00
14:00	9.93	7.57	4.19	6.31	6.54	2.08	10.69	7.26	4.19	9.32	7.60	3.93	9.04	7.70	3.84	8.60	7.50	3.52	8.74	7.40	3.55	14:00
15:00	8.73	7.50	3.60	6.15	6.68	2.05	9.32	7.54	3.90	9.46	7.56	3.98	8.19	7.43	3.29	8.46	7.47	3.44	8.95	7.62	3.76	15:00
16:00	9.03	7.48	3.73	6.27	6.71	2.11	9.83	7.27	3.94	8.62	7.40	3.49	8.62	7.47	3.52	9.03	7.17	3.51	8.16	7.38	3.25	16:00
17:00	8.73	7.38	3.53	5.97	6.49	1.91	8.83	7.48	3.63	9.23	7.54	3.86	7.86	7.36	3.10	9.43	7.21	3.73	8.02	7.38	3.18	17:00
18:00	8.40	7.30	3.34	6.01	6.53	1.94	8.79	7.52	3.63	8.79	7.45	3.60	8.35	7.51	3.40	8.51	7.49	3.48	7.97	7.31	3.13	18:00
19:00	8.47	7.40	3.42	6.79	6.98	2.43	9.38	7.43	3.86	9.08	7.59	3.81	7.66	7.31	2.98	8.64	7.31	3.46	9.06	7.36	3.68	19:00
20:00	9.12	7.49	3.77	7.05	7.15	2.62	8.76	7.37	3.54	9.25	7.59	3.69	8.58	7.53	3.53	8.73	7.40	3.54	8.31	7.30	3.29	20:00
21:00	8.53	7.51	3.50	7.83	7.50	3.15	8.79	7.53	3.63	9.20	7.47	3.81	6.03	7.38	3.19	9.49	7.10	3.70	8.93	7.46	3.67	21:00
22:00	8.03	7.32	3.17	9.02	7.50	3.73	8.31	7.29	3.29	8.74	7.41	3.55	8.18	7.50	3.32	9.23	7.23	3.68	8.29	7.43	3.34	22:00
23:00	8.10	7.27	3.17	9.24	7.47	3.79	8.10	7.36	3.22	8.37	7.41	3.37	7.48	7.36	2.91	8.18	7.27	3.21	8.05	7.10	3.08	23:00
Average:	8.25	7.23	3.24	7.88	7.17	3.04	8.06	7.15	3.09	8.23	7.26	3.25	7.98	7.26	3.13	7.99	7.19	3.10	8.16	7.14	3.15	Ave
Minimum:	6.27	6.51	2.05	5.97	6.49	1.91	5.61	6.35	1.72	6.16	6.40	1.97	6.34	6.45	2.06	6.08	6.47	1.95	6.33	6.46	2.06	Min
Maximum:	10.80	7.75	4.42	9.48	7.60	3.91	11.75	7.54	4.66	9.95	7.64	3.98	9.78	7.70	4.11	9.49	7.55	3.73	11.22	7.62	4.45	Max

V&A

Hourly Data: Depth, Velocity and Flow

From 1/11/2008 to 1/18/2008

Monitoring Site:

Apple Valley South

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	7.42	7.15	2.81
Weekly Minimum:	5.23	6.46	1.59
Weekly Maximum:	10.72	7.61	4.27

	Friday 1/11/2008			Saturday 1/12/2008			Sunday 1/13/2008			Monday 1/14/2008			Tuesday 1/15/2008			Wednesday 1/16/2008			Thursday 1/17/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	8.04	7.35	3.18	6.61	7.18	2.42	6.47	7.17	2.35													0:00
1:00	6.65	6.85	2.32	5.99	7.00	2.07	6.37	6.94	2.23													1:00
2:00	6.02	6.65	1.98	6.38	7.10	2.28	5.85	6.83	1.96													2:00
3:00	6.23	6.78	2.12	5.58	6.53	1.76	5.68	6.84	1.89													3:00
4:00	5.98	6.63	1.95	5.55	6.53	1.74	5.31	6.49	1.63													4:00
5:00	6.02	6.52	1.94	5.66	6.57	1.81	5.23	6.46	1.59													5:00
6:00	6.11	6.64	2.02	5.60	6.55	1.77	5.34	6.58	1.67													6:00
7:00	6.40	6.89	2.22	5.69	6.68	1.84	5.51	6.66	1.78													7:00
8:00	7.18	7.34	2.76	6.14	6.99	2.14	6.07	6.96	2.10													8:00
9:00	6.79	7.23	2.52	6.84	7.33	2.59	6.65	7.26	2.46													9:00
10:00	7.51	7.31	2.90	7.33	7.43	2.86	7.69	7.49	3.07													10:00
11:00	7.80	7.48	3.12	8.30	7.50	3.37	10.25	7.17	3.97													11:00
12:00	7.60	7.59	3.05	8.72	7.38	3.53	7.74	7.61	3.14													12:00
13:00	8.59	7.36	3.40	10.28	7.06	3.99	9.38	7.45	3.81													13:00
14:00	8.02	7.45	3.22	9.62	7.21	3.78	9.27	7.39	3.70													14:00
15:00	8.64	7.25	3.43	7.96	7.41	3.17	7.28	7.51	2.87													15:00
16:00	8.33	7.17	3.25	7.98	7.39	3.17	9.33	7.32	3.71													16:00
17:00	7.90	7.39	3.13	7.61	7.25	2.93	8.98	7.43	3.68													17:00
18:00	7.79	7.21	3.01	7.89	7.44	3.15	9.74	7.54	4.11													18:00
19:00	7.66	7.36	2.99	7.70	7.40	3.04	10.72	7.12	4.22													19:00
20:00	7.84	7.32	3.08	7.46	7.42	2.92	10.70	7.29	4.27													20:00
21:00	7.21	7.30	2.75	7.41	7.34	2.86	9.98	7.58	4.25													21:00
22:00	7.21	7.25	2.74	6.86	7.32	2.59	9.36	7.45	3.88													22:00
23:00	6.75	7.31	2.53	6.84	7.13	2.52	9.03	7.44	3.71													23:00
Average:	7.26	7.15	2.73	7.17	7.13	2.68	7.83	7.16	3.00													Ave
Minimum:	5.98	6.52	1.94	5.55	6.53	1.74	5.23	6.46	1.59													Min
Maximum:	8.64	7.59	3.43	10.28	7.50	3.99	10.72	7.61	4.27													Max

V&A

Temporary Flow Monitoring Study

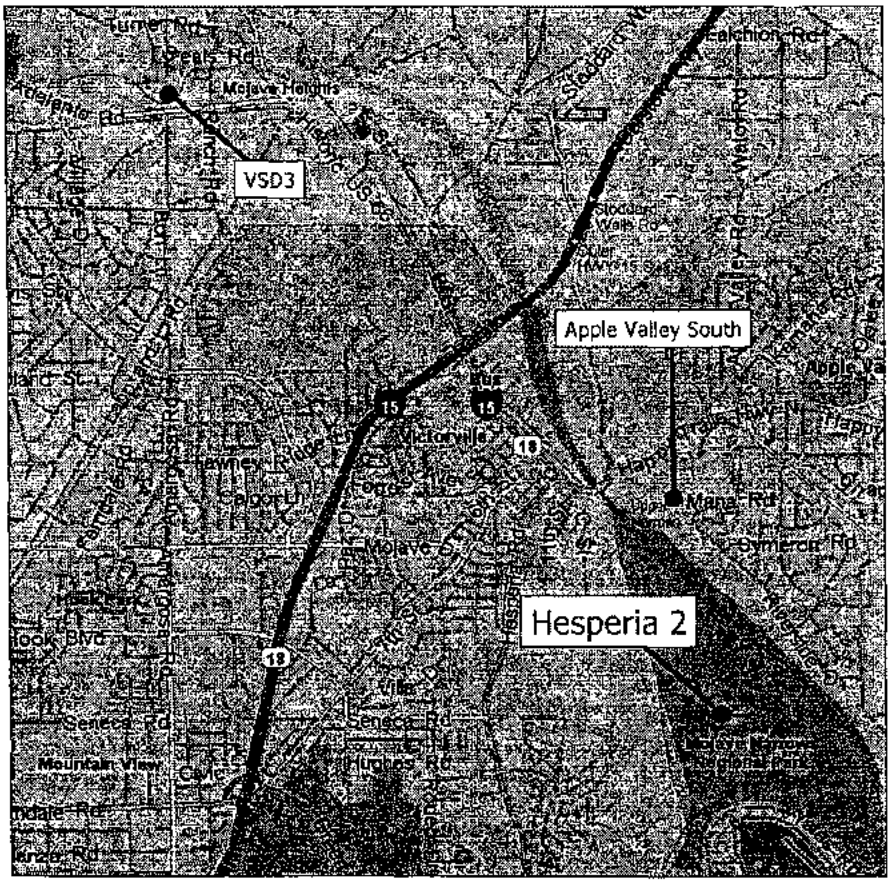
Sanitary Sewer Collection System

Monitoring Site: Hesperia 2

Manhole Address: Park Road Mojave Narrows Regional Park

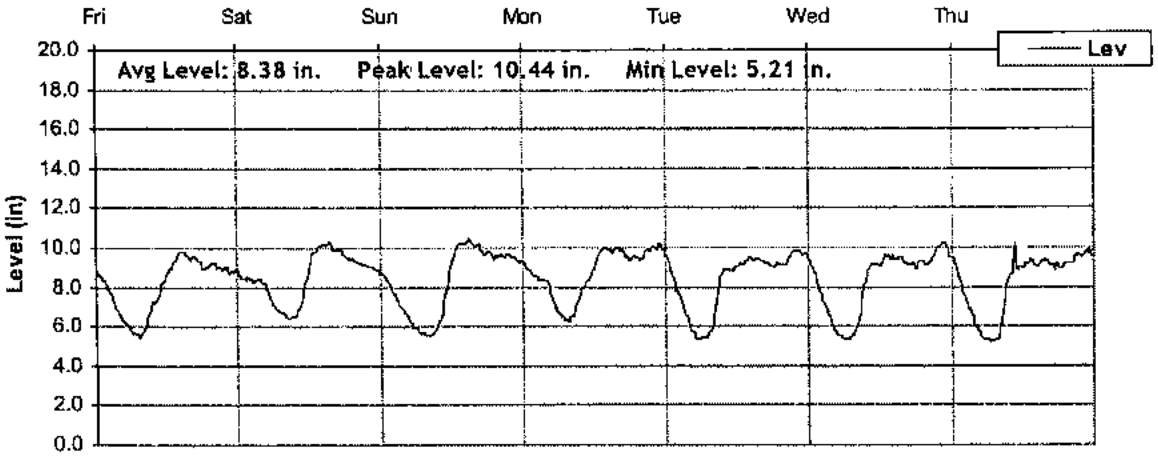
Size/Type of Line: 21-inch Pipe

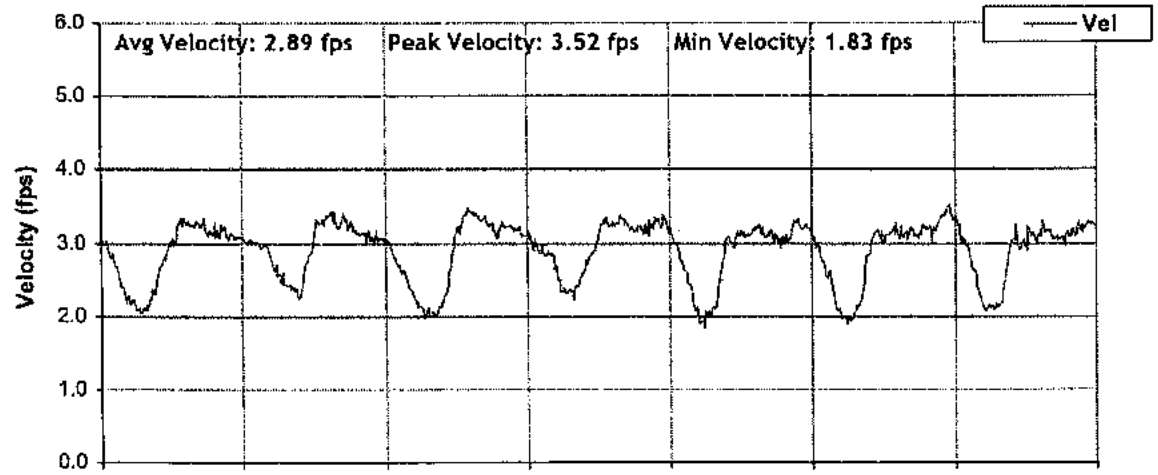
Data Summary Report

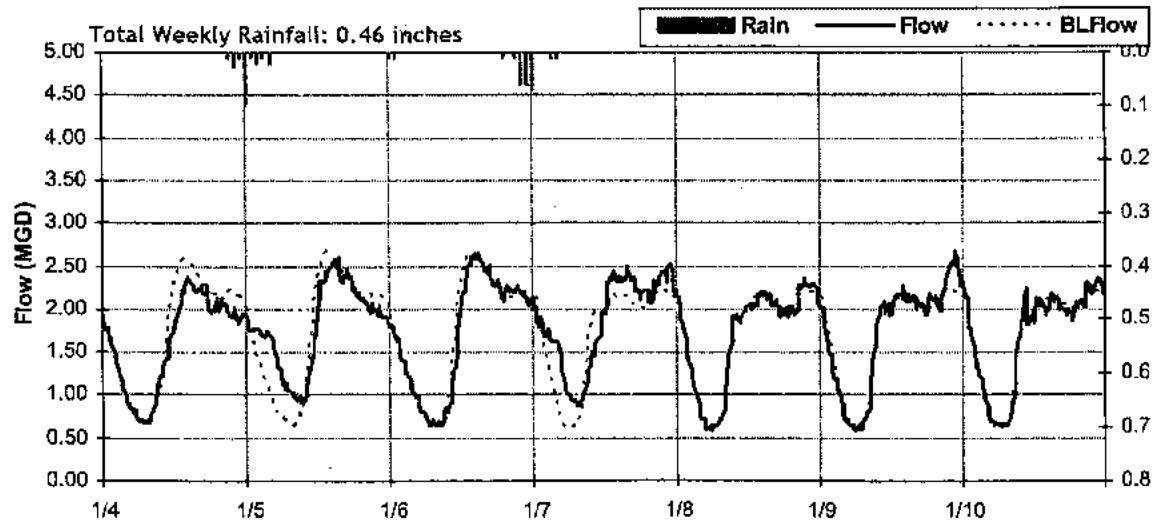


Level, Velocity and Flow
From 1/4/2008 to 1/11/2008

Monitoring Site:
Hesperia 2





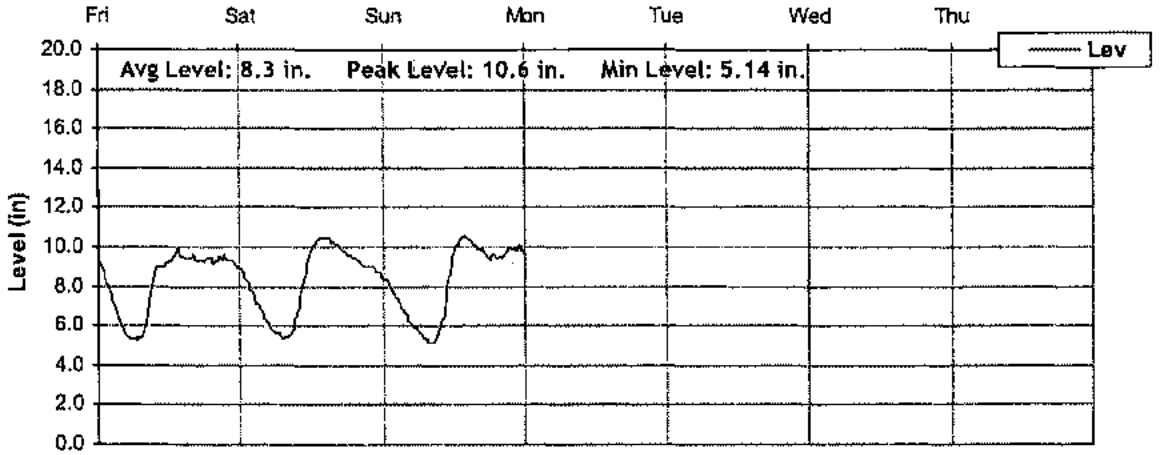


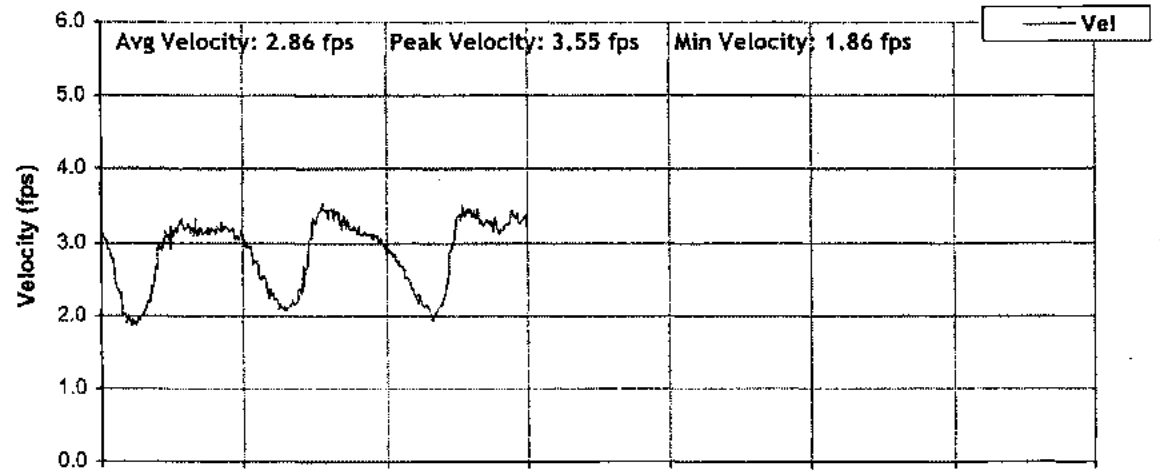
Avg Flow: 1.73 MGD Peak Flow: 2.66 MGD Min Flow: 0.57 MGD

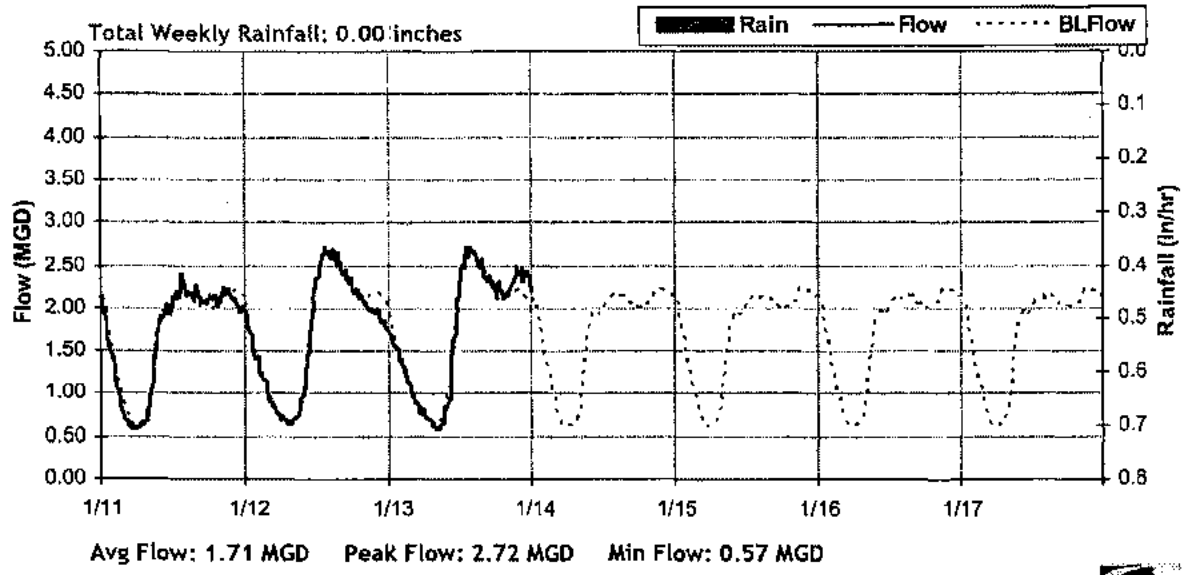
V&A

Level, Velocity and Flow
From 1/11/2008 to 1/18/2008

Monitoring Site:
Hesperia 2







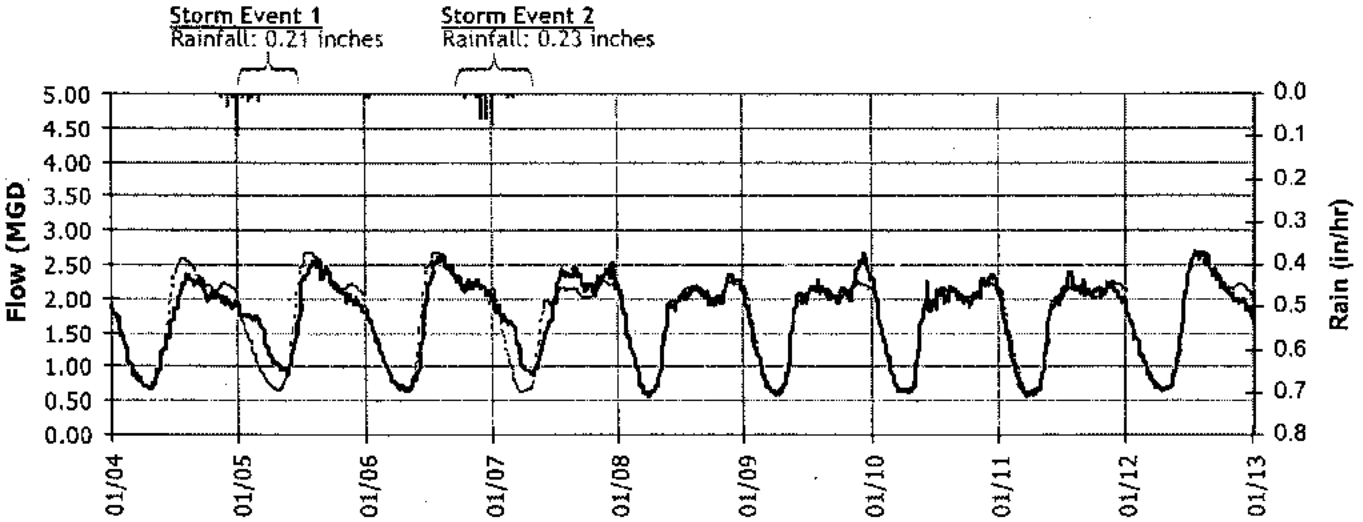
Avg Flow: 1.71 MGD Peak Flow: 2.72 MGD Min Flow: 0.57 MGD

V&A

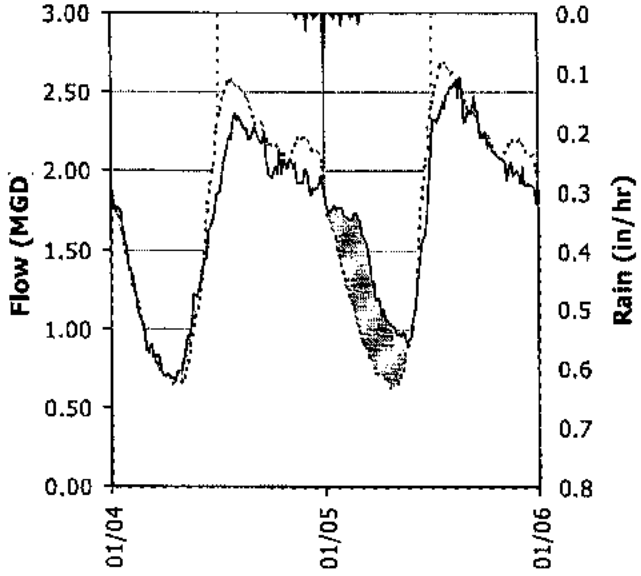
I/I Summary

Monitoring Site:
Hesperia 2

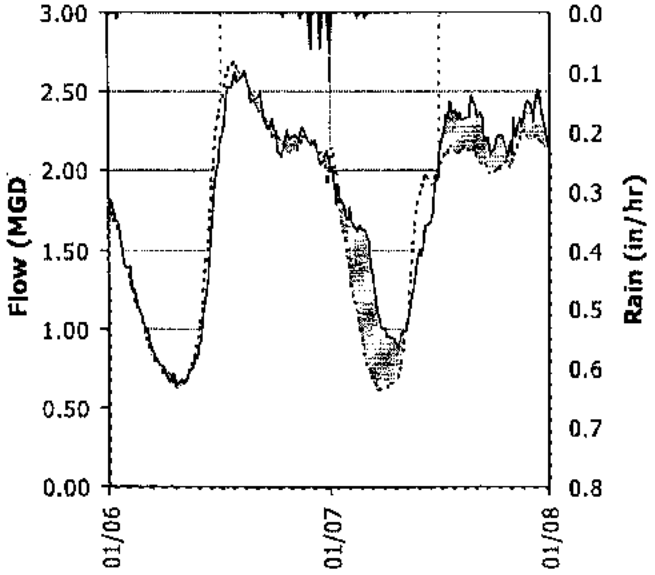
Baseline, Realtime, and I/I Flows over Monitoring Period:



Storm Event #1 Detail I/I Graph



Storm Event #2 Detail I/I Graph



Storm Event #1 I/I Analysis

Rainfall:	0.21	*inches*
Peak Flow:	1.83	*MGD*
Peak I/I Rate:	0.76	*MGD*
PF:	1.08	
Peak Level:	8.61	*inches*
d/D Ratio:	0.41	
Total I/I:	159,000	*gallons*

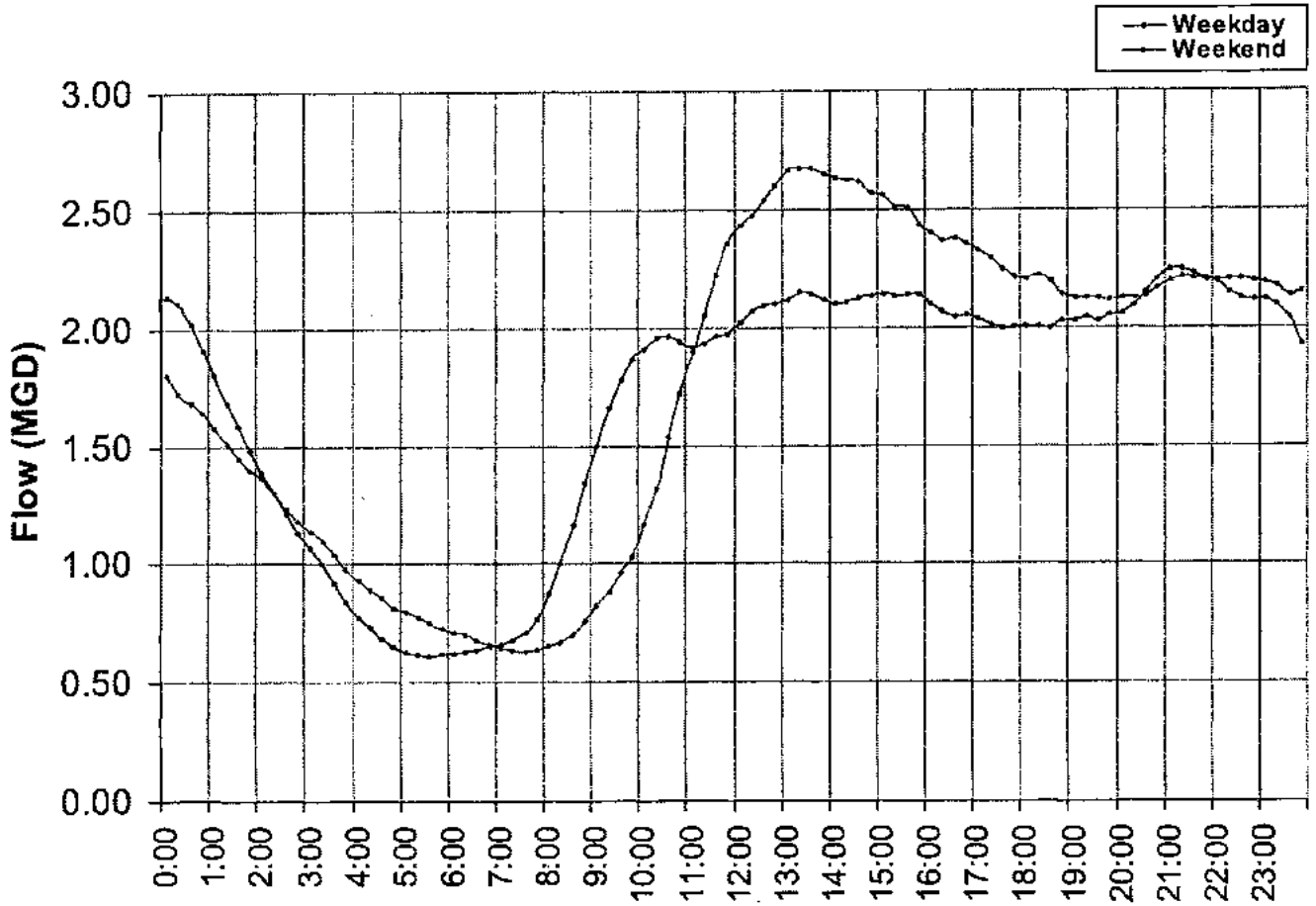
Storm Event #2 I/I Analysis

Rainfall:	0.23	*inches*
Peak Flow:	1.90	*MGD*
Peak I/I Rate:	0.84	*MGD*
PF:	1.12	
Peak Level:	8.86	*inches*
d/D Ratio:	0.42	
Total I/I:	124,000	*gallons*

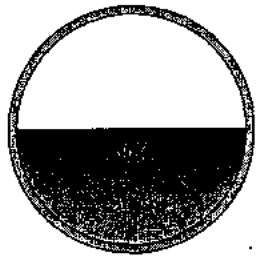
V&A

Average Dry Weather Flow

Monitoring Site:
Hesperia 2

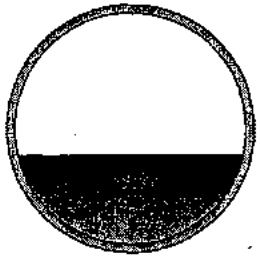


Peak Measured Flow:
2.72 *MGD*



Peak measured flow shown in weekly graphs on following pages

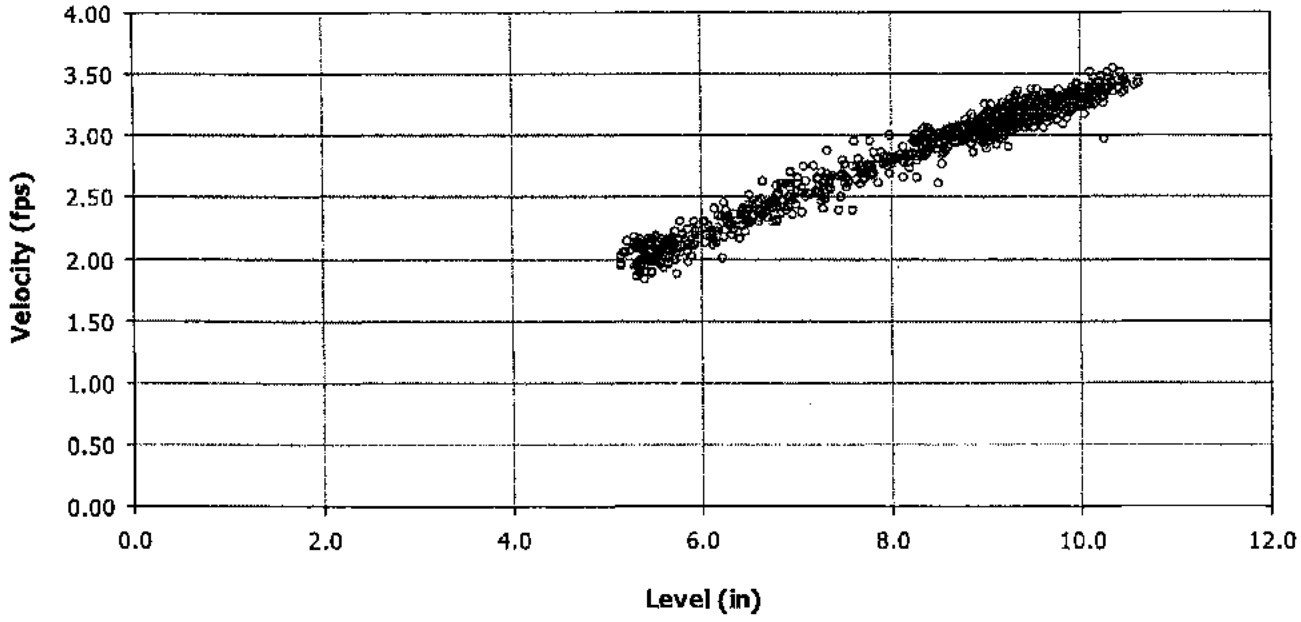
Average Dry Weather Flow:
1.70 *MGD*

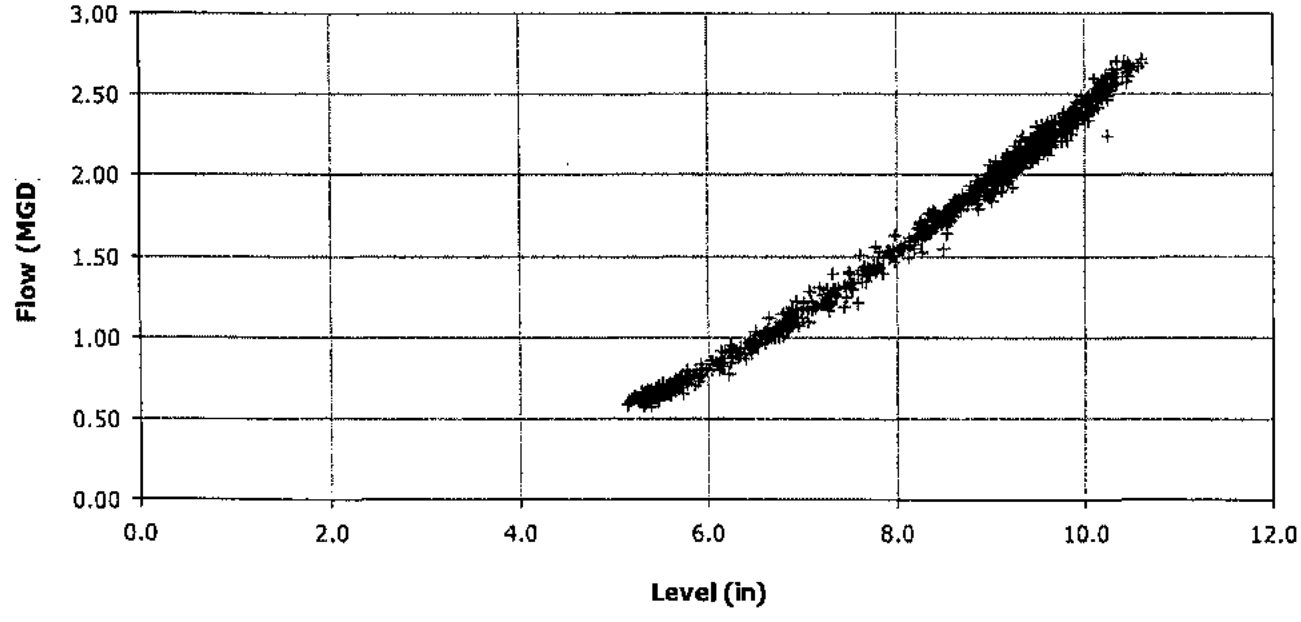


V&A

Scatter Plots (Flow, Velocity vs. Depth)

Monitoring Site: Hesperia 2





V&A

Hourly Data: Depth, Velocity and Flow

From 1/4/2008 to 1/11/2008

Monitoring Site:

Hesperia 2

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	8.38	2.89	1.73
Weekly Minimum:	5.26	1.89	0.60
Weekly Maximum:	10.34	3.43	2.60

	Friday 1/4/2008			Saturday 1/5/2008			Sunday 1/6/2008			Monday 1/7/2008			Tuesday 1/8/2008			Wednesday 1/9/2008			Thursday 1/10/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	8.62	3.02	1.81	9.66	3.27	2.28	8.55	2.98	1.77	9.04	3.02	1.93	9.30	3.09	2.05	9.05	3.02	1.94	9.30	3.29	2.19	0:00
1:00	8.18	2.88	1.62	9.99	3.32	2.42	8.10	2.79	1.55	8.70	2.96	1.80	8.28	2.88	1.64	8.18	2.81	1.58	8.18	3.01	1.69	1:00
2:00	7.55	2.64	1.33	10.19	3.39	2.53	7.51	2.64	1.32	8.45	2.89	1.69	7.42	2.65	1.30	7.22	2.57	1.21	7.24	2.83	1.35	2:00
3:00	6.82	2.39	1.05	10.17	3.31	2.47	6.94	2.51	1.13	8.32	2.85	1.63	6.54	2.36	0.97	6.52	2.35	0.97	6.55	2.54	1.05	3:00
4:00	6.29	2.20	0.86	9.93	3.30	2.39	6.50	2.31	0.95	7.89	2.75	1.47	5.78	2.06	0.72	5.70	2.05	0.70	5.78	2.20	0.77	4:00
5:00	5.98	2.18	0.79	9.77	3.25	2.30	5.98	2.14	0.78	6.95	2.41	1.08	5.41	1.89	0.60	5.45	1.96	0.63	5.38	2.10	0.66	5:00
6:00	5.65	2.08	0.70	9.46	3.21	2.18	5.73	2.03	0.70	6.55	2.33	0.96	5.42	2.03	0.65	5.33	1.97	0.61	5.26	2.14	0.65	6:00
7:00	5.61	2.11	0.71	9.38	3.13	2.10	5.61	2.04	0.68	6.34	2.31	0.91	5.74	2.12	0.73	5.64	2.12	0.71	5.36	2.15	0.67	7:00
8:00	6.30	2.28	0.89	9.19	3.09	2.02	5.61	2.04	0.68	6.67	2.43	1.03	6.95	2.48	1.12	6.60	2.41	1.02	6.59	2.55	1.07	8:00
9:00	7.15	2.50	1.17	9.12	3.10	2.00	6.11	2.20	0.83	7.53	2.64	1.33	8.55	2.93	1.74	8.41	2.89	1.68	8.38	2.98	1.72	9:00
10:00	7.55	2.76	1.39	8.99	3.05	1.94	7.06	2.49	1.15	8.19	2.80	1.57	8.87	3.00	1.87	9.15	3.13	2.04	9.27	3.05	2.02	10:00
11:00	8.40	2.96	1.72	8.79	3.04	1.88	8.64	3.00	1.81	8.64	2.99	1.81	8.92	3.12	1.96	9.12	3.11	2.01	8.96	2.98	1.88	11:00
12:00	8.92	3.08	1.93	8.50	3.00	1.77	9.79	3.20	2.27	9.44	3.21	2.18	9.17	3.12	2.03	9.36	3.10	2.08	9.21	3.10	2.03	12:00
13:00	9.45	3.29	2.23	8.44	3.04	1.77	10.19	3.42	2.56	9.95	3.28	2.38	9.28	3.11	2.06	9.50	3.16	2.16	9.28	3.08	2.04	13:00
14:00	9.80	3.27	2.33	8.32	3.00	1.72	10.34	3.41	2.60	9.87	3.26	2.33	9.44	3.19	2.16	9.48	3.18	2.16	9.09	3.16	2.04	14:00
15:00	9.53	3.26	2.23	8.39	2.96	1.72	10.16	3.35	2.50	9.93	3.31	2.40	9.43	3.19	2.15	9.44	3.13	2.12	9.33	3.16	2.11	15:00
16:00	9.53	3.25	2.23	8.16	2.84	1.59	10.05	3.34	2.46	9.89	3.28	2.36	9.29	3.09	2.05	9.17	3.14	2.04	9.19	3.10	2.03	16:00
17:00	9.23	3.23	2.12	7.44	2.63	1.30	9.75	3.25	2.30	9.51	3.18	2.18	9.10	3.09	2.00	9.14	3.09	2.01	9.05	3.07	1.97	17:00
18:00	9.01	3.13	1.99	6.89	2.51	1.11	9.66	3.13	2.19	9.54	3.20	2.20	9.10	3.02	1.95	9.24	3.18	2.09	8.94	3.05	1.93	18:00
19:00	9.19	3.14	2.05	6.68	2.42	1.03	9.54	3.22	2.21	9.46	3.18	2.16	9.15	3.05	1.99	9.22	3.21	2.11	9.22	3.12	2.05	19:00
20:00	9.06	3.20	2.05	6.46	2.37	0.96	9.55	3.22	2.21	9.71	3.19	2.24	9.37	3.15	2.11	9.31	3.12	2.08	9.30	3.16	2.10	20:00
21:00	8.93	3.10	1.95	6.55	2.32	0.96	9.63	3.21	2.23	9.91	3.29	2.37	9.77	3.27	2.32	9.90	3.32	2.39	9.63	3.22	2.24	21:00
22:00	8.83	3.10	1.92	7.15	2.65	1.24	9.47	3.17	2.15	10.05	3.29	2.42	9.75	3.21	2.27	10.18	3.43	2.56	9.67	3.26	2.28	22:00
23:00	8.84	3.08	1.92	8.40	2.92	1.70	9.30	3.12	2.07	9.90	3.22	2.32	9.63	3.19	2.22	9.76	3.39	2.40	9.67	3.24	2.27	23:00
Average:	8.10	2.84	1.62	8.58	2.96	1.81	8.32	2.84	1.71	8.77	2.97	1.86	8.32	2.84	1.69	8.33	2.87	1.72	8.24	2.90	1.70	Ave
Minimum:	5.61	2.08	0.70	6.46	2.32	0.96	5.61	2.03	0.68	6.34	2.31	0.91	5.41	1.89	0.60	5.33	1.96	0.61	5.26	2.10	0.65	Min
Maximum:	9.80	3.29	2.33	10.19	3.39	2.53	10.34	3.42	2.60	10.05	3.31	2.42	9.77	3.27	2.32	10.18	3.43	2.56	9.67	3.29	2.28	Max

V&A

Hourly Data: Depth, Velocity and Flow

From 1/11/2008 to 1/18/2008

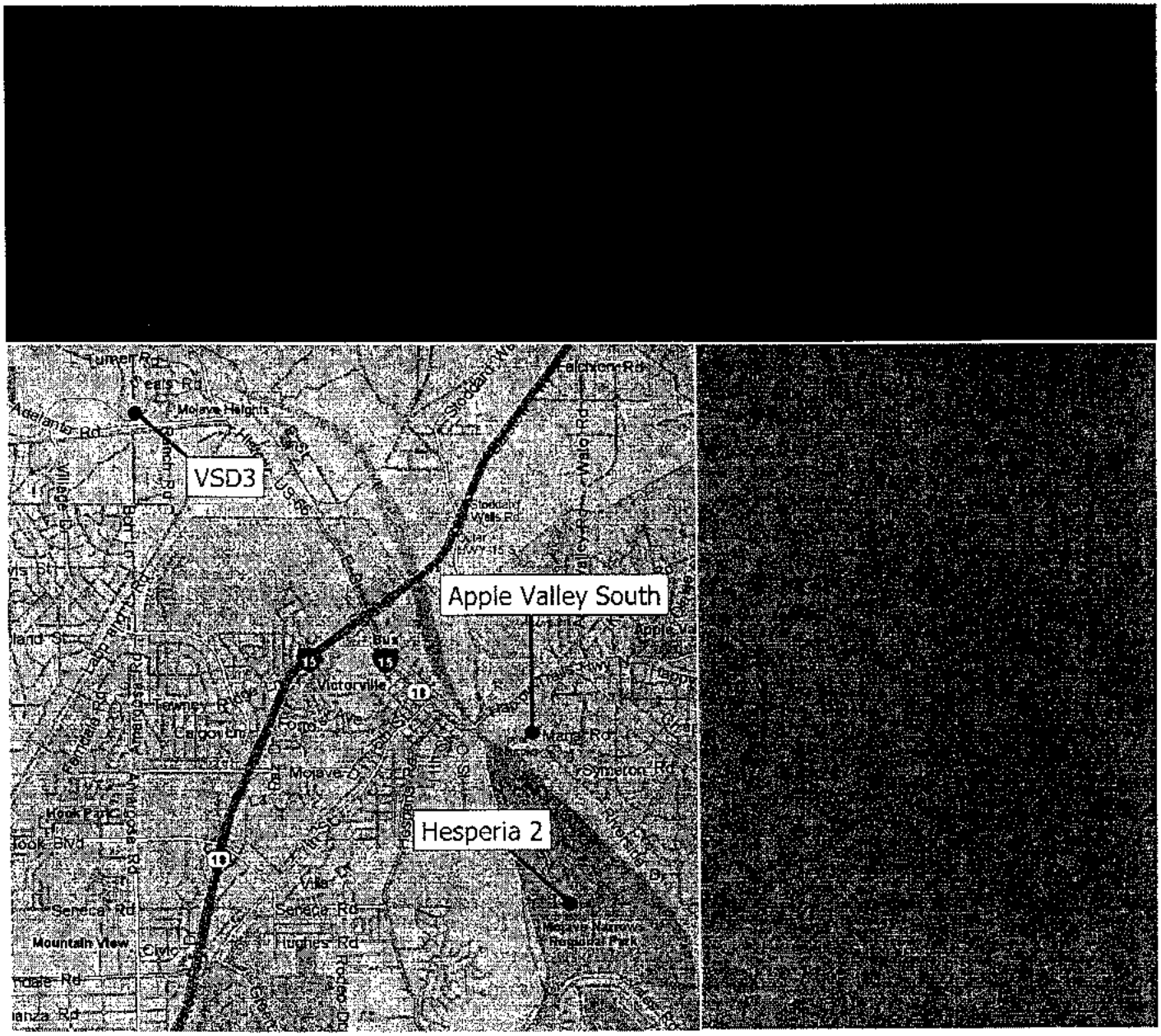
Monitoring Site:

Hesperia 2

	Level (in)	Vel (fps)	Flow (MGD)
Weekly Average:	8.30	2.86	1.71
Weekly Minimum:	5.19	1.90	0.59
Weekly Maximum:	10.56	3.47	2.68

	Friday 1/11/2008			Saturday 1/12/2008			Sunday 1/13/2008			Monday 1/14/2008			Tuesday 1/15/2008			Wednesday 1/16/2008			Thursday 1/17/2008			
Hour	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Level (in)	Vel (fps)	Flow (MGD)	Hour
0:00	9.02	3.09	1.97	8.62	2.96	1.78	8.27	2.85	1.62													0:00
1:00	8.06	2.84	1.56	8.02	2.78	1.52	7.79	2.78	1.46													1:00
2:00	7.15	2.42	1.13	7.36	2.62	1.27	7.28	2.65	1.27													2:00
3:00	6.26	2.14	0.84	6.76	2.48	1.07	6.73	2.49	1.07													3:00
4:00	5.65	1.94	0.65	6.17	2.29	0.87	6.11	2.31	0.87													4:00
5:00	5.31	1.90	0.59	5.71	2.17	0.74	5.82	2.21	0.77													5:00
6:00	5.34	1.97	0.61	5.52	2.11	0.69	5.52	2.13	0.69													6:00
7:00	5.62	2.10	0.70	5.40	2.12	0.67	5.19	2.01	0.60													7:00
8:00	7.03	2.34	1.07	5.69	2.19	0.74	5.27	2.08	0.63													8:00
9:00	8.61	2.81	1.69	6.64	2.42	1.02	6.07	2.24	0.83													9:00
10:00	9.00	3.03	1.93	8.07	2.68	1.48	7.53	2.71	1.37													10:00
11:00	9.17	3.08	2.01	9.51	3.18	2.18	9.33	3.13	2.09													11:00
12:00	9.41	3.16	2.13	10.17	3.36	2.51	10.20	3.39	2.54													12:00
13:00	9.73	3.28	2.31	10.44	3.47	2.68	10.56	3.41	2.67													13:00
14:00	9.45	3.20	2.17	10.45	3.43	2.65	10.34	3.41	2.59													14:00
15:00	9.47	3.19	2.17	10.23	3.40	2.55	10.04	3.33	2.44													15:00
16:00	9.37	3.16	2.12	10.03	3.28	2.40	9.88	3.26	2.35													16:00
17:00	9.27	3.14	2.07	9.79	3.25	2.31	9.51	3.25	2.22													17:00
18:00	9.38	3.18	2.13	9.54	3.19	2.19	9.52	3.23	2.21													18:00
19:00	9.27	3.18	2.10	9.34	3.13	2.09	9.43	3.18	2.15													19:00
20:00	9.43	3.21	2.17	9.11	3.11	2.01	9.64	3.25	2.26													20:00
21:00	9.44	3.18	2.16	9.03	3.09	1.98	9.93	3.38	2.44													21:00
22:00	9.26	3.12	2.06	8.69	3.05	1.91	9.90	3.31	2.39													22:00
23:00	8.98	3.10	1.97	8.60	2.97	1.78	9.80	3.29	2.34													23:00
Average:	8.28	2.82	1.68	8.29	2.86	1.71	8.32	2.89	1.75													Ave
Minimum:	5.31	1.90	0.59	5.40	2.11	0.67	5.19	2.01	0.60													Min
Maximum:	9.73	3.28	2.31	10.45	3.47	2.68	10.56	3.41	2.67													Max

V&A



V&A

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APPENDIX C

INTERCEPTOR HYDRAULIC MODEL OUTPUT

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Hesperia, 2009 1.40 mgd Hour 38

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
H-P046	0.95	18	1.50	0.63
H-P053	0.58	12	1.00	0.58
H-P070	0.71	15	1.25	0.57
H-P058	0.84	18	1.50	0.56
H-P050	0.82	18	1.50	0.55
H-P055	0.81	18	1.50	0.54
H-P061	0.77	18	1.50	0.51
H-P074	0.64	15	1.25	0.51
H-P071	0.50	12	1.00	0.50
H-P056	0.74	18	1.50	0.50
H-P051	0.74	18	1.50	0.49
H-P045	0.73	18	1.50	0.49
H-P063	0.73	18	1.50	0.49
H-P065	0.73	18	1.50	0.49
H-P054	0.72	18	1.50	0.48
H-P044	0.71	18	1.50	0.47
H-P052	0.58	15	1.25	0.46
H-P047	0.69	18	1.50	0.46
H-P059	0.69	18	1.50	0.46
H-P049	0.69	18	1.50	0.46
H-P062	0.68	18	1.50	0.45
H-P067	0.68	18	1.50	0.45
H-P068	0.38	10	0.83	0.45
H-P060	0.67	18	1.50	0.45
H-P057	0.65	18	1.50	0.44
H-P069	0.53	15	1.25	0.43
H-P048	0.43	12	1.00	0.43
H-P072	0.42	12	1.00	0.42
H-P064	0.63	18	1.50	0.42
H-P066	0.63	18	1.50	0.42
H-P073	0.48	15	1.25	0.39
H-PFMC	0.65	24	2.00	0.33
H-P075	0.38	15	1.25	0.30
H-P083	0.25	12	1.00	0.25
H-P079	0.24	12	1.00	0.24
H-P078	0.24	12	1.00	0.24
H-P085	0.23	12	1.00	0.23
H-P084	0.23	12	1.00	0.23
H-P081	0.23	12	1.00	0.23
H-P080	0.22	12	1.00	0.22
H-P076	0.27	15	1.25	0.22
H-P077	0.21	12	1.00	0.21
H-P082	0.25	15	1.25	0.20
H-P086	0.24	15	1.25	0.19

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Hesperia, 2012 1.63 mgd

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
H-P046	1.17	18	1.50	0.78
H-P070	0.90	15	1.25	0.72
H-P053	0.70	12	1.00	0.70
H-P058	1.03	18	1.50	0.68
H-P050	0.97	18	1.50	0.65
H-P055	0.97	18	1.50	0.65
H-P071	0.64	12	1.00	0.64
H-P074	0.80	15	1.25	0.64
H-P061	0.93	18	1.50	0.62
H-P065	0.89	18	1.50	0.60
H-P063	0.89	18	1.50	0.59
H-P056	0.89	18	1.50	0.59
H-P051	0.88	18	1.50	0.59
H-P045	0.85	18	1.50	0.57
H-P054	0.85	18	1.50	0.57
H-P059	0.85	18	1.50	0.57
H-P047	0.84	18	1.50	0.56
H-P062	0.83	18	1.50	0.55
H-P067	0.83	18	1.50	0.55
H-P068	0.46	10	0.83	0.55
H-P044	0.82	18	1.50	0.55
H-P052	0.68	15	1.25	0.54
H-P049	0.81	18	1.50	0.54
H-P060	0.81	18	1.50	0.54
H-P048	0.53	12	1.00	0.53
H-P057	0.79	18	1.50	0.52
H-P069	0.65	15	1.25	0.52
H-P072	0.52	12	1.00	0.52
H-P066	0.77	18	1.50	0.52
H-P064	0.77	18	1.50	0.51
H-P073	0.58	15	1.25	0.47
H-PFMC	0.79	24	2.00	0.39
H-P075	0.46	15	1.25	0.37
H-P083	0.30	12	1.00	0.30
H-P079	0.29	12	1.00	0.29
H-P078	0.29	12	1.00	0.29
H-P085	0.29	12	1.00	0.29
H-P084	0.29	12	1.00	0.29
H-P081	0.28	12	1.00	0.28
H-P080	0.27	12	1.00	0.27
H-P076	0.33	15	1.25	0.26
H-P077	0.25	12	1.00	0.25
H-P082	0.31	15	1.25	0.25
H-P086	0.30	15	1.25	0.24

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Hesperia, 2013 1.71 mgd

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
H-P046	1.50	18	1.50	1.00
H-P070	0.95	15	1.25	0.76
H-P053	0.73	12	1.00	0.73
H-P058	1.07	18	1.50	0.71
H-P047	1.02	18	1.50	0.68
H-P071	0.68	12	1.00	0.68
H-P050	1.01	18	1.50	0.68
H-P055	1.01	18	1.50	0.67
H-P074	0.83	15	1.25	0.66
H-P061	0.97	18	1.50	0.65
H-P065	0.93	18	1.50	0.62
H-P063	0.92	18	1.50	0.61
H-P056	0.92	18	1.50	0.61
H-P051	0.91	18	1.50	0.61
H-P045	0.88	18	1.50	0.59
H-P059	0.88	18	1.50	0.59
H-P054	0.88	18	1.50	0.59
H-P062	0.86	18	1.50	0.58
H-P067	0.86	18	1.50	0.57
H-P068	0.48	10	0.83	0.57
H-P044	0.85	18	1.50	0.57
H-P052	0.70	15	1.25	0.56
H-P060	0.83	18	1.50	0.56
H-P049	0.83	18	1.50	0.56
H-P048	0.55	12	1.00	0.55
H-P057	0.81	18	1.50	0.54
H-P069	0.67	15	1.25	0.54
H-P066	0.80	18	1.50	0.53
H-P072	0.53	12	1.00	0.53
H-P064	0.80	18	1.50	0.53
H-P073	0.60	15	1.25	0.48
H-PFMC	0.83	24	2.00	0.41
H-P075	0.48	15	1.25	0.38
H-P083	0.31	12	1.00	0.31
H-P079	0.31	12	1.00	0.31
H-P078	0.30	12	1.00	0.30
H-P085	0.30	12	1.00	0.30
H-P084	0.30	12	1.00	0.30
H-P081	0.29	12	1.00	0.29
H-P080	0.28	12	1.00	0.28
H-P076	0.34	15	1.25	0.27
H-P077	0.26	12	1.00	0.26
H-P082	0.32	15	1.25	0.26
H-P086	0.31	15	1.25	0.25

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Hesperia, 2015 1.89 mgd

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
H-P046	1.50	18	1.50	1.00
H-P070	1.25	15	1.25	1.00
H-P071	0.85	12	1.00	0.85
H-P053	0.80	12	1.00	0.80
H-P058	1.16	18	1.50	0.77
H-P050	1.09	18	1.50	0.73
H-P055	1.09	18	1.50	0.72
H-P074	0.89	15	1.25	0.71
H-P047	1.04	18	1.50	0.69
H-P061	1.04	18	1.50	0.69
H-P065	0.99	18	1.50	0.66
H-P063	0.99	18	1.50	0.66
H-P056	0.98	18	1.50	0.66
H-P051	0.98	18	1.50	0.65
H-P059	0.95	18	1.50	0.63
H-P045	0.94	18	1.50	0.63
H-P054	0.94	18	1.50	0.63
H-P062	0.92	18	1.50	0.62
H-P067	0.91	18	1.50	0.61
H-P068	0.51	10	0.83	0.61
H-P044	0.91	18	1.50	0.60
H-P052	0.75	15	1.25	0.60
H-P060	0.89	18	1.50	0.59
H-P049	0.89	18	1.50	0.59
H-P057	0.87	18	1.50	0.58
H-P066	0.85	18	1.50	0.57
H-P069	0.71	15	1.25	0.57
H-P064	0.85	18	1.50	0.57
H-P072	0.57	12	1.00	0.57
H-P048	0.54	12	1.00	0.54
H-P073	0.64	15	1.25	0.51
H-PFMC	0.90	24	2.00	0.45
H-P075	0.51	15	1.25	0.41
H-P083	0.34	12	1.00	0.34
H-P079	0.33	12	1.00	0.33
H-P078	0.32	12	1.00	0.32
H-P085	0.32	12	1.00	0.32
H-P084	0.32	12	1.00	0.32
H-P081	0.31	12	1.00	0.31
H-P080	0.30	12	1.00	0.30
H-P076	0.37	15	1.25	0.29
H-P077	0.28	12	1.00	0.28
H-P082	0.34	15	1.25	0.27
H-P086	0.33	15	1.25	0.26

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Hesperia, 2009 1.78 mgd

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
H-P001	0.85	21	1.75	0.48
H-P002	0.69	21	1.75	0.40
H-P003	0.64	15	1.25	0.51
H-P004	0.64	15	1.25	0.51
H-P005	0.62	15	1.25	0.50
H-P006	0.68	15	1.25	0.54
H-P007	0.63	15	1.25	0.50
H-P008	0.64	15	1.25	0.51
H-P009	0.65	15	1.25	0.52
H-P010	0.50	15	1.25	0.40
H-P011	0.46	12	1.00	0.46
H-P012	0.48	12	1.00	0.48
H-P013	0.68	21	1.75	0.39
H-P014	0.72	21	1.75	0.41
H-P015	0.63	15	1.25	0.50
H-P016	0.67	21	1.75	0.38
H-P017	0.67	21	1.75	0.39
H-P018	0.67	21	1.75	0.38
H-P019	0.67	21	1.75	0.38
H-P020	0.70	18	1.50	0.47
H-P021	0.63	15	1.25	0.51
H-P022	0.62	15	1.25	0.49
H-P023	0.55	12	1.00	0.55
H-P024	0.60	15	1.25	0.48
H-P025	0.69	21	1.75	0.39
H-P026	0.71	21	1.75	0.40
H-P027	0.63	15	1.25	0.50
H-P028	0.61	15	1.25	0.49
H-P029	0.49	15	1.25	0.39
H-P030	0.62	15	1.25	0.49
H-P031	0.76	21	1.75	0.43
H-P032	0.77	21	1.75	0.44
H-P033	0.49	15	1.25	0.39
H-P034	0.49	15	1.25	0.39
H-P035	0.86	24	2.00	0.43
H-P036	0.83	24	2.00	0.41
H-P037	0.60	15	1.25	0.48
H-P038	0.60	15	1.25	0.48
H-P039	0.69	18	1.50	0.46
H-P040	0.58	15	1.25	0.47
H-P041	0.58	15	1.25	0.46
H-P042	0.72	18	1.50	0.48
H-P043	0.59	15	1.25	0.47

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Hesperia, 2012 2.28 mgd

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Wet
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Wet
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Wet
H-P004	0.93	15	1.25	0.74	
H-P005	0.96	15	1.25	0.76	
H-P006	0.89	15	1.25	0.71	
H-P007	0.76	15	1.25	0.61	
H-P008	0.77	15	1.25	0.62	
H-P009	0.78	15	1.25	0.63	
H-P010	0.61	15	1.25	0.49	
H-P011	0.54	12	1.00	0.54	
H-P012	0.57	12	1.00	0.57	
H-P013	0.80	21	1.75	0.46	
H-P014	0.86	21	1.75	0.49	
H-P015	0.76	15	1.25	0.61	
H-P016	0.80	21	1.75	0.46	
H-P017	0.80	21	1.75	0.46	
H-P018	0.80	21	1.75	0.46	
H-P019	0.80	21	1.75	0.46	
H-P020	0.85	18	1.50	0.56	
H-P021	0.77	15	1.25	0.62	
H-P022	0.75	15	1.25	0.60	
H-P023	0.68	12	1.00	0.68	
H-P024	0.73	15	1.25	0.58	
H-P025	0.82	21	1.75	0.47	
H-P026	0.85	21	1.75	0.49	
H-P027	0.77	15	1.25	0.62	
H-P028	0.74	15	1.25	0.59	
H-P029	0.61	15	1.25	0.49	
H-P030	0.76	15	1.25	0.61	
H-P031	0.92	21	1.75	0.53	
H-P032	0.94	21	1.75	0.54	
H-P033	0.59	15	1.25	0.47	
H-P034	0.59	15	1.25	0.47	
H-P035	1.05	24	2.00	0.52	
H-P036	1.01	24	2.00	0.50	
H-P037	0.74	15	1.25	0.59	
H-P038	0.75	15	1.25	0.60	
H-P039	0.85	18	1.50	0.56	
H-P040	0.72	15	1.25	0.58	
H-P041	0.72	15	1.25	0.58	
H-P042	0.89	18	1.50	0.59	
H-P043	0.68	15	1.25	0.54	

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Hesperia, 2015 2.88 mgd

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D	
H-P001	1.75	21	1.75	1.00	Dry
H-P002	1.25	21	1.75	0.71	
H-P003	0.91	15	1.25	0.73	
H-P004	0.90	15	1.25	0.72	
H-P005	0.88	15	1.25	0.70	
H-P006	0.89	15	1.25	0.71	
H-P007	0.89	15	1.25	0.72	
H-P008	0.91	15	1.25	0.73	
H-P009	0.93	15	1.25	0.75	
H-P010	0.71	15	1.25	0.57	
H-P011	0.63	12	1.00	0.63	
H-P012	0.67	12	1.00	0.67	
H-P013	0.92	21	1.75	0.52	
H-P014	0.99	21	1.75	0.56	
H-P015	0.90	15	1.25	0.72	
H-P016	0.91	21	1.75	0.52	
H-P017	0.92	21	1.75	0.52	
H-P018	0.92	21	1.75	0.52	
H-P019	0.91	21	1.75	0.52	
H-P020	0.99	18	1.50	0.66	
H-P021	0.91	15	1.25	0.73	
H-P022	0.89	15	1.25	0.71	
H-P023	0.78	12	1.00	0.78	Dry
H-P024	0.85	15	1.25	0.68	
H-P025	0.94	21	1.75	0.54	
H-P026	0.98	21	1.75	0.56	
H-P027	0.89	15	1.25	0.72	
H-P028	0.87	15	1.25	0.70	
H-P029	0.70	15	1.25	0.56	
H-P030	0.90	15	1.25	0.72	
H-P031	1.06	21	1.75	0.61	
H-P032	1.09	21	1.75	0.62	
H-P033	0.69	15	1.25	0.55	
H-P034	0.68	15	1.25	0.54	
H-P035	1.21	24	2.00	0.61	
H-P036	1.16	24	2.00	0.58	
H-P037	0.86	15	1.25	0.69	
H-P038	0.88	15	1.25	0.70	
H-P039	0.99	18	1.50	0.66	
H-P040	0.84	15	1.25	0.68	
H-P041	0.83	15	1.25	0.66	
H-P042	1.04	18	1.50	0.70	
H-P043	0.75	15	1.25	0.60	

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

SVL, 2009 Hour 37

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
SVL-P017	1.21	21	1.75	0.69
SVL-P020	1.18	21	1.75	0.67
SVL-P004	1.49	27	2.25	0.66
SVL-P007	1.48	27	2.25	0.66
SVL-P018	1.13	21	1.75	0.64
SVL-P021	1.12	21	1.75	0.64
SVL-P005	1.41	27	2.25	0.63
SVL-P003	1.41	27	2.25	0.62
SVL-P019	1.09	21	1.75	0.62
SVL-P016	1.08	21	1.75	0.62
SVL-P008	1.38	27	2.25	0.62
SVL-P015	1.06	21	1.75	0.61
SVL-P010	1.36	27	2.25	0.60
SVL-P009	1.33	27	2.25	0.59
SVL-P011	1.31	27	2.25	0.58
SVL-P006	1.30	27	2.25	0.58
SVL-P012	1.28	27	2.25	0.57
SVL-P013	1.27	27	2.25	0.56
SVL-P022	0.85	21	1.75	0.48
SVL-P014	1.00	27	2.25	0.45
SVL-P024	0.61	21	1.75	0.35
SVL-P026	0.60	21	1.75	0.34
SVL-P025	0.59	21	1.75	0.34
SVL-P023	0.59	21	1.75	0.33

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

SVL, 2012 Hour 37

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D	
SVL-P017	1.75	21	1.75	1.00	Dry
SVL-P018	1.49	21	1.75	0.85	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Wet
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Wet
SVL-P004	1.63	27	2.25	0.72	
SVL-P019	1.26	21	1.75	0.72	
SVL-P007	1.61	27	2.25	0.72	
SVL-P016	1.25	21	1.75	0.71	
SVL-P015	1.22	21	1.75	0.70	
SVL-P003	1.53	27	2.25	0.68	
SVL-P005	1.52	27	2.25	0.68	
SVL-P008	1.51	27	2.25	0.67	
SVL-P010	1.48	27	2.25	0.66	
SVL-P009	1.44	27	2.25	0.64	
SVL-P011	1.42	27	2.25	0.63	
SVL-P006	1.40	27	2.25	0.62	
SVL-P012	1.38	27	2.25	0.61	
SVL-P013	1.37	27	2.25	0.61	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Wet
SVL-P014	1.08	27	2.25	0.48	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Wet
SVL-P026	0.62	21	1.75	0.36	
SVL-P025	0.62	21	1.75	0.35	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Wet

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

SVL, 2015 Hour 37

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
SVL-P015	1.75	21	1.75	1.00
SVL-P016	1.75	21	1.75	1.00
SVL-P017	1.75	21	1.75	1.00
SVL-P018	1.75	21	1.75	1.00
SVL-P019	1.75	21	1.75	1.00
SVL-P020	1.75	21	1.75	1.00
SVL-P021	1.75	21	1.75	1.00
SVL-P022	1.75	21	1.75	1.00
SVL-P004	1.83	27	2.25	0.81
SVL-P007	1.80	27	2.25	0.80
SVL-P005	1.72	27	2.25	0.76
SVL-P003	1.69	27	2.25	0.75
SVL-P008	1.66	27	2.25	0.74
SVL-P010	1.63	27	2.25	0.72
SVL-P009	1.57	27	2.25	0.70
SVL-P006	1.57	27	2.25	0.70
SVL-P011	1.55	27	2.25	0.69
SVL-P012	1.51	27	2.25	0.67
SVL-P013	1.49	27	2.25	0.66
SVL-P014	1.17	27	2.25	0.52
SVL-P023	0.81	21	1.75	0.46
SVL-P024	0.66	21	1.75	0.38
SVL-P026	0.64	21	1.75	0.37
SVL-P025	0.64	21	1.75	0.36

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

SAV, 2009 Hour 37

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
A-P003	1.25	15	1.25	1.00
A-P002	1.33	16	1.33	1.00
A-P008	1.02	15	1.25	0.81
A-P009	1.00	15	1.25	0.80
A-P001	0.98	16	1.33	0.73
A-P010	0.89	15	1.25	0.71
A-P013	0.81	15	1.25	0.65
A-P023	0.65	12	1.00	0.65
A-P032	0.64	12	1.00	0.64
A-P059	0.77	15	1.25	0.62
A-P034	0.62	12	1.00	0.62
A-P018	0.61	12	1.00	0.61
A-P016	0.76	15	1.25	0.61
A-P027	0.60	12	1.00	0.60
A-P031	0.59	12	1.00	0.59
A-P035	0.59	12	1.00	0.59
A-P036	0.59	12	1.00	0.59
A-P033	0.59	12	1.00	0.59
A-P037	0.74	15	1.25	0.59
A-P032A	0.59	12	1.00	0.59
A-P026	0.59	12	1.00	0.59
A-P014	0.73	15	1.25	0.58
A-P038	0.71	15	1.25	0.57
A-P028	0.56	12	1.00	0.56
A-P015	0.55	12	1.00	0.55
A-P022	0.53	12	1.00	0.53
A-P021	0.53	12	1.00	0.53
A-P042A	0.53	12	1.00	0.53
A-P012	0.66	15	1.25	0.53
A-P042	0.53	12	1.00	0.53
A-P061	0.65	15	1.25	0.52
A-P020	0.52	12	1.00	0.52
A-P041	0.52	12	1.00	0.52
A-P039	0.52	12	1.00	0.52
A-P017	0.65	15	1.25	0.52
A-P051	0.65	15	1.25	0.52
A-P029	0.51	12	1.00	0.51
A-P054	0.63	15	1.25	0.51
A-P025	0.50	12	1.00	0.50
A-P050	0.63	15	1.25	0.50
A-P011	0.50	12	1.00	0.50
A-P060	0.62	15	1.25	0.50
A-P024	0.50	12	1.00	0.50
A-P052	0.62	15	1.25	0.49
A-P055	0.61	15	1.25	0.49
A-P053	0.61	15	1.25	0.49
A-P057	0.60	15	1.25	0.48
A-P043	0.48	12	1.00	0.48
A-P048	0.60	15	1.25	0.48
A-P056	0.60	15	1.25	0.48

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

A-P049	0.60	15	1.25	0.48
A-P007FMC	0.48	12	1.00	0.48
A-P019	0.60	15	1.25	0.48
A-P058	0.59	15	1.25	0.48
A-P047	0.59	15	1.25	0.47
A-P044	0.46	12	1.00	0.46
A-P030	0.45	12	1.00	0.45
A-P004	0.52	15	1.25	0.42
A-P040	0.41	12	1.00	0.41
A-P063	0.50	15	1.25	0.40
A-P046	0.47	15	1.25	0.38
A-P045	0.38	12	1.00	0.38
A-P007	0.45	15	1.25	0.36
A-P005	0.45	15	1.25	0.36
A-P006	0.45	15	1.25	0.36
A-P064	0.40	15	1.25	0.32
A-P067	0.40	15	1.25	0.32
A-P066	0.40	15	1.25	0.32
A-P068	0.39	15	1.25	0.31
A-P065	0.37	15	1.25	0.30
A-P069	0.25	15	1.25	0.20

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

SAV, 2012 Hour 37

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
A-P003	1.25	15	1.25	1.00
A-P008	1.25	15	1.25	1.00
A-P002	1.33	16	1.33	1.00
A-P009	1.17	15	1.25	0.94
A-P001	0.99	16	1.33	0.74
A-P010	0.91	15	1.25	0.73
A-P013	0.83	15	1.25	0.67
A-P023	0.66	12	1.00	0.66
A-P032	0.66	12	1.00	0.66
A-P059	0.79	15	1.25	0.64
A-P034	0.63	12	1.00	0.63
A-P018	0.62	12	1.00	0.62
A-P042A	0.62	12	1.00	0.62
A-P016	0.78	15	1.25	0.62
A-P027	0.61	12	1.00	0.61
A-P031	0.61	12	1.00	0.61
A-P035	0.61	12	1.00	0.61
A-P036	0.61	12	1.00	0.61
A-P033	0.60	12	1.00	0.60
A-P037	0.75	15	1.25	0.60
A-P032A	0.60	12	1.00	0.60
A-P026	0.60	12	1.00	0.60
A-P014	0.75	15	1.25	0.60
A-P038	0.73	15	1.25	0.58
A-P043	0.58	12	1.00	0.58
A-P004	0.71	15	1.25	0.57
A-P028	0.57	12	1.00	0.57
A-P015	0.57	12	1.00	0.57
A-P022	0.54	12	1.00	0.54
A-P021	0.54	12	1.00	0.54
A-P012	0.67	15	1.25	0.54
A-P042	0.54	12	1.00	0.54
A-P061	0.66	15	1.25	0.53
A-P020	0.53	12	1.00	0.53
A-P041	0.53	12	1.00	0.53
A-P039	0.53	12	1.00	0.53
A-P017	0.66	15	1.25	0.53
A-P051	0.66	15	1.25	0.53
A-P029	0.52	12	1.00	0.52
A-P011	0.52	12	1.00	0.52
A-P054	0.65	15	1.25	0.52
A-P050	0.64	15	1.25	0.51
A-P025	0.51	12	1.00	0.51
A-P060	0.64	15	1.25	0.51
A-P024	0.51	12	1.00	0.51
A-P052	0.63	15	1.25	0.50
A-P055	0.63	15	1.25	0.50
A-P053	0.62	15	1.25	0.50
A-P057	0.62	15	1.25	0.49
A-P048	0.62	15	1.25	0.49

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

A-P056	0.62	15	1.25	0.49
A-P049	0.61	15	1.25	0.49
A-P007FMC	0.49	12	1.00	0.49
A-P058	0.61	15	1.25	0.49
A-P019	0.61	15	1.25	0.49
A-P047	0.60	15	1.25	0.48
A-P044	0.47	12	1.00	0.47
A-P030	0.46	12	1.00	0.46
A-P040	0.42	12	1.00	0.42
A-P063	0.51	15	1.25	0.41
A-P046	0.48	15	1.25	0.39
A-P045	0.38	12	1.00	0.38
A-P007	0.46	15	1.25	0.37
A-P005	0.46	15	1.25	0.37
A-P006	0.46	15	1.25	0.36
A-P064	0.41	15	1.25	0.33
A-P067	0.41	15	1.25	0.33
A-P066	0.41	15	1.25	0.33
A-P068	0.40	15	1.25	0.32
A-P065	0.38	15	1.25	0.31
A-P069	0.26	15	1.25	0.21

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

SAV, 2015 Hour 37

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
A-P003	1.25	15	1.25	1.00
A-P008	1.25	15	1.25	1.00
A-P002	1.33	16	1.33	1.00
A-P009	1.21	15	1.25	0.97
A-P001	1.01	16	1.33	0.76
A-P010	0.94	15	1.25	0.75
A-P004	0.90	15	1.25	0.72
A-P013	0.85	15	1.25	0.68
A-P023	0.68	12	1.00	0.68
A-P032	0.67	12	1.00	0.67
A-P059	0.81	15	1.25	0.65
A-P016	0.80	15	1.25	0.64
A-P034	0.63	12	1.00	0.63
A-P031	0.62	12	1.00	0.62
A-P018	0.62	12	1.00	0.62
A-P027	0.62	12	1.00	0.62
A-P035	0.62	12	1.00	0.62
A-P036	0.62	12	1.00	0.62
A-P033	0.62	12	1.00	0.62
A-P037	0.77	15	1.25	0.62
A-P032A	0.62	12	1.00	0.62
A-P026	0.61	12	1.00	0.61
A-P038	0.73	15	1.25	0.58
A-P028	0.57	12	1.00	0.57
A-P022	0.56	12	1.00	0.56
A-P014	0.69	15	1.25	0.55
A-P021	0.55	12	1.00	0.55
A-P012	0.69	15	1.25	0.55
A-P042	0.55	12	1.00	0.55
A-P042A	0.54	12	1.00	0.54
A-P015	0.54	12	1.00	0.54
A-P020	0.54	12	1.00	0.54
A-P061	0.67	15	1.25	0.54
A-P041	0.54	12	1.00	0.54
A-P017	0.67	15	1.25	0.54
A-P039	0.54	12	1.00	0.54
A-P051	0.67	15	1.25	0.54
A-P029	0.53	12	1.00	0.53
A-P054	0.66	15	1.25	0.53
A-P025	0.52	12	1.00	0.52
A-P050	0.65	15	1.25	0.52
A-P060	0.65	15	1.25	0.52
A-P011	0.52	12	1.00	0.52
A-P052	0.64	15	1.25	0.51
A-P055	0.64	15	1.25	0.51
A-P053	0.63	15	1.25	0.50
A-P024	0.50	12	1.00	0.50
A-P057	0.63	15	1.25	0.50
A-P048	0.62	15	1.25	0.50
A-P056	0.62	15	1.25	0.50

VVWRA SEWER MASTER PLAN
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A-P043	0.50	12	1.00	0.50
A-P007FMC	0.50	12	1.00	0.50
A-P049	0.62	15	1.25	0.50
A-P019	0.62	15	1.25	0.50
A-P058	0.62	15	1.25	0.49
A-P047	0.61	15	1.25	0.49
A-P044	0.47	12	1.00	0.47
A-P030	0.47	12	1.00	0.47
A-P040	0.42	12	1.00	0.42
A-P063	0.52	15	1.25	0.41
A-P046	0.49	15	1.25	0.39
A-P045	0.39	12	1.00	0.39
A-P007	0.47	15	1.25	0.37
A-P005	0.46	15	1.25	0.37
A-P006	0.46	15	1.25	0.37
A-P064	0.42	15	1.25	0.33
A-P067	0.41	15	1.25	0.33
A-P066	0.41	15	1.25	0.33
A-P068	0.40	15	1.25	0.32
A-P065	0.39	15	1.25	0.31
A-P069	0.26	15	1.25	0.21

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Victorville, Upper Narrows to Lower Narrows 2009 Hour 37

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
VV2-P420	1.78	27	2.25	0.79
VV2-P317	1.72	27	2.25	0.77
VV2-P410	1.72	27	2.25	0.76
VV2-P407VSD	1.71	27	2.25	0.76
VV2-P318	1.71	27	2.25	0.76
VV2-P411	1.69	27	2.25	0.75
VV2-P409	1.68	27	2.25	0.75
VV2-P418	1.65	27	2.25	0.73
VV2-P421	1.65	27	2.25	0.73
VV2-P415	1.64	27	2.25	0.73
VV2-P416	1.63	27	2.25	0.72
VV2-P412	1.62	27	2.25	0.72
VV2-P414	1.62	27	2.25	0.72
VV2-P419	1.61	27	2.25	0.72
VV2-P408	1.60	27	2.25	0.71
VV2-P417	1.60	27	2.25	0.71
VV2-P416A	1.60	27	2.25	0.71
VV2-P404	1.60	27	2.25	0.71
VV2-P405	1.59	27	2.25	0.70
VV2-P401	1.57	27	2.25	0.70
VV2-P402	1.57	27	2.25	0.70
VV2-P413	1.56	27	2.25	0.70
VV2-P407	1.56	27	2.25	0.69
VV2-P403	1.53	27	2.25	0.68
VV2-P406	1.52	27	2.25	0.67
VV2-P422	1.48	27	2.25	0.66
VV2-P501	1.91	36	3.00	0.64
VV2-P502	1.81	36	3.00	0.60
VV2-P424	1.77	36	3.00	0.59
VV2-P504	1.71	36	3.00	0.57
VV2-P503	1.65	36	3.00	0.55
VV2-P505A	1.62	36	3.00	0.54
VV2-P425	1.59	36	3.00	0.53
VV2-P426	1.40	36	3.00	0.47
VV2-P423	1.31	36	3.00	0.44

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Victorville, Upper Narrows to Lower Narrows 2012 Hour 37

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
VV2-P318	2.25	27	2.25	1.00
VV2-P410	2.25	27	2.25	1.00
VV2-P420	2.25	27	2.25	1.00
VV2-P411	2.04	27	2.25	0.90
VV2-P401	1.98	27	2.25	0.88
VV2-P421	1.96	27	2.25	0.87
VV2-P317	1.84	27	2.25	0.82
VV2-P409	1.81	27	2.25	0.81
VV2-P404	1.79	27	2.25	0.80
VV2-P405	1.78	27	2.25	0.79
VV2-P407VSD	1.78	27	2.25	0.79
VV2-P402	1.76	27	2.25	0.78
VV2-P418	1.76	27	2.25	0.78
VV2-P415	1.75	27	2.25	0.78
VV2-P416	1.74	27	2.25	0.77
VV2-P407	1.74	27	2.25	0.77
VV2-P412	1.73	27	2.25	0.77
VV2-P414	1.73	27	2.25	0.77
VV2-P408	1.72	27	2.25	0.76
VV2-P419	1.72	27	2.25	0.76
VV2-P416A	1.70	27	2.25	0.76
VV2-P417	1.70	27	2.25	0.76
VV2-P403	1.70	27	2.25	0.76
VV2-P406	1.68	27	2.25	0.75
VV2-P413	1.67	27	2.25	0.74
VV2-P422	1.56	27	2.25	0.69
VV2-P501	2.01	36	3.00	0.67
VV2-P502	1.90	36	3.00	0.63
VV2-P424	1.86	36	3.00	0.62
VV2-P504	1.78	36	3.00	0.59
VV2-P503	1.72	36	3.00	0.57
VV2-P505A	1.69	36	3.00	0.56
VV2-P425	1.67	36	3.00	0.56
VV2-P426	1.46	36	3.00	0.49
VV2-P423	1.37	36	3.00	0.46

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Victorville, Upper Narrows to Lower Narrows 2015 Hour 37

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
VV2-P317	2.25	27	2.25	1.00
VV2-P318	2.25	27	2.25	1.00
VV2-P401	2.25	27	2.25	1.00
VV2-P402	2.25	27	2.25	1.00
VV2-P404	2.25	27	2.25	1.00
VV2-P405	2.25	27	2.25	1.00
VV2-P407	2.25	27	2.25	1.00
VV2-P409	2.25	27	2.25	1.00
VV2-P410	2.25	27	2.25	1.00
VV2-P411	2.25	27	2.25	1.00
VV2-P412	2.25	27	2.25	1.00
VV2-P414	2.25	27	2.25	1.00
VV2-P415	2.25	27	2.25	1.00
VV2-P418	2.25	27	2.25	1.00
VV2-P420	2.25	27	2.25	1.00
VV2-P413	2.24	27	2.25	1.00
VV2-P406	2.20	27	2.25	0.98
VV2-P407VSI	2.12	27	2.25	0.94
VV2-P403	2.10	27	2.25	0.94
VV2-P416	2.10	27	2.25	0.93
VV2-P421	2.09	27	2.25	0.93
VV2-P419	2.06	27	2.25	0.92
VV2-P417	1.84	27	2.25	0.82
VV2-P408	1.82	27	2.25	0.81
VV2-P416A	1.81	27	2.25	0.80
VV2-P422	1.65	27	2.25	0.73
VV2-P501	2.14	36	3.00	0.71
VV2-P502	2.02	36	3.00	0.67
VV2-P424	1.97	36	3.00	0.66
VV2-P504	1.90	36	3.00	0.63
VV2-P503	1.82	36	3.00	0.61
VV2-P425	1.82	36	3.00	0.61
VV2-P505A	1.80	36	3.00	0.60
VV2-P426	1.60	36	3.00	0.53
VV2-P423	1.44	36	3.00	0.48

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Victorville Lower Narrows to Double Barrel, 2009 Hour 38

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
VV2-P303	2.07	36	3.00	0.69
VV2-P104RE	1.95	36	3.00	0.65
VV2-P301	1.87	36	3.00	0.62
VV2-P302	1.81	36	3.00	0.60
VV2-P227	1.64	36	3.00	0.55
VV2-P104RE	1.49	33	2.75	0.54

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Victorville Lower Narrows to Double Barrel, 2013

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
VV2-P104RE	2.20	36	3.00	0.73
VV2-P104RE	1.64	33	2.75	0.60
VV2-P227	1.77	36	3.00	0.59
VV2-P301	2.09	36	3.00	0.70
VV2-P302	2.01	36	3.00	0.67
VV2-P303	2.36	36	3.00	0.79

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Victorville Lower Narrows to Double Barrel, 2012 Hour 38

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
VV2-P104RE	2.13	36	3.00	0.71
VV2-P104RE	1.60	33	2.75	0.58
VV2-P227	1.74	36	3.00	0.58
VV2-P301	2.02	36	3.00	0.67
VV2-P302	1.96	36	3.00	0.65
VV2-P303	2.27	36	3.00	0.76

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Victorville Lower Narrows to Double Barrel, 2015

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
VV2-P303	3.00	36	3.00	1.00
VV2-P104REPL	2.59	36	3.00	0.86
VV2-P301	2.23	36	3.00	0.74
VV2-P302	2.15	36	3.00	0.72
VV2-P104REPL	1.74	33	2.75	0.63
VV2-P227	1.86	36	3.00	0.62

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
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VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Victorville Double Barrel (Main) to RWWRF, 2012 Hour 41

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
VVE-P202	2.23	36	3.00	0.74
VVE-P211FM	2.18	36	3.00	0.73
VVE-P203	2.13	36	3.00	0.71
VVE-P212	2.13	36	3.00	0.71
VVE-P213	2.04	36	3.00	0.68
VVE-P204	2.02	36	3.00	0.67
VVE-P205	2.01	36	3.00	0.67
VVE-P209	2.00	36	3.00	0.67
VVE-P211	1.99	36	3.00	0.66
VVE-P206	1.96	36	3.00	0.65
VVE-P201	1.95	36	3.00	0.65
VVE-P210	1.91	36	3.00	0.64
VVE-P207	1.90	36	3.00	0.63
VVE-P208	1.90	36	3.00	0.63
VVE-P214	1.85	36	3.00	0.62
VVE-P215	1.74	36	3.00	0.58
VVE-P115FM	1.71	36	3.00	0.57
VVE-P224	1.70	36	3.00	0.57
VVE-P225	1.69	36	3.00	0.56
VVE-P114	1.69	36	3.00	0.56
VVE-P113	1.67	36	3.00	0.56
VVE-P226	1.67	36	3.00	0.56
VVE-P223	1.66	36	3.00	0.55
VVE-P115	1.65	36	3.00	0.55
VVE-P100	1.65	36	3.00	0.55
VVE-P104	1.65	36	3.00	0.55
VVE-P105	1.64	36	3.00	0.55
VVE-P221B	1.61	36	3.00	0.54
VVE-P112	1.59	36	3.00	0.53
VVE-P222	1.58	36	3.00	0.53
VVE-P106	1.57	36	3.00	0.52
VVE-P109	1.56	36	3.00	0.52
VVE-P110	1.54	36	3.00	0.51
VVE-P111	1.54	36	3.00	0.51
VVE-P107	1.53	36	3.00	0.51
VVE-P101	1.53	36	3.00	0.51
VVE-P103	1.52	36	3.00	0.51
VVE-P102	1.51	36	3.00	0.50
VVE-P108	1.51	36	3.00	0.50
VVE-P221A	1.51	36	3.00	0.50
VVE-P216	1.41	36	3.00	0.47
VVE-P220	1.31	36	3.00	0.44
VVE-P221	1.07	36	3.00	0.36
VVE-P219	1.02	36	3.00	0.34
VVE-P217A	1.02	36	3.00	0.34
VVE-P218	0.98	36	3.00	0.33
VVE-P217	0.96	36	3.00	0.32

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Victorville Double Barrel (Relief) to RWWRF, 2018

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
VV-RS-P003	3.50	42	3.50	1.00
VV-RS-P006	3.50	42	3.50	1.00
VV-RS-P024	3.50	42	3.50	1.00
VV-RS-P025	3.50	42	3.50	1.00
VV-RS-P028	3.50	42	3.50	1.00
VV-RS-P029	3.48	42	3.50	1.00
VV-RS-P026	3.48	42	3.50	0.99
VV-RS-P007	3.46	42	3.50	0.99
VV-RS-P027	3.44	42	3.50	0.98
VV-RS-P004	3.42	42	3.50	0.98
VV-RS-P029	3.28	42	3.50	0.94
VV-RS-P008	3.22	42	3.50	0.92
VV-RS-P030	3.13	42	3.50	0.90
VV-RS-P005	3.11	42	3.50	0.888
VV-RS-P009	3.03	42	3.50	0.87
VV-RS-P031	2.87	42	3.50	0.82
VV-RS-P033	2.86	42	3.50	0.82
VV-RS-P010	2.80	42	3.50	0.80
VV-RS-P021	2.78	42	3.50	0.79
VV-RS-P032	2.73	42	3.50	0.78
VV-RS-P022	2.71	42	3.50	0.77
VV-RS-P045	2.68	42	3.50	0.77
VV-RS-P011	2.61	42	3.50	0.75
VV-RS-P042	2.50	42	3.50	0.71
VV-RS-P034	2.49	42	3.50	0.71
VV-RS-P018	2.49	42	3.50	0.71
VV-RS-P012	2.46	42	3.50	0.70
VV-RS-P015	2.45	42	3.50	0.70
VV-RS-P017	2.41	42	3.50	0.69
VV-RS-P043	2.39	42	3.50	0.68
VV-RS-P016	2.36	42	3.50	0.67
VV-RS-P023	2.34	42	3.50	0.67
VV-RS-P013	2.34	42	3.50	0.67
VV-RS-P044	2.34	42	3.50	0.67
VV-RS-P041	2.29	42	3.50	0.65
VV-RS-P019	2.29	42	3.50	0.65
VV-RS-P014	2.28	42	3.50	0.65
VV-RS-P039	2.23	42	3.50	0.64
VV-RS-P038	2.23	42	3.50	0.64
VV-RS-P001	2.22	42	3.50	0.63
V-RS-P016FM	2.21	42	3.50	0.63
VV-RS-P020	2.21	42	3.50	0.63
VV-RS-P002	2.17	42	3.50	0.62
VV-RS-P000	2.11	42	3.50	0.60
VV-RS-P040	2.10	42	3.50	0.60
VV-RS-P034A	1.72	42	3.50	0.49
VV-RS-P035	1.43	42	3.50	0.41
VV-RS-P036	1.38	42	3.50	0.39
VV-RS-P037	1.30	42	3.50	0.37

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Victorville Double Barrel (Relief) to RWWRF, 2012 Hour 41

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
VV-RS-P006	2.57	42	3.50	0.73
VV-RS-P024	2.51	42	3.50	0.72
VV-RS-P025	2.45	42	3.50	0.70
VV-RS-P007	2.43	42	3.50	0.69
VV-RS-P003	2.39	42	3.50	0.68
VV-RS-P028	2.39	42	3.50	0.68
VV-RS-P045	2.38	42	3.50	0.68
VV-RS-P029	2.33	42	3.50	0.67
VV-RS-P026	2.33	42	3.50	0.67
VV-RS-P033	2.30	42	3.50	0.66
VV-RS-P021	2.26	42	3.50	0.65
VV-RS-P032	2.24	42	3.50	0.64
VV-RS-P031	2.23	42	3.50	0.64
VV-RS-P027	2.22	42	3.50	0.63
VV-RS-P022	2.21	42	3.50	0.63
VV-RS-P004	2.19	42	3.50	0.62
VV-RS-P010	2.12	42	3.50	0.61
VV-RS-P042	2.12	42	3.50	0.61
VV-RS-P008	2.12	42	3.50	0.60
VV-RS-P015	2.09	42	3.50	0.60
VV-RS-P029FMC	2.08	42	3.50	0.59
VV-RS-P018	2.08	42	3.50	0.59
VV-RS-P012	2.08	42	3.50	0.59
VV-RS-P043	2.05	42	3.50	0.58
VV-RS-P030	2.04	42	3.50	0.58
VV-RS-P009	2.04	42	3.50	0.58
VV-RS-P016	2.02	42	3.50	0.58
VV-RS-P017	2.02	42	3.50	0.58
VV-RS-P013	2.01	42	3.50	0.57
VV-RS-P011	2.01	42	3.50	0.57
VV-RS-P044	2.00	42	3.50	0.57
VV-RS-P041	1.97	42	3.50	0.56
VV-RS-P014	1.96	42	3.50	0.56
VV-RS-P023	1.94	42	3.50	0.55
VV-RS-P039	1.93	42	3.50	0.55
VV-RS-P001	1.92	42	3.50	0.55
VV-RS-P034	1.92	42	3.50	0.55
VV-RS-P038	1.92	42	3.50	0.55
VV-RS-P016FMC	1.89	42	3.50	0.54
VV-RS-P002	1.89	42	3.50	0.54
VV-RS-P005	1.84	42	3.50	0.53
VV-RS-P000	1.84	42	3.50	0.52
VV-RS-P019	1.82	42	3.50	0.52
VV-RS-P040	1.82	42	3.50	0.52
VV-RS-P020	1.71	42	3.50	0.49
VV-RS-P034A	1.34	42	3.50	0.38
VV-RS-P035	1.24	42	3.50	0.35
VV-RS-P036	1.20	42	3.50	0.34
VV-RS-P037	1.14	42	3.50	0.33

VVWRA SEWER MASTER PLAN
EXISTING INTERCEPTOR CAPACITY ANALYSIS
MODEL OUTPUT RESULTS SUMMARY

Victorville Double Barrel (Main) to RWWRF, 2018

ID	Adjusted Depth (ft)	Diameter (in)	Diameter (ft)	Adj d/D
VVE-P202	3.00	36	3.00	1.00
VVE-P203	3.00	36	3.00	1.00
VVE-P204	3.00	36	3.00	1.00
VVE-P205	3.00	36	3.00	1.00
VVE-P211	3.00	36	3.00	1.00
VVE-P211FMC	3.00	36	3.00	1.00
VVE-P212	3.00	36	3.00	1.00
VVE-P213	3.00	36	3.00	1.00
VVE-P214	3.00	36	3.00	1.00
VVE-P215	3.00	36	3.00	1.00
VVE-P206	3.00	36	3.00	1.00
VVE-P207	2.95	36	3.00	0.98
VVE-P208	2.90	36	3.00	0.97
VVE-P209	2.88	36	3.00	0.96
VVE-P210	2.84	36	3.00	0.95
VVE-P201	2.32	36	3.00	0.77
VVE-P216	2.31	36	3.00	0.77
VVE-P114	2.03	36	3.00	0.68
VVE-P113	2.01	36	3.00	0.67
VVE-P115FMC	1.98	36	3.00	0.66
VVE-P224	1.98	36	3.00	0.66
VVE-P115	1.98	36	3.00	0.66
VVE-P104	1.97	36	3.00	0.66
VVE-P225	1.97	36	3.00	0.66
VVE-P105	1.95	36	3.00	0.65
VVE-P226	1.93	36	3.00	0.64
VVE-P223	1.92	36	3.00	0.64
VVE-P100	1.91	36	3.00	0.64
VVE-P112	1.89	36	3.00	0.63
VVE-P106	1.86	36	3.00	0.62
VVE-P221B	1.86	36	3.00	0.62
VVE-P109	1.85	36	3.00	0.62
VVE-P222	1.83	36	3.00	0.61
VVE-P111	1.82	36	3.00	0.61
VVE-P110	1.82	36	3.00	0.61
VVE-P107	1.81	36	3.00	0.60
VVE-P101	1.80	36	3.00	0.60
VVE-P103	1.80	36	3.00	0.60
VVE-P108	1.79	36	3.00	0.60
VVE-P102	1.79	36	3.00	0.60
VVE-P221A	1.73	36	3.00	0.58
VVE-P220	1.50	36	3.00	0.50
VVE-P221	1.26	36	3.00	0.42
VVE-P217	1.25	36	3.00	0.42
VVE-P219	1.16	36	3.00	0.39
VVE-P217A	1.15	36	3.00	0.38
VVE-P218	1.11	36	3.00	0.37

APPENDIX D

RECYCLED WATER OPTIONS TECHNICAL MEMORANDUM

RBF CONSULTING

Technical Memorandum

To: Mr. Logan Olds, General Manager Victor Valley Wastewater Reclamation Authority

From: Kevin Schmidt, PE

Date: November 17, 2009

Re: Recycled Water Options

This technical memorandum analyzes two options for providing recycled water in the VVWRA Service Area:

1. Treat all wastewater at the Regional Wastewater Reclamation Facility (RWWRF) and deliver recycled water to customers in Hesperia and Apple Valley.

2. Construct subregional reclamation plants in Hesperia and Apple Valley for delivery of recycled water to customers in the close proximity to the treatment plants.

An "apples-to-apples" method of comparison must be used to reasonably evaluate the two options. The following assumptions were used to develop the comparison of the two alternatives:

1. The comparison considers construction of capital facilities that should be sized to accommodate flow well into the future; to provide reasonable longevity. This analysis uses a twenty year window for that purpose.

2. Capital and operation/maintenance costs were evaluated. In order to simplify the evaluation of operation and maintenance costs, only the cost for electricity required to deliver the recycled water was considered. Costs for treatment and delivery of recycled water to customers was assumed to be similar for both options.

3. Three components of VVWRA capital facilities were evaluated for each option:

    a. Treatment, including any new sewers, lift stations and force mains to route flow to the subregional plants.

    b. Upgrade of existing VVWRA Interceptor Sewers.

    c. Recycled water pumping and transmission facilities to the proposed subregional treatment sites.

Flow Projection

A twenty-year window was selected for evaluation of the two alternatives. One of the options used in the most recent Service Area Flow Projection for VVWRA was to research average long term growth rates in communities similar to those in the VVWRA Service Area. This method led to a long term average growth rate of 2.7%. Figure 1 shows the anticipated growth in sewage flow in the service area and influent to the RWWRF from the current level of 12.5 mgd to 22.0 mgd in the year 2030. The method for estimating the flow assumes that the City of Adelanto will remain out of the JPA and no other treatment plant will divert flow from the RWWRF.

Option 1-Treat Flow at RWWRF/Pump to Recycled Water Customers

This option routes all wastewater to the RWWRF for treatment and pumping back to recycled water customers in Hesperia and Apple Valley. An estimate has been prepared for VVWRA to upgrade the RWWRF to 22. The treatment process will provide Title 22 effluent for Unrestricted Use.

Wastewater Treatment Upgrades

The estimate for treatment at the RWWRF is $125,649,000 in 2008 dollars, or $133,400,000 in 2009 dollars using a 6% escalation factor. The estimate includes a new membrane bioreactor complex and ultraviolet disinfection system and upgrades to the RWWRF's power distribution system, utility water system, digester gas cleaning system, sludge dewatering system, emergency storage facilities, primary clarifiers, headworks and flow equalization system.

Recycled Water Transmission Facilities

High head vertical turbine pumps would be required to lift recycled water from the RWWRF to customers in Apple Valley and Hesperia. Ground elevation at the Brewster Park (the highest elevation recycled water customer in Apple Valley) is 2910 feet. Elevation at the RWWRF is approximately 2610 feet; yielding a lift of 300 feet.

Similarly, in the City of Hesperia, the highest grade elevation for recycled water customers is approximately 3310 feet. Applying the RWWRF elevation yields a lift of approximately 700 feet.

Headloss in the piping from the RWWRF to recycled water customers in Apple Valley and Hesperia must be added to the above referenced static lift to approximate total dynamic head at the recycled water pumps. For the purpose of this analysis, it is assumed that, ultimately, two mgd will be supplied to Apple Valley and two mgd will be supplied to Hesperia. Therefore, an 18 inch diameter pipe would be required from the RWWRF to Highway 18. From that point, two 14 inch diameter pipelines would be extended; one to the recycled water markets at and around Brewster Park in Apple Valley; and one to the Hesperia Water Reclamation Plant 1.

Headloss in the piping add approximately 243 feet to the static lift for a total dynamic head at the pump of approximately 943 feet to Hesperia. The first phase pump station would include two pumps (one duty and one spare), with space to add a third when recycled water flow in Hesperia and Apple Valley increases to four mgd.

An estimate of probable capital cost has been prepared for the recycled water transmission system associated with this option. The estimate is shown in Table 1 in 2009 dollars.

Table 1-Option 1 Recycled Water Transmission Cost

Item	Probable Capital Cost
18" Common Pipeline	$7,380,000
14" Hesperia Branch	$7,154,000
14" Apple Valley Branch	$4,578,000
RW Pump Station	$3,500,000
Total	$22,612,000

Upgrade Existing Interceptor

VVWRA has developed a calibrated model for assessing the capacity of its existing Interceptor. The Interceptor was first constructed in 1970 when capacity at the RWWRF was only 4.0 mgd. Extensive upgrades would be necessary to accommodate a service area flow of 22 mgd. The following assumptions were made for the evaluation:

1. The Santa Fe Bypass Sewer is under construction to correct physical deficiencies in the Interceptor from Hercules to Bear Valley Road. This section was therefore exempted from the upgrade calculation.
2. The Interceptor section between Bear Valley Road and the South Apple Valley Interceptor is currently under design for replacement due to physical deficiencies and was therefore exempted from the upgrade calculation.
3. It is assumed that no paralleling will occur through the Upper Narrows due to the difficulty of construction and environmental sensitivity. Instead, the Upper Narrows Pump Station will be upgraded for this purpose.

The Interceptor Model was run to determine the required parallel sewer construction. Table 2 summarizes the results in 2009 dollars.

Composite

A composite estimate of probable capital cost was prepared for Option 1. The results are shown in Table 3.

Table 3-Option 1 Composite Cost

Item	Probable Capital Cost
Treatment	$133,400,000
RW Transmission	$22,612,000
Interceptor Upgrades	$36,569,000
Total	$192,581,000

Option 2-Construct Subregional Plants in Apple Valley and Hesperia

This option evaluates the cost of constructing subregional water reclamation plants in Apple Valley and Hesperia. Both plants would be designed and constructed to supply one mgd immediately and an additional one mgd in the future. Both plants would discharge waste solids back to the Interceptor for treatment at the RWWRF, and route treated effluent to percolation ponds during rainy periods.

Wastewater Treatment Upgrades

The Hesperia and Apple Valley Water Reclamation Plants would be constructed for an ultimate capacity of two mgd, each. In order to accommodate an overall service area flow of 22 mgd, the RWWRF must be upgraded to 18 mgd.

An estimate of probable capital cost was prepared for an expansion of the RWWRF to 18 mgd. The estimate upgrades the facility to a membrane bioreactor design with ultraviolet disinfection for an estimated cost of $95,000,000 in 2009 dollars.

The preliminary design of the Apple Valley and Hesperia Water Reclamation Plants is ongoing. The design develops each site for an ultimate 2 mgd, with initial equipment

provisions for 1 mgd. Waste solids will be routed to the existing Interceptor for processing at the RWWRF. A gravity sewer is required to supply the Apple Valley Water Reclamation Plant. A lift station and force main are required for transferring sewage to the Hesperia Water Reclamation Plant. Table 4 shows the estimate of probable capital cost for the water reclamation plants, sewer, lift station and force main.

Table 4-Option 2 Wastewater Treatment Costs

Item	Probable Capital Cost
Upgrade RWWRF	$95,000,000
Construct Subregional Plants	$48,000,000
Nanticoke Bypass Sewer	$5,300,000
Hesperia Lift Station/FM	$2,000,000
Total	$150,300,000

Upgrade Existing Interceptor

The Interceptor Model was run to assess the necessity for upgrades with 2 mgd diverted to the Hesperia Water Reclamation Plant and 2 mgd diverted to the Apple Valley Water Reclamation Plant. As with Option 1, the currently planned Santa Fe Bypass Interceptor and North Hesperia Interceptor were exempted from the cost for upgrades as they are being replaced because of physical deficiencies.

The diversion of four mgd from the RWWRF eases loading on the Interceptor and results in fewer sections that require upgrades to accommodate 2030 flow. Table 5 shows the required upgrades and estimate of probable capital cost.

Composite

The wastewater treatment upgrades for Option 2 have been combined with the required paralleling of the Interceptor to create a composite cost in 2009 dollars. The estimate is shown in Table 6.

Table 6-Option 2 Composite Cost

Item	Probable Capital Cost
Treatment	$150,300,000
Interceptor Upgrades	$2,787,000
Total	$153,087,000

Operation and Maintenance Costs

Treatment costs, such as staffing and chemicals, are predicted to be very similar for the two options. The same is expected for Interceptor operation and maintenance. The major distinction between the two options will be in electricity usage. Option 1 has all sewage routed to the RWWRF, the lowest point in the Service Area, and recycled water pumped back up to the highest points. Option 2 will divert sewage at the higher elevations, close to the recycled water usage areas, requiring only minor pumping to the Hesperia Water Reclamation Plant.

An estimate of the difference in electrical usage has been prepared. The estimate is in 2009 dollars and assumes an average rate of $0.12 per kilowatt-hour. Table 7 shows the estimate.

Table 7-Comparison of Electricity Pumping Costs

Option	Annual Cost
Option 1	$563,911
Option 2	$31,158

Summary

This technical memorandum compares two long term strategic options for VVWRA: Option 1-Route all sewage for the next twenty years to the RWWRF, treat the sewage there to Title 22 Standards (Unrestricted Use), and pump the recycled water to markets in Hesperia and Apple Valley; and Option 2-Divert sewage in Apple Valley and Hesperia to water reclamation plants located close to the recycled water customers in those areas.

Projected wastewater flow twenty years from now (in 2030) is 22 mgd. Each option has impacts on capital and operating costs for VVWRA. Capital cost impacts include wastewater treatment, sewers, lift stations, force mains and recycled water transmission facilities. The major impact on operation and maintenance costs is electricity usage.

Table 8 shows the estimate of probable capital cost for each option and annual electricity costs in 2009 dollars.

Table 8-Summary of Costs

Option	Capital Costs	Annual Electricity Cost
Option 1	$192,581,000	$563,911
Option 2	$153,087,000	$31,158

APPENDIX E

CONDITION ASSESSMENT RECOMMENDATIONS TABLES

APPENDIX E - TABLE 1
Victor Valley Wastewater Reclamation Authority
Sewer Master Plan - Condition Assessment
High Priority Manhole Improvement Recommendations

Area	MH #	Reason for Recommendation	Recommended Improvement Description	Estimated Capital Cost	Status
Hesperia	48	Moderate to significant manhole corrosion	Repair mortar loss of damaged sections. Epoxy coating of manhole interior recommended	$4,000	Incomplete
Hesperia	5	Manhole rim located below grade	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
Hesperia	26	Manhole rim located below grade	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
Hesperia	33	Manhole rim located below grade	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
Hesperia	73	Manhole located in low area where storm water accumulates	Seal manhole cover and plug holes to prevent excess inflow	$2,500	Incomplete
Hesperia	76	Manhole rim located below grade	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
SVL/CSA-64	9	Manhole located in pasture that is routinely flooded, cover frame corroded	Raise manhole rim to prevent excess inflow. Replace cover frame and cover.	$7,000	Incomplete
SVL/CSA-64	10	Manhole located in pasture that is routinely flooded, cover frame corroded	Raise manhole rim to prevent excess inflow. Replace cover frame and cover. Re-coat interior	$7,000	Incomplete
SVL/CSA-64	11	Manhole located in pasture that is routinely flooded, cover frame corroded	Raise manhole rim to prevent excess inflow. Replace cover frame and cover. Re-coat interior	$7,000	Incomplete
SVL/CSA-64	12	Manhole located in pasture that is routinely flooded, cover frame corroded	Raise manhole rim to prevent excess inflow. Replace Cover frame and Cover. Re-Coat interior	$7,000	Incomplete
SVL/CSA-64	13	Manhole located in pasture that is routinely flooded. cOver frame corroded. Interior coating unfinished.	Raise manhole rim to prevent excess inflow. Replace cover frame and cover. Re-coat interior	$7,000	Incomplete
SVL/CSA-64	14	Unable to locate manhole - buried below grade	Locate and raise manhole rim to prevent excess inflow	$2,500	Incomplete
SVL/CSA-64	17	Manhole rim located below grade	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
SVL/CSA-64	22	Manhole located in low lying field that could flood	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
SVL/CSA-64	23	Manhole located below grade	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
SVL/CSA-64	24	Manhole located in low lying field that could flood	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
SVL/CSA-64	25	Manhole located in low lying field that could flood	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
S. Apple Valley	18	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Incomplete
S. Apple Valley	20	Significant corrosion of cover frame outside street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	21	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	22	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	24	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	30	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	39	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	40	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	41	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	42	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	43	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	44	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	45	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	47	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	49	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	50	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	59	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008

APPENDIX E - TABLE 1
Victor Valley Wastewater Reclamation Authority
Sewer Master Plan - Condition Assessment
High Priority Manhole Improvement Recommendations

Area	MH ID	Observed Condition	Recommended Improvement Description	Estimated Cost	Status
S. Apple Valley	61	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	67	Significant corrosion of cover frame in street right of way	Replace cover and cover frame with corrosion resistant materials	$2,500	Incomplete
S. Apple Valley	70	Significant corrosion of entire manhole and manhole cover frame in street ROW	Replace manhole and epoxy coat interior. Replace cover and cover frame with corrosion resistant materials	$2,500	Completed April 2008
S. Apple Valley	19	Manhole located below grade on dirt road	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
S. Apple Valley	38	Manhole located below grade adjacent to paved road	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
S. Apple Valley	69	Manhole located below grade	Raise manhole rim to prevent excess inflow	$2,500	Incomplete
Victorville	RS-1	Moderate corrosion of manhole, significant corrosion near rim, and moderate corrosion of cover frame	Cleaning, and recoating interior of manhole recommended	By VVWRA	Incomplete
Victorville	RS-41	Minimal corrosion of manhole, minimal corrosion of cover frame, grout missing around cover frame, and sink hole located next to manhole	Cleaning & recoating of manhole, grouting cover frame, and examine sink hole recommended	By VVWRA	Incomplete
Victorville	1-11	Minimal corrosion of manhole, significant corrosion of top riser, and moderate grease build up	Cleaning and recoating of manhole, and replace top riser recommended	$2,500	Incomplete
Victorville	2-22	Minimal corrosion of manhole, minimal corrosion of cover frame, grout missing around cover frame, and sink hole located next to manhole	Cleaning & recoating of manhole, grouting cover frame, and examine sink hole recommended	$2,500	Incomplete

APPENDIX E - TABLE 2
Victor Valley Wastewater Reclamation Authority
Sewer Master Plan - Condition Assessment
Medium Priority Manhole Improvement Recommendations

Agency	Manhole ID	Observed Manhole Condition	Recommended Improvement Description	Estimated Capital Cost	Project Status
Hesperia	84	Fair corrosion of cover frame outside normal traveled way	Replace cover and cover frame	$2,500	Incomplete
Hesperia	70	Partial separation of Manhole risers	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	71	Partial separation of Manhole risers	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	75	Significant separation between Manhole risers	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	78	Significant separation between Manhole risers	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	79	Partial separation of Manhole risers	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	80	Significant separation between Manhole risers	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	81	Significant separation between Manhole risers	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	82	Partial separation of Manhole risers	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	84	Partial separation of Manhole risers	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	85	Significant separation between Manhole risers	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	87	Significant separation between Manhole risers	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	1 through 43	Manholes exhibit moderate to thick scum layer	Clean manholes	By VVWRA	Incomplete
SVL/CSA-64	24	Vegetation growing through manhole risers	Cleaning/coating recommended	$2,500	Incomplete
SVL/CSA-64	23	Vegetation growing through manhole risers	Cleaning/coating recommended	$2,500	Incomplete
SVL/CSA-64	16	Moderate corrosion of manhole.	Interior re-coating and repairs recommended	$2,500	Incomplete
SVL/CSA-64	15	Moderate corrosion of manhole	Interior re-coating and repairs recommended	$2,500	Incomplete
SVL/CSA-64	9	Coating application appears unfinished, primer coat only. Cover frame corroded	Re-coat interior, replace cover frame	$5,000	Incomplete
SVL/CSA-64	8	Coating application appears unfinished, primer coat only. Cover frame corroded	Re-coat interior, replace cover frame	$5,000	Incomplete
SVL/CSA-64	7	Coating application appears unfinished, primer coat only. Cover frame corroded	Re-coat interior, replace cover frame	$5,000	Incomplete
SVL/CSA-64	6	Coating application appears unfinished, primer coat only. Cover frame corroded	Re-coat interior, replace cover frame	$5,000	Incomplete
SVL/CSA-64	5	Coating application appears unfinished, primer coat only. Cover frame corroded	Re-coat interior, replace cover frame	$5,000	Incomplete
SVL/CSA-64	4	Coating application appears unfinished, primer coat only. Cover frame corroded	Re-coat interior, replace cover frame	$5,000	Incomplete
SVL/CSA-64	3	Coating application appears unfinished, primer coat only. Cover frame corroded	Re-coat interior, replace cover frame	$5,000	Incomplete
S. Apple Valley	11	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Incomplete
S. Apple Valley	12	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Incomplete
S. Apple Valley	14	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Incomplete
S. Apple Valley	15	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Incomplete
S. Apple Valley	16	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Incomplete
S. Apple Valley	17	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Incomplete
S. Apple Valley	19	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Incomplete
S. Apple Valley	28	Fair corrosion of cover frame outside normal traveled way	Replace cover and cover frame	$2,500	Completed April 2008
S. Apple Valley	32A	Significant corrosion of cover frame outside normal traveled way	Replace cover and cover frame	$2,500	Incomplete
S. Apple Valley	33	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Incomplete
S. Apple Valley	36	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Incomplete
S. Apple Valley	38	Fair corrosion of cover frame outside normal traveled way	Replace cover and cover frame	$2,500	Completed April 2008
S. Apple Valley	46	Fair corrosion of cover frame outside normal traveled way	Replace cover and cover frame	$2,500	Completed April 2008
S. Apple Valley	48	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Completed April 2008

APPENDIX E - TABLE 2
Victor Valley Wastewater Reclamation Authority
Sewer Master Plan - Condition Assessment
Medium Priority Manhole Improvement Recommendations

Area	MH ID	Reason for Recommendation	Recommended Improvement / Description	Estimated Capital Cost	Status
S. Apple Valley	51	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Completed April 2008
S. Apple Valley	52	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Completed April 2008
S. Apple Valley	53	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Completed April 2008
S. Apple Valley	54	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Completed April 2008
S. Apple Valley	55	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Completed April 2008
S. Apple Valley	56	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Completed April 2008
S. Apple Valley	57	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Completed April 2008
S. Apple Valley	58	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Completed April 2008
S. Apple Valley	60	Significant corrosion of cover frame outside of accessible traveled way	Replace cover and cover frame	$2,500	Completed April 2008
Victorville	RS-2	Significant corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-5	Significant corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-6	Significant corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-7	Significant corrosion of manhole, moderate corrosion of cover frame, and cover frame not bolted down	Cleaning and recoating of manhole, and bolting of cover frame recommended	$2,500	Incomplete
Victorville	RS-8	Significant corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-14	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-16	Significant corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-19	Significant corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-20	Significant corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-21	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-25	Moderate corrosion of manhole, and significant corrosion of cover frame	Cleaning, and recoating of manhole, and replace cover frame recommended	$2,500	Incomplete
Victorville	RS-29	Moderate corrosion of manhole, moderate corrosion of cover frame, and grout damaged around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-32	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-38	Minimal corrosion of manhole, significant corrosion of cover frame, and manhole rim located below grade	Cleaning and recoating of manhole, replace and raise rim to grade or above recommended	$5,000	Incomplete
Victorville	RS-39	Minimal corrosion of manhole, moderate corrosion of cover frame, and manhole rim located below grade	Cleaning and recoating of manhole, and raise rim to grade or above recommended	$5,000	Incomplete
Victorville	RS-45	Moderate corrosion of manhole, moderate corrosion of cover frame, and grout damaged around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	1-02	Moderate corrosion of manhole, grout missing around cover frame, moderate grease build up, and cover frame not bolted down	Cleaning and recoating of manhole, and bolting and grouting of cover frame recommended	$2,500	Incomplete
Victorville	1-04	Minimal corrosion of manhole, significant corrosion of cover frame, and minimal grease build up	Cleaning and recoating of manhole, and replace cover frame recommended	$2,500	Incomplete
Victorville	1-05	Unable to Open	Open manhole, conduct condition assessment	$0	Incomplete
Victorville	1-06	Unable to Open	Open manhole, conduct condition assessment	$0	Incomplete
Victorville	1-07	Minimal corrosion of manhole, grout missing around cover frame, cover frame not bolted down and cracked	Cleaning and recoating of manhole, replace cover frame and grout recommended	$2,500	Incomplete
Victorville	1-08	Minimal corrosion of manhole, and significant corrosion of cover frame	Cleaning and recoating of manhole, and replace cover frame recommended	$2,500	Incomplete
Victorville	1-09	Moderate corrosion of manhole, and significant corrosion of cover frame	Cleaning and recoating of manhole, and replace cover frame recommended	$2,500	Incomplete

APPENDIX E - TABLE 2
Victor Valley Wastewater Reclamation Authority
Sewer Master Plan - Condition Assessment
Medium Priority Manhole Improvement Recommendations

Agency	Manhole ID	Condition Recommendations	Recommended Improvement Description	Estimated Capital Cost	Comments
Victorville	1-10	Minimal corrosion of manhole, and significant corrosion of cover frame	Cleaning and recoating of manhole, replace cover frame recommended	$2,500	Incomplete
Victorville	1-12	Moderate corrosion of manhole, significant corrosion at outlet, and moderate grease build up	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	1-13	Moderate to Significant corrosion of manhole, and significant corrosion of cover frame	Cleaning and recoating of manhole, replace cover frame recommended	$5,000	Incomplete
Victorville	1-14	Significant corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	1-15	Unable to Open	Open manhole, conduct condition assessment	$0	Incomplete
Victorville	2-02	Minimal corrosion of manhole, and significant corrosion of cover frame	Cleaning and recoating of manhole, replace cover frame recommended	$5,000	Incomplete
Victorville	2-04	Moderate corrosion of manhole, significant corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, replace cover frame and grout recommended	$5,000	Incomplete
Victorville	2-08	Minimal corrosion of manhole, and significant corrosion of cover frame	Cleaning and recoating of manhole, replace cover frame and grout recommended	$5,000	Incomplete
Victorville	2-09	Minimal corrosion of manhole, damage to cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, replace cover frame and grout recommended	$5,000	Incomplete
Victorville	2-11	Significant corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	2-12	Significant corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	2-13	Minimal corrosion of manhole, damage to cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, replace cover frame and grout recommended	$5,000	Incomplete
Victorville	2-14	Minimal corrosion of manhole, significant corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, replace cover frame and grout recommended	$5,000	Incomplete
Victorville	2-17	Significant corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	2-17A	Significant corrosion of manhole, minimal corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	2-19	Moderate corrosion of manhole, and minimal corrosion of cover frame	Cleaning and recoating of manhole recommended	$2,500	Incomplete
Victorville	2-20	Minimal corrosion of manhole, moderate corrosion of cover frame, and manhole rim located below grade	Cleaning and recoating of manhole, and raise manhole to grade or above recommended	$5,000	Incomplete
Victorville	2-21	Moderate corrosion of manhole, moderate corrosion of cover frame, and manhole rim located below grade	Cleaning and recoating of manhole, and raise manhole to grade or above recommended	$5,000	Incomplete
Victorville	2-21A	Moderate corrosion of manhole, moderate corrosion of cover frame, and manhole rim located below grade	Cleaning and recoating of manhole, and raise manhole to grade or above recommended	$5,000	Incomplete
Victorville	2-25	Minimal corrosion of manhole, minimal corrosion of cover frame, grout missing around cover frame, and cover frame not bolted down	Cleaning and recoating of manhole, and bolting and grouting of cover frame recommended	$3,000	Incomplete

APPENDIX E - TABLE 3
Victor Valley Wastewater Reclamation Authority
Sewer Master Plan - Condition Assessment
Lower Priority Manhole Improvement Recommendations

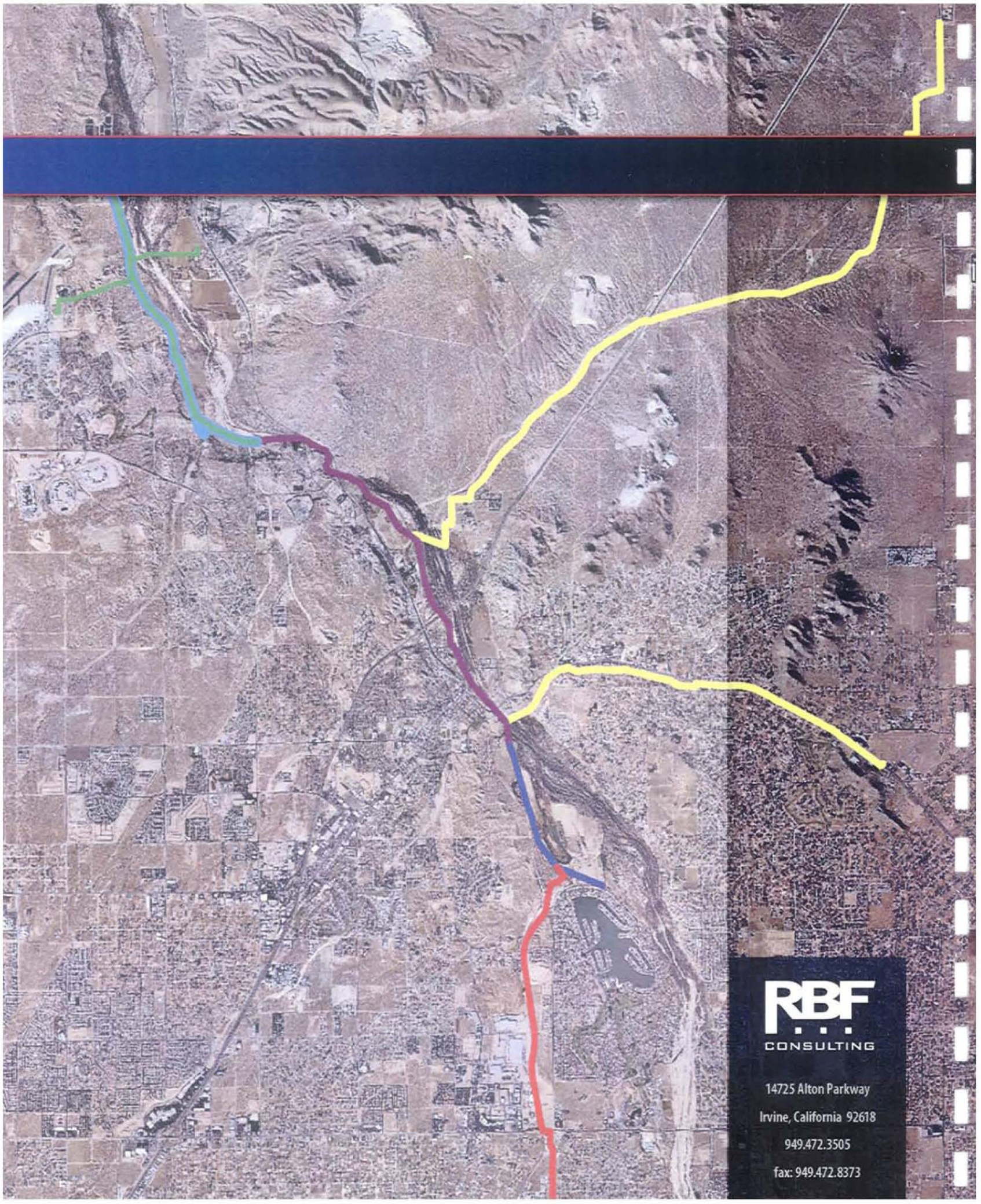
Agency	MH ID	Reason for Recommendation	Recommended Improvement Description	Estimated Capital Cost	Status
Hesperia	57	Minor Seperation of Manhole risers at top of manhole	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	61	Minor Seperation of Manhole risers at top of manhole	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	62	Minor Seperation of Manhole risers at top of manhole	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	65	Minor Seperation of Manhole risers at top of manhole	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	66	Minor Seperation of Manhole risers at top of manhole	Clean, repair missing grout, epoxy coat interior	$3,000	Incomplete
Hesperia	77	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	2	Blistering of interior epoxy coating on bottom portion of manhole at walls and on bench	Partial Manhole Epoxy Coating Replacement	$2,000	Incomplete
S. Apple Valley	3	Damage and blistering on bottom half of interior epoxy coating at manhole walls and on bench	Partial Manhole Epoxy Coating Replacement	$2,000	Incomplete
S. Apple Valley	4	Interior epoxy coating deterioration throughout manhole	Full Replacement of Manhole Interior Epoxy Coating	$2,500	Incomplete
S. Apple Valley	5	Interior epoxy coating deterioration throughout manhole	Full Replacement of Manhole Interior Epoxy Coating	$3,000	Incomplete
S. Apple Valley	6	Interior epoxy coating deterioration at manhole rim	Partial Manhole Epoxy Coating Replacement	$2,000	Incomplete
S. Apple Valley	7	Interior epoxy coating deterioration at manhole rim	Partial Manhole Epoxy Coating Replacement	$2,000	Incomplete
S. Apple Valley	8	Interior epoxy coating deterioration around manhole bench and at rim	Partial Manhole Epoxy Coating Replacement	$3,000	Incomplete
S. Apple Valley	9	Interior epoxy coating deterioration at manhole rim	Partial Manhole Epoxy Coating Replacement	$3,000	Incomplete
S. Apple Valley	10	Fair corrosion of cover frame outside normal traveled way, interior coating deteriorating	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	13	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	23	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	25	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	26	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	27	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	29	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	31	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	32	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	34	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	35	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	37	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Completed April 2008
S. Apple Valley	42A	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Completed April 2008
S. Apple Valley	63	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Completed April 2008
S. Apple Valley	64	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete

APPENDIX E - TABLE 3
Victor Valley Wastewater Reclamation Authority
Sewer Master Plan - Condition Assessment
Lower Priority Manhole Improvement Recommendations

Agency	MH ID #	Reason for Recommendation	Recommended Improvement Description	Estimated Capital Cost	Source
S. Apple Valley	65	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	66	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	68	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
S. Apple Valley	69	Moderate corrosion of cover frame outside normal traveled way	Replace cover and cover frame with corrosion resistant materials, partial re-coat of interior	$3,500	Incomplete
Victorville	RS-3	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-4	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-9	Moderate corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-10	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-11	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-12	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-13	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-15	Moderate corrosion of manhole, and minimal corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-17	Minimal corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-18	Minimal corrosion of manhole, minimal corrosion of cover frame, and grease build up on benches	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-22	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-23	Minimal corrosion of manhole, and minimal corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-24	Minimal corrosion of manhole, moderate corrosion of cover frame, and grout damaged around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-26	Minimal corrosion of manhole, moderate corrosion of cover frame, and grout damaged around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-27	Minimal corrosion of manhole, moderate corrosion of cover frame, and grout damaged around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-28	Minimal corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-30	Moderate corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-31	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-33	Minimal corrosion of manhole, minimal corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-34	Minimal corrosion of manhole, moderate corrosion of cover frame, and grout damaged around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-34A	Minimal corrosion of manhole, minimal corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-35	Minimal corrosion of manhole, minimal corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-36	Minimal corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-37	Minimal corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete

APPENDIX E - TABLE 3
Victor Valley Wastewater Reclamation Authority
Sewer Master Plan - Condition Assessment
Lower Priority Manhole Improvement Recommendations

Agency	MHID	Inspection Recommendations	Recommended Improvement Description	Estimated Capital Cost	Status
Victorville	RS-40	Minimal corrosion of manhole, moderate corrosion of cover frame, grease build up on benches, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-42	Minimal corrosion of manhole, minimal corrosion of cover frame, grease build up on benches, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	RS-43	Minimal corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	RS-44	Minimal corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	1-01	Moderate corrosion of manhole, and moderate grease build up	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	1-03	Minimal corrosion of manhole, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	2-01	Minimal corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	2-03	Moderate corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	2-05	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	2-06	Moderate corrosion of manhole, and moderate corrosion of cover frame	Cleaning, and recoating of manhole recommended	$2,500	Incomplete
Victorville	2-07	Minimal corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	2-10	Minimal corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	2-15	Minimal corrosion of manhole, and moderate corrosion of cover frame	Cleaning and recoating of manhole recommended	$2,500	Incomplete
Victorville	2-16	Minimal corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	2-18	Moderate corrosion of manhole, moderate corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	2-21B	Minimal corrosion of manhole, and moderate corrosion of cover frame	Cleaning and recoating of manhole recommended	$2,500	Incomplete
Victorville	2-23	Minimal corrosion of manhole, minimal corrosion of cover frame, and grout missing around cover frame	Cleaning and recoating of manhole, and grouting cover frame recommended	$2,500	Incomplete
Victorville	2-24	Moderate corrosion of manhole, and minimal corrosion of cover frame	Cleaning and recoating of manhole recommended	$2,500	Incomplete
Victorville	2-26	Minimal corrosion of manhole, and moderate corrosion of cover frame	Cleaning and recoating of manhole recommended	$2,500	Incomplete



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