

**APPENDIX D**

**Sanitary Sewer Study  
BKF Engineers**

# **SANITARY SEWER STUDY**

**ASSOCIATED WITH**

## **CAMPUS AT NORTH FIRST STREET PROJECT (PHASED COMMERCIAL DEVELOPMENT)**

**SAN JOSE, CALIFORNIA**

**Prepared by BKF Engineers  
BKF Job No.: 20070174-10**

**February 22, 2008  
(Preliminary Draft Copy)**

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## INTRODUCTION

The Campus at North First (CNF) project is located in San Jose in Santa Clara County, California. The existing undeveloped 42.95-acre project site is bounded by an existing commercial development and PG&E substation to the north, North First Street to the east, existing office buildings and parking lots to the south, and Orchard Parkway to the west. The project will consist of eight office/commercial buildings, four parking structures, and a recreational building. The project breaks down into four phases as follows:

Table 1 – Proposed Phased Development

Phase	Building	Office Gross Floor Area (sq ft)	Retail Gross Floor Area (sq ft)	Restaurant Gross Floor Area (sq ft)	Gym Gross Floor Area (sq ft)
1	A	338,781		17,670	
1	B	306,973	25,454		
1	C				16,969
2	D	319,745			
2	E	319,745			
3	F	349,025			
3	G	349,025			
4	H	378,305			
4	I	378,305			
<b>TOTAL</b>		<b>2,739,904</b>	<b>25,454</b>	<b>17,670</b>	<b>16,969</b>

The following report verifies that:

- The existing 8-inch line in proposed East-West Street and the 15-inch main in North First Street have adequate capacity for the Phase 1 development.
- The existing 15-inch main in Orchard Parkway has adequate capacity for the future development phases (Phase 2 through 4) at full build-out.

Sewer is a gravity system; therefore, pipe invert elevations are critical to providing service to the proposed development and tying into the existing City systems in the proposed East-West Street along southern property line, in Orchard Parkway, and in North First Street. This report will show that the existing 8-inch line in the proposed East-West Street along the southern property line, 15-inch main in North First Street, and 15-inch main in Orchard Parkway have adequate two-thirds full-capacity to convey Phase 1 and future development peak sewage flows at full build-out.

Refer to Figure 1 for proposed sanitary sewer layout.

## EXISTING SANITARY SEWER SYSTEM

The proposed project site is surrounded by an existing public and private (Component Drive) sanitary sewer collection system as follows:

- On the southern side of the project, located near the southern property line, there is an 8-inch VCP line flowing easterly toward North First Street. This pipe then connects to an existing 15-inch vitrified clay pipe (VCP) main located in North First Street, which flows north towards West Trimble Road.
- On the western side of the project, there is an existing 8 to 15-inch VCP main located within Orchard Parkway. This line starts between Charcot Avenue and Atmel Way as an 8-inch VCP line. Along the Phase 2 project frontage, between Atmel Way and Component Drive, the line increases to a 10-inch VCP main. Along the Phase 3 and 4 frontages, the sewer main increases to a 15-inch pipe and continues to flow north towards West Trimble Road, where it connects to the existing 21-inch main.
- There is a private 10-inch VCP main located within Component Drive that extends east from Orchard Parkway to the west side of the existing PG&E Substation.

The original BEA Development Project Draft EIR document, dated March 2004 entitled 2.8 million square feet of office/research and development use for the 42.95-acre site. The Draft EIR states that the City of San Jose Department of Public Works (DPW) staff was contacted during the entitlement phase and available sanitary sewer capacity within the project area was confirmed in January of 2004 (see Appendix B).

At our team meeting with the City of San Jose DPW on November 19, 2007, staff requested that a sanitary sewer flow monitoring study be conducted to confirm that existing system capacity within the development area is available to serve Phase 1 and future development phases at full build-out conditions. As a result, staff requested that two sewer manholes be monitored for four weeks (see attached Figure 2 for sampling manhole locations and Appendix C for a copy of the flow monitoring study). The 8-inch line located in the proposed East-West Street has a full and two-thirds full constructed slope capacity of 0.76 and 0.60 cubic feet per second (cfs) with a slope of 0.0040, respectively (see Appendix A, Table A3). The 15-inch main located in North First Street has a full and two-thirds full constructed slope capacity of 3.93 and 3.10 cfs with a slope of 0.0037, respectively (see Appendix A, Table A3). The 10-inch main located in Component Drive has a full and two-thirds full constructed slope capacity of 1.28 and 1.01 cfs with a slope of 0.0034, respectively (see Appendix A, Table A3). The 15-inch main located in Orchard Parkway has a full and two-thirds full constructed slope capacity of 2.89 and 2.28 cfs with a slope of 0.0020, respectively (see Appendix A, Table A3).

## **PROPOSED SANITARY SEWER SYSTEM**

The proposed on-site private sanitary sewer system will consist of new 6 to 8-inch VCP or PVC (SDR 35) sewer laterals that collect and convey each individual building sewer flow to the existing public and private (Component Drive) sanitary sewer system fronting the project site as follows:

- Phase 1, Building A – Discharge to the existing 15-inch VCP main in North First Street.
- Phase 1, Building B and C – Discharge to the existing 8-inch VCP line in the proposed East-West Street along the southern property line.
- Phase 2, Building D and E – Discharge to existing 10-inch VCP main in Component Drive.
- Phase 3, Building F – Discharge to existing 10-inch VCP main in Component Drive.
- Phase 3, Building G – Discharge to existing 15-inch VCP main in Orchard Parkway.
- Phase 4, Building H and I – Discharge to existing 15-inch VCP main in Orchard Parkway.

The flow for each office building is calculated in Appendix A, Table A1.

## **DESIGN CRITERIA**

### **Sewer Demand**

The existing off-site system was evaluated using City provided sewer demand rates for the following different uses:

- Office: 0.14 gallons per day per square foot (gpd/sf).
- Retail: 0.07 gpd/sf.
- Restaurant: 1.04 gpd/sf.
- Recreational Building (gym): 0.42 gpd/sf.

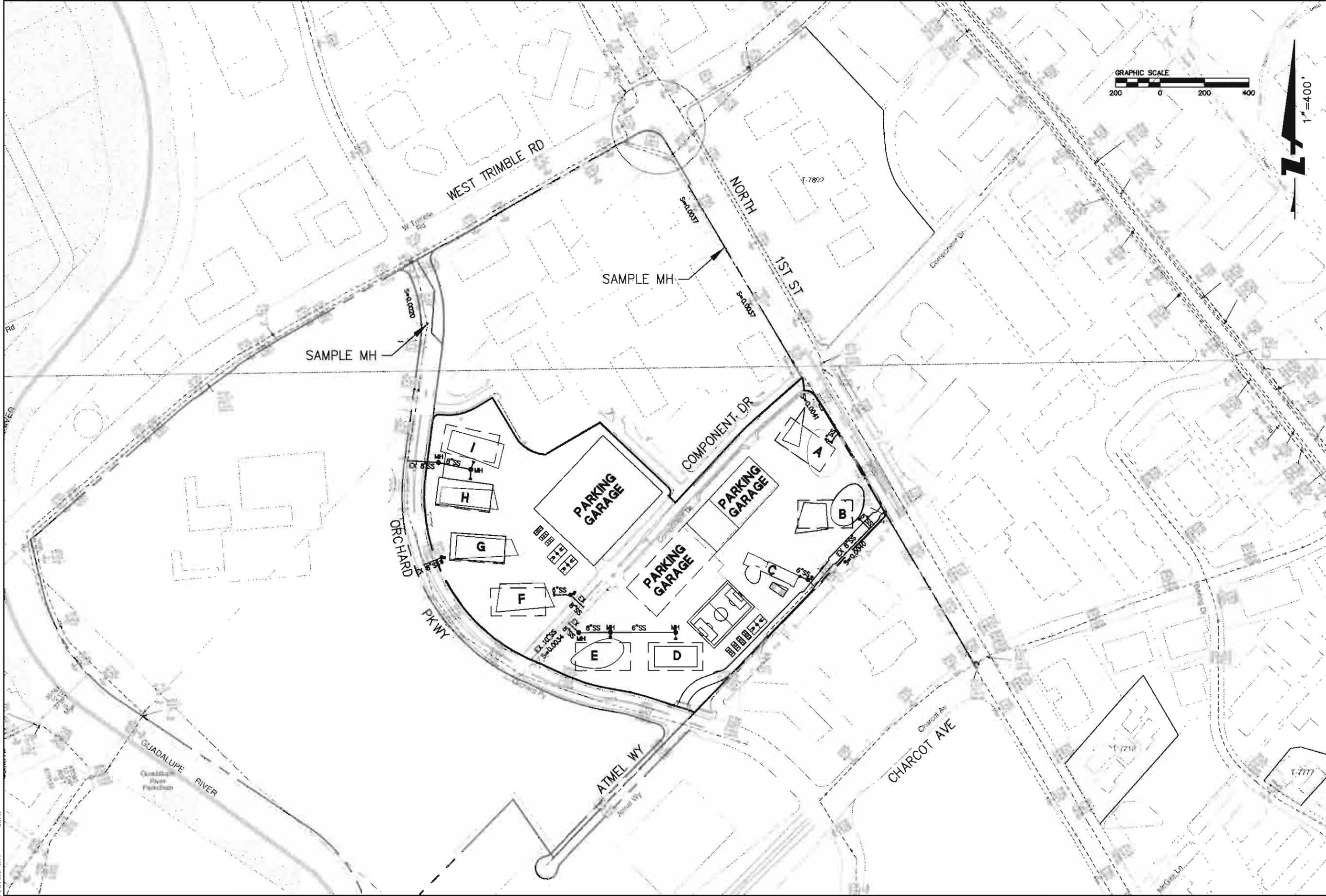
### **Hydraulic Design Criteria**

- Minimum slope for proposed 6 to 8-inch site collection line – 0.010.
- Material for proposed public 8-inch and larger pipe – Vitrified Clay Pipe (VCP).
- Material for proposed building Sewer laterals, 6 to 8-inch pipe – VCP or Polyvinyl Chloride (PVC), SDR 35.
- Coefficient of friction for existing VCP pipe (Manning's "n") – 0.013.
- Coefficient of friction for proposed VCP pipe (Manning's "n") – 0.013.
- Coefficient of friction for proposed PVC pipe (Manning's "n") – 0.013.
- Minimum cover for new pipe – 3.5 feet for mains and 3.0 feet for laterals.
- The current City of San Jose Design Guidelines for Sanitary Sewers require the peak flow rate to be determined using the formula  $Q_p = 2.49(Q_a)^{0.91}$ , where  $Q_p$  is the peak flow rate in million gallons per day and  $Q_a$  is the average flow rate in million gallons per day.
- Peak flow rate is not to exceed two-thirds full pipe capacity.

## **CONCLUSION**

The existing off-site sanitary sewer system is analyzed by comparing the constructed slope capacity to the estimated total peak flow (adding development peak demand to existing maximum daily flow, referred to as “baseline flow”, obtained from E2 study, see Appendix C). For the purpose of this report, we represented the worst case scenario by using the highest observed maximum daily demand of 0.439 (occurred February 4, 2008) and 0.266 (occurred February 8, 2008) million gallons per day (MGD) as the existing baseline flow in North First Street and Orchard Parkway, respectively (see Appendix C). The total peak flow is 0.28, 1.30, 0.66 and 1.80 for the 8-inch line in the proposed East-West Street, the 15-inch main in North First Street, 10-inch main in Component Drive, and the 15-inch main in Orchard Parkway, respectively. Using the worst case baseline scenario, the estimated total peak flow(s) are still below the two-thirds full-flow capacity for all four pipe segments within the project area (see Appendix A, Table A3). Therefore, capacity is available to serve Phase 1 and the project at full build-out conditions, which is also consistent with the conclusions reported in the original BEA Development Project Draft EIR, dated March 2004.

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**CAMPUS AT NORTH FIRST STREET  
 SANITARY SEWER STUDY**  
**FIGURE 1 - PROPOSED SITE PLAN SEWER LAYOUT**  
 SAN JOSE SANTA CLARA COUNTY CALIFORNIA

Revision	No.	Date	By

Drawing Number: 1 of 1

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City of San José  
 Department of Public Works  
 Katy Allen, Director



# SANITARY SEWER SYSTEM

Color	Description
Red	Sanitary Sewer
Pink	Sanitary Sewer
Black	Sanitary Sewer
Blue	Sanitary Sewer
Green	Sanitary Sewer
Grey	Sanitary Sewer

50  
 B

Last Revised 1/2020

CAMPUS AT NORTH FIRST  
Sanitary Sewer Study  
Appendix A

Table A1: Proposed Phase I Estimated Sewer Demand

Building Usage	Building Area (sf)	Design Flow (1) (gpd/sf)	Average Flow Rate (MGD)	Peak Flow (2) (MGD)	Day (hours)	Peak Hour Flow (gpm)	Phase Discharge to 8" Pipe at South PL (cfs)	Phase Discharge to 15" Pipe in North 1st Street (cfs)	Phase Discharge to 15" Pipe in Orchard Parkway (cfs)	Phase Discharge to 10" Pipe in Component Drive (cfs)
Phase 1 - Bldg A, Office Use	338,781	0.14	0.047	0.155	24.00	108	0.24	0.24	-	-
Phase 1 - Bldg A, Restaurant Use	17,670	1.04	0.018	0.066	24.00	46	0.10	0.10	-	-
Phase 1 - Bldg B, Office Use	306,973	0.14	0.043	0.142	24.00	99	0.22	0.22	-	-
Phase 1 - Bldg B, Retail Use	25,454	0.07	0.002	0.008	24.00	6	0.01	0.01	-	-
Phase 1 - Bldg C, Gym Use	16,969	0.42	0.007	0.028	24.00	19	0.04	0.04	-	-
<b>TOTAL</b>	<b>705,847</b>			<b>0.399</b>	<b>24.00</b>	<b>277</b>	<b>0.62</b>	<b>0.62</b>	<b>-</b>	<b>-</b>

Table A2: Proposed Future Phases (Phases 2 to 4) Estimated Sewer Demand

Building Usage	Building Area (sf)	Design Flow (1) (gpd/sf)	Average Flow Rate (MGD)	Peak Flow (2) (MGD)	Day (hours)	Peak Hour Flow (gpm)	Phase Discharge to 8" Pipe at South PL (cfs)	Phase Discharge to 15" Pipe in North 1st Street (cfs)	Phase Discharge to 15" Pipe in Orchard Parkway (cfs)	Phase Discharge to 10" Pipe in Component Drive (cfs)
Phase 2 - Bldg D & E, Office Use	639,490	0.14	0.090	0.277	24.00	192	0.43	-	0.43	0.43
Phase 3 - Bldg F & G, Office Use	698,050	0.14	0.098	0.300	24.00	208	0.46	-	0.23	0.23
Phase 4 - Bldg H & I, Office Use	756,610	0.14	0.106	0.323	24.00	224	0.50	-	0.50	-
<b>TOTAL</b>	<b>2,094,150</b>			<b>0.900</b>	<b>24.00</b>	<b>625</b>	<b>1.39</b>	<b>-</b>	<b>1.16</b>	<b>0.66</b>

Notes:

- (1) Per Exhibit E "STP COEFFS. & RATES" received from Vivian Tom on 1/15/2008
- (2) Peak Flow = 2.49 \* (Average Flow Rate)<sup>0.91</sup> per City of San Jose - Design Guidelines for Sanitary Sewers

**CAMPUS AT NORTH FIRST**  
Sanitary Sewer Study  
Appendix A

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Table A3: Existing Off-Site Sanitary Sewer Pipe Capacity

Building Usage	Pipe Size (inches)	Constructed Slope (ft/ft)	Full Flow Capacity (MGD)	2/3 Full Flow Capacity (cfs)	2/3 Full Flow Depth (3) (ft)	Observed Max Flow Depth (4) (ft)	Observed Max Flow (4) (MGD)	Observed Max Flow (4) (cfs)	Phase 1 Peak Project Demand (5) (cfs)	Future Phase Peak Project Demand (5) (cfs)	Estimated Total Peak Flow (cfs)	Percentage of Full Flow Pipe Capacity (%)	Percentage of 2/3 Full Flow Pipe Capacity (%)
Discharge to 8" Pipe at South PL (Bldg. B & C)	8	0.0040 (1)	0.491	0.60	5.4	0.00	0.000	0.00	0.28	0.00	0.28	36	46
Discharge to 15" Pipe in North 1st Street (Bldg. A, B & C)	15	0.0037 (1)	2.540	3.10	10.1	6.4	0.439	0.68	0.62	0.00	1.30	33	42
Discharge to 10" Pipe in Component Drive (Bldg. D, E & F)	10	0.0034 (2)	0.827	1.01	6.7	0.00	0.000	0.00	0.00	0.66	0.66	52	65
Discharge to 15" Pipe in Orchard Parkway (Bldg. D, E, F, G, H & I)	15	0.0020 (2)	1.868	2.28	10.1	2.8	0.266	0.41	0.00	1.39	1.80	62	79

**Notes:**

- (1) Pipe slope field surveyed by BKF Engineers
- (2) Pipe slope per record drawings for Lands of Agilent Technologies, Inc. by Nolte and Associates, dated October 17, 2003.
- (3) City of San Jose Sanitary Sewer Design Standards Requirement.
- (4) Observed flow and depth provided by E2.
- (5) Peak Flow = 2.49 \* (Average Flow Rate)<sup>0.91</sup> per City of San Jose - Design Guidelines for Sanitary Sewers. Demands based on Loads, designated by use, provided by Vivian Tom at the City of San Jose Public Works Department.

**K. UTILITIES**

The information provided in this section is based on a utilities investigation prepared by *HMH Engineers* (see Appendix I).

1. **Existing Setting**

**Water Service**

Water service to the project site is provided by San José Municipal Water System (SJMW). There is currently a 12-inch water main in O'Nel Drive and a 12-inch water main in Guadalupe Parkway. North First Street has a 17.25-inch water main that transitions to a 16-inch line and then a 12-inch line as it goes north. Orchard Parkway currently has a 12-inch water main, and Component Drive has an 18-inch water main. Based on information provided by SJMW, there is adequate water available to support the domestic water demand and fire flow requirements of the proposed project<sup>17</sup>.

**Sanitary Sewer/Wastewater Treatment**

Wastewater from the City of San José is treated at the San Jose/Santa Clara Water Pollution Control Plant, located near Alviso. The Water Pollution Control Plant (WPCP) is owned jointly by the two cities and operated by the City of San Jose's Department of Environmental Services. The WPCP provides primary, secondary, and tertiary treatment of wastewater and has the capacity to treat 167 million gallons of wastewater a day (mgd).<sup>18</sup>

The WPCP is currently operating under a 120 million gallon per day dry weather effluent flow constraint. This requirement is based upon the State Water Resources Control Board and the Regional Water Quality Control Board concerns over the effects of additional freshwater discharges from the WPCP on the saltwater marsh habitat, and pollutant loading to the Bay from the WPCP. Approximately ten percent of the plant's effluent is recycled for non-potable uses and the remainder flows into San Francisco Bay.

Currently, there is a 15-inch sewer main located in North First Street and two sewer mains (a 10-inch and a 15-inch) located in Orchard Parkway. An 8-inch sewer main is located along the southern boundary of the project site that connects to the mains in North First Street and Orchard Parkway. Based on information provided by the City of San José Public Works Department, there is adequate sewer capacity to accommodate the proposed project<sup>19</sup>.

**Storm Drainage System**

The City of San José owns and maintains the storm drainage system which serves the project site. The storm drainage system flows to a pump station that then discharges to the Guadalupe River. Currently, there is one 48-inch storm drain transitioning to a 54-

<sup>17</sup> Tim Town, San José Municipal Water System, January 2004

<sup>18</sup> City of San Jose Website

<sup>19</sup> Mike O'Connell, San José Public Works Department, January 2004

inch line in North First Street, a recently constructed 96-inch line in Orchard Parkway, and a recently constructed 30-inch line in Component Drive. The lines that serve the project site drain into the Guadalupe River. The Guadalupe River flows north, carrying the effluent from the storm drains into San Francisco Bay. There is no overland release of stormwater directly into any water body from the project site.

### **Solid Waste**

Commercial solid waste generated in San José is collected under non-exclusive collection franchises, and may be disposed of at any of the four privately owned landfills in San José. According to the Source Reduction and Recycling Element prepared for the City of San José and the County-wide Integrated Waste Management Plan, there is sufficient landfill capacity for Santa Clara County needs for at least 25 more years. Recycling services are available to most businesses.

## **2. Utilities Impacts**

### **Thresholds of Significance**

For the purposes of the EIR, a utility and service impact is considered significant if the project would:

1. Require or result in the construction of new stormwater or wastewater facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
2. Result in a determination by the wastewater treatment provider that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
3. Need new or expanded entitlements for water supplies; or
4. Be served by a landfill with insufficient permitted capacity.

### **Water Service**

At full build out, the proposed development would result in a water demand of approximately 392,000 to 504,000 gallons per day (the proposed project would represent half of this total).<sup>20</sup> Based on analysis of the project by San José Municipal Water, it has been determined that there is adequate water supply to support the proposed development.

### **Sanitary Sewer/Wastewater Treatment**

At full build out, the proposed development would result in a total estimated wastewater flow of 392,000 gallons per day (gpd) with a total peak discharge of 784,000 gpd (the proposed project would represent half of this total). Based on information provided by the City of San José Public Works Department, there is adequate sewer capacity in North First Street, Orchard Parkway, and Component Drive to accommodate the proposed project.

<sup>20</sup> Based on the San José Municipal Water system rates for Office and Design-Engineering Office uses (0.140 and 0.180 gallons per day per square foot respectively).

## Sanitary Sewer

### **Background**

Sanitary sewer service is provided to the site by the City of San Jose. Wastewater is treated at the San Jose/Santa Clara Water Pollution Control Plant (WPCP) located in Alviso. The WPCP is a regional facility that provides primary, secondary, and tertiary wastewater treatment for several surrounding cities and sanitation districts. The cities of San Jose and Santa Clara jointly own the facility, but San Jose operates and maintains the plant.

During average dry weather, the WPCP is permitted to treat up to 167 million gallons per day (mgd) of wastewater. The WPCP's treatment capacity of 167 mgd is allocated between the several agencies served. The total capacity allocated to the City of San Jose is approximately 106 mgd (Joe Denk, City of San Jose, May 2003).

Sanitary sewer lines serving the project area consist of an existing 15" sewer main northeast of the project site in North First Street, a 10" and 15" sewer main in Orchard Parkway, and an 8" sewer main along the southeast boundary of the project site connecting to the sewer mains in North First Street and Orchard Parkway. Sanitary sewer laterals enter the site at various locations to provide service to the project.

Future development on the project site will generate additional demand for wastewater treatment. In order to reduce flows, the City encourages constituents to use recycled (i.e., reclaimed) water as much as possible. Additional measures recommended by the City's Environmental Services Division to reduce sewage production include: (1) standard water conservation measures, (2) installation of public fountains, (3) use of recycled (reclaimed) water for irrigation, and (4) double piping to allow use of reclaimed water for toilets. These measures would be incorporated into future industrial uses as required.

Based upon current flow in the sanitary sewers adjacent to the proposed development, adequate capacity would be available to serve the anticipated project (Mike O'Connell, San Jose Public Works, January 2004).

### **General Plan Policies**

- Sewage Treatment Policy #7 states that the City should monitor and regulate growth so that the cumulative sewage treatment demand of all development can be accommodated by San Jose's share of the treatment capacity of the San Jose/Santa Clara Water Pollution Control Plant
- Sewage Treatment Policy #9 states that the City should continue to encourage water conservation programs which result in reduced demand for sewage treatment capacity.

### **Program-level Measures**

- Any required upgrade to the sanitary sewer line capacity to serve future industrial development would be funded by developer fees.

**CAMPUS AT NORTH FIRST**  
**Sanitary Sewer Study**  
**Appendix C**

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**North First Sanitary Flow First 2 Weeks as 15" Pipe**

**Daily Summary**

Date	Avg Flow(MGD)	Min Flow(MGD)	Max Flow(MGD)	Max Depth(in.)	Rain(in.)
1/29/08	0.082	0.000	0.290	6.210	0.01
1/30/08	0.195	0.095	0.352	6.514	0.05
1/31/08	0.199	0.104	0.369	6.374	0.07
2/1/08	0.198	0.112	0.354	6.388	0.01
2/2/08	0.162	0.112	0.227	5.701	0.05
2/3/08	0.159	0.102	0.316	5.791	0.08
<b>2/4/08</b>	<b>0.201</b>	<b>0.058</b>	<b>0.439</b>	<b>6.364</b>	<b>0.00</b>
2/5/08	0.187	0.088	0.379	6.212	0.00
2/6/08	0.187	0.080	0.344	6.161	0.00
2/7/08	0.174	0.090	0.342	6.144	0.00
2/8/08	0.171	0.085	0.337	6.262	0.00
2/9/08	0.124	0.083	0.182	5.429	0.00
2/10/08	0.135	0.084	0.327	5.700	0.00
2/11/08	0.160	0.088	0.281	5.999	0.00
2/12/08	0.169	0.100	0.285	5.983	0.00
2/13/08	0.160	0.094	0.349	6.028	0.00
2/14/08	0.159	0.081	0.317	6.065	0.00

**Notes:**

Preliminary flow sampling data provided by E2.

Information shall be considered preliminary until the final report is prepared.

**BKF ENGINEERS**

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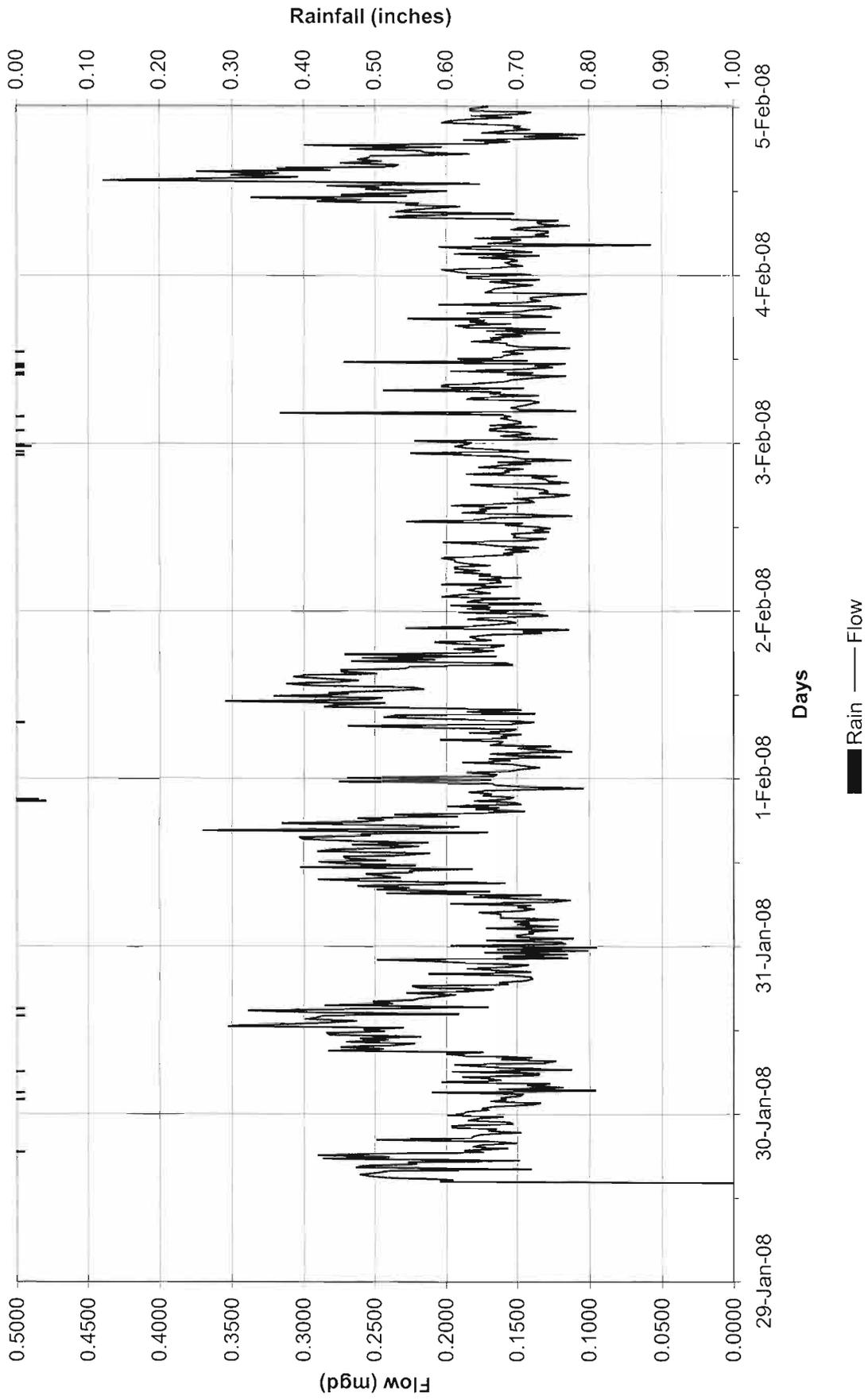
Ph: 650-482-6300

K:\MAIN\2007\070174\06 Design Information - Reports\E Sanitary Sewer System\Sewer Flow Study - E2\08\_0220 \_ BKF Chart 4\North 1st 2 weeks Flow Plot.xls

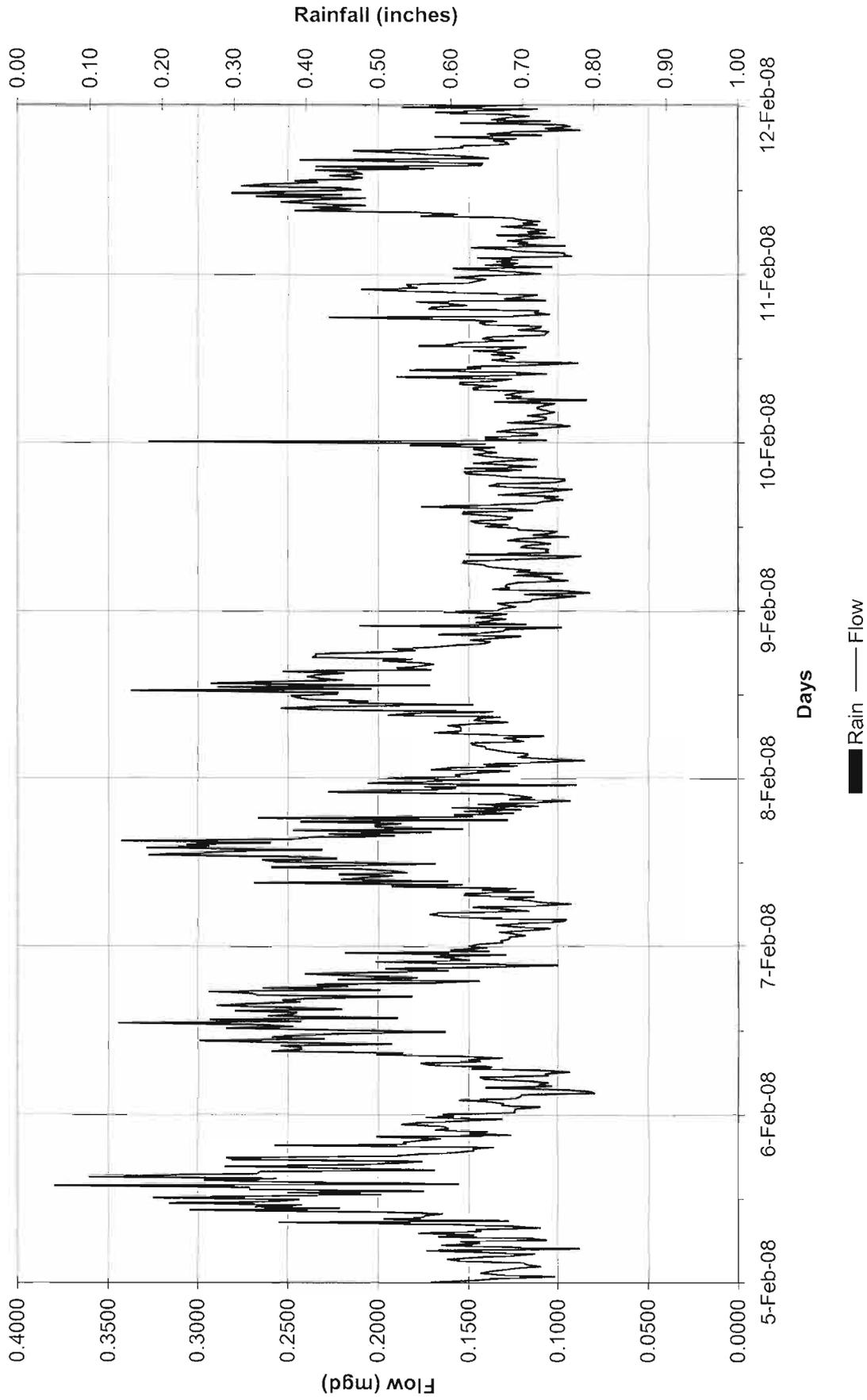
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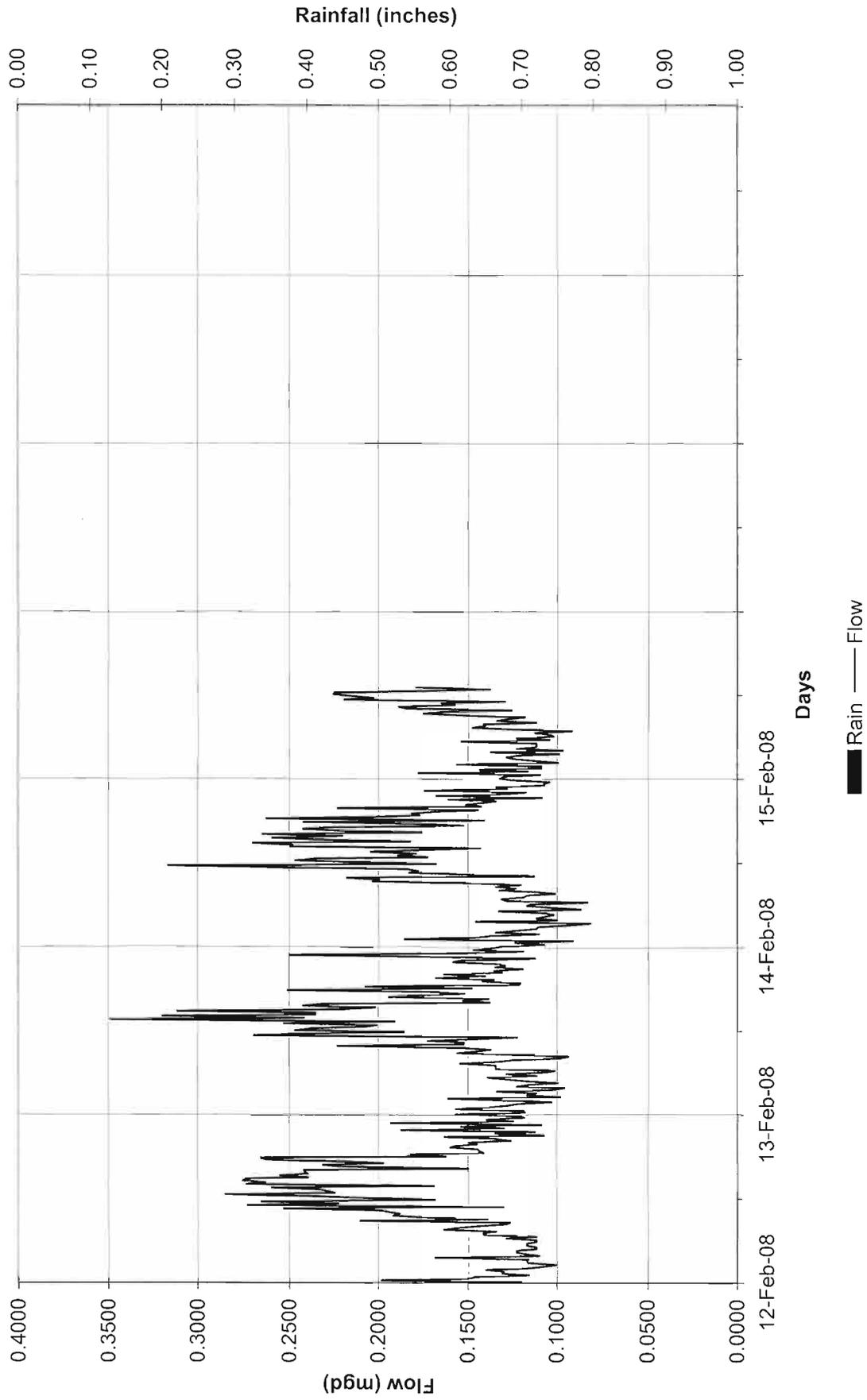
# North First Sanitary Flow First 2 Weeks



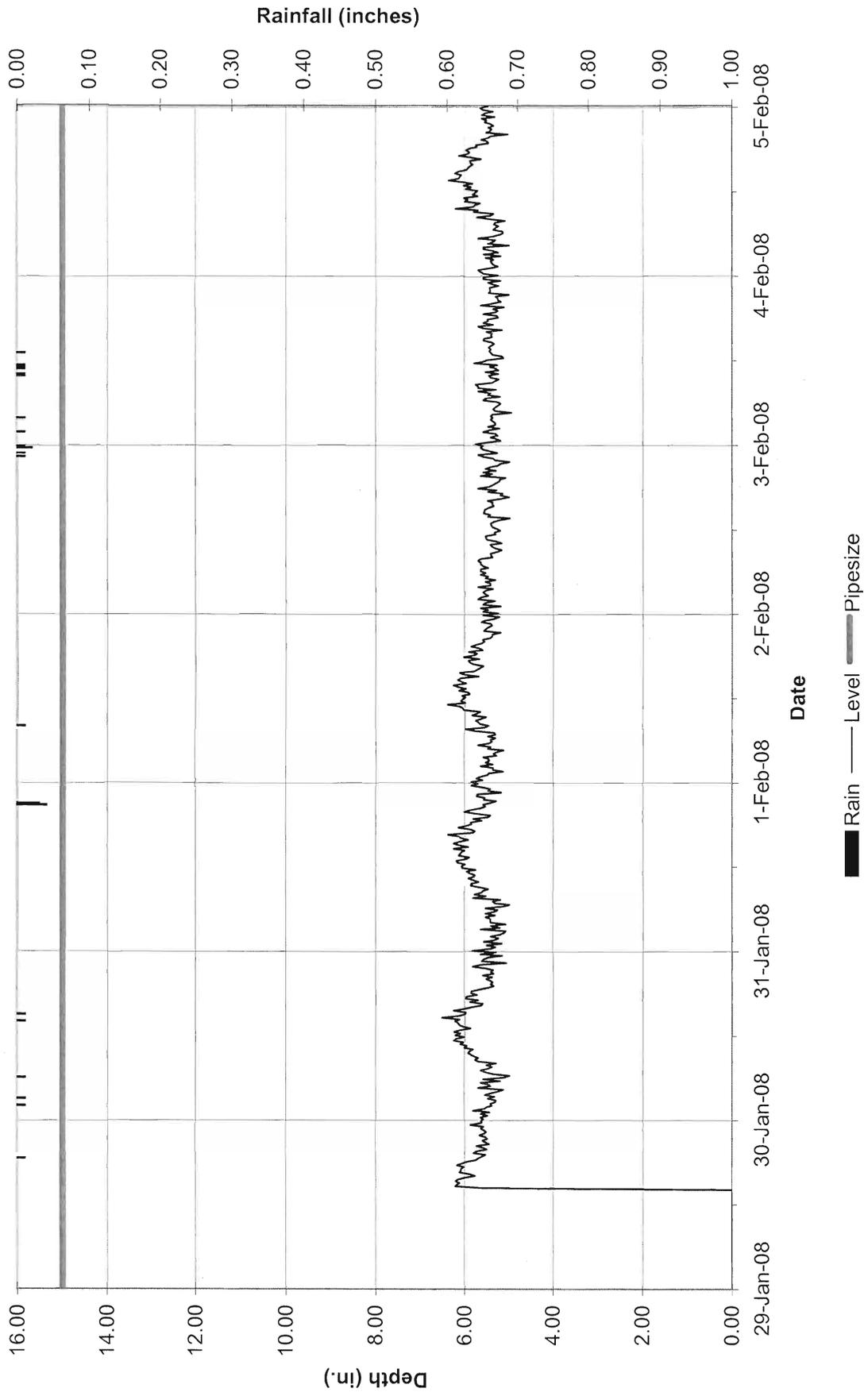
# North First Sanitary Flow First 2 Weeks



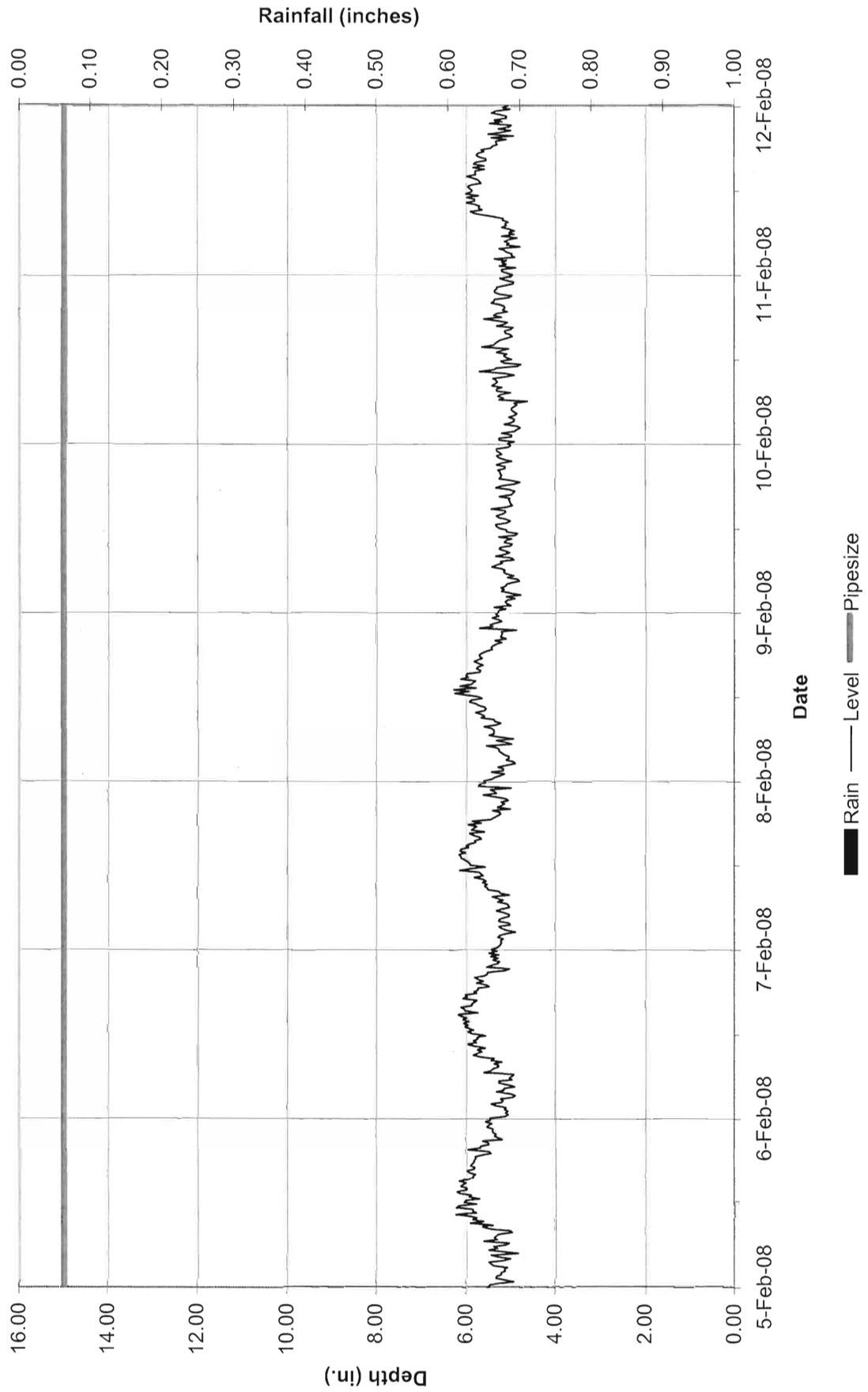
# North First Sanitary Flow First 2 Weeks



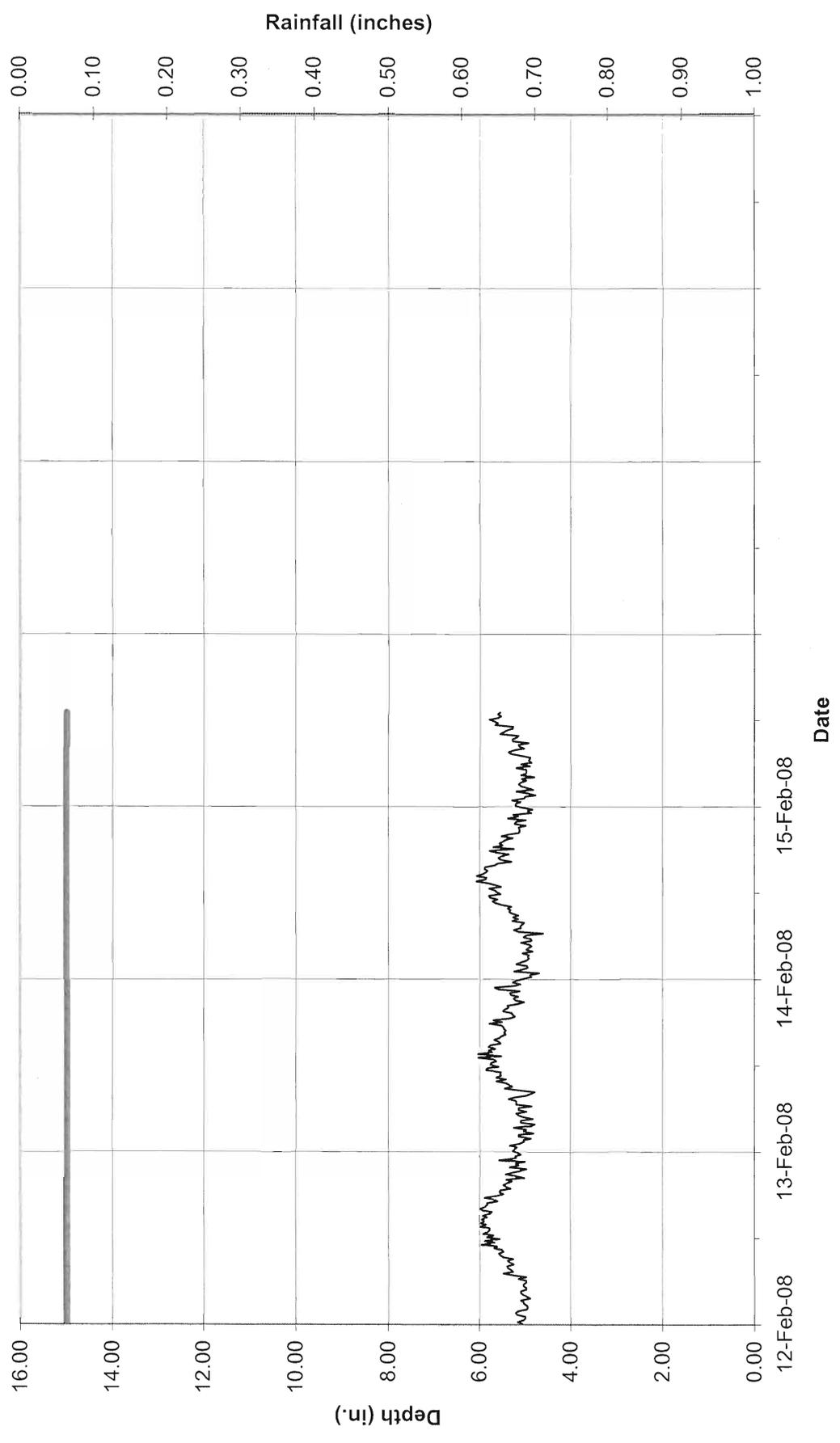
# North First Sanitary Flow First 2 Weeks Depth



# North First Sanitary Flow First 2 Weeks Depth



# North First Sanitary Flow First 2 Weeks Depth



■ Rain — Level — Pipe size

## Flow Monitoring Services Campus



Campus Site 2 SV.JPG



Campus Site 2 IV.JPG



Campus Site 2 IVZ.JPG



Campus Site 2 P0.JPG

## Flow Monitoring Services

### Campus



Campus Site 2 P1.JPG



Campus Site 2 P2.JPG

**CAMPUS AT NORTH FIRST**  
**Sanitary Sewer Study**  
**Appendix C**

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**Orchard Sanitary Flow First 2 Weeks**

**Daily Summary**

Date	Avg Flow(MGD)	Min Flow(MGD)	Max Flow(MGD)	Max Depth(in.)	Rain(in.)
1/29/08	0.076	0.000	0.236	2.779	0.01
1/30/08	0.149	0.056	0.232	2.953	0.05
1/31/08	0.162	0.064	0.262	2.967	0.07
2/1/08	0.150	0.038	0.231	2.715	0.01
2/2/08	0.145	0.064	0.213	2.598	0.05
2/3/08	0.147	0.051	0.231	2.605	0.08
2/4/08	0.174	0.075	0.246	2.733	0.00
2/5/08	0.162	0.070	0.248	2.737	0.00
2/6/08	0.161	0.064	0.242	2.680	0.00
2/7/08	0.181	0.045	0.264	2.741	0.00
<b>2/8/08</b>	<b>0.164</b>	<b>0.094</b>	<b>0.266</b>	<b>2.837</b>	<b>0.00</b>
2/9/08	0.124	0.060	0.176	2.731	0.00
2/10/08	0.112	0.059	0.146	2.625	0.00
2/11/08	0.136	0.055	0.209	2.754	0.00
2/12/08	0.135	0.055	0.210	2.633	0.00
2/13/08	0.157	0.110	0.245	2.624	0.00
2/14/08	0.150	0.096	0.221	2.685	0.00

**Notes:**

Preliminary flow sampling data provided by E2.

Information shall be considered preliminary until the final report is prepared.

**BKF ENGINEERS**

255 Shoreline Drive, Suite 200

Redwood City, CA 94065

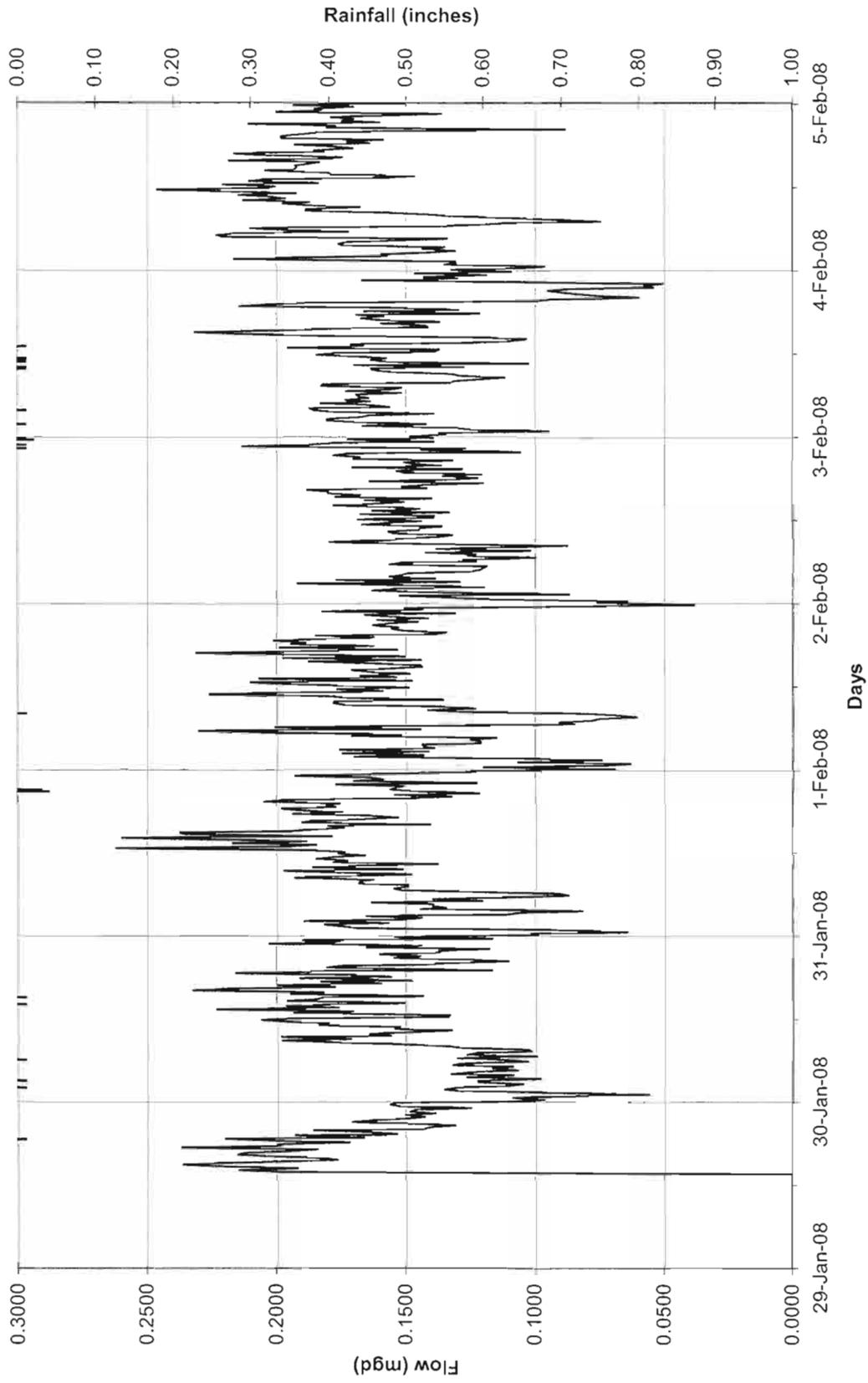
Ph: 650-482-6300

K:\MAIN\2007\070174\06 Design Information - Reports\E Sanitary Sewer System\Sewer Flow Study - E2\08\_0220 \_ BKF Chart 4\Orchard PY 2 weeks Flow Plot.xls

February 22, 2008  
(Preliminary Draft Copy)

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# Orchard Sanitary Flow First 2 Weeks

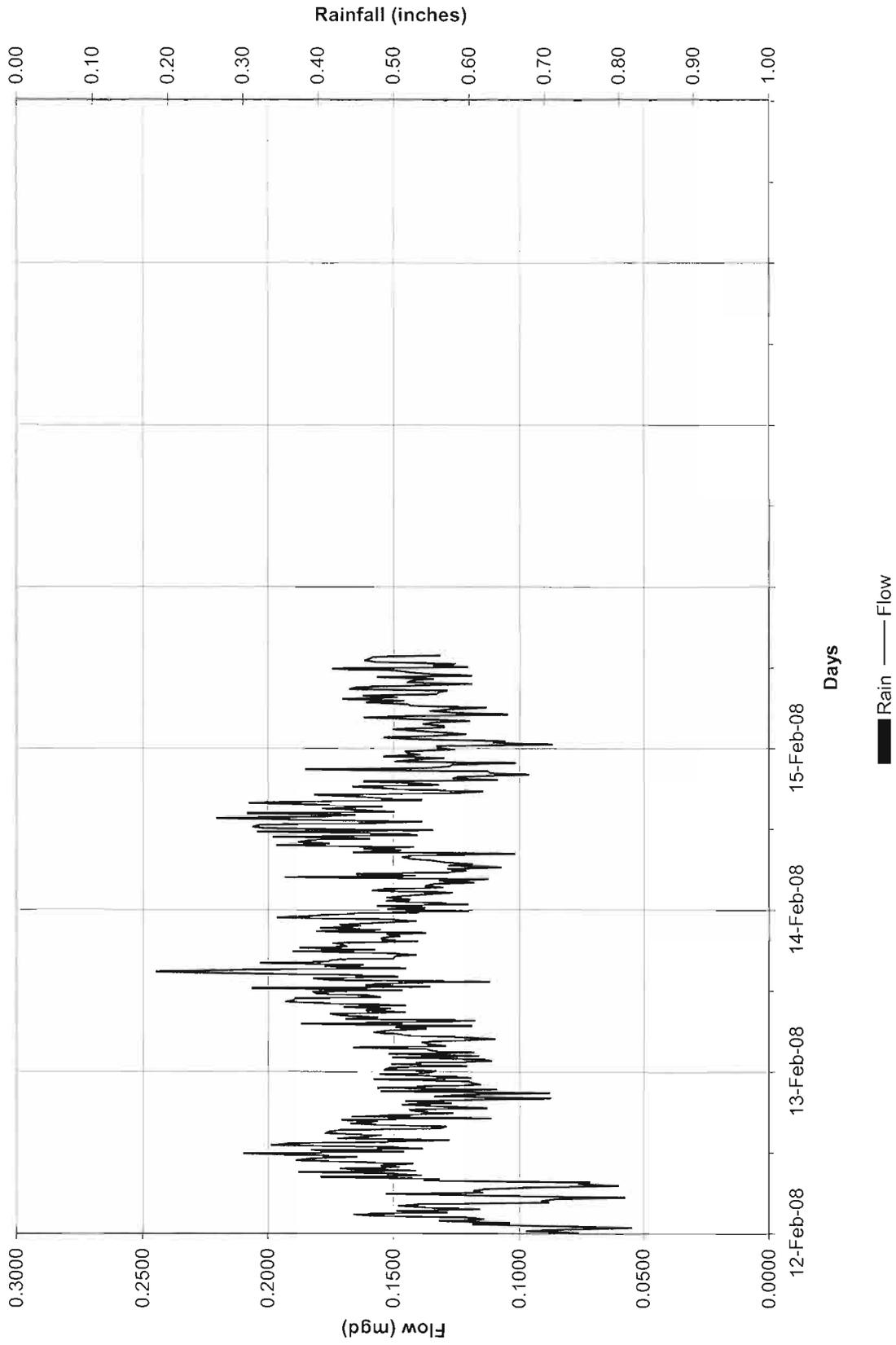


Rain
  Flow

	12:00:00 AM								
Maximum	0.236	0.232	0.262	0.231	0.231	0.213	0.231	0.231	0.246
Average	0.076	0.149	0.162	0.150	0.150	0.145	0.147	0.147	0.174
Minimum	0.000	0.056	0.064	0.038	0.038	0.064	0.051	0.051	0.075
Rain (inches)	0.01	0.05	0.07	0.01	0.01	0.05	0.08	0.08	0.00

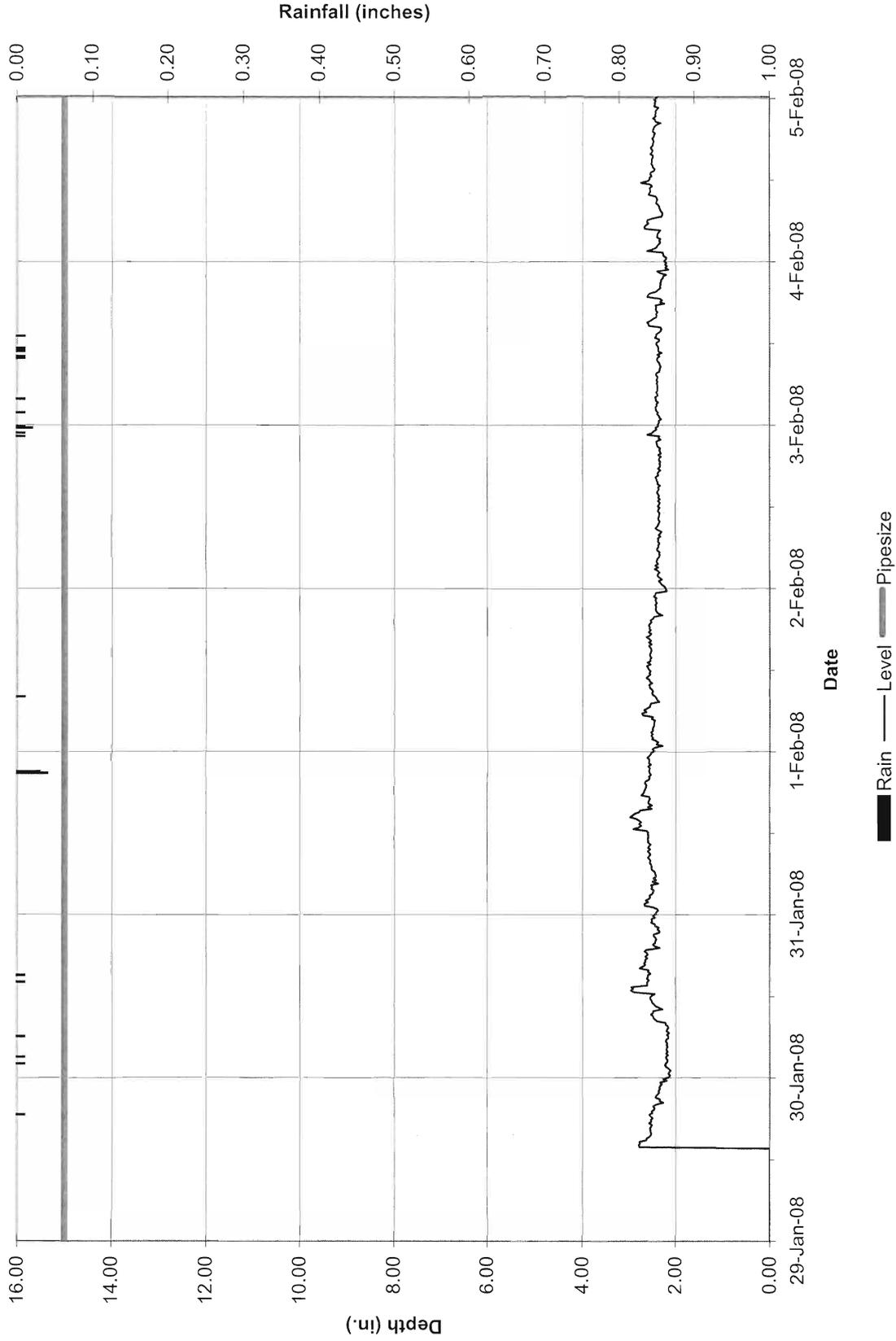


# Orchard Sanitary Flow First 2 Weeks



	12:00:00 AM	12:00:00 AM	12:00:00 AM
Maximum	0.210	0.245	0.221
Average	0.135	0.157	0.150
Minimum	0.055	0.110	0.096
Rain (inches)	0.00	0.00	0.00

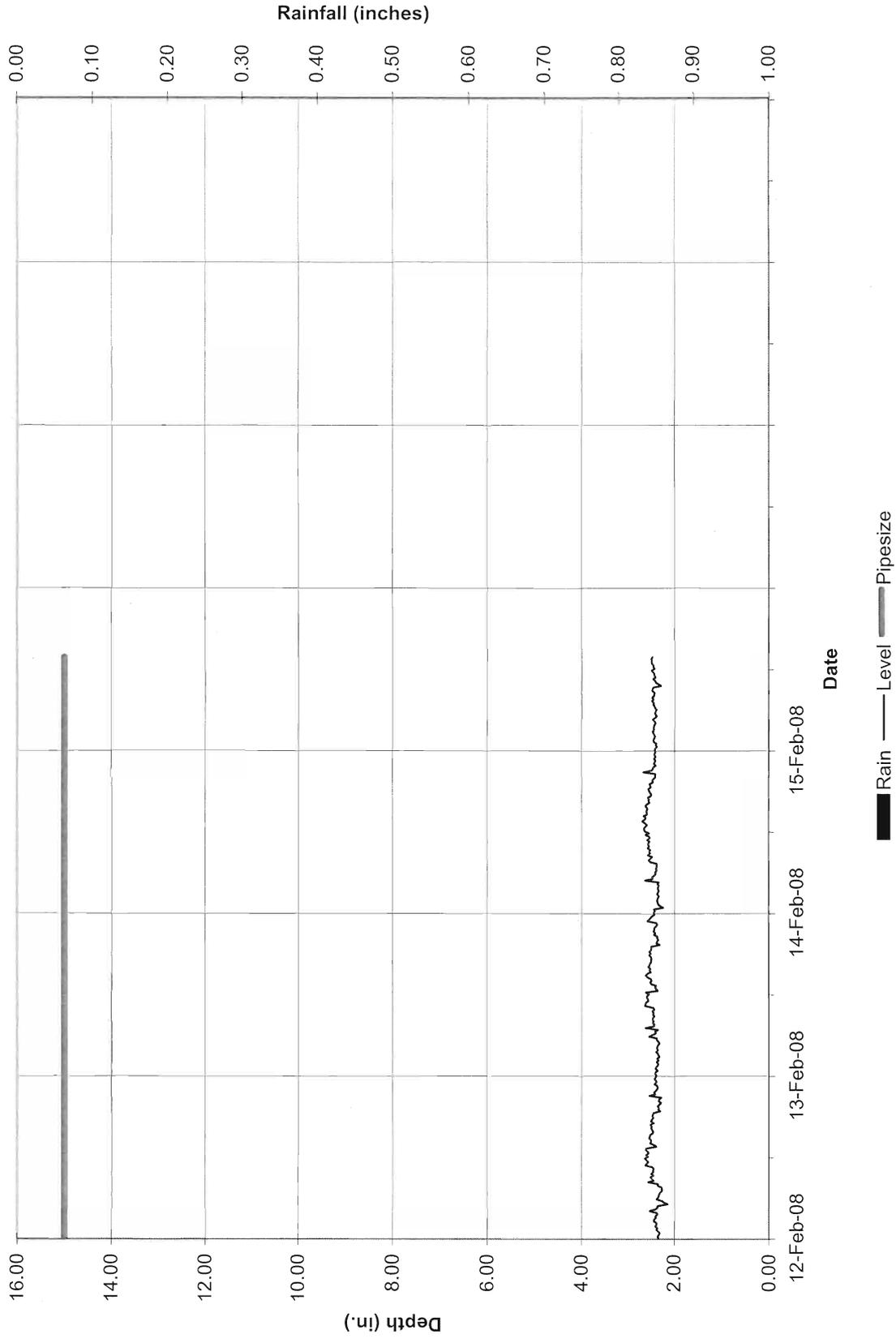
# Orchard Sanitary Flow First 2 Weeks Depth



	12:00:00 AM								
Maximum	2.779	2.953	2.967	2.715	2.598	2.605	2.605	2.733	2.733
Average	1.054	2.410	2.578	2.494	2.357	2.368	2.368	2.441	2.441
Minimum	0.000	2.138	2.361	2.188	2.218	2.149	2.149	2.204	2.204
Rain (inches)	0.01	0.05	0.07	0.01	0.05	0.08	0.08	0.00	0.00



# Orchard Sanitary Flow First 2 Weeks Depth



	12:00:00 AM				
Maximum	2.633	2.624	2.685	2.491	
Average	2.420	2.450	2.485	2.432	
Minimum	2.141	2.313	2.237	2.473	
Rain (inches)	0.00	0.00	0.00	0.00	0.00

## Flow Monitoring Services Campus



Campus Site 1 SV.JPG



Campus Site 1 IV.JPG



Campus Site 1 P0.JPG



Campus Site 1 P1.JPG