APPENDIX A

MANHOLE INSPECTION
TECHNICAL MEMORANDUM

MEMORANDUM

To: Mark Welsh
County of San Mateo, DPW

From: Charlie Joyce
Brown & Caldwell

Date: October 12, 1998 File- 4692.01/10

Subject: Sanitary Sewer and Water System Evaluation Study
Manhole Inspection Memorandum of Field Work

INTRODUCTION

This memorandum presents a summary of the field investigations conducted during the winter and spring of 1997 on inspection of manholes in the nine sewer districts maintained by the San Mateo County Department of Public Works. A total of 873 manholes in the nine districts were inspected with the following in each district:

Table 1
Number of Manholes Inspected By District

District	Manholes Inspected
Burlingame Hills Sewer Maintenance District	90
Crystal Springs County Sanitation District	257
Devonshire County Sanitation District	37
Emerald Lake Heights Sewer Maintenance District	233
Fair Oaks Sewer Maintenance District	204
Harbor Industrial Sewer Maintenance District	22
Kensington Square Sewer Maintenance District	6
Oak Knoll Sewer Maintenance District	17
Scenic Heights County Sanitation District	7

The purpose of this memorandum is to provide the background of how the manholes inspections were conducted, manhole numbering, interpretation of the manhole data, how the data will be used for other parts of the sanitary sewer collection system evaluation, and a summary of critical locations in the districts where repair work should take place. The memorandum also includes descriptions on how to locate photographs related to an inspected manhole in the 12 three ring binders provided at the completion of this project.

This memorandum does not provide the condition assessment of the sanitary collection system. That work effort will be completed as part of a later task in the project when the other parts of the field data, namely flow monitoring, television inspection, and smoke testing, are completed.

MANHOLE INSPECTION OVERVIEW

A key part of the data collection consisted of documenting the findings of the inspections for analysis. Two methods of documenting the manhole inspection were used for this project. The first was a field form set up to allow the field crew to collect data in an efficient manner on the condition of the manhole. The second method of documenting the manhole condition was to photograph defects found during the visual inspections. The manhole inspections were top side inspections where the condition of the manhole was observed from the surface.

In order to collect additional data on each manhole location a "Camera on a Stick" (Figure 1) was lowered into the manhole and a photograph of each pipe entering and leaving the manhole was taken. Where infiltration/inflow or other manholes conditions warranted a photograph was also taken from the "Camera on a Stick".

The view in the pipeline using the "Camera on a Stick" is dependent on the flow, debris, and channel benching in the manhole. Where the camera can be placed in the channel with a clear view of the pipeline the photograph typically shows approximately 20 feet of the sewer away from the manhole for an 8-inch diameter sewer. Larger sewer diameters typically show a longer distance and smaller sewer diameters show a shorter distance.

Figure 1

Pipes were photographed in a clockwise direction to avoid confusion and to allow for cataloging the photographs. Pipe A was always the first pipe in the clockwise direction from the primary outlet pipe(s). Drop manholes would have a photograph taken of both the top and bottom of the drop manhole and were noted as such in the comment field of that pipe. Each pipe in the drop manhole pipe was given a separate pipe identifier.

A copy of a blank field form used to document manhole conditions is included as Attachment A. Also in that attachment is a blank form for the pipe condition assessment that was completed for each pipe when the photographs were reviewed.

Manhole numbering modifications to the existing manholes numbering system for each basin were performed so that each manhole in the nine districts has a discrete unique label. The manhole number is an eight character alpha/numeric with the following definition:

B0001A04

B	Burlingame Hills, see Table 2.
0001	Manhole Number with zeros shown for place holders.
A	Several manholes were placed after initial numbering using a letter - A, B, etc. When not needed this part of field is left blank.
04	District Map Number as supplied by County.

Table 2
District Designators

District	Designator
Burlingame Hills Sewer Maintenance District	B
Crystal Springs County Sanitation District	C
Devonshire County Sanitation District	D
Emerald Lake Heights Sewer Maintenance District	E
Fair Oaks Sewer Maintenance District	F
Harbor Industrial Sewer Maintenance District	H
Kensington Square Sewer Maintenance District	K
Oak Knoll Sewer Maintenance District	O
Scenic Heights County Sanitation District	S

The manholes were numbered as the inspections were completed. Each completed form was then entered into a Microsoft Access v2.0 database that was programmed for manhole inspection analysis. Each item on the inspection form was input to the data base. The checks and boxes on the inspection form translate to a yes/no or numerical value in the database for future use in the condition assessment analysis. Data related to the pipe photographs were entered directly into the database after the photographs were developed and reviewed.

Manholes were selected for inspection to provide a representative random sample of the manholes in each of the nine districts. Manholes were identified for inspection from the collection system maps. The manholes selected normally met one of the following criteria:

- Connection of more than two sewers entering the manhole
- One of the sewers entered into or exited from an easement
- The sewer segment appeared typical to the area served
- A special flow connection or cross-connection was shown on the maps
- A manhole with many laterals entering, such as a cul-de-sac.

Manholes located in easements were also inspected, although access to many of these manholes was not possible due to obstructions, locked gates, or the occasional fence built over the manhole. Traffic control measures were used to route vehicles around the field crew and the crew followed safety precautions as outlined in the Field Health and Safety Plan required on all

Brown and Caldwell field related projects.

MANHOLE INSPECTION BINDERS

A series of three-ring binders containing the print outs from the database with the accompanying photographs for each inspected manhole were assembled. The binders are numbered by an alpha/numeric format where the first letter corresponds to the district and the number corresponds to the binder number for that district. This format allows for future manhole inspections to be placed in successive binders. A field was added to the database so that the binder number could be attached to the manhole number.

A summary report is contained at the front of each binder to facilitate the location of a manhole. The summary report is provided in two orientations: 1) by film roll number, and 2) by manhole number. The contents of the binders area are arranged by film roll number for each District, rather than by manhole number.

The photographs for each manhole are arranged so the first photo (normally upper left) is the manhole number followed by the manhole cover, channel, or other defect photographs. The pipe photographs follow using the same convention as identified in the field inspection, beginning with Pipe A and proceeding through to Pipe X.

Locating a manhole in the binders is most easily accomplished by using the database query "BINDER/ROLL/MHID" to identify the binder number and the roll number of the associated photographs and then looking up the database print out and photographs in the appropriate binder.

Of the 873 manholes inspected a total of 2,480 pipes were photographed. The following tables provide summary information related to the manholes and pipes inspected. The tables are arranged by manhole number. Specific database reports for manholes and pipes, Attachments B and C, respectively, follow this memorandum.

Manholes
Manholes with Bench/Channel Defects Worse Than Moderate
Manholes with Roots
Manholes with Grease
Manholes with Frame and Cover Problems
Manholes with Infiltration/Inflow and Flow Caps
Manholes with Major Debris in Channel

Pipes
Pipes with Separated Joints Greater than Moderate and Deflections Greater than One Inch

Pipes with Greater than Minor Corrosion
Pipes with Infiltration/Inflow
Pipes with Greater than Light Grease
Pipes with Greater than Light Roots
Pipes with Roots and Grease
Pipes with Cracks and Fractures
Pipes with Plugs and Obstructions

Insert “B” Tab Here

APPENDIX B

1997 FLOW MONITORING PROGRAM TECHNICAL MEMORANDUM

MEMORANDUM 4692-02

November 19, 1997

TO: MARK WELCH, COUNTY OF SAN MATEO

FROM: BRIAN HAMMER, BROWN AND CALDWELL
CHARLIE JOYCE, BROWN AND CALDWELL

SUBJECT: COUNTY OF SAN MATEO MASTER PLAN
1997 FLOW MONITORING PROGRAM

This memorandum documents the flow monitoring program conducted for the County of San Mateo Master Plan during the winter of 1997. The purpose of the project was to measure the flow rate during dry weather and discrete rainfall events in the San Mateo County area. This memorandum discusses the flow monitoring program and subsequent data analysis. Results of the flow monitoring program are attached.

Flow Monitoring Locations

A flow monitoring plan was developed to determine dry weather flow rates and Inflow/Infiltration (I/I) rates in the County of San Mateo wastewater collection system. As part of the flow monitoring plan, specific locations within the County sanitary collection systems where temporary flow monitors and rain gauges could be installed were identified and evaluated. Potential monitoring site evaluations were conducted the week of January 16, 1997, by Brown and Caldwell staff.

During the field evaluation, manholes were inspected to determine their hydraulic suitability for flow monitoring and accessibility. Special safety considerations were also documented. Fifteen manholes were selected for temporary flow monitoring among the nine sewer district. Additionally, four rain gauge sites in the County collection system were also located and evaluated. The selected flow monitoring sites and rain gauge locations are listed in Table 1 and Table 2, respectively. Flow monitoring site reconnaissance forms for the selected manholes are included in Attachment A. Included in Attachment A are schematic diagrams of each sewer district showing the flow monitor locations.

Table 1 Flow Monitoring Locations

Flow monitor site	Location	Pipe diameter, in.
11	Burlingame Hills - 2815 Adeline near Alvarado	8
12	Burlingame Hills - 2872 Canyon Road	8
21	Crystal Springs - Polhemus Road near Ascension Street	10
22	Crystal Springs - Polhemus Road and Ticonderoga Road	8
31	Devonshire - Devonshire Road and Exeter Street	8
41	Emerald Lake - 1706 Cordilleras Road	8
42	Emerald Lake - Lake Boulevard and Oak Knoll Drive	8
43	Emerald Lake - Glenwood Drive at Garret Park	6
44	Emerald Lake - 1036 Lakeview Drive	6
51	Fair Oaks - Douglas Court. (end)	30
52	Fair Oaks - Bay Road at Willow Street.	30
53	Fair Oaks - 559 Oakside Drive	21
54	Fair Oaks - 343 Nimitz Avenue.	15
55	Fair Oaks - Woodside Road. near Churchhill	10

Table 2 Rain Gauge Locations

Rain gauge no.	Location
1	Burlingame Hills - Hillside at Newton, Fire Station #2
2	Crystal Springs - 2295 Cobble Hill at Ticonderoga Road (private residence)
3	Emerald Lake - California at Jefferson, Fire Station #19
4	Fair Oaks - Bay Road at 2nd Street., Fire Station #11

Flow Monitoring

Montedoro-Whitney WDFM-8 flow monitors were installed at the fifteen selected locations on January 22 and 23, 1997. These monitors are capable of measuring both depth and velocity of flow. The combined depth and velocity measurements make it possible to calculate flow rates for open channel conditions and during surcharge or backwater conditions.

Depth measurements were made by a differential pressure type strain gauge. One side of the sensing element is open to atmospheric pressure. This prevents errors due to changes in barometric pressure. Adjustments for temperature differences are made to further insure the accuracy of the measurements. The depth of flow sensing element is located on the bottom of the monitoring probe, which allows for depth measurements from zero to a maximum of 10 feet when the probe is centered exactly on the bottom of the pipe.

In field conditions, it is very difficult to center the probe exactly on the bottom of the pipe. The resultant difference between actual water surface level and monitored water surface level is called a depth offset. Corrections for the depth offset are discussed later in this memorandum. Depth measurements with these monitors are accurate to 0.01 of a foot under laboratory conditions. Accuracy of depth measurements in the field is dependent on the hydraulic characteristics of the flow stream at the monitoring site, proper installation techniques, and frequent maintenance procedures.

The monitors measure flow velocity using the ultrasonic Doppler shift method. The velocity sensor on the monitor sends an ultrasonic signal into the flow stream and measures velocities based on the Doppler shift. The flow monitoring velocity sensor is located approximately 1.5 inches from the bottom of the sensor and must be completely submerged to obtain accurate velocity measurements.

Velocity measurements are made at the bottom of the pipe near the wall and, therefore, are not actually measuring the average velocity of the flow stream. The difference between the monitored velocity and the average velocity is called a velocity offset and is also discussed later in this memorandum.

Precipitation intensity and duration were measured at four temporary locations in the County service area. The rain gauges were tipping bucket type gauges connected to portable electronic event recorders. The rain gauges are calibrated to tip after 0.01 inches of rainfall is received. The event recorder documents the time of each tip. Rain gauges 1 and 3 were installed on January 24, 1997. Rain gauges 2 and 4 were installed January 23, 1997. The flow monitors and rain gauges were removed on March 18, and March 24, 1997, respectively.

Flow Monitor Calibration

Calibration data was collected to verify both depth and velocity and to develop a depth-to-discharge relationship for the monitoring sites. Calibration data was obtained approximately once a week by manually measuring the depth and velocity of the flow stream with portable equipment. Field staff were responsible for maintaining the flow monitoring equipment and obtaining calibration information. The data was collected at various times in the diurnal cycle including early morning low flow periods and peak flow periods. Attachment B provides a listing of the calibration data for each flow monitoring location.

Data Analysis

Flow monitoring data analysis consisted of developing depth to discharge relationships for calculating flows, and determining depth and velocity offset values for the raw data. These tasks are described in the following paragraphs.

Depth-to-Discharge Relationship. The first step in the data analysis process was to develop a flow depth-to-discharge rating curve for each monitoring site. The rating curve was used to determine flows under open channel conditions. During the monitoring site calibration, the average velocity and corresponding depth of flow were measured approximately twice weekly at each of the flow monitoring sites. Average velocity measurements were made by field crews using portable velocity probes. The portable velocity probe is capable of continuously samples the velocity of the flow stream. Field crews move the portable velocity probe throughout the cross-sectional area of the flow stream for a period of 10 to 40 seconds and the average velocity was calculated automatically by the portable equipment.

These measurements were used to develop depth-to-discharge relationships. Calibration measurements were made at various times of the day and various days of the week to obtain information during the largest range of conditions experienced in the system during the monitoring period.

Actual flow rates were calculated from the calibration data using the continuity equation (flow = area x average velocity). The flow rate was then used to calculate the equivalent hydraulic slope at the site using Mannings equation. The average slope for all the manual measurements was then calculated and flow rates were plotted on a depth-versus-flow graph, and a Mannings curve was "fitted" to the data points. The curve utilizes the standard Mannings equation for open-channel flow, and use a depth-variable roughness coefficient or Mannings "n" value. The curves were then used to convert the flow monitoring depth measurements to flow rates during open channel flow conditions. When surcharging occurs, the depth and velocity measurements were used to calculate the flow rate using the continuity equation.

Offsets. The site calibration measurements were also used to develop depth and velocity offsets for the flow monitoring sites. Depths offsets occur when the flow monitoring probe was not installed exactly in the center of the pipe. Velocity offsets occur because the velocity sensor measures a point velocity near the pipe wall. In addition, each sensor has an inherent electronic offset. Manual calibration data was used to correct the monitored depth measurements and convert the point velocities to an average velocity. For this project, the combined electronic and physical offset remained constant at each of the flow monitoring sites during the flow monitoring period.

Results

Four storm events occurred during the flow monitoring program. The storm dates and their daily rainfall totals are summarized in Table 3.

Table 3 Rain Gauge Results, inches

Date	Rain Gauge 1 Burlingame Hills	Rain Gauge 2 Crystal Springs	Rain Gauge 3 Emerald Lake	Rain Gauge 4 Fair Oaks
01/24/97	0.63	0.56	0.71	0.59
01/25/97	1.20	1.15	1.64	1.02
01/26/97	0.53	0.43	0.52	0.25
02/17/97	0.21	0.13	0.13	0.07
03/02/97	0.23	0.11	0.21	0.02
03/16/97	0.34	0.13	0.40	0.10

The flow monitors at sites 12 and 44 either failed or became clogged with debris, for noted periods of time. For site 44, we do not recommend using the flow data from February 23, 1997, to March 16, 1997, as flow levels were too low to measure accurately. Also, flow monitoring at site 12 failed from February 20, 1997, to February 25, 1997. No additional monitoring problems were noted. Table 4 presents the dry weather and wet weather flow monitoring results of this analysis.

Table 4 Flow Monitoring Results, million gallons per day

Flow Monitoring Site	Minimum Flow	Average Flow	Peak Dry Weather Flow	Peak Wet Weather Flow
11	0.01	0.11	0.27	1.13
12	0.06	0.11	0.17	0.24
21	0.01	0.34	1.12	2.82
22	0.03	0.12	0.37	0.50
31	0.02	0.08	0.20	0.65
41	0.01	0.04	0.07	0.18
42	0.01	0.02	0.04	0.09
43	0.01	0.02	0.03	0.07
44	0.01	0.03	0.10	0.12
51	0.29	0.66	1.31	2.30
52	0.41	1.79	3.22	8.89
53	0.41	1.20	2.26	4.26
54	0.19	0.41	0.80	1.94
55	0.00	0.22	0.48	1.10

Listed below is a summary of the contents of the attachments:

Attachment A Flow Monitoring Site Reconnaissance Forms.

Attachment B. Flow Calibration Data

Attachment C Graphical Flow Summary. Graphical plots of minimum, daily, and peak flow rates.

BH:CJ:jm
Attachments

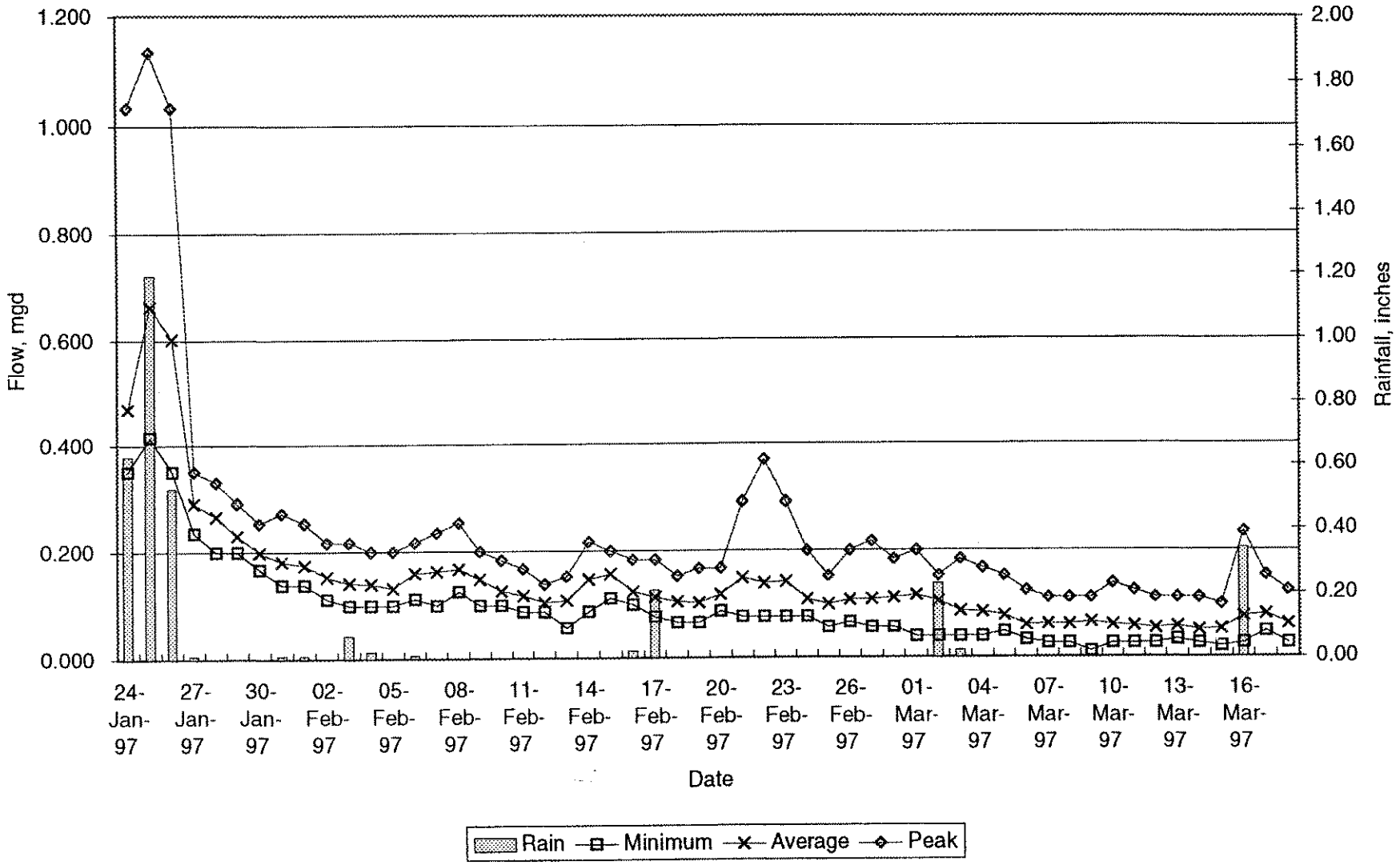
ATTACHMENT A

FLOW MONITORING SITE RECONNAISSANCE FORMS

ATTACHMENT C

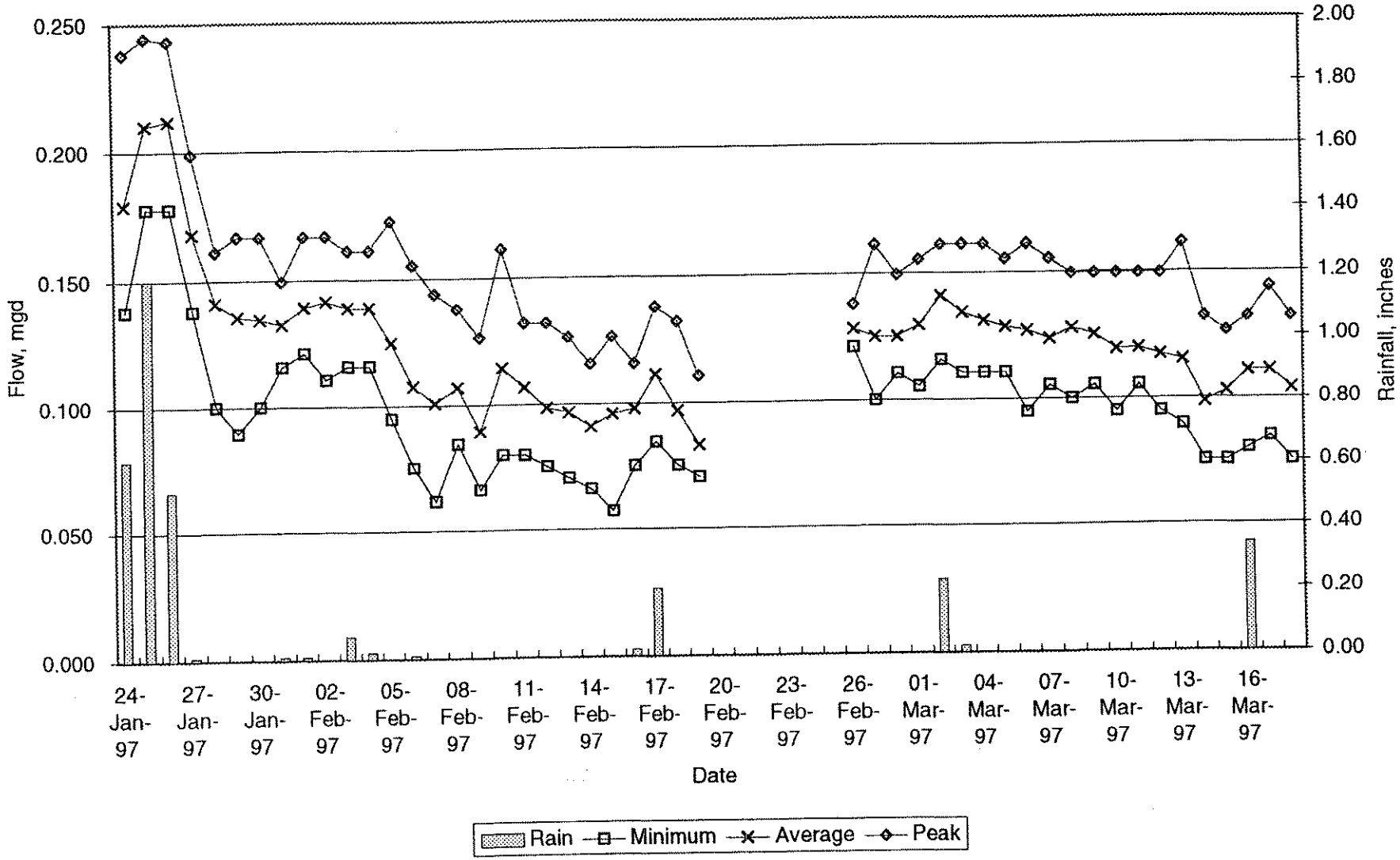
GRAPHICAL FLOW SUMMARY
GRAPHICAL PLOTS OF MINIMUM, DAILY, AND PEAK FLOW RATES

County of San Mateo
Daily Flow Rates -- Site 11 -- 2815 Adeline, near Alvarado
8" Diameter

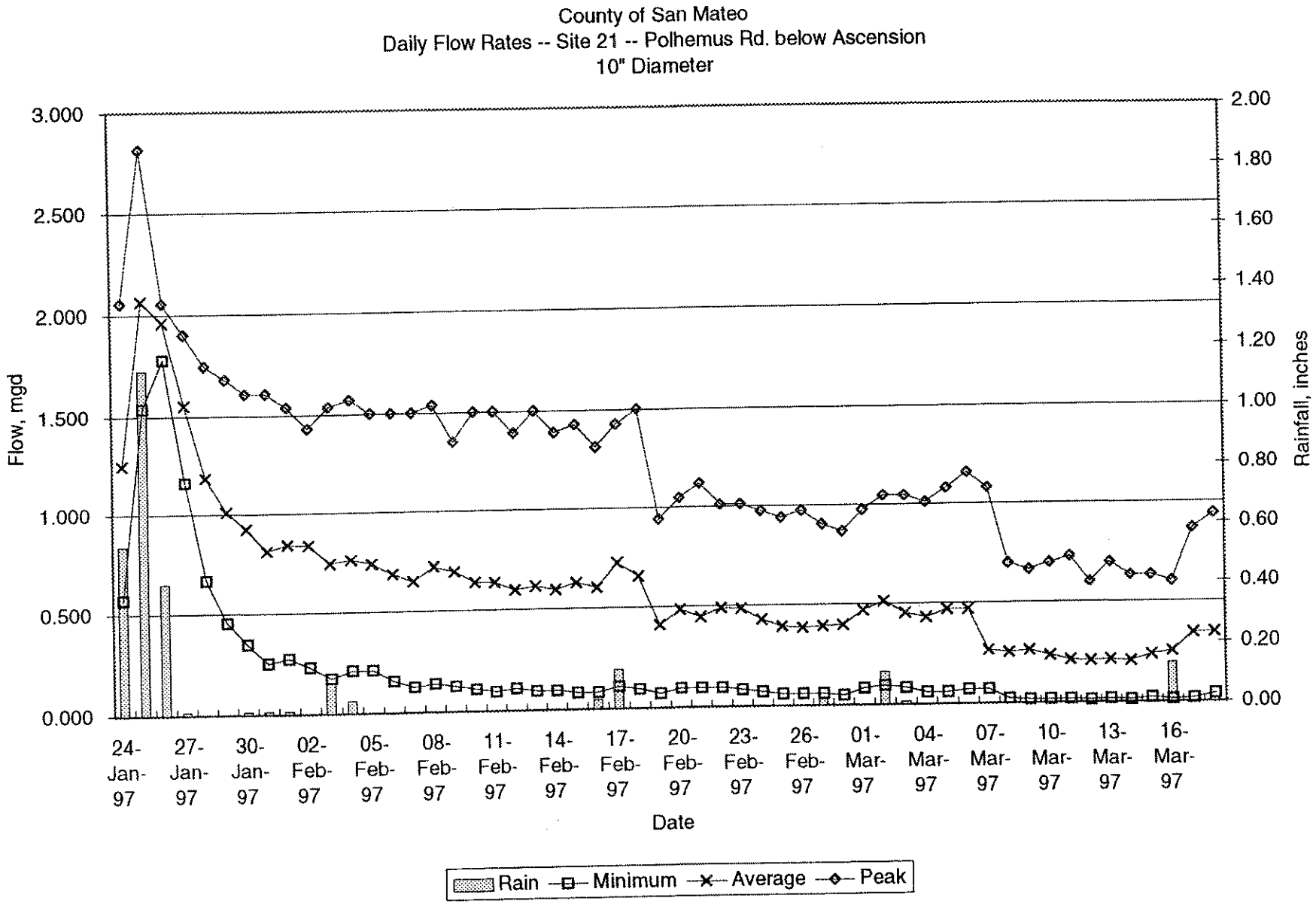


e:\4692\333\current:333_11.xls

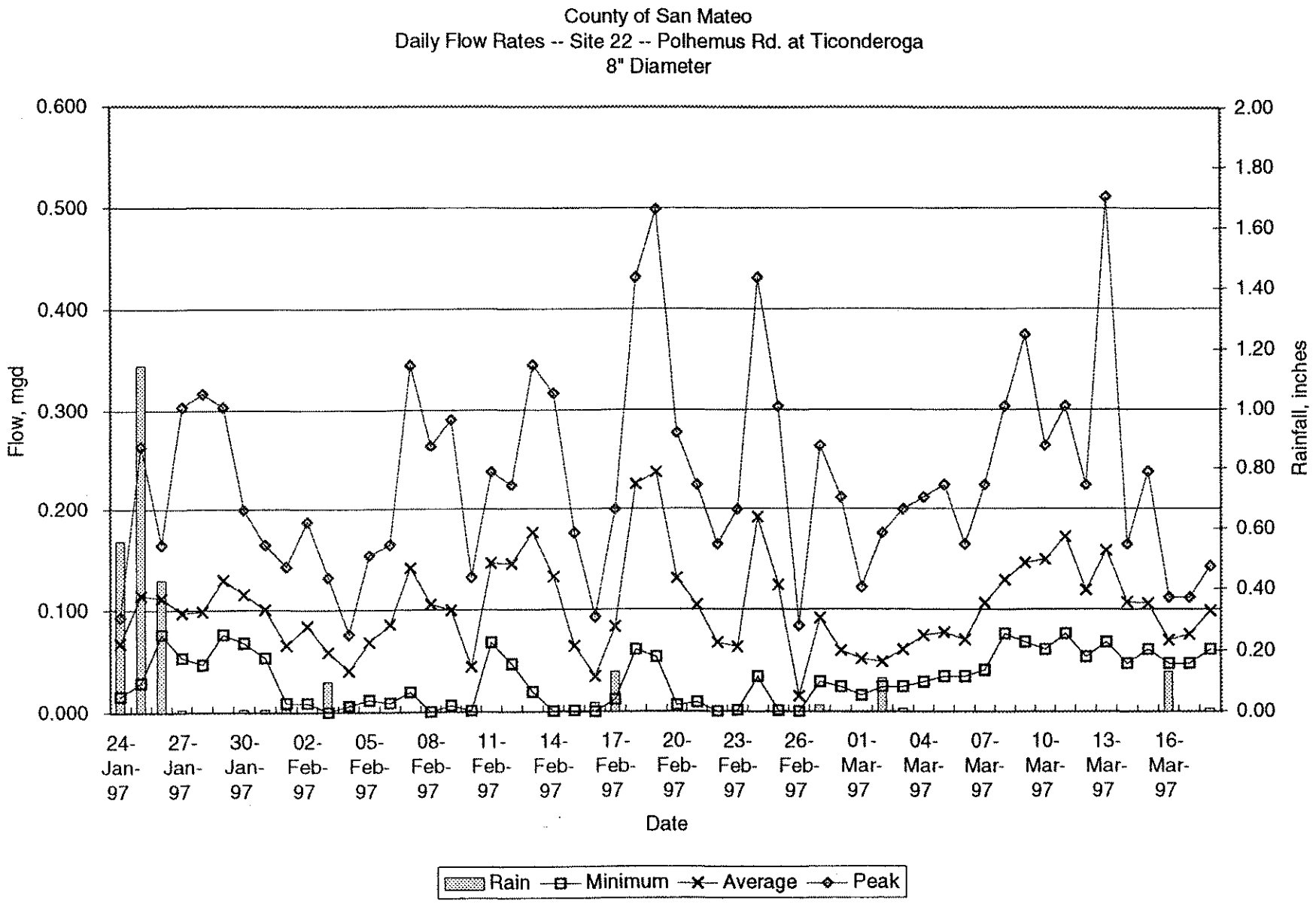
Country of San Mateo
Daily Flow Rates -- Site 12 -- 2872 Canyon Rd.
8" Diameter



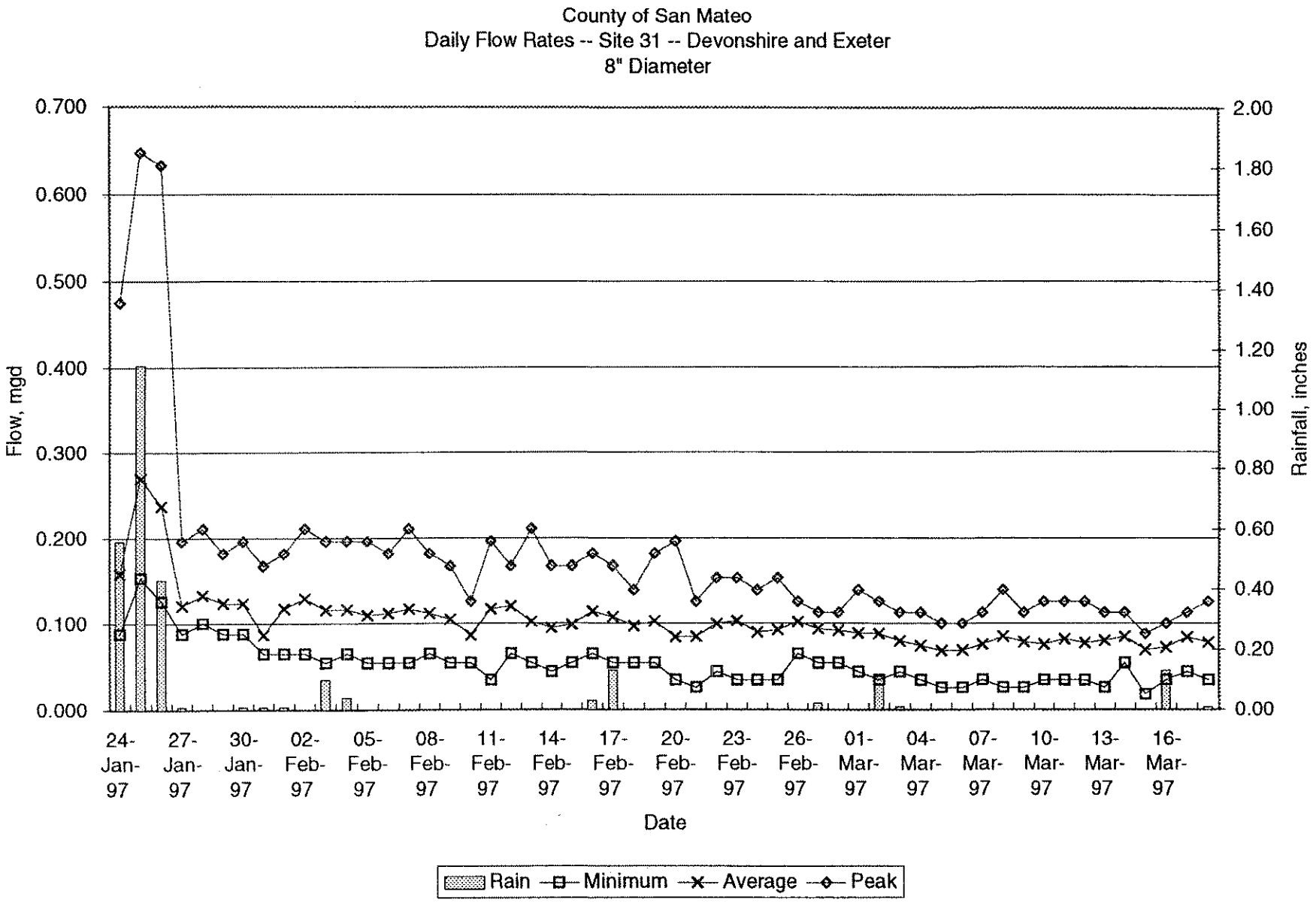
e:\4692\333\Current:333_12.xls



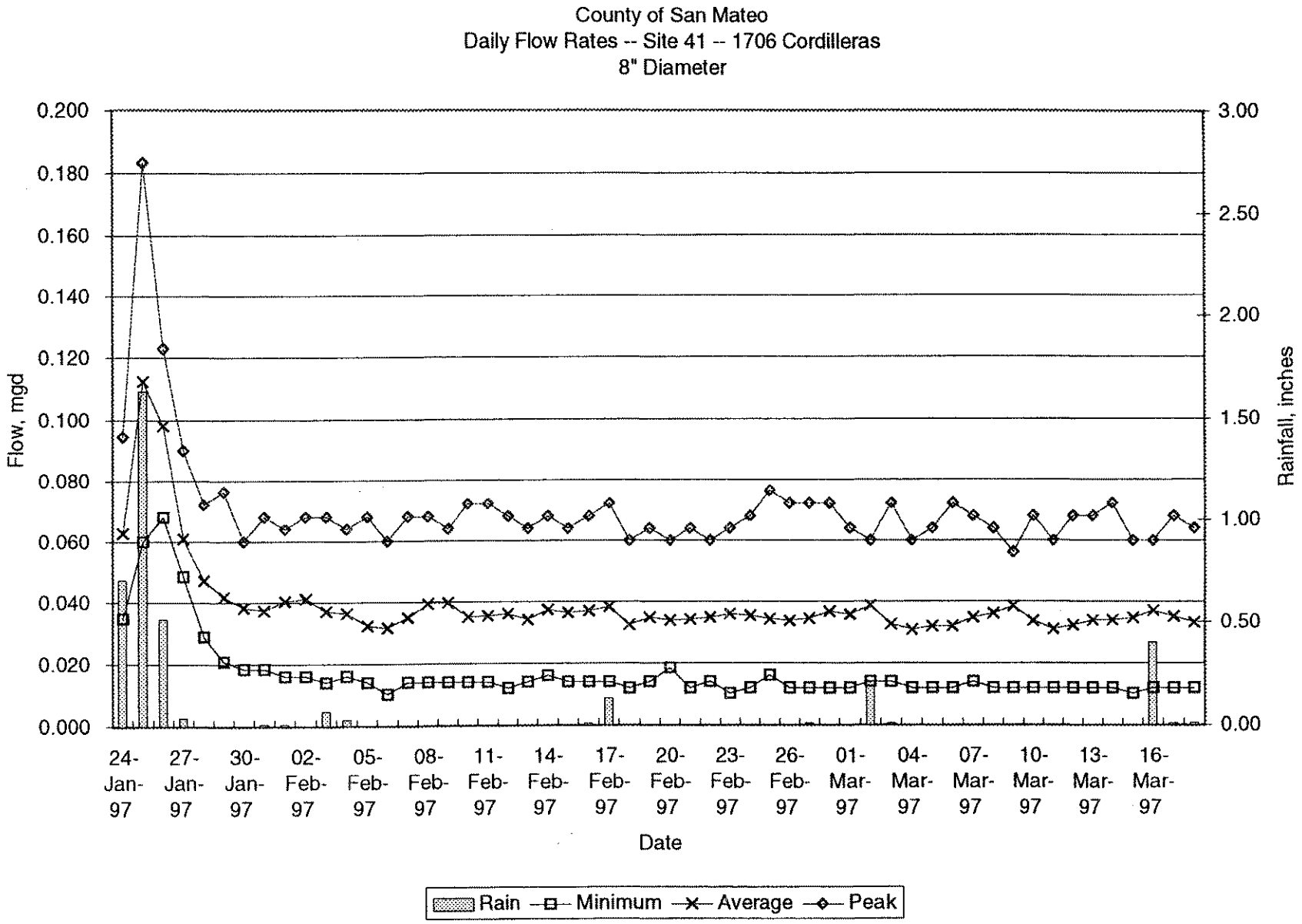
e:\4692\333\Current:333_21.xls



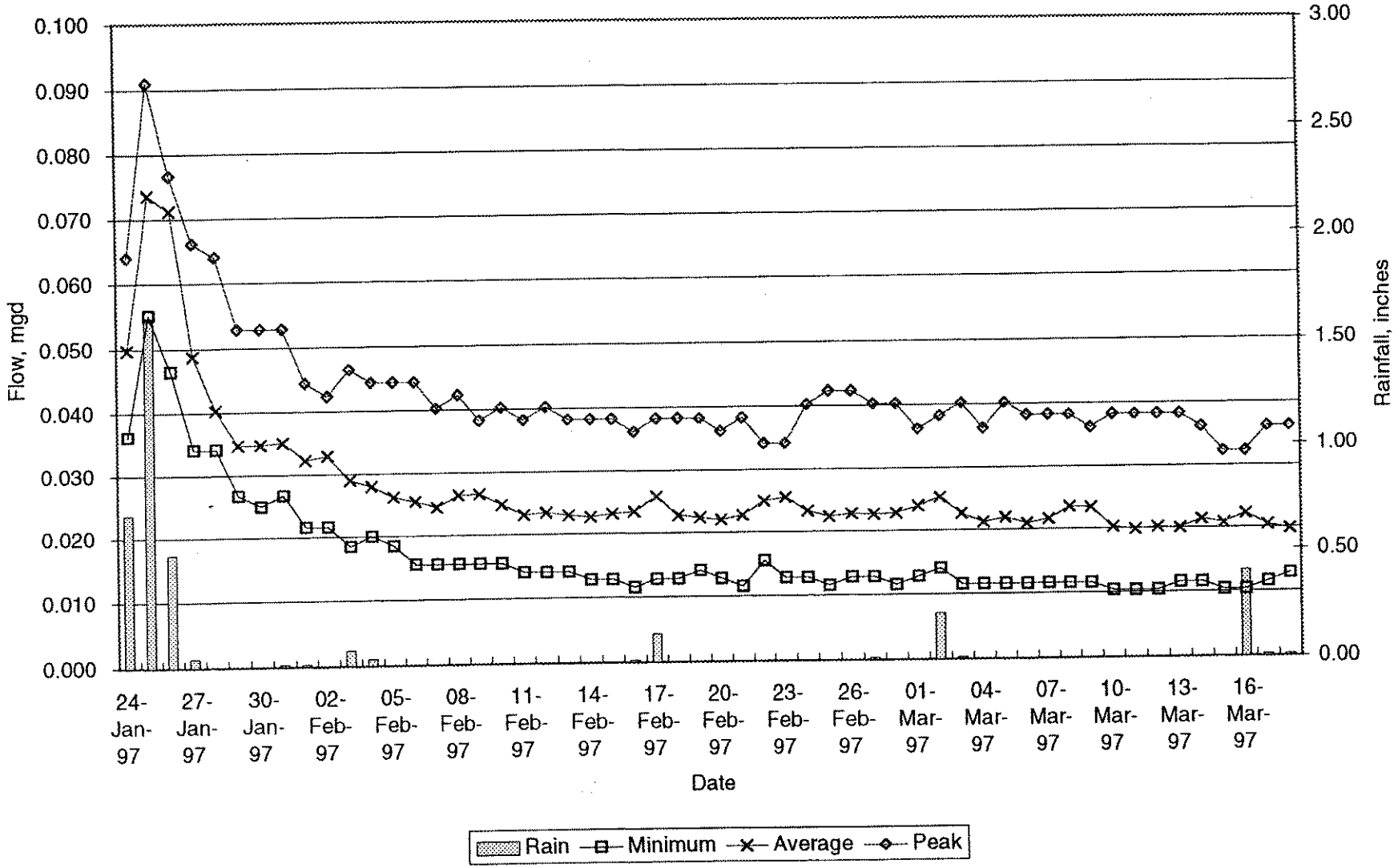
e:\4692\333\Current:333_22.xls



e:\4692\333\Current:333_31.xls

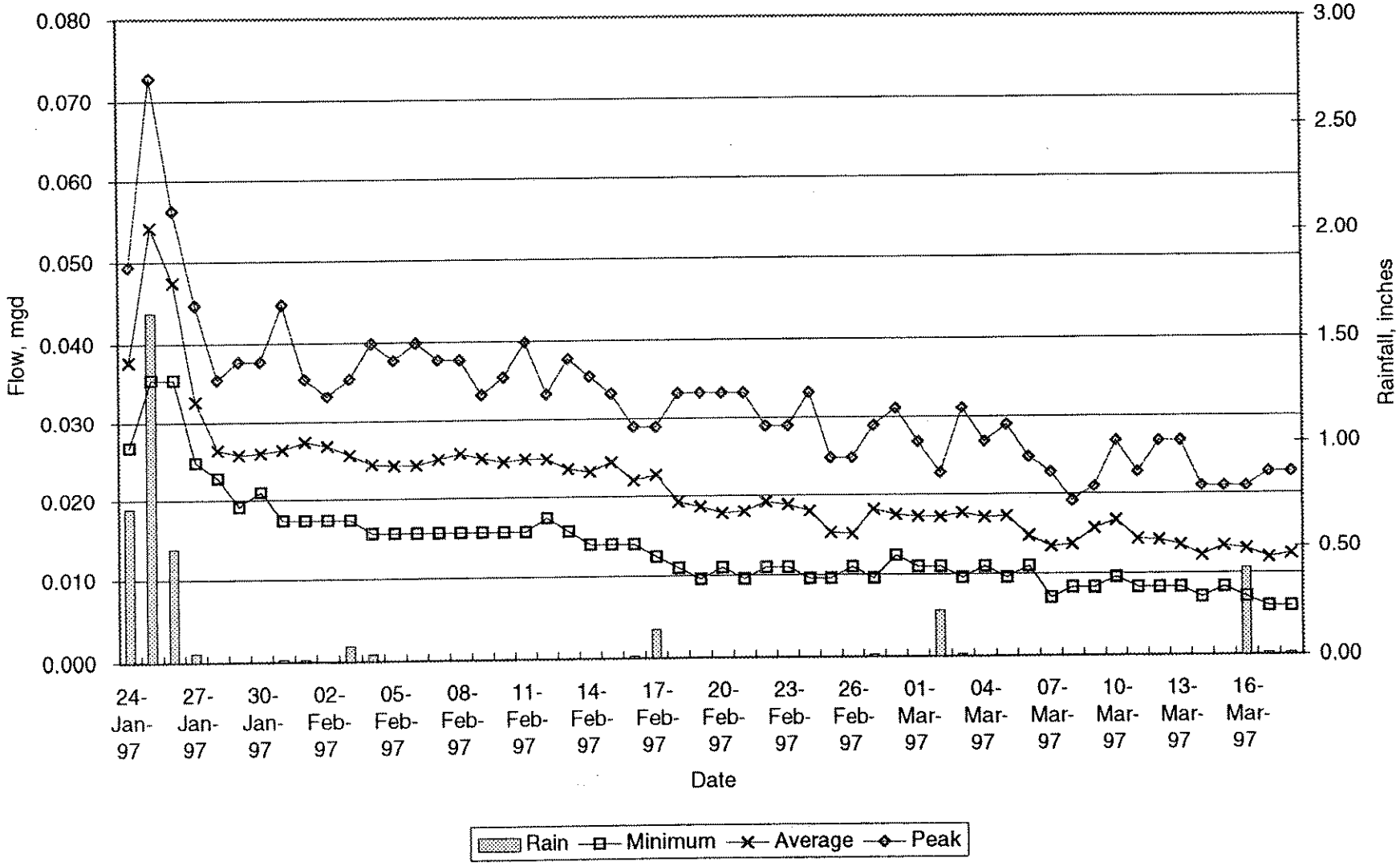

County of San Mateo
Daily Flow Rates -- Site 41 -- 1706 Cordilleras
8" Diameter
Flow, mgd
0.200
0.180
0.160
0.140
0.120
0.100
0.080
0.060
0.040
0.020
0.000
Rainfall, inches
3.00
2.50
2.00
1.50
1.00
0.50
0.00
24-Jan-97
27-Jan-97
30-Jan-97
02-Feb-97
05-Feb-97
08-Feb-97
11-Feb-97
14-Feb-97
17-Feb-97
20-Feb-97
23-Feb-97
26-Feb-97
01-Mar-97
04-Mar-97
07-Mar-97
10-Mar-97
13-Mar-97
16-Mar-97
Date
Rain
Minimum
Average
Peak

County of San Mateo
Daily Flow Rates -- Site 42 -- Lake Blvd. and Oak Knoll
8" Diameter

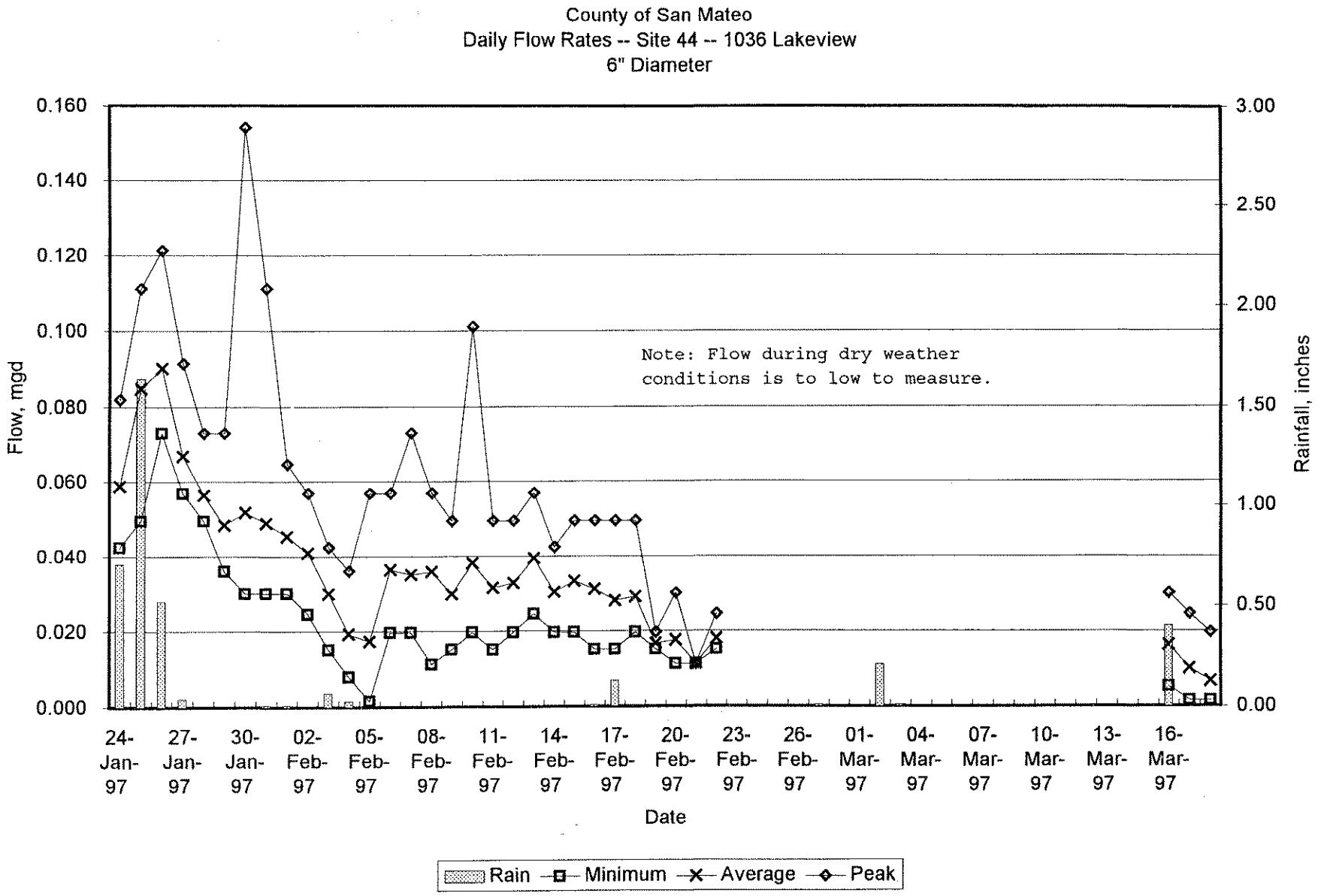


e:\4692\333\Current:333_42.xls

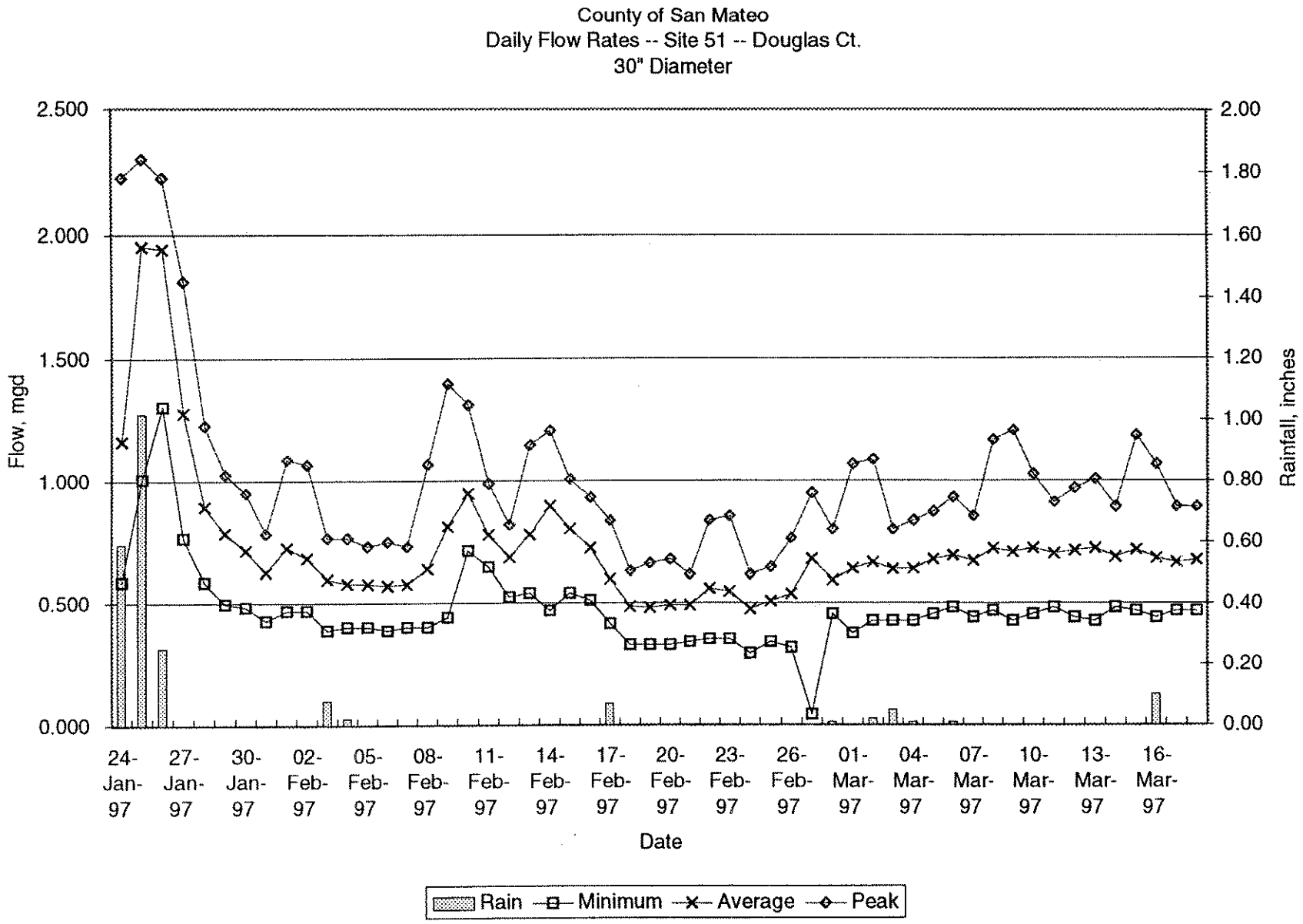
County of San Mateo
Daily Flow Rates -- Site 43 -- Glenwood Drive at Garret Pk.
6" Diameter



e:\4692\333\Current:333_43.xls

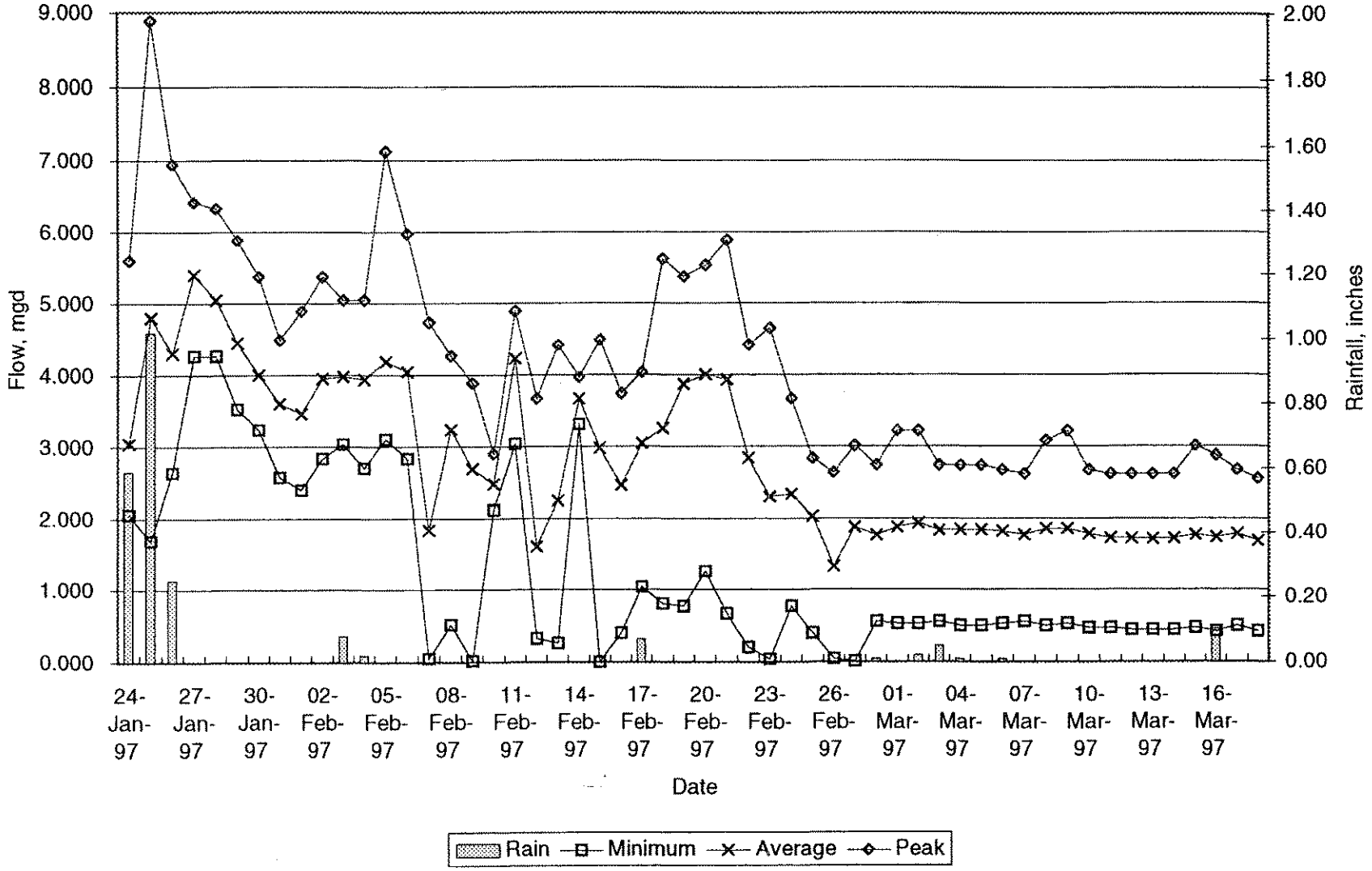


e:\4692\333\Current:333_44.xls



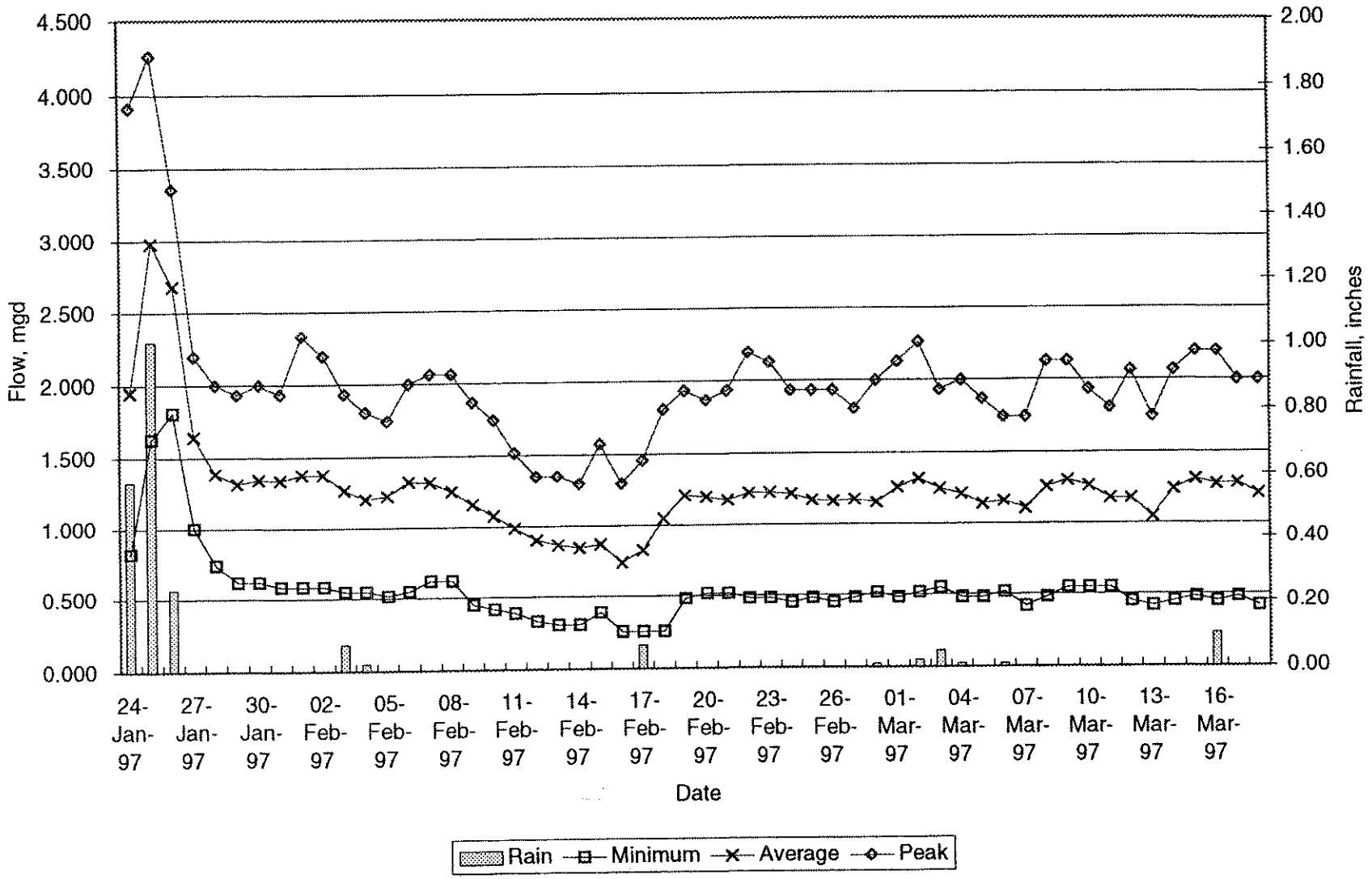
e:\4692\333\Current:333_51.xls

County of San Mateo
Daily Flow Rates -- Site 52 -- Bay Rd. at Willow Street
30" Diameter

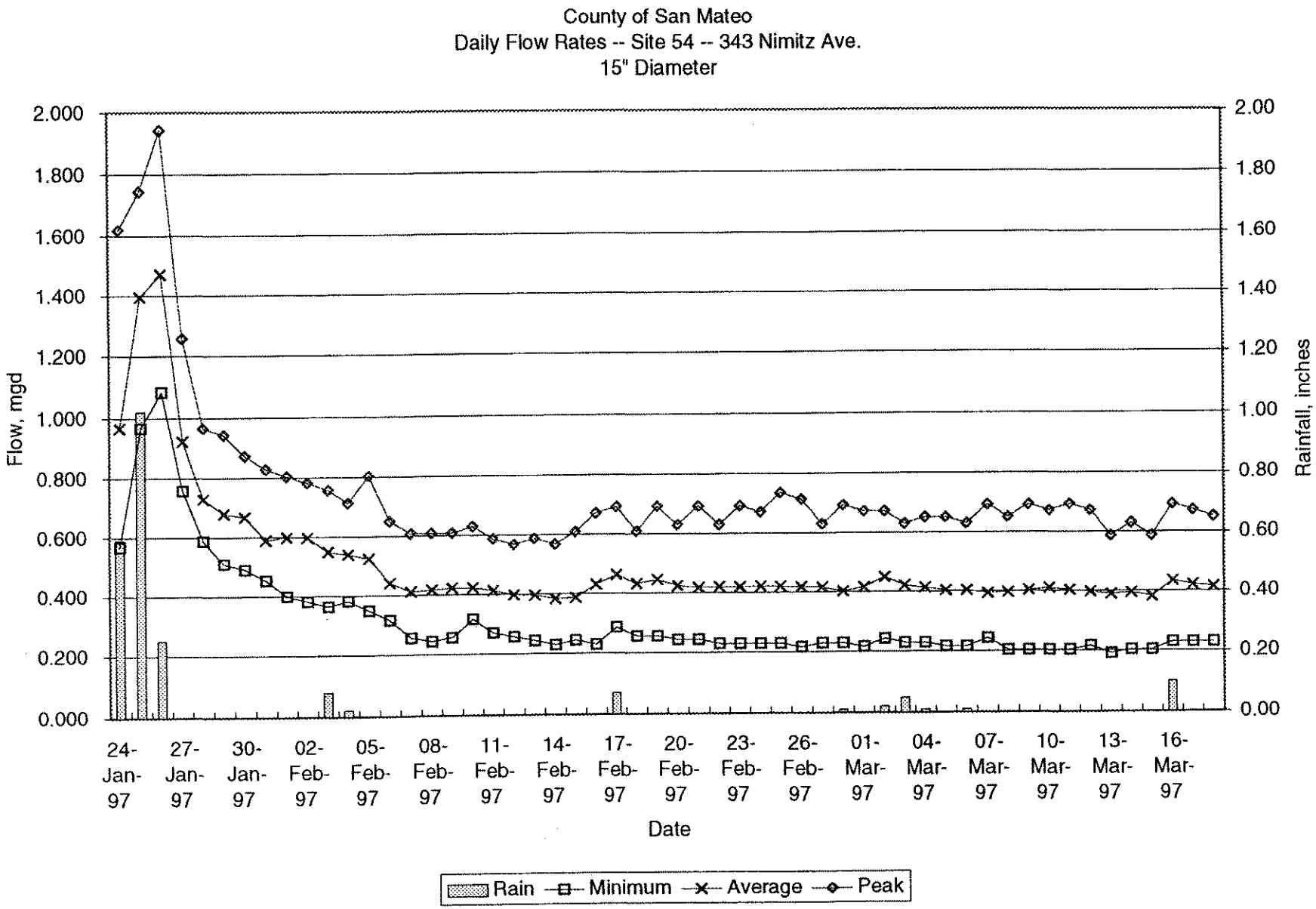


e:\4692\333\Current:333_52.xls

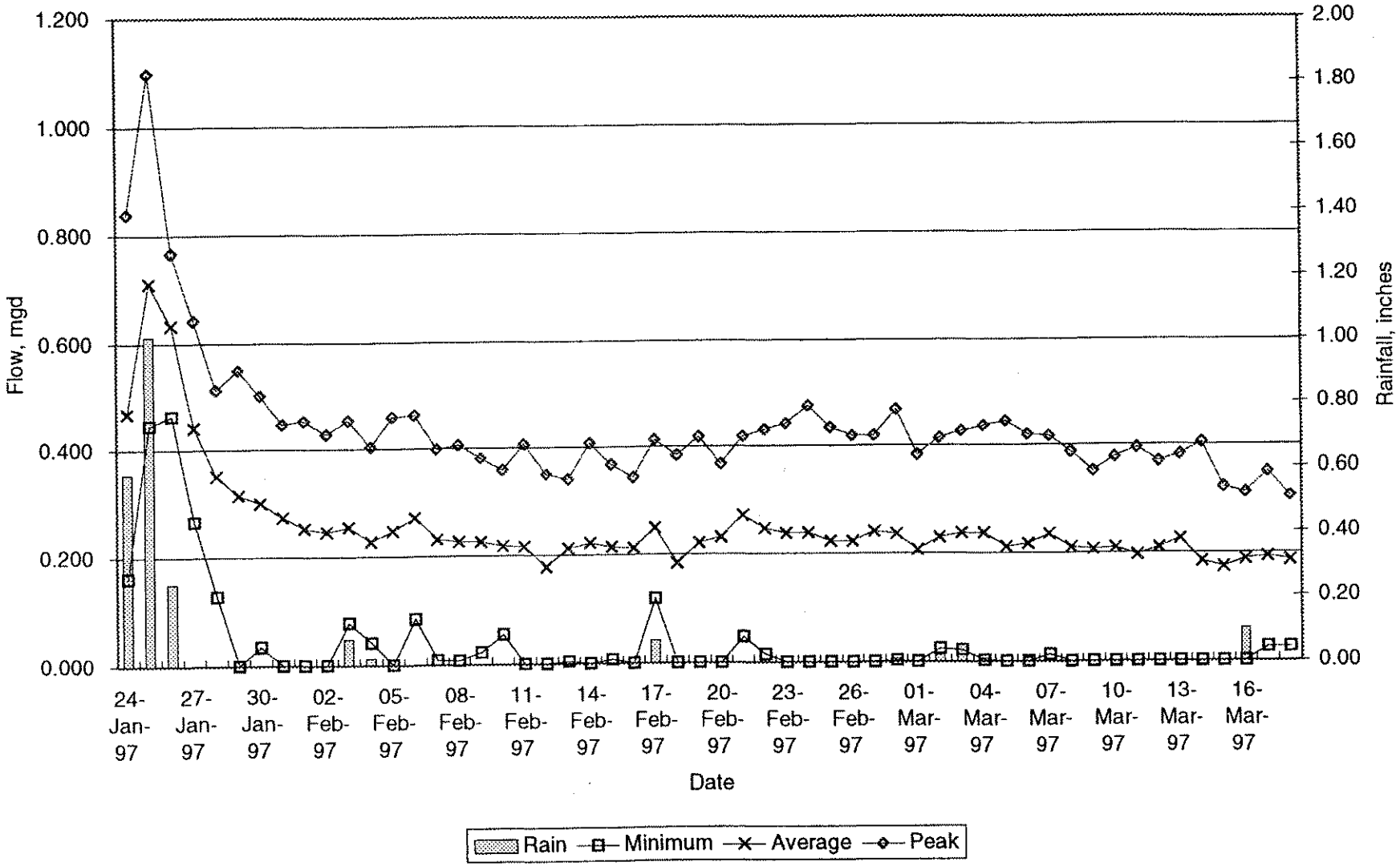
County of San Mateo
Daily Flow Rates -- Site 53 -- 559 Oakside
21" Diameter



e:\4692\333\Current:333_53.xls


County of San Mateo
Daily Flow Rates -- Site 54 -- 343 Nimitz Ave.
15" Diameter
Flow, mgd
Rainfall, inches
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
24-Jan-97
27-Jan-97
30-Jan-97
02-Feb-97
05-Feb-97
08-Feb-97
11-Feb-97
14-Feb-97
17-Feb-97
20-Feb-97
23-Feb-97
26-Feb-97
01-Mar-97
04-Mar-97
07-Mar-97
10-Mar-97
13-Mar-97
16-Mar-97
Date
Rain
Minimum
Average
Peak

County of San Mateo
Daily Flow Rates -- Site 55 -- Woodside Rd. near Churchhill
10" Diameter



e:\4692\333\Current:333_55.xls

Insert “C” Tab Here

APPENDIX C

SMOKE TESTING TECHNICAL MEMORANDUM AND RESULTS

MEMORANDUM 14692-003

October 13, 1998

TO: MARK WELSH
COUNTY OF SAN MATEO, DPW

FROM: BRIAN HAMMER
BROWN AND CALDWELL

SUBJECT: WASTEWATER MASTER PLAN
SMOKE TESTING FIELD INSPECTION

This technical memorandum presents the results of the smoke testing program performed during the summer of 1998 as part of the Wastewater Master Plan. Smoke testing was performed in sections of the Burlingame Hills, Crystal Springs, Devonshire, Emerald Lake, and Fair Oaks Sewer Districts.

Smoke Testing

Smoke testing is a quick and effective method for identifying many types of wastewater collection system deficiencies. Typical defects encountered during a smoke testing program include the following:

1. Broken or deteriorated building laterals.
2. Improperly capped cleanouts.
3. Broken or deteriorated sewer mains.
4. Unsealed or damaged manholes.
5. Sags and/or obstructions in the mains.
6. Direct and indirect connections between storm and sanitary sewer systems.
7. Untrapped or improper building plumbing.
8. Illegal sewer connections.

Although smoke testing is an efficient method of identifying collection system inadequacies, certain conditions affect the interpretation and effectiveness of the test. One factor that affects smoke testing results is the extent and porosity of the cover over the sewer main or service lateral. For instance, pilot studies have indicated that only one-third or less of defective laterals are detected by smoke testing.

Another limitation is that smoke cannot emerge through highly impervious surfaces such as concrete or asphalt, unless they are cracked. Additionally, smoke will not travel through saturated soil. Therefore, this fieldwork is most effectively conducted only during dry weather, when the soil is at its driest condition.

Smoke Testing Field Procedures

The smoke testing program consisted of public notification and actual smoke testing. Public notification was accomplished by means of two separate public notices prior to smoke testing: one distributed approximately 1 week followed by another 24-48 hours in advance of testing, to individual residences and businesses. These notices, shown in Figure 1, explained the reason smoke testing was being performed and gave a brief description of the procedures to be used by the smoke testing crew. The notices also advised persons with respiratory ailments or similar problems to contact the County Department of Public Works office so field crews could provide these people with special attention during the smoke testing operation.

The smoke testing field program consisted of circulating a nontoxic and nonstaining "smoke" through the sewer system. A specialized blower was used to circulate smoke through the sewer system at a rate of approximately 1,500 cubic feet per minute. Smoke traveled through the connecting mainlines and service laterals until it came out of defects or roof vents. Each defect found was photographed using digital cameras to document the defect. The crew maintained field logs in which they recorded the address, relative location, and type of defect found. Information from the field logs was input to a specialized ACCESS database for documentation and analysis. Inspection forms were then printed directly from the program along with the digital image of the defect.

Smoke Testing Results

Smoke testing was performed during the dry months of August and September 1998 to prevent smoke from being trapped in high groundwater and saturated soils. Smoke testing was performed in all subbasins in the Districts of Burlingame Hills and Devonshire, with the exception of those areas where the crew did not have access, and in selected subbasins of the Crystal Springs, Emerald Lakes, and Fair Oaks Districts. Those selected subbasins were 21line1, 21line2, 22line2, and SP in the Crystal Springs District, 45 in the Emerald Lake District, and 54 in the Fair Oaks Sewer Maintenance District. These subbasins are shown in Figure 2. Some sewer lines in these areas could not be accessed. Approximately 140,000 lineal feet of sewer line was tested during the 3-week inspection period.

A total of 201 defects was located and documented by field crews during the smoke testing period. Table 1 provides a summary of the defects for each of the Districts. The most prevalent defect noted was faulty cleanouts. Cross-connections between the sanitary sewer and the storm drain system were not noted during the testing period. Summary tables of the smoke testing results are provided in Attachments A1 and A2. Smoke testing forms and photographs of the defects are provided in Attachment B.

Potential health concern defects exist where direct physical contact with sewage or sewer gas is possible through open pipes, uncapped cleanouts, or poor plumbing connections. Whenever a resident reported smoke inside a building, a crew member inspected the location of the smoke to determine the source of the smoke. The smoke sources commonly found inside a home or commercial building were dried out or defective sink/bathtub traps, faulty plumbing, untrapped connections to the sewer, and area or floor drains. Area and floor drains were documented where applicable. Residents were provided with practical information regarding what could be done about the other problems to protect against the possibility of sewer gas or sewage entering the residence or business.

Uncapped cleanouts at ground or below ground level are both a public health concern and potential inflow source. The majority of defects noted were uncapped cleanouts where either the cap was loose, broken or deteriorated, or missing from the cleanout. We recommend the county consider having these cleanouts capped tightly to prevent sewage form spilling out into public areas and to eliminate cleanouts as a source of inflow.

Insert “D” Tab Here

APPENDIX D

TELEVISION INSPECTION RESULTS

County of San Mateo - Wastewater Master Plan
Mainline Sewer Internal Inspection
District: Fair Oaks

RUN No.	STREET OR PARCEL No.	UPSTREAM MANHOLE No.	DOWNSTREAM MANHOLE No.	DEPTH	LENGTH BETWEEN MANHOLES, ft	COMPLETE FOOTAGE TAPED, ft	PIPE SIZE, in	PIPE JOINT LENGTH, ft	PIPE MATERIAL TYPE	DATE OF INSPECTION	VIDEO TAPE No.	MAINLINE SEWER DEFECTS																						T	EST. I/I FLOW RATE, gpm	TOTAL No. of DEFECTS TO REHABILITATE	Total Score	COMMENTS
												CRACK		JTS		LATERALS			ROOTS		I/I						ALIGN		STRUC.			M.S.		S.C.						
												CP1	CP2	OJ1	OJ2	PT1	PT2	PT3	RJ	RT	I1	I2	I3	I4	I5	I6	A1	A2	S1	S2	S3	M1	M2	C1	C2					
51,52	155 Elanor Dr.	2064	2041			12	6		VCP	1/20/99	10-1, 2	2							·3										1						6	492	
71	39 Melanie Ln.	2011	2010			178	6		VCP	2/1/99	11-9	12		1					7										5						25	166	
50	139 Elanor Dr.	2065	2064			154	6		VCP	1/20/99	9-15	9							10	1								1	3						24	138	
56	238 Elanor Dr.	2063	2062			67	6		VCP	1/20/99	10-6	8							2										1						11	113	Poor grade of line. Unable to get by.
45	2100 Stockbridge Ave.	1813	1812			285	6		VCP	1/19/99	9-10	20																3	2					4	25	84	Needs to be replaced very soon
48, 49	139 Elanor Dr.	2066	2065			127	6		VCP	1/20/99	9-13,1 4	7							11	3									1					3	22	69	Shattered pipe.
54	167 Elanor Dr.	2042	2041			37	6		VCP	1/20/99	10-4	6							5																11	62	Reverse set up.
65, 67	439 Stockbridge Ave.	2009	2007			49	6		VCP	1/21/99	11-3, 5	1							2									1							4	61	Hole in pipe shifted pipe unable to TV. Will revers set up.
57	234 Elanor Dr.	2063	2062			39	6		VCP	1/20/99	10-7	7																						1	7	56	Poor grade of line.
82	3383 Middlefield Rd.	1448	1447	3		369	6		VCP	4/8/99	22-1	2						7										7						7	16	51	
58	234 Elanor Dr.	2062	2061			113	6		VCP	1/20/99	10-8	16							7	1														1	24	50	Poor grade of line.
81	3260 Middlefield Rd.	1447	1446	3		366	6		VCP	4/7/99	21-6	3						6											3					8	12	46	
26	234 Polhemus Ave.	1747	1746			312	6		VCP	1/12/99	8-3	18						1	1									3						5	23	43	
30	222 Polhemus Ave.	1743	1742			313	6		VCP	1/13/99	8-7	19							1									1	1					1	22	43	
59	214 Elanor Dr.	2061	2051			214	6		VCP	1/20/99	10-9, 10	10							10										1						21	42	Shattered pipe.
46	2120 Stockbridge Ave.	1815	1813			246	6		VCP	1/19/99	9-11								1											1				1	2	41	
25	234 Polhemus Ave.	1748	1747			103	6		VCP	1/12/99	8-2	14																							14	41	Line needs replaced almost every joint cracked or shattered
2	Page & 15-th Ave.	88	89	4		10	6		VCP	11/23/98	1-2			2																					2	40	Unable to get camera by due to offset in line.
53	161 Elenor Dr.	2041	2042			118	6		VCP	1/20/99	10-3	9							14	1															24	36	Poor grade of line. Unable to get by.
7	3257 6-th	1319	1317			211	8		VCP	1/5/99	6-12	6															1		1					6	8	36	
76	2951 Milddlfield Rd.	1442	1442-A	4		263	6		VCP	4/7/99	21-1	1						6										1	1					10	9	33	1442-A is an extra MH.
61	200 Elanor Dr.	2051	2050			144	6		VCP	1/20/99	10-11	10							14	2														2	26	33	
62	475 Elanor Dr.	2003	2004			318	6		VCP	1/20/99	10-12	14							1									2						1	17	30	Pipe needs to be replaced. Poor grade of line.
27	230 Polhemus Ave.	1746	1743			313	6		VCP	1/13/99	8-4	20							5									1						1	26	29	
55	167 Elanor Dr.	2042	2049			202	6		VCP	1/20/99	10-5	12						1	16	1														4	30	28	Poor grade of line.
31	214 Polhemus Ave.	1742	1741			313	6		VCP	1/13/99	8-8	19							2									1						4	22	28	
47	139 Elanor Dr.	2067	2066			67	6		VCP	1/20/99	9-12	4							4																8	24	
23	241 Polhemus Ave.	1749	1748			210	6		VCP	1/12/99	7-14	15							1															3	16	23	
39	2023 Stockbridge Ave.	1811	1810			119	6		VCP	1/19/99	9-4																	1						2	1	23	
32	211 Polhemus Ave.	1741	1739			317	6		VCP	1/13/99	8-9	12		1					5	1								1						2	20	22	
41	1950 Stockbridge Ave.	1809	1808			125	6		VCP	1/19/99	9-6																	1							1	20	
36, 38	1926 Stockbridge Ave.	1808	1807			150	6		VCP	1/18/99	9-3								1									1						3	2	19	
80	3162 Middlefield Rd.	1455	1454	4		306	6		VCP	4/7/99	21-5	1						2											1					5	4	19	Pulled out a lot of grease.
17	598 5-th Ave.	1360	1323			409	6		VCP	1/11/99	7-8	4						2	4										1					8	11	18	
44	2054 Stockbridge Ave.	1812	1811			230	6		VCP	1/19/99	9-9	4																1						3	5	17	
24	236 Polhemus Ave.	1771	1748			326	6		VCP	1/12/99	8-1	2							12	5							2	1						5	22	17	
70	401 Stockbride Ave.	2009	2008			102	6		VCP	2/1/99	11-8	7																	1	2				1	10	17	Broken pipe hole in pipe. Needs replaced.

RUN No.	STREET OR PARCEL No.	UPSTREAM MANHOLE No.	DOWNSTREAM MANHOLE No.	DEPTH	LENGTH BETWEEN MANHOLES, ft	COMPLETE FOOTAGE TAPED, ft	PIPE SIZE, in	PIPE JOINT LENGTH, ft	PIPE MATERIAL TYPE	DATE OF INSPECTION	VIDEO TAPE No.	MAINLINE SEWER DEFECTS																				T	EST. I/I FLOW RATE, gpm	TOTAL No. of DEFECTS TO REHABILITATE	Total Score	COMMENTS
												CRACK		JTS		LATERALS			ROOTS		I/I						ALIGN		STRUC.			M.S.		S.C.					
												CP1	CP2	OJ1	OJ2	PT1	PT2	PT3	RJ	RT	I1	I2	I3	I4	I5	I6	A1	A2	S1	S2	S3	M1	M2	C1	C2					
3	Page & 15-th Ave.	87	88	4.8		18	6		VCP	11/23/98	1-3	1																								1	17	
77	2929 Middlefield Rd.	1442-A	1441			244	6		VCP	4/7/99	21-2	2						4									1		1						7		8	16	
21	1776 Stockbridge Ave.	1794	1793			40	6		VCP	1/12/99	7-12	1							2																		3	13	
1	3523 Page	95	98	2.7		52	6		VCP	11/23/98	1-1	1															2								1		3	12	
74	3620 Douglas Ave.	2483	2482	7		258	6		VCP	4/6/99	20-9							1											1						3		2	11	Tape and log says MH 2501 to 2482 should have been 2483 to 2482.
6	Page & 17-th Ave.	65	72 (Burried)	3.7		147	6		VCP	11/24/98	1-6	1		4													1								3		6	10	Unable to get camera by due to offset in line.
69	36 Melanie Ln.	2010	2009			20	6		VCP	2/1/99	11-7	1																		1							2	10	Line needs to be replaced. Unable to TV line Entire line bottom of pipe is gone at MH 2009.
18	4298 Stockbridge Ave	1790	1789			10	6		VCP	1/11/99	7-9								1																		1	10	
73	2500 Bay Rd.	2551	2550	5		375	6		VCP	4/6/99	20-8	1						1	1									1							7		4	10	
4, 5	Page & 17-th Ave.	73	65	3.7		298	6		VCP	11/24/98	1-4, 5	5		4																						5		9	9	Unable to get camera by due to offset in line.
34	1890 Stockbridge Ave.	1806-A	1805			78	6		VCP	1/18/99	8-11	2																									2	8	
8	3257 Fair Oaks	1317	1316			315	8		VCP	1/5/99	6-13	1	1					3																		14	5	8	
20	1806 Stockbridge Ave.	1799	1794			184	6		VCP	1/11/99	7-11	3															3								2		6	8	
63	481 Elanor Dr.	2005	2004			206	6		VCP	1/21/99	11-1	4																								1		4	6	
11	676 6-th Ave.	1320	1319			126	8		VCP	1/6/99	7-2	2															1										3	6	At 43' VCP to Iron Pipe. Removed 10 gal rock sand and grease.
68	76 Melanie Ln.	2013	2012			209	6		VCP	1/21/99	11-6	2							11																1		13	5	
19	1770 Stockbridge Ave.	1793	1790			443	6		VCP	1/11/99	7-10	2						2	7																9		11	5	
66	481 Stockbridge Ave.	2007	2005			171	6		VCP	1/21/99	11-4	2							1																		3	4	
33	1890 Stockbridge Ave.	1806	1806-A			25	6		VCP	1/18/99	8-10																								1			4	
14	590 6-th Ave.	1355	1323			212	6		VCP	1/11/99	7-5							2	1																6		3	3	
22	1846 Stockbridge Ave.	1800	1799			267	6		VCP	1/12/99	7-13	1																								5		1	3	
42	2054 Stockbridge Ave.	1818	1817			167	6		VCP	1/19/99	9-7																3								2		3	3	
28	8 Betty Lane	1773	1772			323	6		VCP	1/13/99	8-5	1							3								3										7	3	
75	2696 Bay Rd.	2484	2483	5		257	6		VCP	4/6/99	20-10	1						1																	4		2	3	
84	834 Douglas Ave.	2501	2482	7		277	8		VCP	4/8/99	22-3																2								5		2	3	Unable to get by due to heavy sag.
83	2600 Douglas Ave.	2503	2501	8		367	8		VCP	4/8/99	22-2																2								7		2	2	
72	2384 Bay Rd	2550	2549	7		374	6		VCP	4/6/99	20-7							2							1		1								7		4	2	
16	3300 Edison Way	1324	1323			343	6		VCP	1/11/99	7-7							2																	8		2	2	
43	2022 Stockbridge Ave.	1817	1811			75	6		VCP	1/19/99	9-8																1										1	1	
79	3096 Middlefield Rd.	1454	1453	4		318	6		VCP	4/7/99	21-4																								4			1	
29	222 Polhemus Ave.	1772	1743			91	6		VCP	1/13/99	8-6								1																		1	1	
35	1860 Stockbridge Ave.	1805	1800			185	6		VCP	1/18/99	8-12							1									1								1		2	1	
12	3355 Edison Way	1321	1320			104	10		VCP	1/6/99	7-3																1										1	1	
78	3060 Middlefield Rd.	1453	1452	4		273	6		VCP	4/7/99	21-3																								2			1	
37	1926 Stockbridge Ave.	1807	1806			142	6		VCP	1/18/99	9-2							1																	1		1	1	
9	727 6-th Ave	1316	1312			315	8		VCP	1/5/99	6-14	2						2											1						20		5	1	
64	481 Stockbridge Ave.	2006 c/o	2005			4	6		VCP	1/21/99	11-2																		1						4		1		Unable to shattered pipe.
60	200 Elanor Dr.	2051	2061			54	6		VCP	1/20/99	10-10																		1								1		Shattered pipe. Unable to get by.
40	1990 Stockbridge Ave.	1810	1809			149	6		VCP	1/19/99	9-5																												
15	3355 Edison Way	1323	1322			50	8		VCP	1/11/99	7-6																												

RUN No.	STREET OR PARCEL No.	UPSTREAM MANHOLE No.	DOWNSTREAM MANHOLE No.	DEPTH	LENGTH BETWEEN MANHOLES, ft	COMPLETE FOOTAGE TAPED, ft	PIPE SIZE, in	PIPE JOINT LENGTH, ft	PIPE MATERIAL TYPE	DATE OF INSPECTION	VIDEO TAPE No.	MAINLINE SEWER DEFECTS																				T	EST. I/I FLOW RATE, gpm	TOTAL No. of DEFECTS TO REHABILITATE	Total Score	COMMENTS
												CRACK		JTS		LATERALS			ROOTS		I/I					ALIGN		STRUC.			M.S.		S.C.					
												CP1	CP2	OJ1	OJ2	PT1	PT2	PT3	RJ	RT	I1	I2	I3	I4	I5	I6	A1	A2	S1	S2	S3	M1	M2	C1	C2				
13	3355 Edison Way	1322	1321			52	10		VCP	1/11/99	7-4																										Spend two days cleaning pipe. Could not completely clean the pipe. Pipe looks like 8" Iron Pipe.
10	787 6-th Ave.	1312	1300			170	8		VCP	1/5/99	7-1																										Heavy flow in line even slightly plugged off.
TOTAL						15025						330	1	12				47	167	15				1			25		31	28	1					221		658		

Insert “E” Tab Here

APPENDIX E

HYDRAULIC MODEL TECHNICAL MEMORANDUM

MEMORANDUM 14692-006

December 22, 1998

TO: MARK WELSH
COUNTY OF SAN MATEO, DPW

FROM: CHARLIE JOYCE
BROWN AND CALDWELL

SUBJECT: WASTEWATER MASTER PLAN
FLOW PROJECTIONS AND HYDRAULIC MODELING

This technical memorandum presents the results of the hydraulic modeling performed to determine the amount of available capacity in the County of San Mateo (County) trunk sewers. Modeling was performed on the major trunk sewers in Burlingame Hills (BH), Crystal Springs (CS), Devonshire (DS), Emerald Lake (EL), and Fair Oaks (FO), Oak Knoll (OK) and Scenic Heights (SH) sewer districts.

Design Flow Projections

Wastewater flows were divided into base sanitary flow (BSF) and wet weather infiltration/inflow (I/I) components for this study. Base sanitary flow factors are based on dry weather flow monitoring performed during the winter of 1997. Due to limited rainfall during the winter of 1997, additional wet weather flow monitoring was performed during the following season. El Nino effects resulted in extensive rainfall during the January and February of 1998. Wet weather flow projections are based on flow monitoring results from second flow monitoring program.

BSF. BSF is wastewater contributed by residential, commercial, industrial, and public users. Base flow is directly related to land use and varies throughout the day and between weekdays and weekends. BSF from residential areas has a typical diurnal pattern with peak flows occurring in the morning after 7:00 a.m. and a second smaller peak occurring in the evening.

BSF flow contributions to the hydraulic model are based on the flow monitoring data collected during dry weather periods. Actual dry weather hydrographs were extracted from the flow monitoring data and used in the model. Dry weather periods were used to minimize the amount of groundwater infiltration included in the calculation. Groundwater infiltration occurs when groundwater levels are above the sewer pipes and the pipes have defects that allow infiltration. Some groundwater infiltration is undoubtedly included in the BSF rates, however, extensive review of accurate water use date in each District would be needed to determine the amount of groundwater infiltration in each area.

Dry weather flow projections were prepared for current land use conditions only. Land use planners for the County and affected City agencies indicated that growth or significant in-filling was not expected in the future.

Flow monitoring was not performed in the OK and SH Districts. BSF calculations for these Districts are based on the number of parcels in the District and a per parcel water use rate of 220 gallons per day. A conservative sanitary peaking factor of 3.5 was used to determine the peak dry weather flow.

Wet Weather I/I Flow

I/I consists of direct inflow of storm water runoff and rainfall-induced infiltration of storm water percolating into the collection system. Inflow occurs when storm water enters the collection system through illegally connected catch basins, area drains, or home roof gutter downspouts, or through manhole covers of cleanout lids. Inflow can become severe if surface flooding occurs and manholes and cleanouts are submerged or used to drain low-lying areas.

I/I accounts for the large increase in peak flows that occur during rainfall events. In areas with older sewers, I/I is typically the largest component of the total wastewater flow. I/I was evaluated by calculating the "R" factor for each of the monitored basins for each storm. An "R" factor is the percentage of rainfall that enters the collection system as I/I. The composite minimum and maximum "R" factor for each District is listed in Table 1.

Table 1, R Factors

District	Minimum R factor	Maximum R factor
Burlingame Hills	0.026	0.113
Crystal Springs	0.027	0.102
Devonshire	0.018	0.040
Emerald Lake	0.024	0.105
Fair Oaks	0.012	0.111

To determine the effects of I/I on the capacity of the wastewater conveyance system a wet weather design storm was developed. The January 18, 1998 rainfall event was very similar to a 5-year design storm in terms of intensity, duration, and volume. Therefore, this storm was selected as the design event. Minor adjustments were made to the rainfall hydrograph to account for differences in the volume between the actual storm and the 5-year design rainfall.

To develop wet weather hydrographs for use in the model, unit hydrographs were developed for each basin. Unit hydrographs are based on the "R" factor and the individual runoff characteristics for each basin. Synthetic hydrographs were added to the base flow hydrographs and the total hydrograph was input to the model.

Due to the lack of flow monitoring data for the OK and SH areas, a conservative I/I rate of 2,400 gallons per acre per day was used. This rate is used by the Central Contra Costa Sanitary District and is the most conservative rate in use in the Bay Area.

Capacity Analysis

Major trunk sewers in each of the sewer Districts were modeled to determine if any capacity deficiencies exist. The HYDRA model developed by PIZER, Inc. was used to simulate wastewater flows in the each of the Districts collection systems. HYDRA routes flow hydrographs through the collection system and accounts for the time delays of peak flow from various tributary areas as the flows move downstream. A standard Manning's friction coeffcient of 0.0135 was used for the analysis.

Modeled flow is compared to the theoretical capacity of each pipe segment. The capacity of each pipeline is a function of the pipeline slope and diameter. Surveying was required in various areas to verify the pipeline slope. If capacity deficiencies were detected, the program was used to size the appropriate relief and/or replacement sewer size.

Hydraulic models of the Harbor Industrial and Kensington Square districts were not prepared due to their small size. Both districts are much less than 50 acres in size. An 8-inch diameter sewer with a slope of 0.1 percent has enough capacity to serve a tributary area greater than 50 acres in size using conservative flow factors for BSF and I/I. Therefore, it was assumed that trunk sewers in the Harbor Industrial and Kensington Square districts have adequate capacity.

Hydrographs produced by the model were compared to the actual wet weather hydrographs from the flow monitoring to verify model calibration. An example of a model calibration hydrograph for the Burlingame Hills District is shown in Figure 1.

The modeled sewers for each District and the results of the modeling are shown on Figure 2 through Figure 8. Relief sewer sizes for each District are summarized in Tables 2 through Table 5. Hydraulic capacity deficiencies were not found in the DS, OK or SH Districts. Complete model results are given in Attachment A.

Table 2, Hydraulic Modeling Results, Burlingame Hills

Upstream Manhole	Downstream Manhole	Existing Diameter, inches	Length, ft	Recommended Relief Sewer Sizes, inches
B004603	B000204	6-8	2,610	8
B000204	B000104	8	216	12
Total			2,826	

Table 3, Hydraulic Modeling Results, Crystal Springs

Upstream Manhole	Downstream Manhole	Existing Diameter, inches	Length, ft	Recommended Relief Sewer Sizes, inches
C019105	C014405	10	1,714	8
C014405	C000301	10	3,280	12
Total			4,994	

Table 4, Hydraulic Modeling Results, Emerald Lake

Upstream Manhole	Downstream Manhole	Existing Diameter, inches	Length, ft	Recommended Relief Sewer Sizes, inches
E115601	E115201	6	455	8
E102322	E101634	8	1,163	8
E101634	E101134	8	342	12
Total			1,960	

Table 5, Hydraulic Modeling Results, Fair Oaks

Upstream Manhole	Downstream Manhole	Existing Diameter, inches	Length, ft	Recommended Relief Sewer Sizes, inches
F198636	F198227	10	1,170	8
F197727	F193228	10	1,327	10
F193228	F191828	8-10	1,743	15
F190528	F183828	15	1,253	15
F183828	F170419	18	2,911	30
F170419	F169919	15-18	870	27
F169919	F168014	15	1,642	15
F157414	F156914	10	1,049	10
F156914	F156714	10	176	15
F120311	F117211	8-10	921	18
F117211	F116211	10-12	1,883	12
F116211	F115610	12-18	1,489	24
F156614	F145009	15-21	2,979	24
F143709	F115510	10-21	3,251	15
F115510	F114904	30	2,857	45
TOTAL			25,521	

C:\HYDRA\SANMATEO\FPIPES.CMD 11:29 7-Jan-99
MGD

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** AF214535 Analysis of Existing Pipes

Link	Long	Slope Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes Vel d/D	Qmax %Cap QRem	GrUp HGLUp DiffUp	GrDn HGLDn DiffDn	SrCh/Dlt Parallel Replace
1	149	0.0117	142.04	0.2	0.9	1.01	1.33	154.74	152.94	***/***
		10	140.29	0.0	0.0	2.87	76.05	230.12	229.17	
F214535						0.67		-75.38	-76.23	
2	251	0.0117	140.29	0.2	0.9	1.01	1.33	152.94	150.50	***/***
		10	137.35	0.0	0.0	2.87	76.15	229.17	227.83	
F214435						0.67		-76.23	-77.33	
3	133	0.0108	137.35	0.2	0.9	1.01	1.28	150.50	149.31	***/***
		10	135.91	0.0	0.0	2.87	79.21	227.83	227.09	
F214335						0.69		-77.33	-77.78	
4	144	0.0055	135.91	0.2	0.9	1.01	0.91	149.31	145.67	***/***
		10	135.12	0.0	0.0	2.87	111.28	227.09	226.29	6
F214235						0.88	0.10	-77.78	-80.62	12
5	80	0.0071	135.12	0.2	0.9	1.01	1.04	145.67	147.55	***/***
		10	134.55	0.0	0.0	2.87	97.64	226.29	225.82	
F214135						0.79		-80.62	-78.27	
6	256	0.0061	134.55	0.2	0.9	1.01	0.96	147.55	150.45	***/***
		10	133.00	0.0	0.0	2.87	105.92	225.82	224.45	4
F214035						0.84	0.06	-78.27	-74.00	12
7	69	0.0086	133.00	0.2	0.9	1.01	1.14	150.45	143.66	***/***
		10	132.41	0.0	0.0	2.87	89.13	224.45	224.03	
F213935						0.74		-74.00	-80.37	
8	224	0.0046	132.41	0.2	0.9	1.01	0.84	143.66	140.52	***/***
		10	131.37	0.0	0.0	2.87	120.96	224.03	222.83	6
F2138A35						1.00	0.18	-80.37	-82.31	12
9	181	0.0062	131.37	0.2	0.9	1.01	0.97	140.52	138.30	***/***
		10	130.25	0.0	0.0	2.87	104.78	222.83	221.84	4
F213835						0.83	0.05	-82.31	-83.54	12
10	133	0.0114	130.25	0.2	0.9	1.01	1.31	138.30	136.54	***/***
		10	128.74	0.0	0.0	2.87	77.35	221.84	221.10	
F213735						0.68		-83.54	-84.56	
11	139	0.0088	128.74	0.2	0.9	1.01	1.16	136.54	134.26	***/***
		10	127.51	0.0	0.0	2.87	87.62	221.10	220.33	
F2136A35						0.73		-84.56	-86.07	
12	224	0.0104	127.51	0.2	0.9	1.01	1.25	134.26	130.13	***/***
		10	125.18	0.0	0.0	2.87	80.81	220.33	219.13	
F213635						0.70		-86.07	-89.00	

C:\HYDRA\SANMATEO\FPIPES.CMD 11:30 7-Jan-99
MGD

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** AF214535 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San / Inf	Sto / Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
13	245	0.0111	125.18	0.2	0.9	1.01	1.29	130.13	130.26	***/***
		10	122.46	0.0	0.0	2.87	78.22	219.13	217.81	
F213535						0.68		-89.00	-87.55	
14	133	0.0100	122.46	0.2	0.9	1.01	1.23	130.26	129.43	***/***
		10	121.13	0.0	0.0	2.87	82.42	217.81	217.07	
F213436						0.71		-87.55	-87.64	
15	384	0.0104	121.13	0.2	0.9	1.01	1.25	129.43	125.99	***/***
		10	117.14	0.0	0.0	2.87	80.86	217.07	215.05	
F213336						0.70		-87.64	-89.06	
16	208	0.0079	117.14	0.2	0.9	1.01	1.09	125.99	123.57	***/***
		10	115.50	0.0	0.0	2.87	92.82	215.05	213.93	
F213236						0.76		-89.06	-90.36	
17	296	0.0084	115.50	0.3	1.4	1.56	1.12	123.57	122.70	***/***
		10	113.02	0.0	0.0	4.42	138.53	213.93	210.03	8
F198636						1.00	0.43	-90.36	-87.33	12
18	267	0.0070	113.02	0.3	1.4	1.56	1.03	122.27	120.00	***/***
		10	111.15	0.0	0.0	4.42	151.52	210.03	206.66	8
F198536						1.00	0.53	-87.76	-86.66	12
19	282	0.0076	111.15	0.3	1.4	1.56	1.07	120.00	118.00	***/***
		10	109.00	0.0	0.0	4.42	145.22	206.66	203.11	8
F198436						1.00	0.49	-86.66	-85.11	12
20	325	0.0090	109.00	0.3	1.4	1.56	1.17	118.00	116.00	***/***
		10	106.07	0.0	0.0	4.42	133.55	203.11	199.04	8
F198336						1.00	0.39	-85.11	-83.04	12
21	160	0.0136	106.07	0.3	1.4	1.56	1.43	116.00	114.00	***/***
		10	103.89	0.0	0.0	4.42	108.63	199.04	196.96	4
F198227						0.86	0.12	-83.04	-82.96	12
22	224	0.0133	103.89	0.3	1.4	1.56	1.42	114.00	110.00	***/***
		10	100.92	0.0	0.0	4.42	110.12	196.96	194.11	6
F198127						0.87	0.14	-82.96	-84.11	12
23	229	0.0147	100.92	0.3	1.4	1.56	1.49	110.00	104.86	***/***
		10	97.56	0.0	0.0	4.42	104.68	194.11	191.20	4
F198027						0.83	0.07	-84.11	-86.34	12
24	251	0.0220	97.56	0.3	1.4	1.60	1.82	104.86	96.60	***/***
		10	92.05	0.0	0.0	4.53	87.73	191.20	187.85	
F197827						0.73		-86.34	-91.25	

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** AF214535 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
25	293	0.0081	92.05	0.3	1.4	1.60	1.11	96.60	95.00	***/***
		10	89.68	0.0	0.0	4.53	144.52	187.85	183.98	8
F197727						1.00	0.49	-91.25	-88.98	12
26	261	0.0498	89.68	0.3	1.4	1.60	2.74	95.00	86.89	***/***
		10	76.69	0.0	0.0	4.53	58.26	183.98	180.51	
F197427						0.57		-88.98	-93.62	
27	240	0.0144	76.69	0.3	1.4	1.60	1.47	86.89	77.49	***/***
		10	73.24	0.0	0.0	4.53	108.41	180.51	177.31	4
F197327						0.85	0.12	-93.62	-99.82	12
28	240	0.0140	73.24	0.3	1.4	1.60	1.45	77.49	78.00	***/***
		10	69.88	0.0	0.0	4.53	109.85	177.31	174.11	6
F197227						0.86	0.14	-99.82	-96.11	12
29	293	0.0068	69.88	0.3	1.4	1.60	1.01	78.00	79.50	***/***
		10	67.89	0.0	0.0	4.53	157.72	174.11	170.24	10
F197127						1.00	0.58	-96.11	-90.74	12
30	314	0.0102	67.89	0.5	1.6	2.01	0.69	79.50	71.60	***/***
		8	64.68	0.0	0.0	8.90	292.94	170.24	148.07	12
F193228						1.00	1.32	-90.74	-76.47	12
31	304	0.0098	64.68	0.5	1.6	2.01	0.67	71.60	68.00	***/***
		8	61.69	0.0	0.0	8.90	298.60	148.07	127.47	12
F193128						1.00	1.33	-76.47	-59.47	15
32	394	0.0083	61.69	0.5	1.6	2.01	1.12	68.00	67.50	***/***
		10	58.42	0.0	0.0	5.69	179.27	127.47	120.07	10
F193028						1.00	0.89	-59.47	-52.57	15
33	267	0.0031	58.42	0.5	1.6	2.01	0.69	67.50	66.20	***/***
		10	57.59	0.0	0.0	5.69	292.92	120.07	114.48	15
F192528						1.00	1.32	-52.57	-48.28	15
34	48	0.0027	57.59	0.5	1.6	2.01	0.64	66.20	66.20	***/***
		10	57.46	0.0	0.0	5.69	313.82	114.48	113.27	15
F192428						1.00	1.37	-48.28	-47.07	18
35	139	0.0031	57.46	0.5	1.6	2.01	0.68	66.20	65.60	***/***
		10	57.03	0.0	0.0	5.69	293.63	113.27	110.24	15
F192228						1.00	1.32	-47.07	-44.64	15
36	277	0.0034	57.03	0.5	1.6	2.01	0.71	65.60	64.80	***/***
		10	56.10	0.0	0.0	5.69	281.86	110.24	104.45	15
F192028						1.00	1.30	-44.64	-39.65	15

C:\HYDRA\SANMATEO\FPIPES.CMD

11:30 7-Jan-99
MGD

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** AF214535

Analysis of Existing Pipes

Link	Long	Slope Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes Vel d/D	Qmax %Cap QRem	GrUp HGLUp DiffUp	GrDn HGLDn DiffDn	SrCh/Dlt Parallel Replace
37	309	0.0052	56.10	0.5	1.6	2.01	2.61	64.80	64.01	***/***
		15	54.50	0.0	0.0	2.53	76.97	104.45	104.09	
F191828						0.67		-39.65	-40.08	
38	245	0.0102	54.50	0.5	1.6	2.01	3.65	64.01	61.91	***/***
		15	52.01	0.0	0.0	2.53	54.94	104.09	103.48	
F191728						0.55		-40.08	-41.57	
39	251	0.0080	52.01	0.5	1.6	2.01	3.24	61.91	57.92	***/***
		15	50.00	0.0	0.0	2.53	61.89	103.48	102.85	
F191428						0.59		-41.57	-44.93	
40	261	0.0075	50.00	0.5	1.6	2.01	3.14	57.92	54.23	***/***
		15	48.04	0.0	0.0	2.53	63.91	102.85	102.20	
F191128						0.60		-44.93	-47.97	
41	288	0.0081	48.04	0.5	1.6	2.01	3.25	54.23	52.75	***/***
		15	45.72	0.0	0.0	2.53	61.71	102.20	101.49	
F190828						0.59		-47.97	-48.74	
42	293	0.0024	45.72	0.9	2.1	2.83	1.76	52.75	51.30	***/***
		15	45.03	0.0	0.0	3.56	160.76	101.49	99.95	15
F190528						1.00	1.07	-48.74	-48.65	18
43	256	0.0027	45.03	0.9	2.1	2.83	1.87	51.30	49.68	***/***
		15	44.35	0.0	0.0	3.56	151.36	99.95	98.68	12
F190218						1.00	0.96	-48.65	-49.00	18
44	304	0.0027	44.35	0.9	2.1	2.83	1.87	49.68	49.00	***/***
		15	43.54	0.0	0.0	3.56	151.13	98.68	97.20	12
F190118						1.00	0.96	-49.00	-48.20	18
45	400	0.0018	43.54	0.9	2.1	2.83	1.56	49.00	52.11	***/***
		15	42.80	0.0	0.0	3.56	181.37	97.20	95.27	15
F190018						1.00	1.27	-48.20	-43.16	21
46	171	0.0006	42.80	1.4	3.3	4.20	1.43	52.11	52.55	***/***
		18	42.70	0.0	0.0	3.68	294.89	95.27	94.50	24
F183828						1.00	2.78	-43.16	-41.95	30
47	224	0.0003	42.70	1.4	3.3	4.20	0.96	52.55	52.64	***/***
		18	42.64	0.0	0.0	3.68	435.75	94.50	93.54	30
F172719						1.00	3.24	-41.95	-40.90	33
48	192	0.0018	42.64	1.4	3.3	4.20	2.48	52.64	52.32	***/***
		18	42.30	0.0	0.0	3.68	169.47	93.54	92.71	18
F172619						1.00	1.72	-40.90	-40.39	24

C:\HYDRA\SANMATEO\FPIPES.CMD

11:30 7-Jan-99
MGD

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** AF214535

Analysis of Existing Pipes

Link	Long	Slope Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes Vel d/D	Qmax %Cap QRem	GrUp HGLUp DiffUp	GrDn HGLDn DiffDn	SrCh/Dlt Parallel Replace
49	373	0.0002	42.30	1.4	3.3	4.20	0.75	52.32	51.99	***/***
		18	42.24	0.0	0.0	3.68	562.29	92.71	91.18	33
F172519						1.00	3.46	-40.39	-39.19	36
50	21	0.0257	42.24	1.4	3.3	4.20	9.45	51.99	51.98	***/***
		18	41.70	0.0	0.0	3.68	44.47	91.18	90.99	
F172419						0.49		-39.19	-39.01	
51	298	0.0004	41.70	1.4	3.3	4.20	1.18	51.98	53.58	***/***
		18	41.58	0.0	0.0	3.68	355.39	90.99	89.75	27
F172319						1.00	3.02	-39.01	-36.17	30
52	107	0.0017	41.58	1.4	3.3	4.20	2.42	53.58	53.25	***/***
		18	41.40	0.0	0.0	3.68	173.88	89.75	89.24	18
F171819						1.00	1.79	-36.17	-35.99	24
53	187	0.0005	41.40	1.4	3.3	4.20	1.36	53.25	53.55	***/***
		18	41.30	0.0	0.0	3.68	308.39	89.24	88.42	24
F1717A19						1.00	2.84	-35.99	-34.87	30
54	208	0.0005	41.30	1.4	3.3	4.24	1.29	53.55	54.96	***/***
		18	41.20	0.0	0.0	3.71	328.12	88.42	87.50	27
F171719						1.00	2.95	-34.87	-32.54	30
55	37	0.0051	41.20	1.4	3.3	4.24	4.22	54.96	54.66	***/***
		18	41.01	0.0	0.0	3.71	100.40	87.50	87.25	4
F171619						0.80	0.02	-32.54	-32.59	21
56	394	0.0000	41.01	1.4	3.3	4.24	0.30	54.66	53.90	***/***
		18	41.00	0.0	0.0	3.711	428.06	87.25	85.61	48
F171519						1.00	3.94	-32.59	-31.71	54
57	320	0.0003	41.00	1.4	3.3	4.24	1.04	53.90	51.35	***/***
		18	40.90	0.0	0.0	3.71	406.98	85.61	84.26	30
F171419						1.00	3.20	-31.71	-32.91	33
58	59	0.0093	40.90	1.4	3.3	4.24	5.69	51.35	50.65	***/***
		18	40.35	0.0	0.0	3.71	74.51	84.26	83.93	
F171319						0.66		-32.91	-33.28	
59	53	0.0019	40.35	1.4	3.3	4.24	2.56	50.65	51.10	***/***
		18	40.25	0.0	0.0	3.71	165.63	83.93	83.62	18
F171219						1.00	1.68	-33.28	-32.52	24
60	267	0.0005	40.25	1.4	3.3	4.24	1.30	51.10	47.62	***/***
		18	40.12	0.0	0.0	3.71	326.05	83.62	82.47	27
F170519						1.00	2.94	-32.52	-34.85	30

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** AP214535 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
61	75	0.0016	40.12	1.4	3.3	4.24	2.36	47.62	46.76	***/***
		18	40.00	0.0	0.0	3.71	179.86	82.47	82.07	18
F170419						1.00	1.88	-34.85	-35.31	24
62	251	0.0013	40.00	1.4	3.3	4.24	2.10	46.76	45.18	***/***
		18	39.68	0.0	0.0	3.71	201.49	82.07	80.99	21
F170319						1.00	2.14	-35.31	-35.81	24
63	107	0.0004	39.68	1.4	3.3	4.24	1.14	45.18	45.00	***/***
		18	39.64	0.0	0.0	3.71	372.10	80.99	80.47	27
F170219						1.00	3.10	-35.81	-35.47	30
64	298	0.0005	39.64	1.4	3.3	4.24	1.28	45.00	43.91	***/***
		18	39.50	0.0	0.0	3.71	331.93	80.47	79.21	27
F170119						1.00	2.96	-35.47	-35.30	30
65	139	0.0010	39.50	1.4	3.3	4.20	1.15	43.91	43.71	***/***
		15	39.36	0.0	0.0	5.30	365.43	79.21	77.36	24
F170019						1.00	3.05	-35.30	-33.65	27
66	59	0.0134	39.36	1.4	3.3	4.20	4.19	43.71	43.57	***/***
		15	38.57	0.0	0.0	5.30	100.22	77.36	76.55	4
F169919						0.80	0.01	-33.65	-32.98	18
67	245	0.0056	38.57	1.4	3.3	4.20	2.72	43.57	40.64	***/***
		15	37.19	0.0	0.0	5.30	154.53	76.55	73.86	12
F169719						1.00	1.48	-32.98	-33.22	18
68	245	0.0039	37.19	1.4	3.3	4.20	2.26	40.64	40.00	***/***
		15	36.24	0.0	0.0	5.30	186.24	73.86	71.17	15
F169613						1.00	1.95	-33.22	-31.17	21
69	107	0.0049	36.24	1.4	3.3	4.20	2.53	40.00	39.97	***/***
		15	35.72	0.0	0.0	5.30	166.36	71.17	69.87	15
F169514						1.00	1.68	-31.17	-29.90	21
70	96	0.0101	35.72	1.4	3.3	4.20	3.64	39.97	39.00	***/***
		15	34.75	0.0	0.0	5.30	115.37	69.87	68.69	8
F168714						0.91	0.56	-29.90	-29.69	18
71	448	0.0059	34.75	1.4	3.3	4.20	2.79	39.00	36.39	***/***
		15	32.09	0.0	0.0	5.30	150.51	68.69	63.95	12
F168614						1.00	1.41	-29.69	-27.56	18
72	245	0.0057	32.09	1.4	3.3	4.20	2.73	36.39	35.10	***/***
		15	30.70	0.0	0.0	5.30	153.97	63.95	61.26	12
F168514						1.00	1.47	-27.56	-26.16	18

C:\HYDRA\SANMATEO\FPIPES.CMD 11:30 7-Jan-99
MGD

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** AF214535 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
73	165	0.0048	30.70	1.4	3.3	4.20	2.51	35.10	34.55	***/***
		15	29.91	0.0	0.0	5.30	167.61	61.26	59.38	15
F168114						1.00	1.70	-26.16	-24.83	21
74	32	0.0022	29.91	1.4	3.3	4.24	1.69	34.55	40.88	***/***
		15	29.84	0.0	0.0	5.35	250.15	59.38	58.82	18
F168014						1.00	2.54	-24.83	-17.94	24

Lateral length= 16087 Upstream length= 16087

*** BF157414 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
75	298	0.0036	34.88	0.3	0.9	1.12	0.74	40.88	38.00	***/***
		10	33.80	0.0	0.0	3.17	150.89	67.09	65.01	8
F157414						1.00	0.38	-26.21	-27.01	12
76	304	0.0063	33.80	0.3	0.9	1.12	0.97	38.00	37.31	***/***
		10	31.90	0.0	0.0	3.16	114.81	65.01	63.06	6
F157314						0.90	0.14	-27.01	-25.75	12
77	149	0.0061	31.91	0.3	0.9	1.12	0.96	37.31	36.00	***/***
		10	31.00	0.0	0.0	3.16	116.14	63.06	62.06	6
F157214						1.00	0.16	-25.75	-26.06	12
78	149	0.0033	31.00	0.3	0.9	1.12	0.70	36.00	35.68	***/***
		10	30.51	0.0	0.0	3.16	158.28	62.06	61.06	10
F157114						1.00	0.41	-26.06	-25.38	12
79	149	0.0032	30.48	0.3	0.9	1.12	0.70	35.68	35.00	***/***
		10	30.00	0.0	0.0	3.16	159.92	61.06	60.06	10
F157014						1.00	0.42	-25.38	-25.06	12
80	139	0.0009	30.00	0.3	0.9	1.12	0.36	35.00	34.38	***/***
		10	29.88	0.0	0.0	3.16	308.91	60.06	59.13	15
F156914						1.00	0.75	-25.06	-24.75	18
81	37	0.0011	29.88	0.3	0.9	1.12	0.40	34.38	34.34	***/***
		10	29.84	0.0	0.0	3.16	276.05	59.13	58.82	15
F156814						1.00	0.71	-24.75	-24.48	15

Lateral length= 1225 Upstream length= 1225

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** DF141610 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
82	309	0.0029	11.51	0.1	0.0	0.08	3.18	20.32	18.40	***/***
		18	10.61	0.0	0.0	0.07	2.49	23.46	23.46	
F141610						0.12		-3.14	-5.06	
83	298	0.0035	10.61	0.1	0.0	0.08	3.46	18.40	16.70	***/***
		18	9.58	0.0	0.0	0.07	2.29	23.46	23.46	
F141510						0.12		-5.06	-6.76	
84	304	0.0030	9.58	0.1	0.0	0.08	3.22	16.70	14.30	***/***
		18	8.67	0.0	0.0	0.07	2.46	23.46	23.46	
F141410						0.12		-6.76	-9.16	
85	293	0.0031	8.67	0.1	0.0	0.08	3.28	14.30	14.99	***/***
		18	7.76	0.0	0.0	0.07	2.41	23.46	23.46	
F140810						0.12		-9.16	-8.47	
86	37	0.0008	7.76	0.1	0.0	0.08	1.68	14.99	15.03	***/***
		18	7.73	0.0	0.0	0.07	4.72	23.46	23.46	
F140710						0.17		-8.47	-8.43	
87	32	0.0078	7.73	0.1	0.0	0.08	5.21	15.03	15.00	***/***
		18	7.48	0.0	0.0	0.07	1.52	23.46	23.46	
F140610						0.10		-8.43	-8.46	

Lateral length= 1273 Upstream length= 1273

*** CF260308 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
88	171	0.0042	9.25	0.3	0.1	0.40	0.80	17.48	16.00	
		10	8.53	0.0	0.0	2.13	49.70	9.68	8.96	
F260308						0.52		7.80	7.04	
89	187	0.0039	8.53	0.3	0.1	0.40	0.76	16.00	14.70	
		10	7.81	0.0	0.0	2.07	51.97	8.97	8.25	
F2602A08						0.53		7.03	6.45	
90	405	0.0036	7.81	0.3	0.1	0.40	0.74	14.70	13.10	
		10	6.35	0.0	0.0	2.02	53.71	8.26	6.80	
F260208						0.54		6.44	6.30	

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** CF260308 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
91	298	0.0035	6.35	0.3	0.1	0.40	0.72	13.10	12.90	
		10	5.32	0.0	0.0	1.99	54.85	6.81	5.78	
F260108						0.55		6.29	7.12	
92	96	0.0026	5.32	0.3	0.1	0.40	0.63	12.90	13.00	
		10	5.07	0.0	0.0	1.81	63.20	5.82	5.57	
F260008						0.60		7.08	7.43	
93	330	0.0029	5.07	0.3	0.1	0.40	0.67	13.00	11.60	
		10	4.10	0.0	0.0	1.88	59.48	5.55	4.58	
F259308						0.57		7.45	7.02	
94	288	0.0029	4.10	0.3	0.1	0.40	0.66	11.60	10.70	
		10	3.26	0.0	0.0	1.88	59.71	4.58	3.74	
F259208						0.58		7.02	6.96	
95	277	0.0031	3.26	0.3	0.1	0.40	0.68	10.70	9.70	
		10	2.41	0.0	0.0	1.91	58.22	3.73	2.88	
F259108						0.57		6.97	6.82	
96	358	0.0024	2.41	0.3	0.1	0.40	0.61	9.70	8.80	
		10	1.54	0.0	0.0	1.77	65.42	2.92	2.05	
F259008						0.61		6.78	6.75	
97	346	0.0025	1.54	0.3	0.1	0.40	0.62	8.80	7.98	
		10	0.66	0.0	0.0	1.80	63.95	2.04	1.16	
F258908						0.60		6.76	6.82	
98	346	0.0032	0.66	0.3	0.1	0.40	0.69	7.98	7.04	
		10	-0.43	0.0	0.0	1.93	57.46	1.13	0.04	
F258304						0.56		6.85	7.00	
99	330	0.0037	-0.43	0.3	0.1	0.40	0.75	7.04	6.65	
		10	-1.65	0.0	0.0	2.04	53.04	0.02	-1.20	
F258204						0.54		7.02	7.85	
100	11	0.1409	-1.65	0.3	0.1	0.40	4.61	6.65	6.98	***
		10	-3.20	0.0	0.0	1.12	8.59	-0.87	-0.91	
F254904						0.22		7.52	7.89	

Lateral length= 3443 Upstream length= 3443

*** EF120311 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

101	394	0.0044	11.08	0.3	1.1	1.35	0.81	16.36	16.14	***/***
		10	9.36	0.0	0.0	3.82	165.68	34.17	30.29	10
F120311						1.00	0.53	-17.81	-14.15	15
102	85	0.0007	9.36	0.3	1.1	1.35	0.33	16.14	16.80	***/***
		10	9.30	0.0	0.0	3.82	412.02	30.29	29.42	18
F120211						1.00	1.02	-14.15	-12.62	18
103	85	0.0007	9.30	0.3	1.1	1.35	0.33	16.80	17.34	***/***
		10	9.24	0.0	0.0	3.82	412.02	29.42	28.54	18
F118711						1.00	1.02	-12.62	-11.20	18
104	48	0.0092	9.24	0.3	1.1	1.35	1.18	17.34	14.93	***/***
		10	8.80	0.0	0.0	3.82	114.34	28.54	27.99	6
F118611						0.90	0.17	-11.20	-13.06	12
105	224	0.0044	8.80	0.3	1.1	1.35	0.45	14.93	13.37	***/***
		8	7.81	0.0	0.0	5.96	298.58	27.99	20.78	12
F117411						1.00	0.89	-13.06	-7.41	15
106	85	0.0058	7.81	0.3	1.1	1.35	0.51	13.37	13.37	***/***
		8	7.32	0.0	0.0	5.96	261.43	20.78	17.99	10
F117311						1.00	0.83	-7.41	-4.62	12
107	43	0.0116	7.32	0.3	1.1	1.35	1.33	13.37	12.70	***/***
		10	6.82	0.0	0.0	3.82	101.52	17.99	17.82	4
F117211						0.81	0.02	-4.62	-5.12	12
108	43	0.0002	6.82	0.3	1.1	1.35	0.19	12.70	12.60	***/***
		10	6.81	0.0	0.0	3.82	717.83	17.82	17.32	21
F117111						1.00	1.16	-5.12	-4.72	21
109	224	0.0052	6.81	0.3	1.1	1.35	0.88	12.60	12.50	***/***
		10	5.65	0.0	0.0	3.82	152.12	17.32	15.19	8
F117011						1.00	0.46	-4.72	-2.69	12
110	272	0.0040	5.65	0.3	1.1	1.35	0.77	12.50	12.00	***/***
		10	4.57	0.0	0.0	3.82	173.72	15.19	12.64	10
F116911						1.00	0.57	-2.69	-0.64	15
111	267	0.0016	4.57	0.3	1.1	1.35	0.80	12.00	11.50	***/***
		12	4.14	0.0	0.0	2.65	167.74	12.64	11.79	12
F116811						1.00	0.54	-0.64	-0.29	15
112	224	0.0020	4.14	0.3	1.1	1.35	0.89	11.50	11.25	***/***
		12	3.70	0.0	0.0	2.65	151.88	11.79	10.98	10
F116711						1.00	0.46	-0.29	0.27	15
113	261	0.0016	3.70	0.3	1.1	1.35	0.81	11.25	11.00	***
		12	3.27	0.0	0.0	2.65	165.84	10.98	10.03	12
F116611						1.00	0.53	0.27	0.97	15

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** EF120311 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
114	277	0.0016	3.27	0.3	1.1	1.35	0.80	11.00	10.75	***
		12	2.83	0.0	0.0	2.65	168.90	10.03	9.04	12
F116511						1.00	0.55	0.97	1.71	15
115	272	0.0016	2.83	0.3	1.1	1.35	0.80	10.75	10.50	***
		12	2.39	0.0	0.0	2.65	167.37	9.04	8.06	12
F116411						1.00	0.54	1.71	2.44	15
116	298	0.0001	2.39	0.3	1.1	1.35	0.23	10.50	9.85	***
		12	2.35	0.0	0.0	2.65	581.02	8.06	6.99	24
F116211						1.00	1.11	2.44	2.86	24
117	288	0.0030	2.35	0.3	1.1	1.35	1.09	9.85	9.00	***
		12	1.50	0.0	0.0	2.65	123.91	6.99	5.96	8
F116110						1.00	0.26	2.86	3.04	15
118	330	0.0010	1.50	0.6	2.3	2.69	1.89	9.00	8.50	***
		18	1.16	0.0	0.0	2.36	142.24	5.96	5.42	15
F116010						1.00	0.80	3.04	3.08	21
119	320	0.0010	1.16	0.6	2.3	2.69	1.89	8.50	8.00	***
		18	0.83	0.0	0.0	2.36	142.18	5.42	4.88	15
F115910						1.00	0.80	3.08	3.12	21
120	309	0.0006	0.83	0.6	2.3	2.69	1.50	8.00	7.73	***
		18	0.63	0.0	0.0	2.36	179.46	4.88	4.35	18
F115810						1.00	1.19	3.12	3.38	24
121	213	0.0011	0.63	0.6	2.3	2.69	1.94	7.70	7.25	***
		18	0.40	0.0	0.0	2.36	138.94	4.35	3.98	15
F115710						1.00	0.75	3.35	3.27	21
122	565	0.0031	0.40	0.6	2.3	2.69	3.26	7.25	6.37	***
		18	-1.33	0.0	0.0	2.36	82.51	3.98	3.05	
F115610						0.71		3.27	3.32	

Lateral length= 5127 Upstream length= 5127

*** FF012611 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
123	373	0.0018	5.70	0.1	0.2	0.22	0.52	13.67	13.06	
		10	5.03	0.0	0.0	1.33	42.88	6.10	5.43	
F012611						0.48		7.57	7.63	

C:\HYDRA\SANMATEO\FPIPES.CMD 11:30 7-Jan-99
MGD

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** FF012611 Analysis of Existing Pipes

Link	Long	Slope Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes Vel d/D	Qmax %Cap QRem	GrUp HGLUp DiffUp	GrDn HGLDn DiffDn	SrCh/Dlt Parallel Replace
124	21	0.0005	5.03	0.1	0.2	0.22	0.27	13.06	13.93	
		10	5.02	0.0	0.0	0.84	83.20	5.62	5.61	
F011511						0.71		7.44	8.32	
125	293	0.0034	5.02	0.1	0.2	0.22	0.72	13.93	12.24	
		10	4.02	0.0	0.0	1.68	31.08	5.36	4.36	
F011411						0.40		8.57	7.88	
126	384	0.0003	4.02	0.1	0.2	0.22	0.22	12.24	11.12	
		10	3.90	0.0	0.0	0.63	102.70	4.70	4.58	4
F011311						0.82	0.01	7.54	6.54	12
127	96	0.0042	3.90	0.1	0.2	0.22	0.79	11.12	11.16	
		10	3.50	0.0	0.0	1.79	28.13	4.22	3.82	
F011211						0.38		6.90	7.34	
128	155	0.0032	3.50	0.1	0.2	0.22	0.70	11.16	10.50	
		10	3.00	0.0	0.0	1.64	31.96	3.84	3.34	
F011111						0.41		7.32	7.16	
129	32	0.0188	3.00	0.1	0.2	0.22	1.68	10.50	10.10	
		10	2.40	0.0	0.0	3.09	13.26	3.22	2.62	
F011011						0.27		7.28	7.48	
130	107	0.0052	2.40	0.1	0.2	0.22	0.89	10.10	9.25	
		10	1.84	0.0	0.0	1.93	25.10	2.70	2.14	
F010911						0.36		7.40	7.11	
131	171	0.0030	1.84	0.1	0.2	0.22	0.68	9.25	8.52	
		10	1.32	0.0	0.0	1.61	32.92	2.19	1.67	
F010811						0.41		7.06	6.85	
132	314	0.0030	1.32	0.1	0.2	0.22	0.67	8.52	7.10	
		10	0.38	0.0	0.0	1.60	33.18	1.67	0.73	
F010711						0.42		6.85	6.37	
133	336	0.0035	0.38	0.1	0.2	0.22	0.73	7.10	5.65	***
		10	-0.80	0.0	0.0	0.63	30.64	0.74	0.45	
F010611						0.40		6.36	5.20	
134	139	0.0024	-0.80	0.1	0.2	0.22	0.97	5.65	4.80	***
		12	-1.13	0.0	0.0	0.44	22.91	0.45	0.43	
F010506						0.34		5.20	4.37	
135	187	0.0020	-1.13	0.1	0.2	0.22	0.89	4.80	4.80	***
		12	-1.50	0.0	0.0	0.44	25.10	0.43	0.42	
F010406						0.36		4.37	4.38	

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** FF012611 Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
136	384	0.0011	-1.50	0.5	1.0	1.23	0.66	4.80	3.31	***
		12	-1.92	0.0	0.0	2.42	185.82	0.42	-0.80	12
F005006						1.00	0.57	4.38	4.11	18

Lateral length= 2992 Upstream length= 2992

*** SOUTH TRUNK Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
137	53	0.0191	29.84	1.6	4.2	5.33	5.00	34.34	36.00	***/***
		15	28.83	0.0	0.0	6.73	106.63	58.82	57.03	6
F156714						0.84	0.33	-24.48	-21.03	18
138	421	0.0032	28.83	1.6	4.2	5.34	2.04	36.00	32.61	***/***
		15	27.50	0.0	0.0	6.74	262.37	57.03	49.81	18
F156614						1.00	3.31	-21.03	-17.20	24
139	53	0.0185	27.50	1.6	4.2	5.34	4.93	32.61	32.61	***/***
		15	26.52	0.0	0.0	6.74	108.45	49.81	48.59	6
F156514						0.85	0.42	-17.20	-15.98	18
140	11	0.1382	26.52	1.6	4.2	5.34	21.91	32.92	31.20	***/***
		18	25.00	0.0	0.0	4.68	24.39	48.59	48.59	
F156314						0.35		-15.67	-17.39	
141	293	0.0028	25.00	1.6	4.2	5.34	3.14	31.20	31.20	***/***
		18	24.17	0.0	0.0	4.68	170.38	48.59	46.61	18
F156214						1.00	2.21	-17.39	-15.41	24
142	330	0.0048	24.17	1.6	4.2	5.34	4.10	31.20	29.98	***/***
		18	22.57	0.0	0.0	4.68	130.23	46.61	44.41	12
F156114						1.00	1.24	-15.41	-14.43	21
143	320	0.0038	22.57	1.6	4.2	5.34	3.65	29.98	29.87	***/***
		18	21.34	0.0	0.0	4.68	146.27	44.41	42.27	15
F156014						1.00	1.69	-14.43	-12.40	21
144	139	0.0006	21.34	1.7	4.6	5.90	2.26	29.87	28.25	***/***
		21	21.25	0.0	0.0	3.80	260.92	42.27	41.81	27
F149414						1.00	3.64	-12.40	-13.56	33

C:\HYDRA\SANMATEO\FPIPES.CMD 11:30 7-Jan-99
MGD

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** SOUTH TRUNK Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
145	107	0.0015	21.25	1.7	4.6	5.91	3.44	28.25	27.90	***/***
		21	21.09	0.0	0.0	3.80	171.82	41.81	41.34	21
F149314						1.00	2.47	-13.56	-13.44	27
146	314	0.0012	21.09	1.7	4.6	5.91	2.08	27.90	26.41	***/***
		18	20.70	0.0	0.0	5.17	284.39	41.34	38.58	24
F149214						1.00	3.83	-13.44	-12.17	27
147	298	0.0037	20.70	1.7	4.6	5.91	3.58	26.41	25.15	***/***
		18	19.60	0.0	0.0	5.17	164.97	38.58	36.12	18
F149114						1.00	2.33	-12.17	-10.97	24
148	309	0.0021	19.60	1.7	4.6	5.91	2.70	25.15	24.00	***/***
		18	18.95	0.0	0.0	5.17	218.53	36.12	33.59	21
F149014						1.00	3.20	-10.97	-9.59	27
149	384	0.0053	18.95	1.7	4.8	6.09	6.50	24.00	22.80	***/***
		21	16.90	0.0	0.0	3.92	93.79	33.59	32.29	
F145009						0.77		-9.59	-9.49	
150	43	0.0044	16.90	1.7	4.8	6.09	5.91	22.80	22.88	***/***
		21	16.71	0.0	0.0	3.92	103.09	32.29	32.02	6
F144909						0.82	0.18	-9.49	-9.14	24
151	240	0.0041	16.71	1.7	4.8	6.09	5.68	22.88	22.35	***/***
		21	15.73	0.0	0.0	3.92	107.24	32.02	31.06	8
F144109						0.85	0.41	-9.14	-8.71	24
152	245	0.0040	15.73	1.7	4.8	6.09	5.62	22.35	20.91	***/***
		21	14.75	0.0	0.0	3.92	108.35	31.06	30.08	10
F143909						0.85	0.47	-8.71	-9.17	24
153	64	0.0034	14.75	1.7	4.8	6.09	5.21	20.91	20.91	***/***
		21	14.53	0.0	0.0	3.92	116.88	30.08	29.73	12
F143709						1.00	0.88	-9.17	-8.82	24
154	160	0.0151	14.53	1.7	4.8	6.09	10.93	20.91	21.00	***/***
		21	12.11	0.0	0.0	3.92	55.72	29.73	29.05	
F143609						0.55		-8.82	-8.05	
155	288	0.0036	12.11	1.7	4.8	6.09	5.34	21.00	20.70	***/***
		21	11.07	0.0	0.0	3.92	114.04	29.05	27.91	12
F143509						0.90	0.75	-8.05	-7.21	24
156	256	0.0032	11.07	1.7	4.8	6.09	5.03	20.70	19.50	***/***
		21	10.25	0.0	0.0	3.92	121.08	27.91	26.89	12
F143409						1.00	1.06	-7.21	-7.39	24

C:\HYDRA\SANMATEO\FPIPES.CMD

11:30 7-Jan-99
MGD

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** SOUTH TRUNK

Analysis of Existing Pipes

Link	Long	Slope Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes Vel d/D	Qmax %Cap QRem	GrUp HGLUp DiffUp	GrDn HGLDn DiffDn	SrCh/Dlt Parallel Replace
157	298	0.0030	10.25	1.7	4.8	6.09	4.89	19.50	18.50	***/***
		21	9.35	0.0	0.0	3.92	124.69	26.89	25.72	15
F143309						1.00	1.21	-7.39	-7.22	24
158	288	0.0031	9.35	1.7	4.8	6.09	4.97	18.50	17.00	***/***
		21	8.45	0.0	0.0	3.92	122.58	25.72	24.59	15
F143209						1.00	1.12	-7.22	-7.59	24
159	288	0.0034	8.45	1.7	4.8	6.09	5.16	17.00	15.00	***/***
		21	7.48	0.0	0.0	3.92	118.08	24.59	23.46	12
F143110						1.00	0.93	-7.59	-8.46	24
160	240	0.0029	7.48	1.8	4.8	6.15	4.80	15.00	15.92	***/***
		21	6.78	0.0	0.0	3.95	128.00	23.46	22.23	15
F140510						1.00	1.34	-8.46	-6.31	24
161	330	0.0027	6.78	1.8	4.8	6.14	4.59	15.92	12.68	***/***
		21	5.90	0.0	0.0	3.95	133.81	22.23	20.93	15
F140410						1.00	1.55	-6.31	-8.25	24
162	346	0.0025	5.90	1.8	4.8	6.14	4.46	12.68	10.38	***/***
		21	5.03	0.0	0.0	3.95	137.80	20.93	19.57	15
F140310						1.00	1.69	-8.25	-9.19	24
163	341	0.0076	5.03	1.8	4.8	6.14	7.75	10.38	6.91	***/***
		21	2.44	0.0	0.0	3.95	79.29	19.57	18.23	
F139710						0.69		-9.19	-11.32	
164	341	0.0074	2.44	1.8	4.8	6.14	7.63	6.91	7.50	***/***
		21	-0.07	0.0	0.0	3.95	80.54	18.23	16.88	
F139610						0.69		-11.32	-9.38	
165	11	0.1145	-0.07	1.8	4.8	6.14	4.16	7.50	6.37	***/***
		10	-1.33	0.0	0.0	17.43	147.69	16.88	3.05	8
F139110						1.00	1.98	-9.38	3.32	12
166	565	0.0001	-1.33	2.3	7.0	8.74	2.56	6.37	7.91	***
		30	-1.40	0.0	0.0	2.76	341.33	3.05	2.32	42
F115510						1.00	6.18	3.32	5.59	48
167	554	0.0001	-1.40	2.3	7.0	8.75	2.40	7.91	7.24	***
		30	-1.46	0.0	0.0	2.76	365.12	2.32	1.66	45
F115404						1.00	6.35	5.59	5.58	54
168	533	0.0013	-1.46	2.3	7.0	8.75	8.16	7.24	8.37	***
		30	-2.13	0.0	0.0	2.76	107.17	1.66	1.03	12
F115304						0.85	0.59	5.58	7.34	33

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** SOUTH TRUNK

Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
169	480	0.0008	-2.13	2.5	7.1	9.05	6.39	8.37	6.98	***
		30	-2.50	0.0	0.0	2.85	141.70	1.03	0.40	24
F115204						1.00	2.66	7.34	6.58	36
170	373	0.0010	-2.50	2.5	7.1	9.06	7.35	6.98	6.98	***
		30	-2.88	0.0	0.0	2.86	123.38	0.40	-0.10	18
F115104						1.00	1.72	6.58	7.08	33
171	352	0.0009	-2.88	2.5	7.1	9.06	6.94	6.98	6.28	***
		30	-3.20	0.0	0.0	2.86	130.61	-0.10	-0.70	21
F115004						1.00	2.12	7.08	6.98	36
172	298	0.0035	-3.20	3.0	7.3	9.74	13.53	6.28	5.60	***
		30	-4.23	0.0	0.0	3.07	72.02	-0.91	-1.53	
F114904						0.65		7.19	7.13	
173	197	0.0033	-4.23	3.0	7.3	9.76	13.22	5.60	7.90	***
		30	-4.88	0.0	0.0	3.08	73.81	-1.53	-2.02	
F114804						0.66		7.13	9.92	
174	85	0.0019	-4.88	3.0	7.3	9.76	9.99	7.90	5.50	***
		30	-5.04	0.0	0.0	3.08	97.72	-2.02	-2.35	
F114703						0.79		9.92	7.85	
175	320	0.0028	-5.04	3.0	7.3	9.76	12.27	5.50	4.00	***
		30	-5.95	0.0	0.0	3.08	79.50	-2.35	-3.01	
F114603						0.69		7.85	7.01	
176	320	0.0021	-5.95	3.0	7.3	9.76	10.53	4.00	3.00	***
		30	-6.62	0.0	0.0	3.08	92.66	-3.01	-3.66	
F114503						0.76		7.01	6.66	
177	165	0.0019	-6.62	3.0	7.3	9.82	9.98	3.00	2.20	***
		30	-6.93	0.0	0.0	3.09	98.39	-3.66	-4.11	
F114403						0.79		6.66	6.31	
178	176	0.0029	-6.93	3.0	7.3	9.82	12.39	2.20	7.16	***
		30	-7.44	0.0	0.0	3.09	79.22	-4.11	-4.57	
F114303						0.69		6.31	11.73	
179	160	0.0004	-7.44	3.0	7.3	9.82	4.81	7.16	4.79	***
		30	-7.51	0.0	0.0	3.09	203.89	-4.57	-5.01	33
F114203						1.00	5.00	11.73	9.80	42
180	357	0.0049	-7.51	3.0	7.3	9.82	16.11	4.79	1.83	
		30	-9.26	0.0	0.0	5.10	60.91	-6.05	-7.80	
F114103						0.58		10.84	9.63	

C:\HYDRA\SANMATEO\FPIPES.CMD 11:30 7-Jan-99
MGD

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

Lateral length= 11746 Upstream length= 38901
*** NORTH TRUNK Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
181	309	0.0017	-1.92	0.5	1.0	1.23	1.50	3.31	3.13	***
		15	-2.45	0.0	0.0	1.55	81.76	-0.80	-1.13	
F003606						0.70		4.11	4.26	
182	320	0.0022	-2.45	0.5	1.0	1.23	1.68	3.13	2.52	***
		15	-3.14	0.0	0.0	1.55	72.92	-1.13	-1.46	
F003506						0.65		4.26	3.98	
183	320	0.0004	-3.14	0.5	1.0	1.23	0.76	2.52	4.02	***
		15	-3.28	0.0	0.0	1.55	161.89	-1.46	-1.79	15
F003406						1.00	0.47	3.98	5.81	18
184	362	0.0010	-3.28	0.5	1.0	1.23	1.13	4.02	4.32	***
		15	-3.63	0.0	0.0	1.55	108.90	-1.79	-2.16	8
F003306						0.86	0.10	5.81	6.48	18
185	43	0.0063	-3.63	0.5	1.0	1.23	2.87	4.32	4.50	***
		15	-3.90	0.0	0.0	1.55	42.73	-2.16	-2.25	
F003206						0.48		6.48	6.75	
186	267	0.0010	-3.90	0.5	1.0	1.23	1.13	4.50	4.38	***
		15	-4.16	0.0	0.0	1.55	108.52	-2.25	-2.53	6
F0031A06						0.85	0.10	6.75	6.91	18
187	293	0.0009	-4.16	0.5	1.0	1.23	1.08	4.38	3.68	***
		15	-4.42	0.0	0.0	1.55	113.68	-2.53	-2.84	8
F003106						0.89	0.15	6.91	6.52	18
188	384	0.0010	-4.42	0.8	1.5	1.90	1.88	3.68	4.02	***
		18	-4.81	0.0	0.0	1.66	101.02	-2.84	-3.20	4
F003006						0.81	0.02	6.52	7.22	21
189	373	0.0009	-4.81	0.8	1.5	1.90	1.81	4.02	4.14	***
		18	-5.16	0.0	0.0	1.66	105.06	-3.20	-3.56	6
F002906						0.83	0.09	7.22	7.70	21
190	245	0.0024	-5.16	1.0	1.7	2.23	2.92	4.14	4.02	***
		18	-5.76	0.0	0.0	1.95	76.52	-3.56	-3.91	
F002805						0.67		7.70	7.93	
191	400	0.0004	-5.76	1.0	1.7	2.23	1.21	4.02	2.88	***
		18	-5.93	0.0	0.0	1.95	183.74	-3.91	-4.43	18
F002705						1.00	1.02	7.93	7.31	24

C:\HYDRA\SANMATEO\FPIPES.CMD 11:30 7-Jan-99
MGD

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** NORTH TRUNK Analysis of Existing Pipes

Link	Long	Slope / Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes / Vel / d/D	Qmax / %Cap / QRem	GrUp / HGLUp / DiffUp	GrDn / HGLDn / DiffDn	SrCh/Dlt / Parallel / Replace
192	357	0.0015	-5.93	1.0	1.7	2.23	2.27	2.88	2.99	
		18	-6.46	0.0	0.0	2.30	98.31	-4.74	-5.27	
F002605						0.79		7.62	8.26	
193	405	0.0018	-6.46	1.1	2.0	2.57	9.64	2.99	3.23	
		30	-7.17	0.0	0.0	2.37	26.67	-5.54	-6.25	
F002505						0.37		8.53	9.48	
194	346	0.0001	-7.17	1.1	2.0	2.58	2.77	3.23	3.13	
		30	-7.22	0.0	0.0	0.99	93.09	-5.26	-5.31	
F002405						0.76		8.49	8.44	
195	346	0.0004	-7.22	1.1	2.0	2.58	4.63	3.13	3.16	
		30	-7.36	0.0	0.0	1.42	55.63	-5.84	-5.98	
F002305						0.55		8.97	9.14	
196	346	0.0005	-7.36	1.1	2.0	2.56	5.25	3.16	3.20	
		30	-7.54	0.0	0.0	1.55	48.72	-6.07	-6.25	
F002205						0.51		9.23	9.45	
197	288	0.0004	-7.54	1.1	2.0	2.58	4.50	3.20	3.00	***
		30	-7.65	0.0	0.0	0.81	57.26	-5.08	-5.12	
F002105						0.56		8.28	8.12	
198	352	0.0002	-7.65	1.3	2.3	3.03	3.47	3.00	3.20	***
		30	-7.73	0.0	0.0	0.95	87.22	-5.12	-5.19	
F002004						0.73		8.12	8.39	
199	346	0.0004	-7.73	1.3	2.3	3.03	4.46	3.20	3.44	***
		30	-7.86	0.0	0.0	0.95	67.87	-5.19	-5.25	
F001904						0.62		8.39	8.69	
200	400	0.0004	-7.86	1.3	2.3	3.03	4.74	3.44	3.57	***
		30	-8.03	0.0	0.0	0.95	63.81	-5.25	-5.33	
F001804						0.60		8.69	8.90	
201	171	0.0004	-8.03	1.3	2.3	2.98	4.66	3.57	3.74	***
		30	-8.10	0.0	0.0	0.94	63.96	-5.33	-5.37	
F001704						0.60		8.90	9.11	
202	267	0.0004	-8.10	1.5	2.6	3.34	5.74	3.74	4.18	***
		33	-8.20	0.0	0.0	0.87	58.19	-5.37	-5.41	
F001604						0.57		9.11	9.59	
203	426	0.0000	-8.20	1.5	2.6	3.34	2.03	4.18	1.54	***
		33	-8.22	0.0	0.0	0.87	164.43	-5.41	-5.47	30
F001304						1.00	1.31	9.59	7.01	42

C:\HYDRA\SANMATEO\FPIPES.CMD 11:30 7-Jan-99

MGD

FAIR OAKS SEWER DISTRICT 5-year 6-hour Storm

*** NORTH TRUNK Analysis of Existing Pipes

Link	Long	Slope Diam	Invert Up/Dn	San Inf	Sto Mis	Qdes Vel d/D	Qmax %Cap QRem	GrUp HGLUp DiffUp	GrDn HGLDn DiffDn	SrCh/Dlt Parallel Replace
204	320	0.0002	-8.22	1.5	2.6	3.30	4.69	1.54	1.54	
		33	-8.30	0.0	0.0	1.28	70.22	-6.47	-6.55	
F001204						0.64		8.01	8.09	
205	240	0.0002	-8.30	1.5	2.6	3.34	4.28	1.54	3.95	
		33	-8.35	0.0	0.0	1.21	78.06	-6.43	-6.48	
F001104						0.68		7.97	10.43	
206	330	0.0005	-8.35	1.5	2.6	3.34	6.33	3.95	3.44	
		33	-8.50	0.0	0.0	1.58	52.85	-6.87	-7.02	
F000303						0.54		10.82	10.46	
207	53	0.0089	-8.50	1.5	2.6	3.34	27.95	3.44	4.43	
		33	-8.97	0.0	0.0	4.61	11.96	-7.79	-8.26	
F0002A03						0.26		11.23	12.69	
208	21	0.0138	-8.97	1.5	2.6	3.34	34.87	4.43	1.83	
		33	-9.26	0.0	0.0	5.44	9.59	-8.33	-8.62	
F000203						0.23		12.76	10.45	
209	100	0.0074	-9.26	4.3	7.8	11.38	25.53	1.83	3.00	
		33	-10.00	0.0	0.0	6.07	44.59	-7.91	-8.65	
F000103						0.49		9.74	11.65	

Lateral length= 8430 Upstream length= 50323

Insert “F” Tab Here

APPENDIX F

CAPITAL IMPROVEMENT PROJECTS

District: Fair Oaks Priority: 1

Project: Berkshire Avenue

Project Purpose: Hydraulics and Operations & Maintenace

Project Location: Berkshire Avenue from El Camino Real to Huntington Avenue
MH 1566-1490

Existing Conditions:

Pipeline: 256 feet of 12-inch diameter
500 feet of 15-inch diameter
1633 feet of 18-inch diameter

Television Inspection: Not Inspected

Operation & Maintenance 3 callouts/year: [Y] / N

Manhole Inspection: Roots / Pipe / Grease

Hydraulics: Yes, needs 33-inch diameter replacement sewer

Alternative 1: Replace with 33-inch diameter sewer

Alternative 1 Cost: $609,200

Alternative 2: n/a

Alternative 2 Cost: n/a

Alternative 3: n/a

Alternative 3 Cost: n/a

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 1

Project: Selby Lane #2

Project Purpose: Hydraulics

Project Location: Selby Lane Logan Lane to Austin Avenue
MH 1704-1699

Existing Conditions:

Pipeline: 144 feet of 15-inch diameter
767 feet of 18-inch diameter
Television Inspection: Not Inspected
Operation & Maintenance 3 callouts/year: Y / [N]
Manhole Inspection: Roots / Pipe / Grease
Hydraulics: Yes, needs 30-inch diameter replacement sewer

Alternative 1: Replace with 30-inch diameter sewer

Alternative 1 Cost: $209,500

Alternative 2: n/a

Alternative 2 Cost: n/a

Alternative 3: n/a

Alternative 3 Cost: n/a

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 1

Project: Bay Road #2

Project Purpose: Hydraulics and Operations & Maintenance

Project Location: Bay Road from 7th Avenue to 2nd Avenue
MH 1162-1156

Existing Conditions:

Pipeline: 589 feet of 12-inch diameter
1144 feet of 18-inch diameter
Television Inspection: Not Inspected
Operation & Maintenance 3 callouts/year: [Y] / N
Manhole Inspection: Roots / Pipe / Grease
Hydraulics: Yes, needs 24-inch diameter replacement sewer

Alternative 1: Replace with 24-inch diameter sewer

Alternative 1 Cost: $337,900

Alternative 2: n/a

Alternative 2 Cost: n/a

Alternative 3: n/a

Alternative 3 Cost: n/a

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 1

Project: Selby Lane #1

Project Purpose: Hydraulics

Project Location: Selby Lane from El Camino Real to Logan Lane
MH 1699-1680

Existing Conditions:

Pipeline: 1667 feet of 15-inch diameter
Television Inspection Not Inspected
Operation & Maintenance 3 callouts/year: Y / [N]
Manhole Inspection: [Roots] / Pipe / Grease
Hydraulics Yes, needs 24-inch diameter replacement sewer

Alternative 1: Replace with 24-inch diameter sewer

Alternative 1 Cost: $325,000

Alternative 2: n/a

Alternative 2 Cost: n/a

Alternative 3: n/a

Alternative 3 Cost: n/a

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 1

Project: Nimitz Avenue

Project Purpose: Hydraulics

Project Location: Nimitz Avenue from Selby Lane to Himmel Street
MH 1905-1838

Existing Conditions:

Pipeline: 222 feet of 12-inch diameter
989 feet of 15-inch diameter
Television Inspection: Not Inspected
Operation & Maintenance 3 callouts/year: Y / [N]
Manhole Inspection: Roots / Pipe / Grease
Hydraulics: Yes, needs 21-inch diameter replacement sewer

Alternative 1: Replace with 21-inch diameter sewer

Alternative 1 Cost: $218,000

Alternative 2: n/a

Alternative 2 Cost: n/a

Alternative 3: n/a

Alternative 3 Cost: n/a

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 1

Project: Bay Road #1

Project Purpose: Hydraulics

Project Location: Bay Road from 12th Avenue to 7th Avenue
MH 1172-1162

Existing Conditions:

Pipeline: 644 feet of 10-inch diameter
1411 feet of 12-inch diameter

Television Inspection: Not Inspected

Operation & Maintenance 3 callouts/year: Y / [N]

Manhole Inspection: [Roots] / Pipe / [Grease]

Hydraulics: Yes, needs 21-inch diameter replacement sewer

Alternative 1: Replace with 21-inch diameter sewer

Alternative 1 Cost: $369,900

Alternative 2: n/a

Alternative 2 Cost: n/a

Alternative 3: n/a

Alternative 3 Cost: n/a

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 1

Project: 12th Avenue

Project Purpose: Hydraulics

Project Location: 12th Avenue from Spring Street to Fair Oaks Avenue
MH 1203-1172

Existing Conditions:

Pipeline: 956 feet of 10-inch diameter
Television Inspection:
Operation & Maintenance 3 callouts/year: Y / N
Manhole Inspection: Roots / Pipe / Grease
Hydraulics: Yes, needs 18-inch diameter replacement sewer

Alternative 1: Replace with 18-inch diameter sewer

Alternative 1 Cost: $133,800

Alternative 2: n/a

Alternative 2 Cost: n/a

Alternative 3: n/a

Alternative 3 Cost: n/a

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 1

Project: Woodside Road

Project Purpose: Hydraulics

Project Location: Woodside Road from Bonsen Court to Churchill Avenue
MH 1986-1982

Existing Conditions:

Pipeline: 1167 feet of 10-inch pipe
Television Inspection: Not Inspected
Operation & Maintenance 3 callouts/year: Y / [N]
Manhole Inspection: Roots / Pipe / Grease
Hydraulics: Yes, needs 12-inch diameter replacement sewer

Alternative 1: Replace with 12-inch diameter sewer

Alternative 1 Cost: $128,400

Alternative 2: n/a

Alternative 2 Cost: n/a

Alternative 3: n/a

Alternative 3 Cost: n/a

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 1

Project: Santiago Avenue

Project Purpose: Hydraulics

Project Location: Santiago Avenue from Hull Avenue to Woodside Road
MH 1932-1977

Existing Conditions:

Pipeline: 1367 feet of 10-inch diameter
Television Inspection: Not Inspected
Operation & Maintenance 3 callouts/year: Y / [N]
Manhole Inspection: Roots / Pipe / Grease
Hydraulics: Yes, needs 12-inch diameter replacement sewer

Alternative 1: Replace with 12-inch diameter sewer

Alternative 1 Cost: $150,400

Alternative 2: n/a

Alternative 2 Cost: n/a

Alternative 3: n/a

Alternative 3 Cost: n/a

Project Concerns:

Recommended Alternative:

District: Fair Oaks

Priority: 1

Project: El Camino Real #2

Project Purpose: Hydraulics

Project Location: El Camino Real from Berkshire Avenue to Stockbridge Avenue
MH 1567-1574

Existing Conditions:

Pipeline: 1289 feet of 10-inch diameter
Television Inspection: Not Inspected
Operation & Maintenance 3 callouts/year: Y / [N]
Manhole Inspection: Roots / Pipe / Grease
Hydraulics: Yes, needs 18-inch diameter replacement sewer

Alternative 1: Replace with 18-inch diameter sewer

Alternative 1 Cost: $180,500

Alternative 2: n/a

Alternative 2 Cost: n/a

Alternative 3: n/a

Alternative 3 Cost: n/a

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 1

Project: Milton Street/Hull Avenue

Project Purpose: Hydraulics

Project Location: Milton Street and Hull Avenue from Santiago Avenue to Sequoia Avenue
MH 1932-1930, MH 1930-1925, MH 1925-1918

Existing Conditions:

Pipeline: 639 feet of 8-inch diameter
1189 feet of 10-inch diameter

Television Inspection: Not Inspected

Operation & Maintenance 3 callouts/year: Y / [N]

Manhole Inspection: Roots / Pipe / Grease

Hydraulics: Yes, needs 15-inch diameter replacement sewer

Alternative 1: Replace with 15-inch diameter sewer

Alternative 1 Cost: $219,400

Alternative 2: n/a

Alternative 2 Cost: n/a

Alternative 3: n/a

Alternative 3 Cost: n/a

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 3

Project: Eleanor Drive

Project Purpose: Structural

Project Location: Eleanor Drive
MH 2063-2067

Existing Conditions:

Pipeline: 1756 feet of 6-inch diameter
Television Inspection: 1 piece missing
7 broken
severe roots and cracks
Operation & Maintenance 3 callouts/year: Y / [N]
Manhole Inspection: [Roots] / [Pipe] / Grease
Hydraulics:

Alternative 1: Increase Operations & Maintenance (rc)
Spot Repair (136)

Alternative 1 Cost: $240,500

Alternative 2: Pipe Bursting

Alternative 2 Cost: $158,040

Alternative 3: Remove and Replace

Alternative 3 Cost: $149,260

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 3

Project: Melanie Lane

Project Purpose: Structural

Project Location: Melanie Lane from Eleanor Drive to Stockbridge Avenue
MH 2013-2009, MH 2011-2003

Existing Conditions:

Pipeline: 1767 feet of 6-inch diameter
Television Inspection: 1 minor offset joint
4 piece missing
9 broken
severe roots and cracks
Operation & Maintenance 3 callouts/year: Y / [N]
Manhole Inspection: Roots / Pipe / Grease
Hydraulics No

Alternative 1: Increase Operations & Maintenance (rc)
Spot Repair (36)

Alternative 1 Cost: $161,300

Alternative 2: Pipe Bursting

Alternative 2 Cost: $159,030

Alternative 3: Remove and Replace

Alternative 3 Cost: $150,195

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 3

Project: Middlefield Road

Project Purpose: Structural

Project Location: Middle Field Road from 7th Avenue to Dumbarton Avenue
MH 1442-1448

Existing Conditions:

Pipeline: 1279 feet of 6-inch diameter

Television Inspection: 1 minor offset joint
5 broken
9 piece missing
severe cracks
grease

Operation & Maintenance 3 callouts/year: Y / [N]

Manhole Inspection: Roots / Pipe / Grease

Hydraulics No

Alternative 1: Increase Operations & Maintenance (rc)
Spot Repair (52)

Alternative 1 Cost: $137,500

Alternative 2: Pipe Bursting

Alternative 2 Cost: $115,110

Alternative 3: Remove and Replace

Alternative 3 Cost: $108,715

Project Concerns:

Recommended Alternative:

District: Fair Oaks

Priority: 3

Project: Polhemus Avenue

Project Purpose: Structural

Project Location: Polhemus Avenue from Selby Lane to Polhemus Court
MH 1749-1739, MH 1743-1773, MH 1746-1771

Existing Conditions:

Pipeline: 3456 feet of 6-inch diameter

Television Inspection: 1 protruding lateral
2 broken
5 piece missing
5 sags
severe roots and cracks

Operation & Maintenance 3 callouts/year: Y / N

Manhole Inspection: Roots / Pipe / Grease

Hydraulics No

Alternative 1: Increase Operations & Maintenance (rc)
Spot Repair (135)

Alternative 1 Cost: $367,200

Alternative 2: Pipe Bursting

Alternative 2 Cost: $311,040

Alternative 3: Remove and Replace

Alternative 3 Cost: $293,760

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 3

Project: Page Street

Project Purpose: Structural

Project Location: Page Street from Wayne Court East to Rose Avenue
MH 98-89, MH 73-66

Existing Conditions:

Pipeline: 1211 feet of 6-inch diameter
57 feet of 8-inch diameter

Television Inspection: 3 sags
10 minor offset joints
severe cracks

Operation & Maintenance 3 callouts/year: Y / [N]

Manhole Inspection: Roots / [Pipe] / Grease

Hydraulics:

Alternative 1: Increase Operations & Maintenace (rc)
Spot Repair

Alternative 1 Cost: $111,900

Alternative 2: Pipe Bursting for 6-inch diameter
Sliplining for 8-inch diameter
Spot Repair (21)

Alternative 2 Cost: $114,120

Alternative 3: Remove and Replace

Alternative 3 Cost: $107,935

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 3

Project: Stockbridge Avenue

Project Purpose: Structural

Project Location: Stockbridge Avenue from Alameda De Las Pulgas to Parker Avenue
MH 1816-1789

Existing Conditions:

Pipeline: 2756 feet of 6-inch diameter

Television Inspection: 1 collapsed
2 broken
8 sags
8 piece missing
severe roots and cracks

Operation & Maintenance 3 callouts/year: Y / [N]

Manhole Inspection: Roots / [Pipe] / Grease

Hydraulics:

Alternative 1: Increase Operatons & Maintenance (rc)
Spot Repair (43)

Alternative 1 Cost: $241,100

Alternative 2: Pipe Bursting

Alternative 2 Cost: $248,040

Alternative 3: Remove and Replace

Alternative 3 Cost: $234,260

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 3

Project: 6th Avenue

Project Purpose: Structural

Project Location: 6th Avenue from Spring Street to Edison Way
MH 1355-1300, MH 1324-1360

Existing Conditions:

Pipeline: 1122 feet of 8-inch diameter
511 feet of 10-inch diameter

Television Inspection: 3 broken
3 sags
severe roots and cracks

Operation & Maintenance 3 callouts/year: Y / N

Manhole Inspection: Roots / Pipe / Grease

Hydraulics:

Alternative 1: Increase Operations & Maintenace (rc)
Spot Repair (7)

Alternative 1 Cost: $140,900

Alternative 2: Sliplining
Spot Repair (7)

Alternative 2 Cost: $97,480

Alternative 3: Remove and Replace

Alternative 3 Cost: $146,470

Project Concerns:

Recommended Alternative:

District: Fair Oaks Priority: 3

Project: Bay Road #3

Project Purpose: Structural

Project Location: Bay Road and Douglas Avenue
MH 2549-2552, MH 2482-2506, MH 2482-2503

Existing Conditions:

Pipeline: 2478 feet of 6-inch diameter

Television Inspection: 1 I/I at lateral connection
2 piece missing
roots and cracks
5 sags

Operation & Maintenance 3 callouts/year: Y / [N]

Manhole Inspection: [Roots] / [Pipe] / Grease

Hydraulics No

Alternative 1: Increase Operations & Maintenance (rc)
Spot Repair (?)

Alternative 1 Cost: $185,900 *

Alternative 2: Pipe Bursting

Alternative 2 Cost: $223,020

Alternative 3: Remove and Replace

Alternative 3 Cost: $210,630

Project Concerns: No TV.

Recommended Alternative:

District: Fair Oaks Priority: 3

Project: El Camino Real #1

Project Purpose: Structural

Project Location: El Camino Real from Stockbridge Avenue to Tuscaloosa Avenue
MH 1574-1581

Existing Conditions:

Pipeline: 1911 feet of 10-inch diameter
Television Inspection Not Inspected
Operation & Maintenance 3 callouts/year: Y / [N]
Manhole Inspection: Roots / Pipe / Grease
Hydraulics No

Alternative 1: Increase Operations & Maintenace (rc)
Spot Repair (?)

Alternative 1 Cost: $191,100*

Alternative 2: Sliplining

Alternative 2 Cost: $133,770

Alternative 3: Remove and Replace

Alternative 3 Cost: $191,100

Project Concerns: No TV

Recommended Alternative:

District: Fair Oaks

Priority: 3

Project: Hillside Drive

Project Purpose: Structural

Project Location: Hillside Drive
MH 2254-2272

Existing Conditions:

Pipeline: 1656 feet of 6-inch diameter
Television Inspection Not inspected due to inaccessible manholes
Operation & Maintenance 3 callouts/year: Y / N
Manhole Inspection: Roots / Pipe / Grease
Hydraulics No

Alternative 1: Increase Operations & Maintenance (rc)
Spot Repair (?)

Alternative 1 Cost: $124,200*

Alternative 2: Pipe Bursting

Alternative 2 Cost: $149,040

Alternative 3: Remove and Replace

Alternative 3 Cost: $140,760

Project Concerns: No TV. Roads are too narrow.

Recommended Alternative:

District: Fair Oaks Priority: 3

Project: Glenwood Avenure

Project Purpose: Structural

Project Location: Glenwood Avenue near Ridge Court
MH 2305-2309, MH 2306-2307, MH 2212-2289

Existing Conditions:

Pipeline: 1544 feet of 6-inch diameter
Television Inspection Not inspected due to inaccessible manholes
Operation & Maintenance 3 callouts/year: Y / [N]
Manhole Inspection: [Roots] / [Pipe] / Grease
Hydraulics No

Alternative 1: Increase Operations & Maintenance (rc)
Spot Repair (?)

Alternative 1 Cost: $115,800*

Alternative 2: Pipe Bursting

Alternative 2 Cost: $138,960

Alternative 3: Remove and Replace

Alternative 3 Cost: $131,240

Project Concerns: No TV. Roads are too narrow.

Recommended Alternative:

Insert “G” Tab Here

APPENDIX G

SANITARY SEWER RATE MODELS

Inflator 3%

Fair Oaks Alternative 1 CIP Summary

Project	Priority	Alternative 1	Alt 1 Description
Bay Rd.#4	1	$1,005,700	Replace with 45-inch sewer
Oakside/Barron Ave	1	$661,800	Replace with 15-inch sewer
Selby Ln #3	1	$864,400	Replace with 30-inch sewer
Berkshire Ave	1	$609,200	Replace with 24-inch sewer
Selby Ln #2	1	$209,500	Replace with 27-inch sewer
Bay Rd.#2	1	$337,900	Replace with 24-inch sewer
Selby Ln #1	1	$325,000	Replace with 15-inch sewer
Nimitz Ave	1	$218,000	Replace with 15-inch sewer
Bay Rd.#1	1	$369,900	Replace with 12-inch sewer
12th Ave	1	$133,800	Replace with 18-inch sewer
Woodside Rd.	1	$128,400	Replace with 18-inch sewer
Santiago Ave	1	$150,400	Replace with 15-inch sewer
El Camino Real#2	1	$180,500	Replace with 15-inch sewer
Milton St/Hull Ave	1	$219,400	Replace with 15-inch sewer
Eleanor Dr	3	$240,500	Increase O&M (rc) Spot Repair (136)
Melanie Ln	3	$161,300	Increase O&M (rc) Spot Repair (36)
Middlefield Rd	3	$137,500	Increase O&M (rc) Spot Repair (52)
Polhemus Ave	3	$367,200	Increase O&M (rc) Spot Repair (135)
Page St	3	$111,900	Increase O&M (rc) Spot Repair (21)
Stochbridge Ave	3	$241,100	Increase O&M (rc) Spot Repair (43)
6th Ave	3	$140,900	Increase O&M (rc) Spot Repair (7)
Bay Rd.#3*	3	$185,900	Increase O&M (rc) Spot Repair
El Camino Real # 1	3	$191,100	Increase O&M (rc) and Spot Repair
Hillside Dr*	3	$124,200	Increase O&M (rc) Spot Repair
Gleanwood Ave*	3	$115,800	Increase O&M (rc) Spot Repair
Total		**$7,431,300**	

Note:

*TV Inspection was not performed.

Fair Oaks Alternative 1 Revenue Requirements

Item	1994/95	1995/96	1996/97	1997/98	Projected 1998/99 Budget	Projected 1999/00	2000/01	2001/02	2002/03	2003/04
Expenses										
Admin/Eng	$ 268,794	$ 273,215	$ 223,632	$ 444,404	$ 457,736	$ 471,468	$ 485,612	$ 500,181	$ 515,186	$ 530,642
Capital Projects*	$ -	$ 26,510	$ 240,579	$ 93,698	$ 96,509	$ 1,486,260	$ 1,530,848	$ 1,576,773	$ 1,624,076	$ 1,672,799
Debt Service	$ -	$ -	$ 111	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O&M	$ 553,823	$ 496,190	$ 468,397	$ 354,924	$ 365,572	$ 376,539	$ 387,835	$ 399,470	$ 411,454	$ 423,798
Other	$ 102,466	$ 6,494	$ 141,923	$ 14,786	$ 15,230	$ 15,686	$ 16,157	$ 16,642	$ 17,141	$ 17,655
Sewage Treatment	$ 1,059,631	$ 756,061	$ 1,350,444	$ 1,205,623	$ 1,241,792	$ 1,279,045	$ 1,317,417	$ 1,356,939	$ 1,397,647	$ 1,439,577
Source Control	$ 31,893.00	$ 39,088.00	$ 18,164	$ 28,804	$ 29,668	$ 30,558	$ 31,475	$ 32,419	$ 33,392	$ 34,393
Gross Expenses	**$ 2,016,607**	**$ 1,597,558**	**$ 2,443,250**	**$ 2,142,239**	**$ 2,206,506**	**$ 3,659,557**	**$ 3,769,344**	**$ 3,882,424**	**$ 3,998,897**	**$ 4,118,864**
Offsetting Revenue										
Secure Property Taxes**	$ 114,746	$ 119,740	$ 124,396	$ 131,725	$ 120,000	$ 123,600	$ 127,308	$ 131,127	$ 135,061	$ 139,113
Unsecured Property Taxes	$ 15,677	$ 14,994	$ 14,681	$ 15,138	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000
Interest Earned***	$ 2,156	$ 3,559	$ 4,911	$ 6,339	$ 220,726	$ 220,726	$ 220,726	$ 220,726	$ 220,726	$ 220,726
HOPTR	$ 2,449	$ 2,395	$ 2,433	$ 2,434	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400
Annexation Charges	$ 800	$ 400		$ 1,200	$ 400	$ 400	$ 400	$ 400	$ 400	$ 400
Connection Charges	$ 41,773	$ 33,946	$ 31,341	$ 35,502	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Miscellaneous Revenue	$ 28,986	$ 2,088	$ 65,401	$ 4,487	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000
Total Offsetting Revenue	**$ 206,587**	**$ 177,122**	**$ 243,163**	**$ 196,825**	**$ 393,526**	**$ 397,126**	**$ 400,834**	**$ 404,653**	**$ 408,587**	**$ 412,639**
Use of Fund Balance	$ -	$ -	$ (56,969)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Net Revenue Requirements	**$ 1,810,020**	**$ 1,420,436**	**$ 2,143,118**	**$ 1,945,414**	**$ 1,812,980**	**$ 3,262,431**	**$ 3,368,510**	**$ 3,477,771**	**$ 3,590,310**	**$ 3,706,225**
Annual Rate Assuming 11,556 Connections****					157	282	291	301	311	321

Note:

*Projected CIP is paid over 5 years.

**Secure Property Tax revenue is assumed to increase at 3% per year

***Interest Earned in projected years is calculated as 5% of Beginning Fund Balance

****Current Rate is $174.

Fair Oaks Alternative 1 Fund Balance

Item	1994/95	1995/96	1996/97	1997/98	Projected 1998/99 Budget	Projected 1999/00	2000/01	2001/02	2002/03	2003/04
Beginning Fund Balance	$ 3,636,567	$ 3,820,587	$ 4,471,493	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524
Additions to/(Use of) Balance	$ 184,020	$ 650,906	$ (56,969)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Ending Fund Balance	$ 3,820,587	$ 4,471,493	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524

Fair Oaks Alternative 2 CIP Summary

Project	Priority	Alternative 2	Alt 2 Description
Bay Rd.#4	1	$963,220	Replace with 45-inch sewer
Oakside/Barron Ave	1	$407,280	Replace with 15-inch sewer
Selby Ln #3	1	$697,590	Replace with 30-inch sewer
Berkshire Ave	1	$465,855	Replace with 24-inch sewer
Selby Ln #2	1	$200,420	Replace with 27-inch sewer
Bay Rd.#2	1	$337,935	Replace with 24-inch sewer
Selby Ln #1	1	$200,040	Replace with 15-inch sewer
Nimitz Ave	1	$145,320	Replace with 15-inch sewer
Bay Rd.#1	1	$226,050	Replace with 12-inch sewer
12th Ave	1	$133,840	Replace with 18-inch sewer
Woodside Rd.	1	$163,380	Replace with 18-inch sewer
Santiago Ave	1	$164,040	Replace with 15-inch sewer
El Camino Real#2	1	$154,680	Replace with 15-inch sewer
Milton St/Hull Ave	1	$219,360	Replace with 15-inch sewer
Eleanor Dr	3	$158,040	Pipe Bursting
Melanie Ln	3	$159,030	Pipe Bursting
Middlefield Rd	3	$115,110	Pipe Bursting
Polhemus Ave	3	$311,040	Pipe Bursting
Page St	3	$114,120	Pipe Bursting
Stochbridge Ave	3	$248,040	Pipe Bursting
6th Ave	3	$97,480	Sliplining and Spot repair
Bay Rd.#3*	3	$223,020	Pipe Bursting
El Camino Real # 1	3	$133,770	Sliplining
Hillside Dr*	3	$149,040	Pipe Bursting
Gleanwood Ave*	3	$138,960	Pipe Bursting
Total		**$6,326,660**	

Note:

*TV Inspection was not performed.

Fair Oaks Alternative 2 Revenue Requirements

Item	1994/95	1995/96	1996/97	1997/98	Projected 1998/99 Budget	Projected 1999/00	2000/01	2001/02	2002/03	2003/04
Expenses										
Admin/Eng	$ 268,794	$ 273,215	$ 223,632	$ 444,404	$ 457,736	$ 471,468	$ 485,612	$ 500,181	$ 515,186	$ 530,642
Capital Projects*	$ -	$ 26,510	$ 240,579	$ 93,698	$ 96,509	$ 1,265,332	$ 1,303,292	$ 1,342,391	$ 1,382,662	$ 1,424,142
Debt Service	$ -	$ -	$ 111	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O&M	$ 553,823	$ 496,190	$ 468,397	$ 354,924	$ 365,572	$ 376,539	$ 387,835	$ 399,470	$ 411,454	$ 423,798
Other	$ 102,466	$ 6,494	$ 141,923	$ 14,786	$ 15,230	$ 15,686	$ 16,157	$ 16,642	$ 17,141	$ 17,655
Sewage Treatment	$ 1,059,631	$ 756,061	$ 1,350,444	$ 1,205,623	$ 1,241,792	$ 1,279,045	$ 1,317,417	$ 1,356,939	$ 1,397,647	$ 1,439,577
Source Control	$ 31,893.00	$ 39,088.00	$ 18,164	$ 28,804	$ 29,668	$ 30,558	$ 31,475	$ 32,419	$ 33,392	$ 34,393
Gross Expenses	**$ 2,016,607**	**$ 1,597,558**	**$ 2,443,250**	**$ 2,142,239**	**$ 2,206,506**	**$ 3,438,629**	**$ 3,541,788**	**$ 3,648,042**	**$ 3,757,483**	**$ 3,870,207**
Offsetting Revenue										
Secure Property Taxes**	$ 114,746	$ 119,740	$ 124,396	$ 131,725	$ 120,000	$ 123,600	$ 127,308	$ 131,127	$ 135,061	$ 139,113
Unsecured Property Taxes	$ 15,677	$ 14,994	$ 14,681	$ 15,138	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000
Interest Earned***	$ 2,156	$ 3,559	$ 4,911	$ 6,339	$ 220,726	$ 220,726	$ 220,726	$ 220,726	$ 220,726	$ 220,726
HOPTR	$ 2,449	$ 2,395	$ 2,433	$ 2,434	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400
Annexation Charges	$ 800	$ 400		$ 1,200	$ 400	$ 400	$ 400	$ 400	$ 400	$ 400
Connection Charges	$ 41,773	$ 33,946	$ 31,341	$ 35,502	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Miscellaneous Revenue	$ 28,986	$ 2,088	$ 65,401	$ 4,487	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000
Total Offsetting Revenue	**$ 206,587**	**$ 177,122**	**$ 243,163**	**$ 196,825**	**$ 393,526**	**$ 397,126**	**$ 400,834**	**$ 404,653**	**$ 408,587**	**$ 412,639**
Use of Fund Balance	$ -	$ -	$ (56,969)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Net Revenue Requirements	**$ 1,810,020**	**$ 1,420,436**	**$ 2,143,118**	**$ 1,945,414**	**$ 1,812,980**	**$ 3,041,503**	**$ 3,140,954**	**$ 3,243,388**	**$ 3,348,896**	**$ 3,457,568**
Annual Rate Assuming 11,556 Connections****					157	263	272	281	290	299

Note:
*Projected CIP is paid over 5 years.
**Secure Property Tax revenue is assumed to increase at 3% per year
***Interest Earned in projected years is calculated as 5% of Beginning Fund Balance
****Current Rate is $174.

Fair Oaks Alternative 2 Fund Balance

Item	1994/95	1995/96	1996/97	1997/98	Projected 1998/99 Budget	Projected 1999/00	2000/01	2001/02	2002/03	2003/04
Beginning Fund Balance	$ 3,636,567	$ 3,820,587	$ 4,471,493	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524
Additions to/(Use of) Balance	$ 184,020	$ 650,906	$ (56,969)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Ending Fund Balance	$ 3,820,587	$ 4,471,493	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524

Fair Oaks Alternative 3 CIP Summary

Project	Priority	Alternative 3	Alt 3 Description
Bay Rd.#4	1	$963,220	Replace with 45-inch sewer
Oakside/Barron Ave	1	$407,280	Replace with 15-inch sewer
Selby Ln #3	1	$697,590	Replace with 30-inch sewer
Berkshire Ave	1	$465,855	Replace with 24-inch sewer
Selby Ln #2	1	$200,420	Replace with 27-inch sewer
Bay Rd.#2	1	$337,935	Replace with 24-inch sewer
Selby Ln #1	1	$200,040	Replace with 15-inch sewer
Nimitz Ave	1	$145,320	Replace with 15-inch sewer
Bay Rd.#1	1	$226,050	Replace with 12-inch sewer
12th Ave	1	$133,840	Replace with 18-inch sewer
Woodside Rd.	1	$163,380	Replace with 18-inch sewer
Santiago Ave	1	$164,040	Replace with 15-inch sewer
El Camino Real#2	1	$154,680	Replace with 15-inch sewer
Milton St/Hull Ave	1	$219,360	Replace with 15-inch sewer
Eleanor Dr	3	$149,260	Remove and Replace
Melanie Ln	3	$150,195	Remove and Replace
Middlefield Rd	3	$108,715	Remove and Replace
Polhemus Ave	3	$293,760	Remove and Replace
Page St	3	$107,935	Remove and Replace
Stochbridge Ave	3	$234,260	Remove and Replace
6th Ave	3	$146,470	Remove and Replace
Bay Rd.#3*	3	$210,630	Remove and Replace
El Camino Real # 1	3	$191,100	Remove and Replace
Hillside Dr*	3	$140,760	Remove and Replace
Gleanwood Ave*	3	$131,240	Remove and Replace
Total		**$6,343,335**	

Note:

*TV Inspection was not performed.

Fair Oaks Alternative 3 Revenue Requirements

Item	1994/95	1995/96	1996/97	1997/98	Projected 1998/99 Budget	Projected 1999/00	2000/01	2001/02	2002/03	2003/04
Expenses										
Admin/Eng	$ 268,794	$ 273,215	$ 223,632	$ 444,404	$ 457,736	$ 471,468	$ 485,612	$ 500,181	$ 515,186	$ 530,642
Capital Projects*	$ -	$ 26,510	$ 240,579	$ 93,698	$ 96,509	$ 1,268,667	$ 1,306,727	$ 1,345,929	$ 1,386,307	$ 1,427,896
Debt Service	$ -	$ -	$ 111	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O&M	$ 553,823	$ 496,190	$ 468,397	$ 354,924	$ 365,572	$ 376,539	$ 387,835	$ 399,470	$ 411,454	$ 423,798
Other	$ 102,466	$ 6,494	$ 141,923	$ 14,786	$ 15,230	$ 15,686	$ 16,157	$ 16,642	$ 17,141	$ 17,655
Sewage Treatment	$ 1,059,631	$ 756,061	$ 1,350,444	$ 1,205,623	$ 1,241,792	$ 1,279,045	$ 1,317,417	$ 1,356,939	$ 1,397,647	$ 1,439,577
Source Control	$ 31,893.00	$ 39,088.00	$ 18,164	$ 28,804	$ 29,668	$ 30,558	$ 31,475	$ 32,419	$ 33,392	$ 34,393
Gross Expenses	**$ 2,016,607**	**$ 1,597,558**	**$ 2,443,250**	**$ 2,142,239**	**$ 2,206,506**	**$ 3,441,964**	**$ 3,545,223**	**$ 3,651,580**	**$ 3,761,127**	**$ 3,873,961**
Offsetting Revenue										
Secure Property Taxes**	$ 114,746	$ 119,740	$ 124,396	$ 131,725	$ 120,000	$ 123,600	$ 127,308	$ 131,127	$ 135,061	$ 139,113
Unsecured Property Taxes	$ 15,677	$ 14,994	$ 14,681	$ 15,138	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000
Interest Earned***	$ 2,156	$ 3,559	$ 4,911	$ 6,339	$ 220,726	$ 220,726	$ 220,726	$ 220,726	$ 220,726	$ 220,726
HOPTR	$ 2,449	$ 2,395	$ 2,433	$ 2,434	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400
Annexation Charges	$ 800	$ 400		$ 1,200	$ 400	$ 400	$ 400	$ 400	$ 400	$ 400
Connection Charges	$ 41,773	$ 33,946	$ 31,341	$ 35,502	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Miscellaneous Revenue	$ 28,986	$ 2,088	$ 65,401	$ 4,487	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000
Total Offsetting Revenue	**$ 206,587**	**$ 177,122**	**$ 243,163**	**$ 196,825**	**$ 393,526**	**$ 397,126**	**$ 400,834**	**$ 404,653**	**$ 408,587**	**$ 412,639**
Use of Fund Balance	**$ -**	**$ -**	**$ (56,969)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Net Revenue Requirements	**$ 1,810,020**	**$ 1,420,436**	**$ 2,143,118**	**$ 1,945,414**	**$ 1,812,980**	**$ 3,044,838**	**$ 3,144,389**	**$ 3,246,926**	**$ 3,352,540**	**$ 3,461,322**
Annual Rate Assuming 11,556 Connections****					**157**	**263**	**272**	**281**	**290**	**300**

Note:

*Projected CIP is paid over 5 years.

**Secure Property Tax revenue is assumed to increase at 3% per year

***Interest Earned in projected years is calculated as 5% of Beginning Fund Balance

****Current Rate is $174.

Fair Oaks Alternative 3 Fund Balance

Item	1994/95	1995/96	1996/97	1997/98	Projected 1998/99 Budget	Projected 1999/00	2000/01	2001/02	2002/03	2003/04
Beginning Fund Balance	$ 3,636,567	$ 3,820,587	$ 4,471,493	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524
Additions to/(Use of) Balance	$ 184,020	$ 650,906	$ (56,969)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Ending Fund Balance	$ 3,820,587	$ 4,471,493	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524

Fair Oaks Average Alternative CIP Summary

Project	Priority	Minimum Cost	Maximum Cost	Average
Bay Rd.#4	1	$963,220	$1,005,700	$984,460
Oakside/Barron Ave	1	$407,280	$661,800	$534,540
Selby Ln #3	1	$697,590	$864,400	$780,995
Berkshire Ave	1	$465,855	$609,200	$537,528
Selby Ln #2	1	$200,420	$209,500	$204,960
Bay Rd.#2	1	$337,900	$337,935	$337,918
Selby Ln #1	1	$200,040	$325,000	$262,520
Nimitz Ave	1	$145,320	$218,000	$181,660
Bay Rd.#1	1	$226,050	$369,900	$297,975
12th Ave	1	$133,800	$133,840	$133,820
Woodside Rd.	1	$128,400	$163,380	$145,890
Santiago Ave	1	$150,400	$164,040	$157,220
El Camino Real#2	1	$154,680	$180,500	$167,590
Milton St/Hull Ave	1	$219,360	$219,400	$219,380
Eleanor Dr	3	$149,260	$240,500	$194,880
Melanie Ln	3	$150,195	$161,300	$155,748
Middlefield Rd	3	$108,715	$137,500	$123,108
Polhemus Ave	3	$293,760	$367,200	$330,480
Page St	3	$107,935	$114,120	$111,028
Stochbridge Ave	3	$234,260	$248,040	$241,150
6th Ave	3	$97,480	$146,470	$121,975
Bay Rd.#3*	3	$185,900	$223,020	$204,460
El Camino Real # 1	3	$133,770	$191,100	$162,435
Hillside Dr*	3	$124,200	$149,040	$136,620
Gleanwood Ave*	3	$115,800	$138,960	$127,380
Total		**$6,131,590**	**$7,579,845**	**$6,855,718**

Fair Oaks Average Alternative Revenue Requirements

Item	1994/95	1995/96	1996/97	1997/98	Projected 1998/99 Budget	Projected 1999/00	2000/01	2001/02	2002/03	2003/04
Expenses										
Admin/Eng	$ 268,794	$ 273,215	$ 223,632	$ 444,404	$ 457,736	$ 471,468	$ 485,612	$ 500,181	$ 515,186	$ 530,642
Capital Projects*	$ -	$ 26,510	$ 240,579	$ 93,698	$ 96,509	$ 1,371,144	$ 1,412,278	$ 1,454,646	$ 1,498,286	$ 1,543,234
Debt Service	$ -	$ -	$ 111	$ -	$ -	$ -	$ -	$ -	$ -	$ -
O&M	$ 553,823	$ 496,190	$ 468,397	$ 354,924	$ 365,572	$ 376,539	$ 387,835	$ 399,470	$ 411,454	$ 423,798
Other	$ 102,466	$ 6,494	$ 141,923	$ 14,786	$ 15,230	$ 15,686	$ 16,157	$ 16,642	$ 17,141	$ 17,655
Sewage Treatment	$ 1,059,631	$ 756,061	$ 1,350,444	$ 1,205,623	$ 1,241,792	$ 1,279,045	$ 1,317,417	$ 1,356,939	$ 1,397,647	$ 1,439,577
Source Control	$ 31,893.00	$ 39,088.00	$ 18,164	$ 28,804	$ 29,668	$ 30,558	$ 31,475	$ 32,419	$ 33,392	$ 34,393
Gross Expenses	**$ 2,016,607**	**$ 1,597,558**	**$ 2,443,250**	**$ 2,142,239**	**$ 2,206,506**	**$ 3,544,441**	**$ 3,650,774**	**$ 3,760,297**	**$ 3,873,106**	**$ 3,989,299**
Offsetting Revenue										
Secure Property Taxes**	$ 114,746	$ 119,740	$ 124,396	$ 131,725	$ 120,000	$ 123,600	$ 127,308	$ 131,127	$ 135,061	$ 139,113
Unsecured Property Taxes	$ 15,677	$ 14,994	$ 14,681	$ 15,138	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000
Interest Earned***	$ 2,156	$ 3,559	$ 4,911	$ 6,339	$ 220,726	$ 220,726	$ 220,726	$ 220,726	$ 220,726	$ 220,726
HOPTR	$ 2,449	$ 2,395	$ 2,433	$ 2,434	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400
Annexation Charges	$ 800	$ 400		$ 1,200	$ 400	$ 400	$ 400	$ 400	$ 400	$ 400
Connection Charges	$ 41,773	$ 33,946	$ 31,341	$ 35,502	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Miscellaneous Revenue	$ 28,986	$ 2,088	$ 65,401	$ 4,487	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000
Total Offsetting Revenue	**$ 206,587**	**$ 177,122**	**$ 243,163**	**$ 196,825**	**$ 393,526**	**$ 397,126**	**$ 400,834**	**$ 404,653**	**$ 408,587**	**$ 412,639**
Use of Fund Balance	$ -	$ -	$ (56,969)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Net Revenue Requirements	**$ 1,810,020**	**$ 1,420,436**	**$ 2,143,118**	**$ 1,945,414**	**$ 1,812,980**	**$ 3,147,314**	**$ 3,249,940**	**$ 3,355,644**	**$ 3,464,519**	**$ 3,576,660**
Annual Rate Assuming 11,556 Connections****					**157**	**272**	**281**	**290**	**300**	**310**

Note:

*Projected CIP is paid over 5 years.

**Secure Property Tax revenue is assumed to increase at 3% per year

***Interest Earned in projected years is calculated as 5% of Beginning Fund Balance

****Current Rate is $174.

Fair Oaks Average Alternative Fund Balance

Item	1994/95	1995/96	1996/97	1997/98	Projected 1998/99 Budget	Projected 1999/00	2000/01	2001/02	2002/03	2003/04
Beginning Fund Balance	$ 3,636,567	$ 3,820,587	$ 4,471,493	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524
Additions to/(Use of) Balance	$ 184,020	$ 650,906	$ (56,969)	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Ending Fund Balance	$ 3,820,587	$ 4,471,493	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524	$ 4,414,524