FINAL REPORT

March 2011

City of San Buenaventura Water Master Plan

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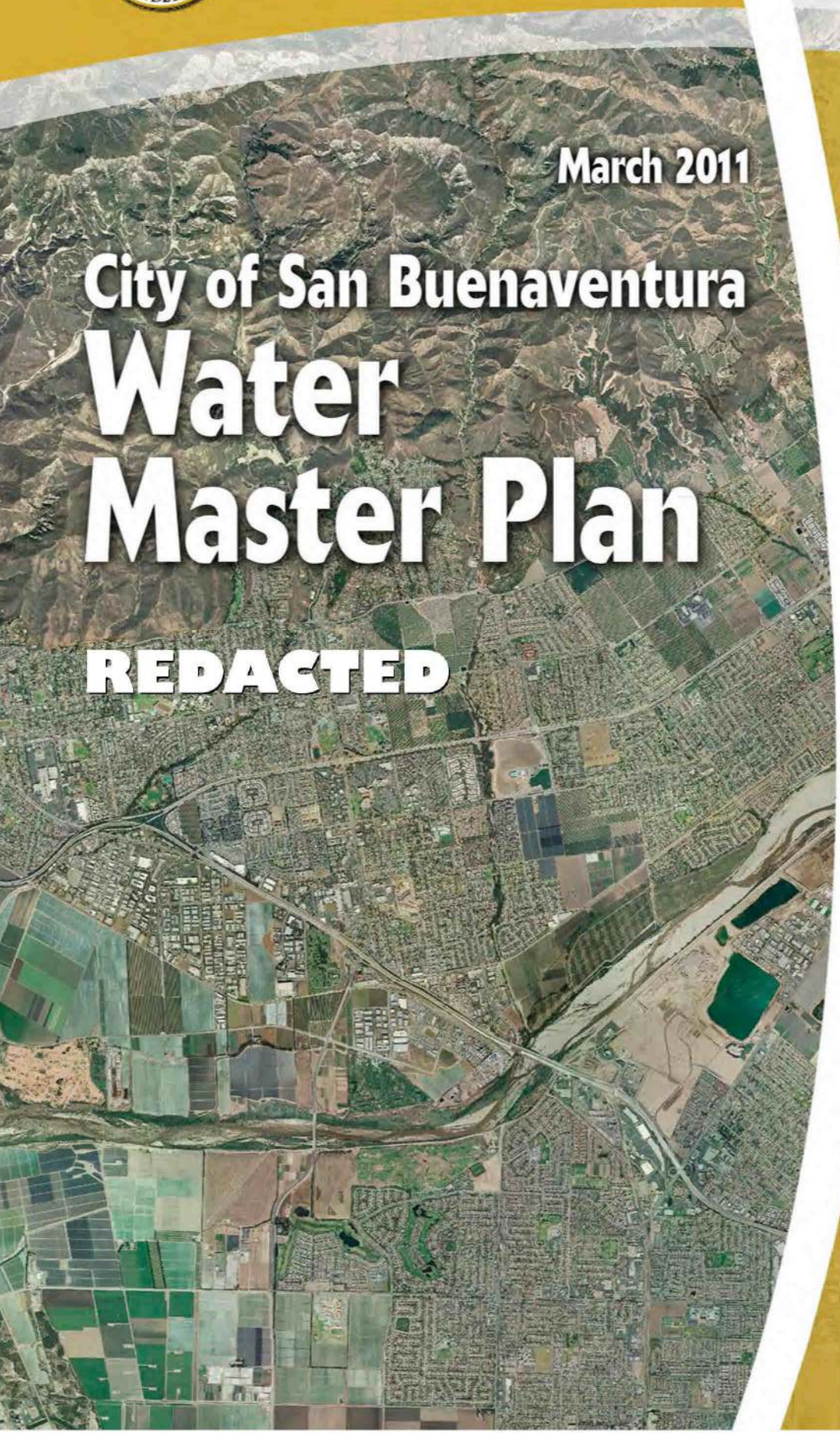

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CITY OF SAN BUENAVENTURA
WATER MASTER PLAN

Final Report

City of San Buenaventura

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TABLE OF CONTENTS

EXECUTIVE SUMMARY i

LIST OF ACRONYMS AND ABBREVIATIONS AC-1

I. INTRODUCTION

A. STUDY AREA I-1
B. CITY HISTORY I-2
C. PROJECT OBJECTIVE I-3
D. PROJECT SCOPE I-3
E. REFERENCE DOCUMENTS I-4

II. LAND USE

A. GENERAL LOCATION, TOPOGRAPHY AND CLIMATE II-1
B. EXISTING LAND USE II-2
C. FUTURE LAND USE II-2
1. Near-Term Developments and Redevelopments II-3
2. Ultimate Build-out II-4

III. DESIGN AND PLANNING CRITERIA AND STANDARDS

A. STORAGE CRITERIA III-1
1. Current Criteria III-1
B. PRESSURE AND VELOCITY CRITERIA III-1
1. Pressure III-1
2. Velocity III-2
C. WATER DEMAND FACTORS III-2
D. WATER PEAKING FACTORS III-4
1. Average Day III-4
2. Maximum Day III-5
3. Peak Hour III-5
4. Summer Average Day III-5
5. Winter Average Day III-5
E. DIURNAL PATTERN III-8
F. FIRE FLOW REQUIREMENTS III-10

VEN0005988

IV. WATER USAGE

A. HISTORICAL IV-1
1. Historical Water Usage IV-1
B. EXISTING WATER USAGE IV-2
1. Pressure Zone Demands IV-2
2. Large Users IV-3
3. Total Water Loss IV-4
C. NEAR TERM WATER USAGE IV-5
D. ULTIMATE WATER USAGE IV-6

V. WATER SUPPLY

A. CURRENT WATER SUPPLY V-1
1. Casitas Municipal Water District V-1
2. Ventura River Surface Water Intake and Upper Ventura River Groundwater Basin/Subsurface Intake and Wells (Foster Park) V-3
3. Mound Groundwater Basin (Mound) V-7
4. Oxnard Plan Groundwater Basin (Fox Canyon Aquifer) V-9
5. Santa Paula Groundwater Basin V-11
B. POTENTIAL WATER SUPPLY V-13
1. State Water Project V-13
2. Saticoy County Yard Well V-14
3. Recycled Water V-15
a. Ventura Water Reclamation Facility (VWRF) V-15
b. Ojai Valley Sanitation District (OVSD) V-16
C. EMERGENCY INTERCONNECTIONS V-17

VI. DISTRIBUTION SYSTEM

A. PRESSURE ZONES VI-1
B. TURNOUTS VI-5
C. RESERVOIRS AND TANKS VI-5
D. PUMP STATIONS VI-11
E. PRESSURE REDUCING VALVES/STATIONS VI-12
F. PIPELINES VI-15
G. TREATMENT PLANTS AND CONDITIONING FACILITIES VI-17

VEN0005989

VII. RESERVOIR STORAGE ANALYSIS

A. INTRODUCTION VII-1
B. STORAGE CRITERIA VII-1
C. EXISTING SYSTEM STORAGE EVALUATION VII-2
1. Available Reservoir Storage (Total Operating Storage) VII-2
2. Required Emergency (Fire Flow) Storage VII-4
3. Available Regulatory Storage VII-5
4. Existing Reservoir Capacity Evaluation VII-6
5. Reservoir Capacity Evaluation – Near-Term Demand Requirements VII-7
D. CONCLUSIONS AND RECOMMENDATIONS VII-7

VIII. WATER SUPPLY ANALYSIS

A. INTRODUCTION VIII-1
B. EXISTING WATER SUPPLY ADEQUACY VIII-1
C. SUPPLY REDUCTION AND OUTAGE SCENARIOS VIII-3
1. Avenue Treatment Plant Out of Service VIII-4
2. Casitas Turnout No. 2 Transmission Main Out of Service VIII-5
3. Victoria Well No. 2 and Mound Well No. 1 Transmission Main Out of Service VIII-7
4. Golf Course Pump Station Transmission Main Out of Service VIII-9
5. Casitas Supply Reduced to Stage 5 Drought Conditions VIII-11
6. Groundwater Supply Reduced to Stage 5 Drought Conditions VIII-14
7. Long Term Drought Conditions with Both Casitas and Groundwater Reductions VIII-16
D. CONCLUSIONS AND RECOMMENDATIONS VIII-17

IX. PUMP STATION ANALYSIS

A. INTRODUCTION IX-1
B. EXISTING CAPACITY EVALUATION IX-1
C. NEAR-TERM CAPACITY EVALUATION IX-4
D. ENERGY ANALYSIS IX-6
1. Existing Rate Schedules IX-7
2. Rate Schedule Recommendations IX-10
E. CONCLUSIONS AND RECOMMENDATIONS IX-11

X. PIPELINE ANALYSIS

A. INTRODUCTION X-1

VEN0005990

B. SMALL WATERLINE REPLACEMENT PROGRAM X-1
C. DISTRIBUTION MAIN REPLACEMENT X-2
1. Hydraulic Evaluation X-2
2. Age Evaluation X-2
D. LOOPING ANALYSIS X-3
E. CONCLUSIONS AND RECOMMENDATIONS X-4

XI. HYDRAULIC EVALUATION

A. INTRODUCTION XI-1
B. HYDRAULIC MODEL XI-1
1. Development XI-1
2. Calibration XI-2
3. Analysis XI-2
4. Updates and Maintenance XI-2
C. EXISTING SYSTEM EVALUATION XI-3
1. Low Pressure Areas XI-3
2. High Pressure Areas XI-4
3. Redundancy and Reliability XI-6
D. CONCLUSIONS AND RECOMMENDATIONS XI-9

XII. FIRE FLOW ANALYSIS

A. INTRODUCTION XII-1
B. EXISTING SYSTEM ANALYSIS XII-1
C. CONCLUSIONS AND RECOMMENDATIONS XII-3

XIII. WATER QUALITY ANALYSIS

A. POTABLE WATER REGULATORY REVIEW ..... XIII -1
1. Introduction ..... XIII -1
2. Recent Changes/Future Regulations ..... XIII -2
3. Summary ..... XIII -13
B. CONCLUSIONS AND RECOMMENDATIONS ..... XIII -14

XIV. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS XIV-1
B. RECOMMENDATIONS XIV-4

VEN0005991

XV. CAPITAL IMPROVEMENT PROGRAM

A. INTRODUCTION XV-1
B. PROJECT IDENTIFICATION NUMBER XV-1
C. PROJECT DETERMINATION XV-1
1. Hydraulic Analysis XV-1
2. Validation of Existing CIP's (2007-2012) XV-2
3. Condition Assessment XV-2
D. PRIORITY CRITERIA XV-2
E. COST BASIS PARAMETERS XV-3
F. RECOMMENDED 10-YEAR CAPITAL IMPROVEMENT PROGRAM XV-3

LIST OF TABLES

Table II-1 Existing Land Use within City General Plan Boundary II-2
Table II-2 Near-Term Land Use Summary II-3
Table II-3 Large Near-Term Development Project Summary (January 2006) II-4
Table II-4 Existing Vacant Lands by Land Use (2005 General Plan Capacity) II-4
Table III-1 Water Demand Factors III-3
Table III-2 Water Peaking Factors III-6
Table III-3 Fire Flow Requirements III-10
Table IV-1 Existing Demands per Pressure Zone IV-2
Table IV-2 Existing Plus Near-Term Demands by Pressure Zone IV-4
Table IV-3 Projected Increase in Average Day Demands at Build-out by Land Use IV-5
Table IV-4 Projected Increase in Demands from Near-Term to Build-out by Land Use IV-6
Table IV-5 Demand Summary IV-6
Table V-1 Historical Water Purchases – Casitas V-3
Table V-2 Water Production – Ventura River V-4
Table V-3 Foster Park Current Operational Capacity V-6
Table V-4 Foster Park Future Additional Operational Capacity V-6
Table V-5 Mound Basin Current Operational Capacity V-7
Table V-6 Mound Basin Future Additional Operational Capacity V-8
Table V-7 Water Production – Mound Basin V-8
Table V-8 Oxnard Plain Current Operational Capacity V-9
Table V-9 Oxnard Plain Future Additional Operational Capacity V-10
Table V-10 Water Production – Oxnard Plain Basin V-10

VEN0005992

Table V-11 Santa Paula Basin Current Operational Capacity V-11
Table V-12 Santa Paula Basin Future Additional Operational Capacity V-11
Table V-13 Water Production – Santa Paula Basin V-12
Table V-14 Summary of Current Water Supply V-13
Table VI-1 Pressure Zones VI-2
Table VI-2 Turnout Summary VI-5
Table VI-3 Existing Reservoirs and Tanks VI-6
Table VI-4 Existing Pump Stations VI-12
Table VI-5 Pressure Reducing Stations VI-13
Table VII-1 Existing Reservoir Storage (Potable Water) VII-3
Table VII-2 Required Emergency (Fire Flow) Storage VII-4
Table VII-3 Available Regulatory Storage VII-5
Table VII-4 Capacity Evaluation – Existing Demand Storage Requirements VII-6
Table VII-5 Capacity Evaluation – Near-Term Demand Storage Requirements VII-7
Table VII-6 Utilization of Excess Pumping Capacity VII-8
Table VIII-1 Casitas Supply VIII-1
Table VIII-2 Avenue Treatment Plant Supply VIII-2
Table VIII-3 Bailey Conditioning Facility Supply VIII-3
Table VIII-4 Saticoy Conditioning Facility Supply VIII-3
Table IX-1 Pump Station Capacity Evaluation – Existing Demands IX-2
Table IX-2 Pump Station Capacity Evaluation (Pump-Through) – Existing Demands IX-3
Table IX-3 Pump Station Capacity Evaluation – Near-Term Demands IX-4
Table IX-4 Pump Station Capacity Evaluation (Pump-Through) – Near-Term Demands IX-5
Table IX-5 Current Rate Structure IX-9
Table IX-6 Recommended Rate Structure IX-10
Table XI-1 Redundant Supply Source XI-8
Table XV-1 CIP Construction Cost Basis Parameters XV-4
Table XV-2 10-year Capital Improvement Program XV-5
Table XV-3 Individual Project Cost Breakdown XV-6

LIST OF FIGURES

Figure III-1 Production Data III-7
Figure III-2 Diurnal Curve III-9
Figure IV-1 Historical Water Usage IV-1
Figure IV-2 Demand Projections (Normal Weather Year) IV-7
Figure VI-1 Pipe Main Material VI-16

VEN0005993

Figure VI-2 Pipe Diameter.....VI-17
Figure X-1 80-Year Pipeline Life – Replacement Projection.....X-3
Figure XII-1 Deficient Fire Flow Nodes by Pressure Zone XII-2

LIST OF EXHIBITS (at end of each Section)

Exhibit I-1 Vicinity Map
Exhibit I-2 City Overview
Exhibit II-1 Land Use Map
Exhibit II-2 Near Term Project Locations
Exhibit V-1 Supply Sources
Exhibit VI-1 Hydraulic Schematic
Exhibit VI-2 Existing System Under Typical Operating Conditions
Exhibit VI-3 Pressure Zones
Exhibit VI-4 Water Facilities
Exhibit VI-5 Pipelines
Exhibit VIII-1 Avenue Treatment Plant Out of Service
Exhibit VIII-2 Casitas Turnout No. 2 Transmission Main Out of Service
Exhibit VIII-3 Victoria Well No.2 and Mound Well No.1 Transmission Main Out of Service
Exhibit VIII-4 Golf Course Pump Station Transmission Main Out of Service
Exhibit VIII-5 Casitas Supply Reduced to Stage 5 Drought Conditions
Exhibit VIII-6 Groundwater Supply Reduced to Drought Conditions
Exhibit VIII-7 Long Term Drought Conditions with both Casitas and Groundwater Supply Reductions
Exhibit X-1 Deficient Pipelines
Exhibit X-1A Deficient Pipelines
Exhibit X-1B Deficient Pipelines
Exhibit X-1C Deficient Pipelines
Exhibit X-2 Pipeline Looping Locations
Exhibit X-2A Pipeline Looping Locations
Exhibit X-2B Pipeline Looping Locations
Exhibit X-2C Pipeline Looping Locations
Exhibit X-2D Pipeline Looping Locations
Exhibit XI-1 Low Pressure Locations
Exhibit XI-2 High Pressure Locations
Exhibit XI-3 210 to 260 Zone Boundary Adjustment
Exhibit XI-4 430 to 330 Zone Boundary Adjustment
Exhibit XII-1 Deficient Fire Flow Locations

APPENDICES

Appendix A: Pending Projects – January 2006
Appendix B: Technical Memorandum No. 1, Wastewater Planning Data (prepared by K/J Consultants)
Appendix C: Memorandum, Seasonal Demands and Diurnal Patterns (prepared by RBF Consulting)
Appendix D: Fire Flow Test Locations and Results

VEN0005994

LIST OF ACRONYMS & ABBREVIATIONS

AF – Acre-feet

AFY – Acre-feet per Year

AMR – Automated Meter Reading

ASL – Above Sea Level

AWWA – American Water Works Association

BPS – Booster Pump Station

CCL – Contaminant Candidate List

CCS – Central Control Station

CDCP – Centers for Disease Control Prevention

CDPH – California Department of Public Health

CFS – Cubic Feet per Second

CIP – Capital Improvement Program

CMMS – Computerized Maintenance Management System

CMWD – Calleguas Municipal Water District or Casitas Municipal Water District

CSTR – Completely Stirred Tank Reaction

DBPR – Disinfection Byproducts Rule

DU – Dwelling Unit

EPA – Environmental Protection Agency

ERP – Emergency Response Plan

ERU – Equivalent Residential Units

GIS – Geographic Information System

GPM – Gallons per Minute

HAA5 – Five Haloacetic Acids

HGL – Hydraulic Grade Line

ISO – Insurance Services Office

LAFCO – Local Agency Formation Commission

LT2ESWTR – Long Term 2 Enhanced Surface Water Treatment Rule

MCL – Maximum Contaminant Level

MG – Million Gallons

MGD – Million Gallons per Day

mg/L – Milligrams per Liter

MRDL – Maximum Residual Disinfectant Level

MSC – Municipal Service Center

NPDWR – National Primary Drinking Water Regulations

VEN0005995

O&M – Operation and Maintenance

Pipe Materials:

- AC or ACP – Asbestos Cement Pipe
- CIP – Cast Iron Pipe
- CCP – Concrete Cylinder Pipe
- CML&C – Cement Mortar Lined and Coated Steel Pipe
- DIP – Ductile Iron Pipe
- PVC – Polyvinyl Chloride Pipe
- RCP – Reinforced Concrete Pipe
- STL – Steel Pipe
- TRN – Transite Pipe

ppb – Parts per Billion

PRV – Pressure Reducing Valve

PRS – Pressure Reducing Station

PS – Pump Station

R – Reservoir

RTU – Remote Terminal Unit

SCADA – Supervisory Control and Data Acquisition

SCC – Saticoy Country Club

SCE – Southern California Edison

SDWA – Safe Drinking Water Act

SMCL – Secondary Maximum Contaminant Level

STL – Steel

T – Tank

TDS – Total Dissolved Solids

TTHM – Total Trihalomethanes

UCMR – Unregulated Contaminant Monitoring Rule

UFC – Uniform Fire Code

UPC – Uniform Plumbing Code

VA – Vulnerability Assessment

VFD – Variable Frequency Drive

WQ – Water Quality

VEN0005996

EXECUTIVE SUMMARY

INTRODUCTION

The City of San Buenaventura (City of Ventura) Water Division (City Water Division) owns, operates and maintains a water distribution system that provides domestic water service to a population of approximately 109,000 persons and has approximately 32,000 service connections. The City's existing water service area includes all portions within the City limits, as well as portions of unincorporated Ventura County that meet the City's policy for water connections outside City limits (Municipal Code Section 22.110.055).

The primary goal of the City Water Division is to provide an adequate, reliable and safe water supply with adequate pressure to customers for domestic and commercial/industrial uses and for fire protection. This Master Plan Report provides an evaluation of the City's Water System at its current condition, and through the City's planning stages. Recommendations for operational changes and capital improvements based on an analysis of water supply, distribution and quality are incorporated into a 10-year capital improvement program.

LAND USE & WATER DEMAND

The City water service area is essentially a built-out community comprised primarily of residential areas. Large commercial and industrial areas exist along Main Street, Harbor Boulevard, Telephone Road, Ventura Avenue, Telegraph Road and Victoria Avenue. The City's Community Development Department compiles proposed and current development projects throughout the entire City in a Pending Project Status Report. These projects are considered to be "near-term" because some level of planning has occurred. The majority of the projects are redevelopments of commercial land and new residential developments. The ultimate build-out is classified as projects expected to occur at some point in the future, but planning stages of the projects has yet to begin. These projects include the anticipated development of all vacant parcels within the City's potential water service area not included in the near-term development summary, as identified in the 2005 General Plan. The existing water demand and projected water demands for each of the planning conditions are summarized in the table below.

Table ES-1: Summary of Water Demand

Demand Condition [1]	Average Day Demand (gpm / afy)	Maximum Day Demand (gpm / afy)	Peak Hour Demand (gpm)
Existing Demands	10,037 / 16,190	15,257 / 24,610	39,112
Near Term Demands	11,095 / 17,896	16,864 / 27,202	44,016
Ultimate Demands	14,078 / 22,708	21,398 / 34,515	55,857

[1] Existing demands are based on actual billing records. Near-term and Ultimate demands are projected.

VEN0005997

WATER SUPPLY

The City's domestic water supply is derived from local groundwater basins, Lake Casitas and surface and sub-surface water from the Ventura River. The City also has a 10,000 acre-foot per year allocation from the California State Water Project. To date the City has not received any of this water because there are no facilities to get the water to the City. There are presently five water sources that provide water to the City water system:

- Casitas Municipal Water District (Casitas)
- Ventura River Foster Park Area (Foster Park)
- Mound Groundwater Basin (Mound)
- Oxnard Plain Groundwater Basin (Fox Canyon Aquifer)
- Santa Paula Groundwater Basin (Santa Paula Basin)

Table ES-2: Summary of Current Water Supply

Water Supply Source	Historical Supply Projection (AFY)	Average Annual Supply (2000-2009) (AFY)	Present Operational Supply Constraint (AFY)
Casitas	4,960 – 8,000	6,200	6,200
Ventura River (Foster Park)	4,200 – 6,700	4,200	4,200
Mound Groundwater Basin	2,500 – 4,000	4,000	5,500 (1)
Oxnard Plain Groundwater Basin	4,100	4,100	6,775 (2)
Santa Paula Groundwater Basin	3,000	1,340	1,600 (3)
Total	**18,760 – 25,800**	**19,840**	**24,275**

[1] Assumes two wells operational, one well at 1,500 gpm and one at 2,000 gpm
[2] Assumes two wells operational at 2,100 gpm each.
[3] Assumes one well operational at 1,000 gpm.

CONCLUSIONS

In general, the City's distribution system is in good physical condition, adequately sized and operated efficiently. The results of the analysis of the distribution system identified some deficiencies that require improvements in order to meet the minimum standards and criteria. A brief description of the conclusions for each system analysis is described herein.

Storage

The City currently has 43.2 MG of operational storage citywide. Of that storage volume, approximately 46% is located in the lowest pressure (210 Pressure Zone), and approximately 23% in located in the 430 Pressure Zone. Based on the City's storage criteria requirements, only one pressure zone has adequate

VEN0005998

storage capacity (210 Pressure Zone). Including the projected near-term water demand increase, the City's storage capacity is deficient by 7.6 MG.

Supply

The City has a diverse portfolio of supply sources. The Casitas supply and the groundwater supply have historically been reliable water supply sources. The Ventura River supply has proved to be less reliable in recent years. Flooding on the river in 2005 caused damage to several City wells, which has greatly reduced the City's available supply from the River. Since the floods, supply from the river is approximately 33% of what was available prior to the floods. Installing new wells, or repairing the damaged wells and pipelines, is proving to be a lengthy process due to environmental regulations. The City has additional rights to groundwater, and also some stored groundwater credits that can be utilized in times of drought. In order to access the additional groundwater, the City will need to construct additional wells and increase the well treatment plant capacity.

Pumping Capacity and Efficiency

The City has 15 pressure zones that provide service to an elevation range of over 1,000 feet. Since the water supply is primarily located in the lowest hydraulic gradients, the City relies on an extensive amount of pumping to move water to the higher gradients. The nominal capacity of the City's pumping facilities is over three times the maximum day demand. The pump station capacity evaluation concluded that there is adequate pumping capacity in all of the City's pressure zones with the exception of the 400 Pressure Zone. For those pump stations that are the sole supply to a single pressure zone, it is critical that the pump station be equipped with on-site back-up power in case of an emergency. There are a total of five pump stations that require on-site back-up power units.

Transmission and Distribution

Some deficiencies, such as inadequate fire flow availability and low pressures, exist because of undersized or aging distribution infrastructure. The City system contains approximately 40,000 feet of distribution pipeline that is less than 6-inches in diameter. The average age of a City pipeline is 42 years old. Based on the median pipeline life expectancy identified in the 2004 Water System Corrosion Study, the average life expectancy of a City pipeline is 80 years. A majority of the pipelines in the City were constructed in 1950's and 1960's. With a life expectancy of 80 years, a large amount of pipe would require replacement between the years 2030 and 2050. Although a majority of the pipe replacement required in the City is over 20 years away, due to the large quantity, approximately 900,000 feet, that requires replacement, the City should start planning and budgeting for a comprehensive pipe replacement program to begin in Year 2020.

VEN0005999

Hydraulics

Maintaining residual pressures between 40 psi and 120 psi throughout the distribution system will help to provide adequate fire flow capacity, as well as increase customer satisfaction. Two specific areas where adjusting a pressure zone boundary will help to alleviate the pressure problems, and provide some operational benefit to the City. The 210 Pressure Zone experiences an area of low pressure, and subsequent low fire flow availability. Serving the area from the 260 Pressure Zone will greatly improve pressure and fire flow availability and the added demand will help to turn water over in the 260 Zone reservoirs, which have been a problem during low demand periods. An area of the 430 Pressure Zone is experiencing pressure in excess of 120 psi. Serving the area from the 330 Pressure Zone will reduce the operating pressure into a normal operating range of 70 – 80 psi, and it will also remove some demand from a higher hydraulic gradient, thus reducing some pumping demand.

Fire Flow

Based on analysis conducted with the hydraulic model, insufficient fire flows were noted at approximately 220 locations throughout the City. Some of those areas will see fire flow improvement as the aging and undersized pipelines are replaced and upsized and zone boundaries are adjusted.

RECOMMENDATIONS

To address the concerns found during the system analysis, the Master Plan recommends 21 one-time capital projects and one long-term program to replace aging water mains. The Master Plan further prioritizes these projects and recommends a 10-year Capital Improvement Program (CIP) for all of the projects. The Pipeline Replacement Program (Project No. 018) would begin in approximately 10 years and continue for the next 35 years. It is recommended that the City begin to fund the Pipeline Replacement Program soon.

Table ES-3 summarizes the 22 recommended projects.

VEN0006000

Table ES-3: Summary of 10-year Capital Improvement Program

Proj. ID	Project Title	Priority	Total
001	Rehabilitate the Gosnell Pump Station	Immediate	$1,290,000
002	Golf Course PS 18" Transmission Main Condition Assessment	Immediate	$105,000
003	New Tank - Arroyo Verde (605 Zone) (Upsize to 3.8 MG)	Medium Term	$9,626,000
004	Casitas No. 2 Turnout 24-inch transmission main inspection	Immediate	$103,000
005	Waterline Extension - Telephone (210/330)	Short Term	$4,035,000
006	330 to 210 Pressure Zone flow control / pressure reducing facility	Short Term	$225,000
007	Construct Saticoy Well No. 3 (2,500-gpm)	Medium Term	$3,625,000
008	Saticoy Conditioning Facility Renovation	Medium Term	$9,000,000
009	Construct Mound Well No. 2 (2,500-gpm)	Short Term	$5,425,000
010	Construct Golf Course Well No. 7 (2,500-gpm)	Short Term	$5,425,000
011	Upgrade Valley Vista Pump Station	Short Term	$1,245,000
012	Mariano Pump Station fixed emergency power	Immediate	$120,000
013	McElrea Pump Station fixed emergency power	Immediate	$120,000
014	Nob Hill Pump Station fixed emergency power	Immediate	$120,000
015	Kalorama Pump Station fixed emergency power	Immediate	$120,000
016	Pipeline Replacement Program - Small diameter pipelines (40,000 LF)	Immediate	$8,640,000
017	Pipeline Replacement Program - Deficient Pipelines (5,500 LF)	Medium Term	$1,691,000
018	Pipeline Replacement Program - General	Long Term	$0
019	Pipeline Looping Program (11,290 LF)	Medium Term	$3,386,000
020	Zone boundary adjustment between the 210 and 260 Pressure Zones	Immediate	$2,778,000
021	Zone boundary adjustment between the 330 and 430 Pressure Zones	Short Term	$0
022	Install an additional PRV in the 360R Zone	Immediate	$225,000
	TOTAL		**$57,304,000**

Note: Project No. 021 has been included in Project No. 005.

VEN0006001

I. INTRODUCTION

A. STUDY AREA

The City of San Buenaventura (City or Ventura) is located 62 miles north of Los Angeles and 30 miles south of Santa Barbara along the California coastline. The City is located within the County of Ventura, and bound by the City of Oxnard to the south, by unincorporated Ventura County to the east and north, and by the Pacific Ocean to the west. The northwest portion of the City is bound by the Ventura River, while the southern portion is bound by the Santa Clara River. The Ventura Freeway (101) bisects the City in the north-south direction, while the Santa Paula Freeway (126) runs east to west through the center of the City. The Ojai Freeway (33) runs along the northwestern edge of the City. The City currently occupies an estimated 21 square miles and has an estimated population of 109,000 persons. Refer to Exhibit I-1 for a Vicinity Map. Exhibit I-2 identifies the City of San Buenaventura boundary, the Sphere of Influence and planning area.

The City Water Section is a subdivision of the Environmental and Water Resources Division within the City's Public Works Department, responsible for the production, treatment, distribution and capital improvement project coordination for the City's water system. The Engineering Division of the Department of Public Works is responsible for the project engineering for design and studies of all capital improvement projects of the City's water system. The Engineering Division offices are located at 501 Poli Street. The City Water Division offices are located at the Public Works Maintenance Facility, located at 336 Sanjon Road. Exhibit I-2 identifies the locations of the City's offices.

The City Water Section provides water service to a population of approximately 109,000 persons and has approximately 32,000 service connections. The City's existing water service area includes all portions within the City limits, as well as portions of unincorporated Ventura County that meet the City's policy for water connections outside City limits (Municipal Code Section 22.110.055).

The City Water Section also operates the Saticoy Country Club (SCC) water system, which consists of residences and country club facilities that are located east of the City. They have their own stand-alone system, which includes two groundwater wells, a booster pump station and two storage tanks. The ownership responsibility for the system is shared between the City and SCC (1/3 and 2/3, respectively). The SCC system has a separate Domestic Water Supply Permit from the California Department of Public Health.

VEN0006002

B. CITY HISTORY

The City of San Buenaventura developed as a result of the ninth and last mission founded in California by Father Junipero Serra in 1782. In 1886, the City incorporated an area of about one square mile around the original Mission San Buenaventura. The Spanish Fathers for the Mission San Buenaventura developed the first water system for the City. It consisted of an aqueduct, which is now abandoned, to convey water from the Ventura River, near San Antonio Creek, to a reservoir located behind the Mission. During subsequent development around the Mission, additional groundwater was obtained from wells in the Ventura and Santa Clara River basins. Water facilities were developed and operated for the City by several individuals and companies over the period of 1869 to 1923. In 1923, the City acquired the water system from the Southern California Edison Company and assumed the responsibility of providing water to City residents. In years following, the City developed additional sources of surface and groundwater, including wells and improvements to the surface water diversion from the Ventura River. Since 1960, the City has purchased surface water from Casitas Municipal Water District (Casitas) to supplement its groundwater supplies.[1]

The City Council of San Buenaventura adopted Resolution No. 90-79 on August 6, 1990 committing to a course of action on water planning and implementation. This resolution was in response to increasing water demands from population growth and development in the City, as well as concerns related to ongoing significant drought conditions. Council also adopted the December 1994 Comprehensive Water Resources Management Plan, a compilation of water supply policy statements that provide guidance to develop and maintain a water system that meets the goals and objectives of the citizens of Ventura.

In addition, three major studies were initiated; the 1992 Master Plan for Reclaimed Water prepared by Black and Veatch, the 1993 Evaluation of Long-Term Alternative Water Sources prepared by James M. Montgomery Consulting Engineers Inc., and the 1993 Water System Operational Evaluation and Improvement Program prepared by Boyle Engineering Corporation.

[1] Per December 2005 Urban Water Management Plan

VEN0006003

C. PROJECT OBJECTIVE

The City contracted with RBF Consulting to provide the City with a current Water Master Plan that will include recommendations for capital improvements based on an analysis of water supply, distribution and quality. The purpose of this project is to evaluate current water usage; evaluate future development/redevelopment within the City water service area; create a hydraulic model of the water system; analyze the model and identify system deficiencies; identify operational changes within the system which may result in more efficient operations; assess the condition of existing water facilities; and evaluate future water quality regulations.

The primary goal of the City Water Division is to provide an adequate, reliable and safe water supply with adequate pressure to customers for domestic and commercial/industrial uses and for fire protection. This Master Plan Report provides an evaluation of the City's Water System at current, and through the City's planning stages. Recommendations for operational changes and needed improvements are incorporated into a 10-year capital improvement program.

D. PROJECT SCOPE

The scope of work for this project includes several tasks that were directly related to the preparation of this Master Plan Report and several tasks that were indirectly related to the Report. The following primary tasks were directly related to the preparation of the Master Plan Report:

- Review Previous Studies
- Review Water Standards
- Review Water Supply Agreements
- Develop existing water demands and peaking factors
- Evaluate future development and/or redevelopment within the City's Water Service Area
- Develop projected water demands
- Identify current and future water quality regulations
- Perform a condition assessment on each facility in the water distribution system
- Create a hydraulic model of the water distribution system
- Analyze current water system operation
- Recommend projects to improve City's water system efficiency
- Identify system deficiencies
- Evaluate the current 2008-2013 Capital Improvement Program (CIP)
- Incorporate conclusions of analysis into an updated 10-year CIP

VEN0006004

E. REFERENCE DOCUMENTS

The following documents were used as reference for the preparation of this Water Master Plan Report:

Comparison of Water System Alternatives (June 1992), Boyle Engineering Corporation.

Master Plan for Reclaimed Water System (August 1992), Black & Veatch.

Water System Operational Evaluation and Improvement Program (June 1993), Boyle Engineering Corporation.

Management Plan for City of San Buenaventura (August 1993), Ecos, Inc.

Comprehensive Water Resources Management Plan (December 1994), City of San Buenaventura Department of Public Works.

Ventura River/San Antonio Creek Watershed Sanitary Survey 2000 Update (May 2001), Boyle Engineering Corporation.

Investigation of Santa Paula Basin Yield (July 2003), Santa Paula Basin Experts Group.

West Ventura County Water Supply Reliability Study (December 2003), Kennedy/Jenks Consultants.

Ventura County Yard Well No. 1 Construction Report (March 2004), Hopkins Groundwater Consultants, Inc.

Water System Corrosion Protection Study (August 2004), Boyle Engineering Corporation.

2008 Biennial Water Supply Report (September 2008), City of San Buenaventura Department of Public Works.

2005 Ventura General Plan (August 2005), City of San Buenaventura.

Draft Santa Paula Basin 2004 Annual Report (August 2005), Groundwater Resources Department.

Urban Water Management Plan (December 2005), City of San Buenaventura Department of Public Works.

2007 Annual Water Quality Drinking Report, Casitas Municipal Water District.

2007 Water Quality Confidence Report, City of San Buenaventura.

Downtown Specific Plan (March 2007), City of San Buenaventura.

Capital Improvement Project Plan for 2008-2013, City of San Buenaventura Department of Public Works.

Evaluation of Long-Term Alternative Water Sources (June 1993), James M. Montgomery Consulting Engineers, Inc.

Preliminary Hydrogeological Study – Foster Park Wellfield Design Study (December 2007), Hopkins Groundwater Consultants, Inc.

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0 1 2 4 Miles

CITY OF SAN BUENAVENTURA

VICINITY MAP

EXHIBIT I-1

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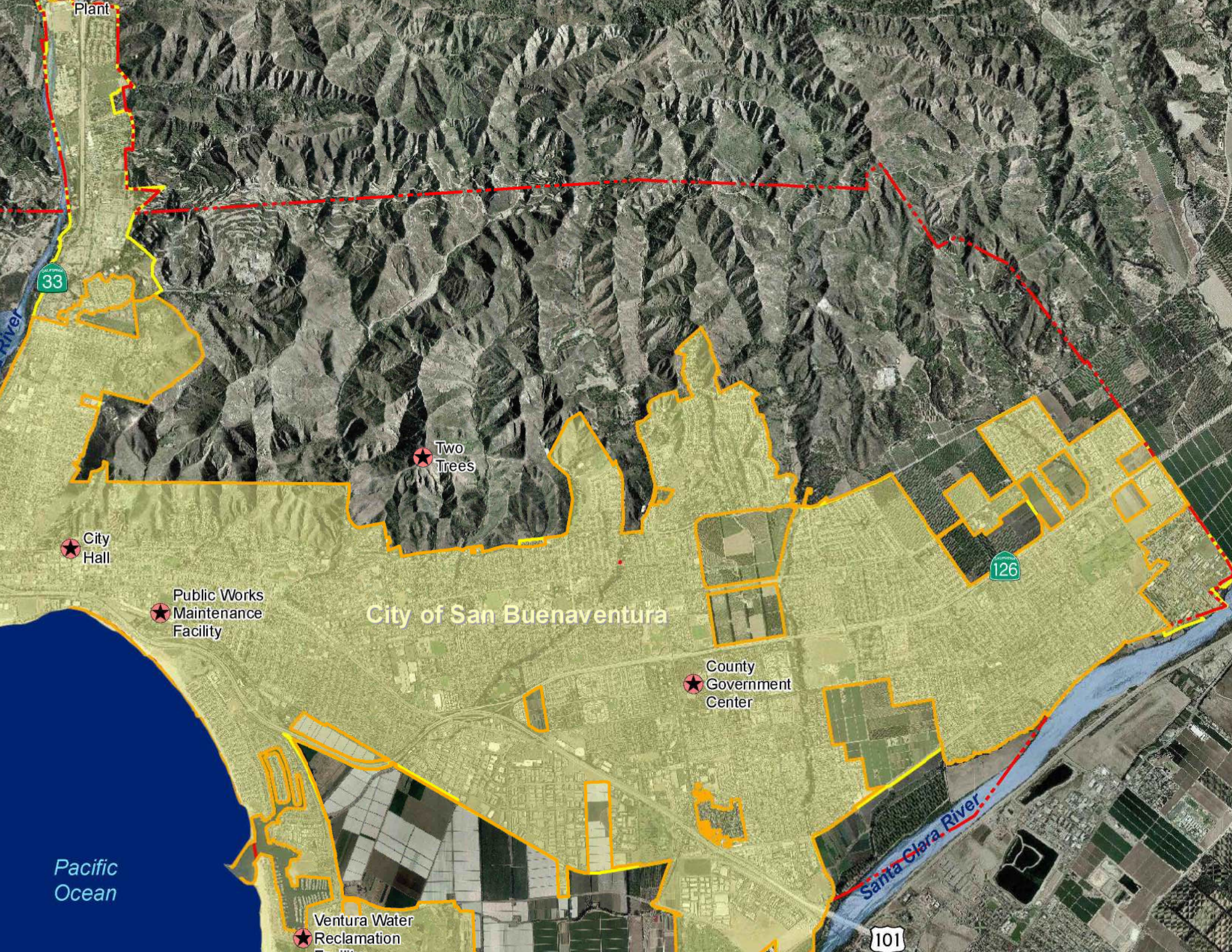
Plant
33
River
Two
Trees
City
Hall
Public Works
Maintenance
Facility
City of San Buenaventura
126
County
Government
Center
Pacific
Ocean
Ventura Water
Reclamation
Santa Clara River
101

II. LAND USE

The early beginnings of the City of San Buenaventura consisted primarily of agricultural land and localized shopping centers. Over time, the City has developed into a primarily residential community with various commercial, industrial and institutional areas scattered throughout the City. The diverse change in the land use over time has been a critical factor in planning for the City's water system. Development and preservation of the land is detailed in the 2005 City of San Buenaventura General Plan.

The City provides water service to all customers within the City limits and those outside the City limits that meet the criteria set forth in the City Municipal Code Section 22.110.055. There are three separate boundaries referenced throughout this report: City Limits, Sphere of Influence, and the General Plan Boundary. The City Limits designate all areas incorporated into the City of San Buenaventura, and total approximately 13,834 acres. The Sphere of Influence designates the probable physical boundary and service area of a local agency, as designated and regulated by the Local Agency Formation Commission (LAFCO). The Sphere of Influence encompasses approximately 22,580 acres. The General Plan Boundary is the boundary identified in the City's 2005 General Plan, and encompasses approximately 30,871 acres.

The City's water service area generally refers to the existing and future customers within the Sphere of Influence.

A. GENERAL LOCATION, TOPOGRAPHY AND CLIMATE

The City of San Buenaventura is a coastal community located in Ventura County in southern California, approximately 60 miles north of Los Angeles and 30 miles south of Santa Barbara. Neighboring cities include; Oxnard, Port Hueneme, and Camarillo.

The City water service area ranges in elevation between sea level at the lowest point, to 1,035 feet at the highest point. In general, elevations increase traveling south to north.

The climate in the City is mild, with temperatures ranging from the low forties to the eighties with an average temperature of 74 degrees Fahrenheit. Annual average precipitation in the City is approximately 17-inches.

VEN0006008

B. EXISTING LAND USE

The City water service area is essentially a built-out community comprised primarily of residential areas. Large commercial and industrial areas exist along Main Street, Harbor Boulevard, Telephone Road, Ventura Avenue, Telegraph Road and Victoria Avenue. A large amount of land within the General Plan Boundary, over 11,500 acres, is dedicated to parks and open space.

Existing land use information was compiled from the 2005 General Plan. The various land use types and densities that are located within the City General Plan Boundary are listed in Table II-1.

Table II-1
Existing Land Use within City General Plan Boundary

Planning Designation	Allowed Density (du/acre)	Area (acres)
Neighborhood Low	0 – 8	4,629
Neighborhood Medium	9 – 20	1,061
Neighborhood High	21 – 54	303
Commerce/Mixed Use	N/A	808
Industry	N/A	1,401
Public and Institutional	N/A	571
Park and Open Space	N/A	11,693
Agriculture	N/A	6,857
Downtown Specific Plan	21 – 54	307
Harbor District	N/A	254
Total	**-**	**27,884**

Note: The difference in land use area stated in Table II-1 and Exhibit II-1 is due to the fact that Table II-1 does not include the area for vacant or additional potential parcels, however Exhibit II-1 does.

Refer to Exhibit II-1 at the end of this Section for the Land Use Map.

C. FUTURE LAND USE

The number of customers served from the City's water system is expected to increase due to planned future developments and changes in land use. Land use changes will impact the operation of the City's distribution system. Proper planning for these changes will enable the City to continue to meet demands, provide adequate fire protection and provide quality service to its customers.

Most of the land within the City's existing water service area is developed. Anticipated changes in land use will primarily occur through redevelopment of existing land and small developments

VEN0006009

(in-fill projects) in the various vacant parcels scattered throughout the City. This section will be broken down to describe the anticipated near-term developments and redevelopments and the ultimate build-out of the City as identified by the 2005 General Plan.

1. Near-Term Developments and Redevelopments

The City's Community Development Department compiles proposed and current development projects throughout the entire City in a Pending Project Status Report. These projects are considered to be near-term because some level of planning has occurred and the projects are anticipated to be completed within the next 2-3 years (it should be noted that some of the projects identified below may have begun construction or have been completed at the time of finalization of this report). The majority of the projects are redevelopments of commercial land and new residential developments. Refer to Exhibit II-2 for the locations of the near-term projects as identified in the January 2006 Pending Project List and Appendix A for a list of the projects. See Table II-2 for a summary of the near-term land use.

Table II-2
Near-Term Land Use Summary

General Plan Land Use Category	Acreage	DU
Neighborhood Low (NL)	221	662
Neighborhood Medium (NM)	188	699
Neighborhood High (NH)	41	256
Commerce/Mixed Use (C)	78	459
Industry (I)	86	-
Public and Institutional (PI)	19	-
Parks and Open Space (POS)	440	-
Downtown Specific Plan (DTSP)	23	445
Total	**1,097**	**2,521**

A few of the larger near-term projects anticipated within the City water service area are listed in Table II-3.

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Table II-3
Large Near-Term Development Project Summary

Project Name	Project Address	DU	Acreage	Land Use Category	Project Number
Parklands	Southwest corner of Wells Rd & Telegraph Rd	252	66.7	NM	RS-99
Parklands	Southwest corner of Wells Rd & Telegraph Rd	235	-	NL	RC-85
Harmony	South of Thille Rd @ Ringo St	182	15.8	NH	RC-61
Island View	NW Corner of Hill Rd and Moon Dr	120	26.9	NM	RS-87
The Grove	Copland Dr & Telephone Rd	75	25.6	NM	RS-98
Melody	Northwest corner of Telegraph Rd & Saratoga	74	15.7	NH	RC-64
Hails	Henderson Rd, West of Montgomery	172	40.1	NL	RS-92
Hails	Henderson Rd, West of Montgomery	60	-	NL	RC-70

2. Ultimate Build-out

The ultimate build-out is classified as projects expected to occur at some point in the future, but planning stages of the projects has yet to begin. These projects include the anticipated development of all vacant parcels within the City's potential water service area not included in the near-term development summary, as identified in the 2005 General Plan. The total area of vacant land that can be ultimately developed are summarized by Land Use Types in Table II-4. Further discussion of the demands generated by the build-out of all vacant lands is described in Section IV.

Table II-4
Existing Vacant Lands by Land Use (2005 General Plan Capacity)

Planning Designation	Allowed Density (du/acre)	Area (acres)
Neighborhood Low	0 – 8	426
Neighborhood Medium	9 – 20	116
Neighborhood High	21 – 54	16
Commerce	N/A	621
Industry	N/A	1,178
Public and Institutional	N/A	0
Park and Open Space	N/A	0
Agriculture	N/A	-
Downtown Specific Plan	21 – 54	30
Harbor District	N/A	41
Total	**-**	**2,428**

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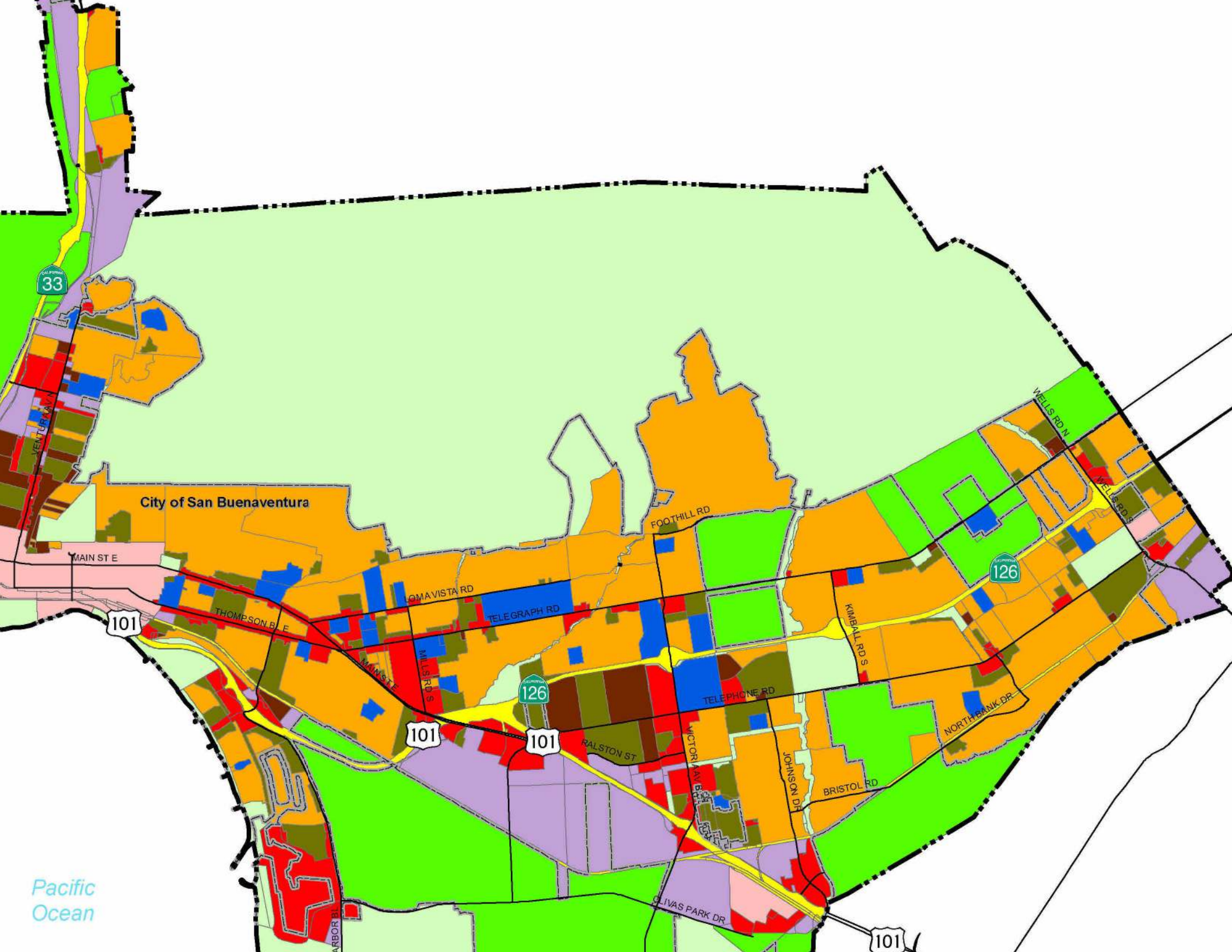
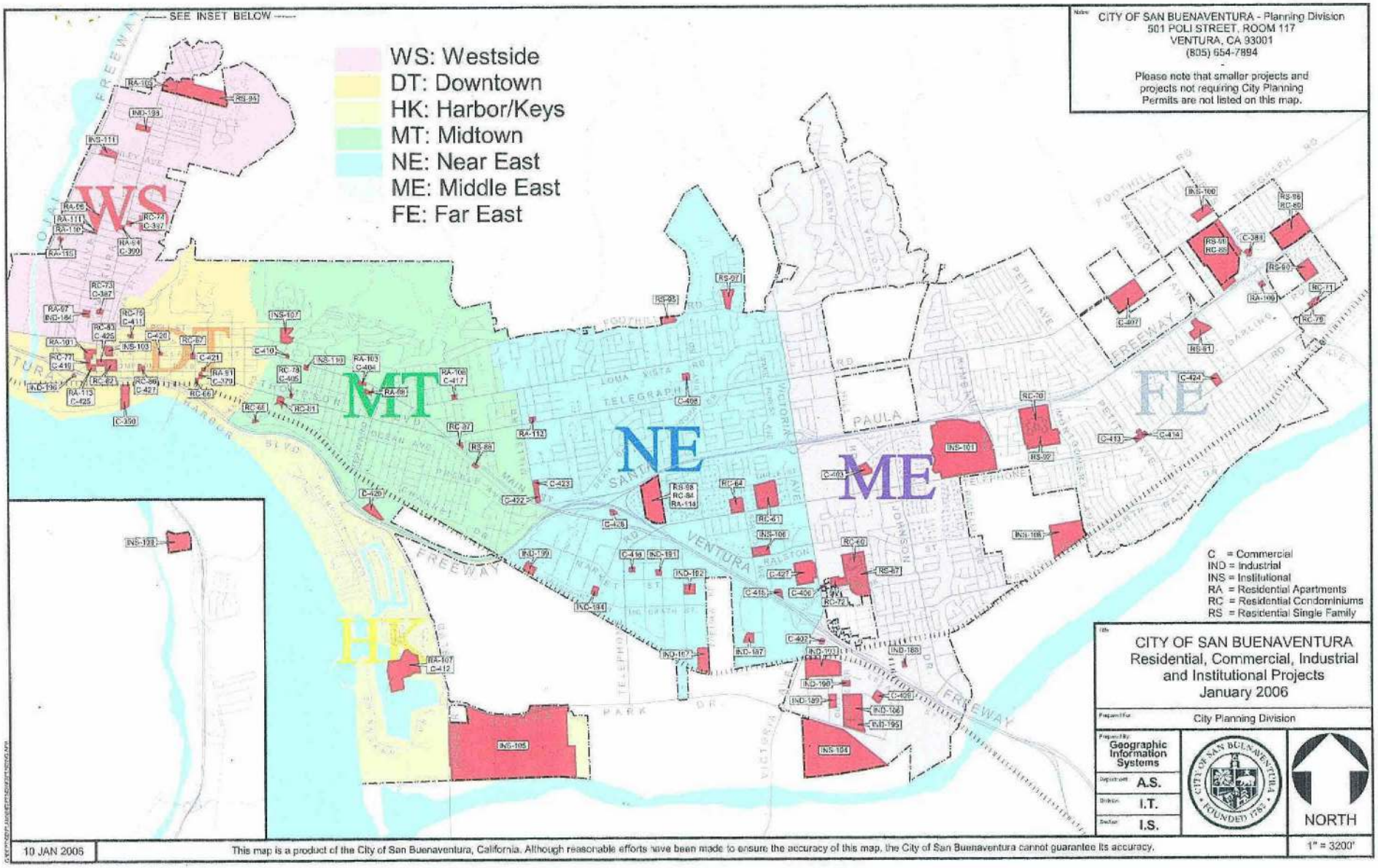

City of San Buenaventura
33
VENTURA AVE
MAIN ST E
101
THOMPSON BLVD
LOMA VISTA RD
TELEGRAPH RD
MAIN ST E
MILLS RD S
126
101
101
FOOTHILL RD
TELEPHONE RD
RALSTON ST
VICTORIA AVE
JOHNSON DR
BRISTOL RD
KIMBALL RD S
NORTHBANK DR
WELLS RD N
WELLS RD S
126
OLIVAS PARK DR
101
Pacific
Ocean



NEAR TERM PROJECT LOCATIONS

EXHIBIT II-2

III. DESIGN AND PLANNING CRITERIA AND STANDARDS

As new or replacement facilities are required throughout the City's water service area, those facilities should be planned for and designed per specific criteria in order to provide a redundant and reliable service to the customers.

A. STORAGE CRITERIA

1. Current Criteria

In accordance with the City's Design and Construction Standards, the total required storage for a pressure zone is the sum of emergency storage and regulatory storage. Emergency storage is identified as the maximum fire flow in the pressure zone for a specified duration (in accordance with Insurance Services Office (ISO), or the City of San Buenaventura Fire Department). Regulatory storage has been defined as 175% of the maximum day demand of the pressure zone.

Total Operational Storage	= Regulatory Storage + Emergency Storage
Regulatory Storage	= 175% of Maximum Day Demand
Emergency Storage	= Maximum Fire Flow in Pressure Zone for Specified Duration

Approved projects that meet the City's policy for water service outside the City limits must meet the requirements of the Ventura County Fire Protection Department for fire flow for each project.

B. PRESSURE AND VELOCITY CRITERIA

1. Pressure

Service pressure is the available water pressure at any water service location as provided by the reservoir or pressure reducing station serving that particular pressure zone. Under peak hour operating conditions, it is recommended that the distribution system maintain a minimum service pressure of 40 psi at all locations. Under minimum hour operating conditions, it is recommended that the distribution system not exceed a maximum service pressure of 150 psi. Service pressures above 80 psi will require a pressure regulator as stated in the Uniform Plumbing Code. Any water service pressure

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above 150 psi will require special approval and either individual pressure regulators or a regulating station on the main line.

Under a fire flow scenario, the minimum allowable residual pressure within the entire pressure zone where a fire flow event is occurring, or pressure required to meet the maximum day demand and fire flow demand, is 20 psi.

2. Velocity

In order to minimize head loss and maintain the integrity of pipeline lining, pipelines should be designed to limit internal velocities to the following criteria under the stated demand conditions:

Peak Hour Demand	= 10 fps or less and friction losses no greater than 10 ft/1,000 ft
Maximum Day Demand plus Fire Flow	= 15 fps

Pipe velocities should be a minimum of 1 foot per second (fps) in order to adhere to required water quality regulations and maintain proper circulation throughout the system.

C. WATER DEMAND FACTORS

A major component of the Water Master Plan is the development of water demand factors that will be used to determine future water demands based on land use and the area of the proposed development. Water demand factors were last developed in 1993, as a part of the 1993 Water System Operational Evaluation and Improvement Program report. Due to population, climate and conservation changes since that time, the City felt it was prudent to re-evaluate the water demand factors and recommend adjustments accordingly. New water demand factors have been developed to estimate the near-term demands as well as to project the future demands.

Water demand factors were developed for the land use categories as defined in the 2005 General Plan. The demand factors were developed using the 2004-2005 billing data in conjunction with the 2005 General Plan land use categories. Using GIS software tools, the billing data was grouped by the general plan land use category they occupy. The demands were summed in each of the general plan land use categories, and then divided by the total

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area of each land use category. This procedure developed "actual" water demand factors based on billing data for each land use category.

The "actual" water demand factors developed do not provide for a safety factor that is typically accounted for during the planning process. In order to adjust the "actual" water demand factors for planning purposes and to provide consistency with the wastewater flow generation factors, the "actual" water demand factors calculated were compared to wastewater planning data established by Kennedy/Jenks Consultants (K/J) in Technical Memorandum No. 1, dated July 27th, 2006. A copy is provided as Appendix B. The wastewater flow factors and return to sewer ratios developed by K/J were verified, then compared to the "actual" water demand factors developed from the billing and general plan information. During the comparison process, the water demand factors were increased proportionally to correspond with the wastewater flow factors.

In addition, water loss was accounted for in the water demand factors. Water loss data provided by the City from 1994 through 2006 was reviewed to determine an appropriate increase in the water demand factors. The water loss data indicated that annual water loss varied anywhere from seven percent to nineteen percent of the water produced for the years of data provided. However, in the last three years of data provided, approximately 9.6% of the water produced was classified as "water loss." Therefore, the flow factors were increased approximately ten percent to account for water loss. Additional information on water loss is provided in Section IV.B.3 of this Report. The planning level demand factors developed for the water system are summarized in Table III-1 below.

Table III-1
Water Demand Factors

Land Use Description	Density (DU/Acre)	Demand Factor	Unit
Neighborhood Low (NL)	0 - 8	1.20	gpm/acre
Neighborhood Medium (NM)	9 - 20	2.00	gpm/acre
Neighborhood High (NH)	21 - 54	5.00	gpm/acre
Commerce (C)	-	1.60	gpm/acre
Industry (I)	-	1.60	gpm/acre
Public and Institutional (PI)	-	0.75	gpm/acre
Parks and Open Space (POS)	-	0.10	gpm/acre
Downtown Specific Plan	21-54	2.55	gpm/acre

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D. WATER PEAKING FACTORS

Peaking factors are used to estimate maximum day and peak hour demands. These factors, wherever possible, are based on actual water usage. When actual water data is not available, peaking factors are based on typical industry standards for water purveyors in southern California.

The City operates the water system in two main operational modes, a summer mode and a winter mode. Due to the significant differences in operational philosophies during these seasonal periods, the hydraulic model was developed to reflect these two modes of operation. Therefore, this Report includes seasonal demand conditions representing the summer and winter average demands.

Typically, seasonal peaking factors are developed using billing information. However, the City does not read all customer meters on a monthly basis, but rather every other month, and all meters are not read at the same time. Using the billing data to generate seasonal peaking factors would be difficult using this data; therefore the City's production data was utilized. A memorandum from RBF to the City describing the calculation of seasonal peaking factors is included as Appendix C.

The City's production data represents all sources of water production including surface and groundwater sources. The production data is recorded on a monthly basis. Production data from 2003 through 2005 was used to arrive at the summer and winter (seasonal) peaking factors.

A total of five (5) demand conditions have been developed to allow for more detailed analyses of the distribution system. The five demand conditions include; Average Day, Maximum Day, Peak Hour, Summer Average Day, and Winter Average Day. The peaking factors for each demand condition are described herein.

1. Average Day

The average day system demands were developed based on billing information from January 2004 to December 2005 received from the City. The maximum day and peak hour demands are derived from the average day demand.

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2. Maximum Day

The maximum day peaking factor was developed using historical production data. The peaking factor was developed using 2003 through 2005 production data. The peak month of production was identified (August of 2003 = 15,734 gpm) and then the average production of 2003 thru 2005 was identified (12,359 gpm). The ratio between these two values (1.27) is the maximum month peaking factor. Assuming that the maximum day demand is approximately 20% larger than the maximum monthly demand (multiply it by a factor of 1.2), the end result is a maximum day peaking factor of 1.52. Therefore, the average day is peaked by a factor of 1.52 to arrive at the maximum day demand.

3. Peak Hour

In a primarily residential community, such as San Buenaventura, the peak hour demand typically occurs in the morning hours between 7 AM and 9 AM. The peaking factor was based on multiplying the maximum day demand by the diurnal peak hour factor of 2.61 (See Section III.E), resulting in a Peak hour factor of 3.97 times the average day demand. The peak hour was found to occur at 7 AM, according to actual hourly meter data of water usage at a large residential apartment complex in the City.

4. Summer Average Day

The production data from 2003 through 2005 was used to develop the summer average day demands. From the production data, the months of June, July, August, and September were classified as the summer months. The peaking factors for the summer months was determined for each of the three years, and then averaged to arrive at an overall summer peaking factor for the demands in the system. See Figure III-1 attached, which displays the 2003 through 2005 production data for each month.

Based on the production data provided, the summer peaking factor calculated was 1.18 times the average yearly production. In an effort to be conservative, the summer peaking factor that will be used for this analysis is 1.20.

5. Winter Average Day

The production data from 2003 through 2005 was used to develop the winter average day demands. The months of December, January, February, and March were classified

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as the winter months. The peaking factors for the winter months were determined for each of the three years, and then averaged to arrive at an overall winter peaking factor for the demands in the system. See Figure III-1 attached, which displays the 2003 through 2005 production data for each month.

Based on the production data provided, the winter peaking factor was 0.82 times the average yearly production. In an effort to be conservative, the winter peaking factor will be 0.80.

See Table III-2 for a summary of the peaking factors used in this Report and recommended for use in estimating future water demands.

Table III-2
Water Peaking Factors

Demand Condition	Peaking Factor
Winter Average Day	0.80 x Average Day
Summer Average Day	1.20 x Average Day
Maximum Day	1.52 x Average Day
Peak Hour	3.97 x Average Day

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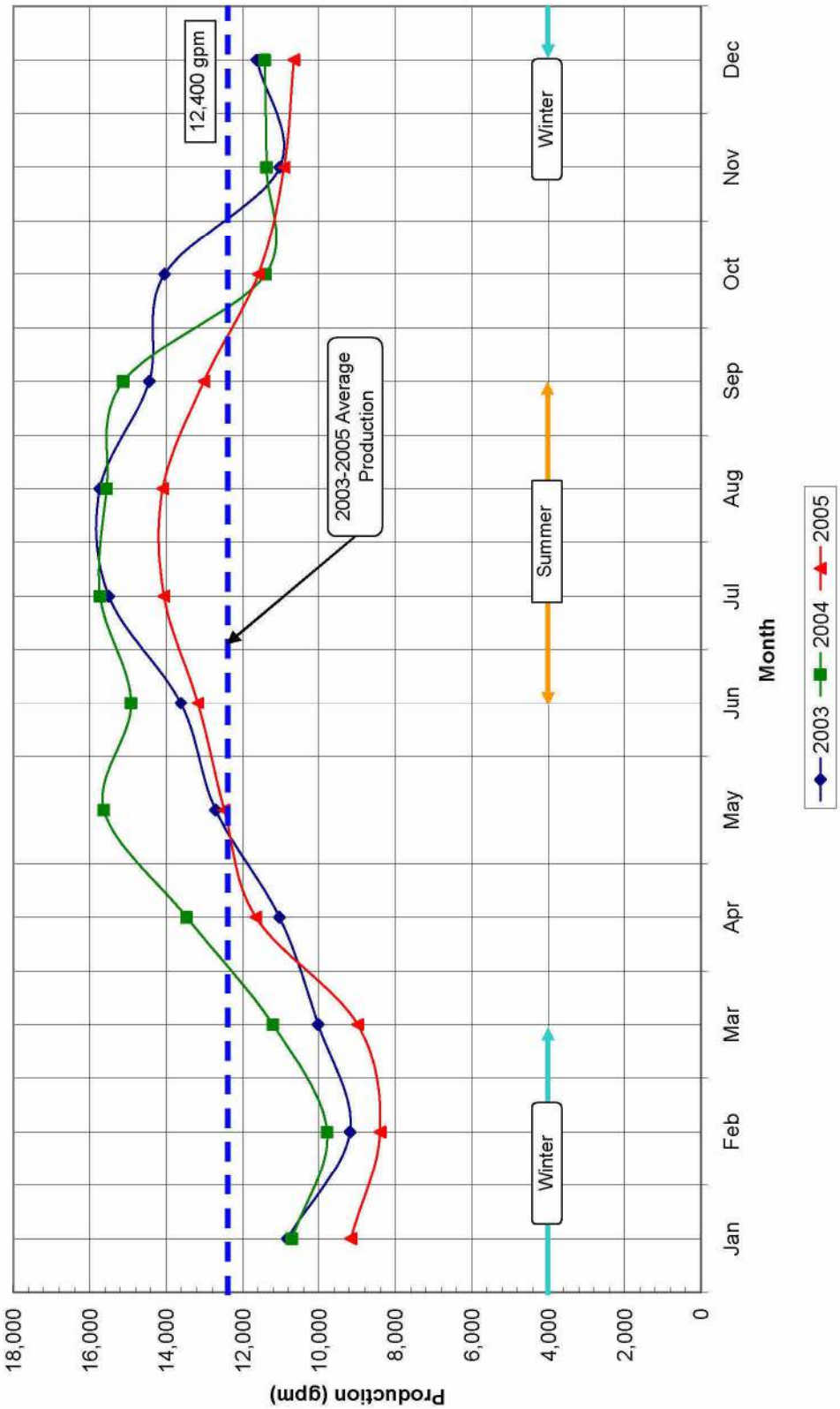
City of San Buenaventura
Figure III-1 Production Data



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E. DIURNAL PATTERN

The diurnal pattern is a graphical representation of time-varying demands over a 24-hour period. The diurnal pattern will show the City's changing demands in relation to an average day demand. This pattern was input into the hydraulic model to simulate actual demand fluctuations in the distribution system throughout a normal day. In addition, the pattern will aid the City in timing planned occurrences, such as flushing and temporary shut-downs within the distribution system.

The diurnal peaking factors were developed using actual meter data from one of the City's large users metered for the modeling effort. A master meter for a large residential apartment complex was selected for use in the development of the system wide diurnal pattern. This large user was selected due to the fact that the diurnal pattern was consistent with industry standard diurnal patterns and determined to be typical of the majority of the citywide land use. The data recorded at this location exhibits a 24-hour variation in demand that is expected to occur throughout the distribution system.

The corresponding diurnal curve for the entire system can be seen as Figure III-2. The average day demands are shown at a factor of 1.0. Generally there is low usage at night and increased usage in the mornings and early evening. There are two peaking times in the City's diurnal pattern, one morning peak at 7 A.M. and one evening peak at 7 P.M. Additionally detail on development of the diurnal curve is included in Appendix C.

In addition to creating a system wide diurnal pattern, the City identified the top eleven water users and installed temporary flow data loggers that recorded usage on an hourly basis. Each top water user has its own diurnal pattern in the hydraulic model.

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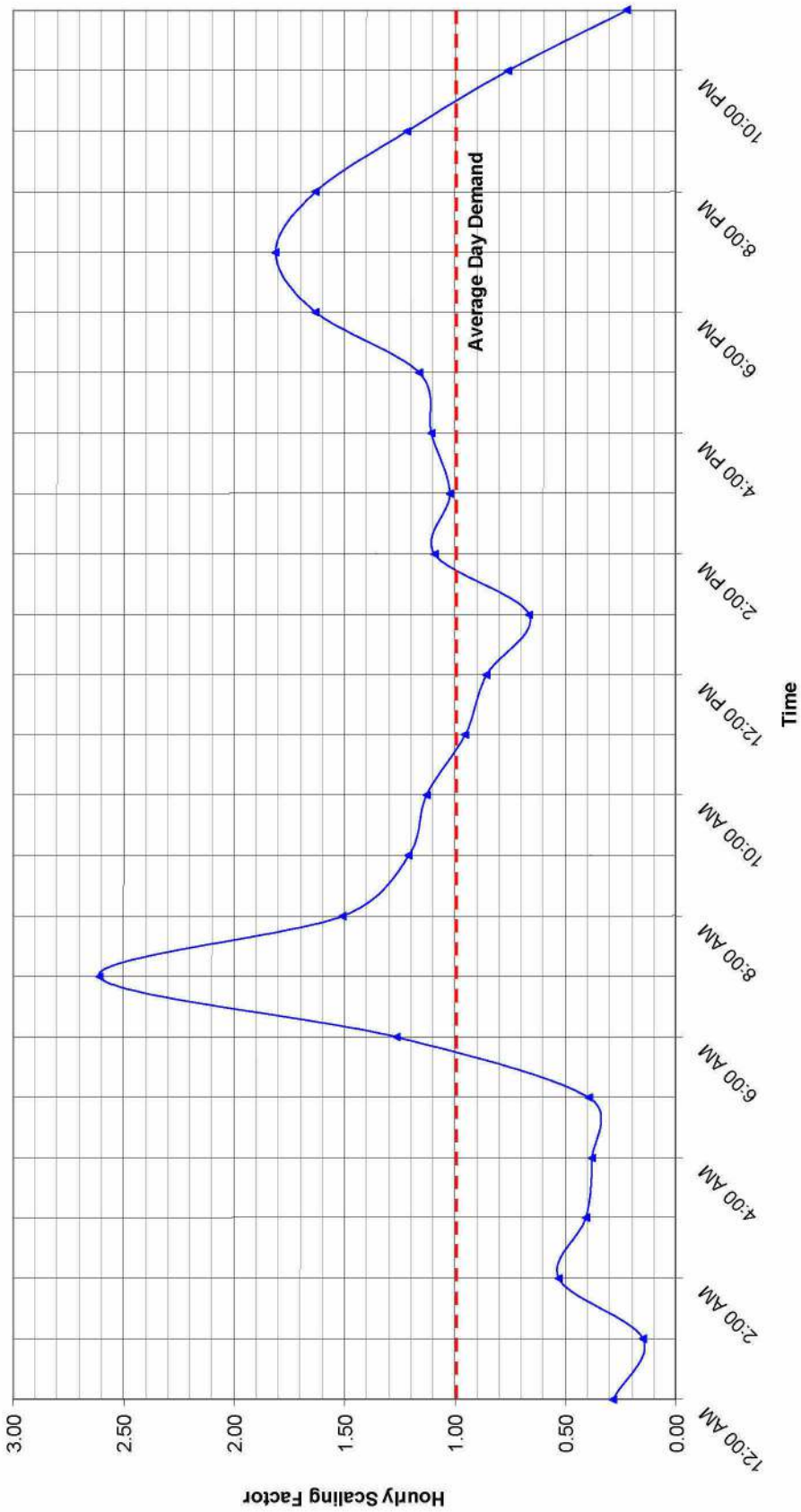

City of San Buenaventura
Figure III-2 Diurnal Curve

F. FIRE FLOW REQUIREMENTS

The City generally follows the fire flow requirements as established by the Insurance Services Office (ISO), the City of San Buenaventura Fire Department, and the Uniform Fire Code (UFC). The water system shall be capable of providing the maximum day demand plus the minimum required fire flow at a single location with a minimum residual pressure of 20 psi. The fire flow may be provided from multiple hydrants provided they are within a specified distance of the structure (as identified in the UFC). An exception to maintaining the minimum pressure requirement is for a fire hydrant located adjacent to a reservoir with no domestic water services between the fire hydrant and the reservoir. Fire flow requirements for specific buildings are identified in Appendix III-A of the Uniform Fire Code (UFC) and are based on building square footage and materials of construction. The City Fire Department has established both fire flow rates and durations for the various land uses in the City according to the 2001 California Fire Code. Table III-3 contains a summary of the fire flow analysis criteria established for this Report.

Table III-3
Fire Flow Requirements

Land Use Type	Fire Flow (gpm)	Duration (hrs.)
Single Family Residential	1,000	2
Multi-Family Residential	1,500	2
Commercial	4,500	4
School/Industrial	4,500	4

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IV. WATER USAGE

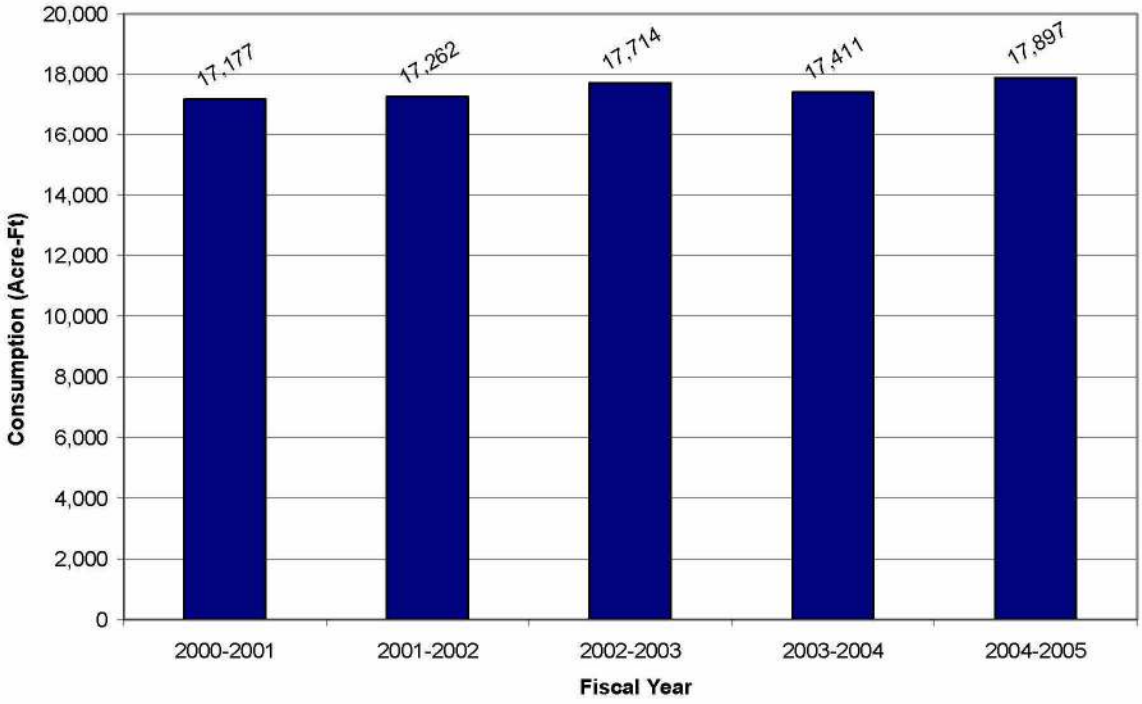
This section will discuss the City's existing water usage trend and the future water usage to be expected at the ultimate build-out of the entire service area.

A. HISTORICAL

1. Historical Water Usage

The historical trend of the water usage has fluctuated slightly from year to year, but has generally increased 2.5% per year. Figure IV-1 shows the historical water usage from the five-year period from 2000-2005, as reported in Table 4-2 of the City's 2005 Urban Water Management Plan.

Figure IV-1
Historical Water Usage



B. EXISTING WATER USAGE

1. Pressure Zone Demands

Water billing records from January 2004 to December 2005 were used to determine the current water usage within the City water service area. The billing information was analyzed to compute the average daily water usage for each meter. Each meter was then spatially assigned to the nearest parcel, allowing the total water usage to be calculated for each parcel.

Utilizing the capabilities of the hydraulic modeling software, the existing average day water demands for each parcel were then totalized into their respective pressure zones. The same was done for the maximum day and peak hour demand conditions. The resulting demands per pressure zone are summarized in Table IV-1. It should be noted that due to the fact that the hydraulic model utilizes several diurnal curves that peak the demands at different times, the peak hour demands summarized in Table IV-1 will not exactly match the demands if the peaking factors identified in Section III were simply applied to the average daily demand.

Table IV-1
Existing Demands per Pressure Zone

Pressure Zone	Average Day		Maximum Day		Peak Hour	
	gpm	cfs	gpm	cfs	gpm	cfs
210	2,147	4.78	3,263	7.27	8,531	19.01
260	507	1.13	770	1.72	2,069	4.61
330	2,141	4.77	3,255	7.25	8,512	18.97
360R	59	0.13	90	0.20	241	0.54
400	714	1.59	1,086	2.42	2,627	5.85
430	3,116	6.94	4,736	10.55	11,605	25.86
430R	30	0.07	46	0.10	122	0.27
466	95	0.21	144	0.32	387	0.86
535	526	1.17	800	1.78	2,149	4.79
588	27	0.06	42	0.09	112	0.25
605K	22	0.05	34	0.08	91	0.20
605	231	0.52	351	0.78	945	2.10
660R	23	0.05	35	0.08	94	0.21
860	341	0.76	519	1.16	1,394	3.11
1035	57	0.13	87	0.19	233	0.52
Total	**10,037**	**22.36**	**15,257**	**33.99**	**39,112**	**87.15**

* Demands generated by hydraulic model and averaged over 24-hours, with the exception of the peak hour which was determined from an instantaneous simulation at the peak hour.

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2. Large Users

In an effort to increase the accuracy of the demand allocation within the model, the City installed seventeen (17) temporary flow data loggers, which monitored what the City identified as their top eleven (11) largest users. The data was recorded from January through March and May through July of 2006. The large user demands were removed from the parcel shape file, and then re-allocated by hand in the model as close to the actual meter location as possible. The demands were allocated as an average day demand based on the data recorded, and the demands were peaked throughout the day using a unique pattern for each of the large users.

3. Total Water Loss

Total water loss was determined by analyzing water loss information provided by the City. An average of the data gathered from 1994-2006 shows that water loss constituted an average of 13% of the total used water. AWWA's Technical and Educational Council conducted a survey, *Survey of State Agency Water Loss Reporting Practices Report*[1], to determine the extent of which state and regional agencies have established programs or policies to assess water loss management. The results of the survey indicated that California Urban Water Conservation Council has set a benchmark to limit unaccounted for water to less than 10% of the total water usage. Some potential reasons for lost water includes water used in operation and maintenance, pipe leaks, reservoir leaks, fire department use, meter error and unmetered water usage. The pipeline replacement program and facility assessment should help identify and reduce unaccounted for water usage. Further analysis of the pipeline replacement program is discussed in Section X.

The City has a meter replacement program and has begun a leak detection program in order to reduce unaccounted for water usage and to identify potential problem areas.

[1] American Water Works Association (AWWA). 2002. *Survey of State Agency Water Loss Reporting Practices Report.* p.13.

VEN0006026

C. NEAR-TERM WATER USAGE

Water usage within the City is expected to increase in the near-term as vacant parcels within the City's water service boundary are developed. Based on development of the vacant parcels, proposed redevelopment projects and proposed new development projects identified in Section II.C.1, the near-term average day demand is projected to increase by approximately 1,058 gpm, or approximately 11% of the total current average day usage. The projected demands for near-term development within the City is estimated based on the pending projects identified by the City in the January 2006 Pending Project List, and do not include the possibility of split parcels or subdivided lots. It is assumed that the existing water service boundaries will not change.

Refer to Table IV-2 for a summary of the near-term water demands (including the existing demands) in each pressure zone within the City's service area.

Table IV-2
Existing Plus Near-Term Demands by Pressure Zone

Pressure Zone	Average Day		Maximum Day		Peak Hour	
	gpm	cfs	gpm	cfs	gpm	cfs
210	2,289	5.10	3,479	7.75	9,080	20.23
260	509	1.14	774	1.73	2,021	4.50
330	2,554	5.69	3,882	8.65	10,132	22.57
360R	61	0.14	93	0.21	241	0.54
400	761	1.70	1,157	2.58	3,019	6.73
430	3,522	7.85	5,354	11.93	13,974	31.14
430R	30	0.07	46	0.10	120	0.27
466	95	0.21	145	0.32	378	0.84
535	563	1.26	856	1.91	2,235	4.98
588	27	0.06	42	0.09	109	0.24
605K	22	0.05	34	0.08	88	0.20
605	236	0.52	358	0.80	935	2.08
660R	26	0.06	40	0.09	104	0.23
860	341	0.76	519	1.16	1,354	3.02
1035	57	0.13	87	0.19	227	0.50
Total	**11,095**	**24.72**	**16,864**	**37.58**	**44,016**	**98.07**

* Demands generated by hydraulic model for Maximum Day and averaged over 24-hours. Average Day and Peak Hour determined by utilizing peaking factors and the Maximum Day demand generated by hydraulic model. It is noted that the demands within this table will not directly correlate with Tables IV-4 and IV-6, due to the varying diurnal curves established for the large users.

VEN0006027

D. ULTIMATE WATER USAGE

Assuming ultimate build-out of the City's water service area per the 2005 General Plan, as shown in Exhibit II-1 and as described in Section II.C.2, the ultimate average day demand is projected to increase by 2,983 gpm over the near-term average day demand. This results in total increase of 4,041 gpm over the existing average day demand, or 40% of the current average day usage. The projected demands for the build-out of the water service area are estimated, and do not include the possibility of split parcels or subdivided lots. It is assumed that the water service boundaries will reflect the 2005 General Plan area.

Table IV-3 contains a summary of the projected increase of water demand at ultimate build-out, which represents the amount of additional water usage expected to occur within the City beyond the existing demands and the near-term demands. As Table IV-3 indicates, there is potential for development within the City even after the near-term developments are complete. The information in Table IV-3 was compiled from information in the 2005 General Plan as well as the Pending Project List from January of 2006.

In some instances, the projected increase in the average day demand is zero due to the fact that the land use is projected to be built-out after the near-term developments have been completed.

Table IV-3
Projected Increase in Average Day Demands at Build-out by Land Use

General Plan Land Use Category	Ultimate Vacant Acreage[1]	Near-Term Vacant Acreage	Remaining Acreage After Near-Term Acreage Developed	Demand Factor (gpm/Ac)	Projected Increase in Average Day Demand (gpm)
Neighborhood Low (NL)	426	221	205	1.20	246
Neighborhood Medium (NM)	116	188	0	2.00	0
Neighborhood High (NH)	16	41	0	5.00	0
Commerce (C)	621	78	542	1.60	868
Industry (I)	1,178	86	1,092	1.60	1,746
Public and Institutional (PI)	0	19	0	0.75	0
Parks and Open Space (POS)	0	440	0	0.10	0
Downtown Specific Plan (DTSP)	30	23	7	2.55	18
Harbor District	41	0	41	2.55	105
Total	**2,428**	**1,097**	**1,331**	**-**	**2,983**

[1] Ultimate Vacant acreage per the 2005 General Plan, Table 3-1.

VEN0006028

Based on the projected average day demands calculated in Table IV-3, the projected maximum day and peak hour demands have also been calculated, as shown in Table IV-4.

Table IV-4
Projected Increase in Demands from Near-Term to Build-out by Land Use

General Plan Land Use Category	Average Day Demand (gpm)	Max Day Demand (gpm)[1]	Peak Hour Demand (gpm)[2]
Neighborhood Low (NL)	246	374	976
Neighborhood Medium (NM)	0	0	0
Neighborhood High (NH)	0	0	0
Commerce (C)	868	1,319	3,446
Industry (I)	1,746	2,655	6,933
Public and Institutional (PI)	0	0	0
Parks and Open Space (POS)	0	0	0
Downtown Specific Plan (DTSP)	18	27	70
Harbor District	105	159	416
Total	**2,983**	**4,534**	**11,841**

[1] Maximum day demands calculated by multiplying average day demands by a factor of 1.52.
[2] Peak hour demands calculated by multiplying average day demands by a factor of 3.97.

As illustrated in Table IV-4, there is potential within the City water service area to have a significant increase in water demand at the time ultimate build-out occurs. Table IV-5 summarizes the existing, near term and ultimate build-out demands that the City may experience.

Table IV-5
Demand Summary

Demand Condition	Average Day Demand (gpm / afy)	Maximum Day Demand (gpm / afy)	Peak Hour Demand (gpm)
Existing Demands	10,037 / 16,190	15,257 / 24,610	39,112
Near Term Demands	11,095 / 17,896	16,864 / 27,202	44,016
Ultimate Demands	14,078 / 22,708	21,398 / 34,515	55,857

VEN0006029

Figure IV-2
Demand Projections (Normal Weather Year)

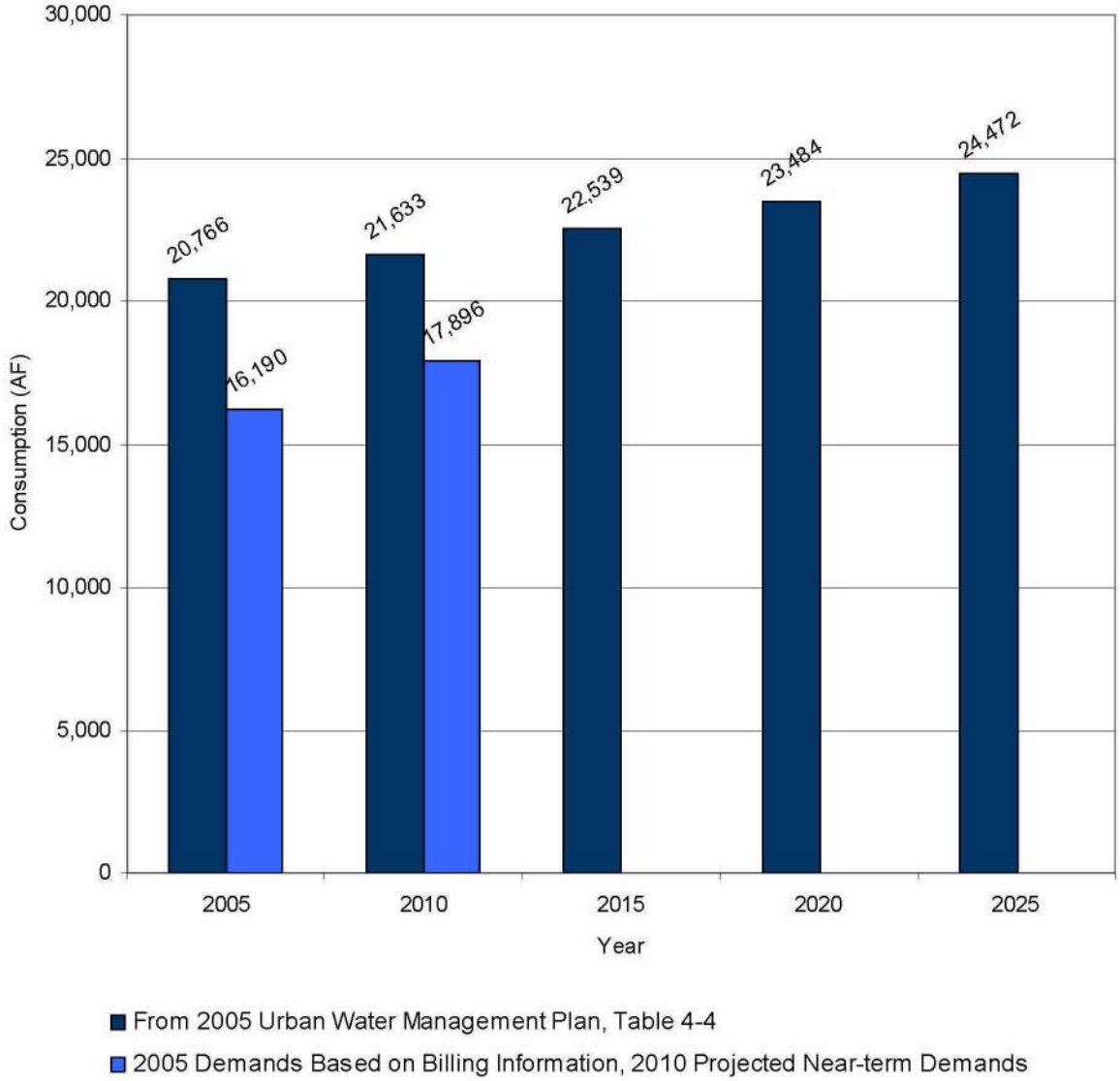

Figure IV-2 shows the demand projections based on information found in the 2005 Urban Water Management Plan. In addition, Figure IV-2 displays the demands for 2005, which are based on billing information as well as the projected demands for 2010, which is based on the near-term demand projections.

V. WATER SUPPLY

The City's domestic water supply is derived from local groundwater basins, Lake Casitas and sub-surface water from the Ventura River. The City also has a 10,000 acre-foot per year allocation from the California State Water Project. To date the City has not received any of this water because there are no facilities to get the water to the City. See B.1 of this Section for a more detailed description of this supply.

There are presently five water sources that provide water to the City water system:

- Casitas Municipal Water District (Casitas)
- Ventura River Foster Park Area (Foster Park)
    - Surface Water Intake
    - Upper Ventura River Groundwater Basin/Subsurface Intake and Wells
- Mound Groundwater Basin (Mound)
- Oxnard Plain Groundwater Basin (Fox Canyon Aquifer)
- Santa Paula Groundwater Basin (Santa Paula Basin)

It should be noted that the City also provides recycled water from the Ventura Water Reclamation Facility. The recycled water system and its supply were not analyzed as a part of this Master Plan Report. A brief description of the existing system is provided in Section B.3.a. Please see Exhibit V-1 for the locations of the City's supply sources.

A. CURRENT WATER SUPPLY

1. Casitas Municipal Water District (Casitas)

The western portion of the City is within Casitas' service area. Approximately 30 percent of the City's water accounts are located within the Casitas service area. The City currently purchases water from Casitas; see Table V-1 for historical water purchases for the past 15 years. Storm water runoff from local watersheds is stored in Lake Casitas, located approximately 10 miles northwest of the City, then treated and delivered to customers by Casitas. Casitas supplies potable water to agricultural, domestic, municipal, and industrial users within its service area. The Casitas service area includes the Ojai Valley, the western part of the City, and the coastal area between the City and Santa Barbara County. Use of Casitas water is restricted to areas within its boundaries. Exhibit V-1 shows the Casitas boundary in respect to the City water service area.

VEN0006031

The "'safe yield" of Lake Casitas is defined to be the amount of water that can be removed from the lake each year without excessive risk that the lake will become dry. The safe yield of Lake Casitas is currently estimated to be 21,920 AFY, based on the critical historical dry period from 1944 to 1965. Studies by Casitas' engineering department have shown that this period represents the most critical dry spell for the Lake's watershed of all the years which historical data is available.

To maintain the future operation of Lake Casitas at safe yield, Casitas established an allocation program for its customers in 1992. The City's allocation can be as high as the in-District demand for Stage I (wet or average year or 8,000 AFY), or reduced to 7,090 AFY for Stage 2 (dry conditions). This amount is incrementally reduced during Stages 3 and 4 dry weather conditions and results in 4,960 AFY for Stage 5 (extremely dry conditions). Stage 2 is initiated when Lake Casitas storage drops below 95,000 AF and Stage 5 is initiated when levels drop below 65,000 AF. The lower allocation remains in effect until the storage is recovered to 90,000 AF. A possible future impact to the multistage allocation system may be the operation of the fish ladder at the Robles Diversion. This may limit the amount of water available to the City.

In July 1995, the City signed the present operating agreement with Casitas establishing the City's minimum annual purchase at 6,000 acre-feet per year (AFY), which is subject to the allocation program described above during drought periods. While additional supply (up to 8,000 AFY) may be available to the City in future years, the present annual supply used within the Casitas district boundary of the City service system is approximately 6,200 AFY (annual average for the last 10 years).

Based on the estimated demands reflected in Chapter VI. Distribution System of this report the estimated future annual supply used within the Casitas district boundary of the City will be approximately 6,200 AF. Table V-1 reflects historical water purchases for the past 15 years from Casitas.

VEN0006032

Table V-1
Historical Water Purchases – Casitas

Year	Purchases (AF) [1]
1995	1,622
1996	4,456
1997	7,089
1998	4,328
1999	7,061
2000	5,836
2001	6,292
2002	7,127
2003	4,912
2004	6,833
2005	7,115
2006	5,398
2007	6,699
2008	5,659
2009	6,236

[1] Figures are from City annual water production records.

Water from Lake Casitas is delivered to the City via a 30-inch (maximum) diameter gravity flow pipeline. City turnouts are located at the Avenue Treatment Plant (CMWD No. 1) and at Ramona and Olive Streets (CMWD No. 2). Combined capacity of the City's turnouts on this pipeline is 21 MGD (7 MGD via CMWD No.1 and 14 MGD via CMWD No. 2).

2. Ventura River Surface Water Intake and Upper Ventura River Groundwater Basin/Subsurface Intake and Wells (Foster Park)

Surface water from the Ventura River is colleted via surface diversion, subsurface collector, and shallow wells and delivered to the Avenue Treatment Plant through the City's Foster Park facilities. Production from this source is a function of several factors including diversion capacity, local hydrology, environmental impacts, and the storage capacity of the Ventura River alluvium and upstream diversions.

The Ventura River water source is dependent upon local hydrology. Currently, the surface intake structure at Foster Park is unused due to the natural channeling of the active river channel bypassing the structure. Each year the flows can change the position

VEN0006033

of the active river channel in relation to the intake structure. According to a model of the Ventura River developed in 1984 and modified in 1992, the Upper Ventura River Basin fills after one or more years of above average rainfall. Once full, it takes three successive years of drought, with below average rainfall to deplete the river basin subsurface storage and cause river water production to drop until the drought ends. More recent ongoing studies are looking at the interaction between groundwater diversion and surface water flow in the Foster Park reach.

The Foster Park facilities produce groundwater throughout the year. However, due to storm flows, the wells are subject to inundation and erosion. The early 2005 winter storms destroyed Nye Well 1A and damaged Nye Wells 2, 7 and 8. The pipeline between Nye Wells 7 and 8 along the west bank of the river and the pipeline that crosses the river from Nye Well 8 to the intake pipeline for the Avenue Treatment Plant were also damaged during the storms. Nye Wells 7 and 8 were repaired in late 2006, the pipeline across the river was repaired in late 2007 and the pipeline repair between Nye Wells 7 & 8 was completed in early 2009. Table V-2 reflects the past 15 years of production from this water source.

Table V-2
Water Production – Ventura River

Year	Production (AF) [1]
1995	9,042
1996	7,926
1997	7,052
1998	8,069
1999	6,419
2000	6,779
2001	5,727
2002	5,951
2003	6,722
2004	6,118
2005 [2]	1,293
2006 [2]	2,244
2007 [2]	1,966
2008 [2]	2,711
2009 [2]	3,037

[1] Figures are from City annual water production records.
[2] Low production due to severe storm events in early 2005 that resulted in extreme damage to the City's Foster Park water production facilities, some repairs were completed in 2009.

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With input from resource agencies and consultants in 2008, the City began conducting studies of the Ventura River flow conditions and is presently operating the Foster Park facilities in an environmentally responsible manner. Presently the City operations staff has voluntarily adopted a well production schedule that limits its pumping based on annual rainfall conditions. The City intends to work with experts to ascertain a pumping regime that will balance production demands with environmental concerns and is presently studying the relationship between groundwater production and surface flows.

Estimations of approximately 6,000 AFY on average is available based on this operational scenario and is comparable to the 50-year average historical City production records between 1960 and 2009. However, operational constraints will likely allow a diversion efficiency of up to 70 percent (average 4,200 AFY) to be obtained under the City's operations schedule, which can be considered reliable for planning purposes and is roughly equal to the annual average for the last 10 years.

The current production capacity of the existing Foster Park facilities is summarized in Table V-3 – Foster Park Current Operational Capacity. The total operational and peaking capacity of the Foster Park facilities is 2,950 gallons per minute (gpm), which is approximately 13 acre-feet per day (AFD). For the purpose of this study, the operational capacity is defined as the production rate at which a well facility can be expected to reliably provide a groundwater supply without creating inordinate stress on the aquifer from which it produces. The peaking capacity is the maximum rate at which a facility can produce water to meet short-term system demands at the risk of imposing stresses which can accelerate well plugging processes. While the peaking capacity of a well is possible, the operational capacity is preferable for planning long-term use of a well facility under reasonable conditions (differential pressure or entrance flow velocity through the well screen, etc.) that are conducive to anticipating a typical service life of 30 to 40 years from a well. If well facilities are equipped with standard motor controls (with only off or on capabilities), the operational and peaking capacity are the same. If pump motor controls are equipped with a variable frequency drive, the peaking capacity may be substantially greater than the operational capacity which is prudent to promote a long-term service life for a well.

In implementation with the Matilija Dam Ecosystem Restoration Project, two additional wells were installed at Foster Park as part of the mitigation measures identified. The wells identified in Exhibit V-3 as Foster Park Nos. 12 and 13 were constructed by and funded through a grant received by the Ventura County Watershed Protection District for

VEN0006035

the city in order to mitigate for water lost as a result of increases in turbidity due to the removal of Matilija Damn. At present, the wells are not to be operated until the project related impacts after removal of Matilija Dam necessitate the activation of these new wells and in accordance with the National Marine Fisheries Biological Opinion for the project. However, the City intents to include the operation of these wells in the environmental analysis of proposed Foster Park Well field improvements. But for the purposes of this report, production from these two wells is not included in the production capacity summarized in Table V-3.

Table V-3
Foster Park Current Operational Capacity

City Well Designation	Operational Capacity (GPM)	Peaking Capacity (GPM)
Nye No. 2 [1]	Inactive	Inactive
Nye No. 7	1,150	1,150
Nye No. 8	550	550
Nye No. 11	150	150
Collector Intake	1,100	1,100
Foster Park No. 12 [2]	NA[2]	NA[2]
Foster Park No. 13 [2]	NA[2]	NA[2]
Total	**2,950**	**2,950**

[1] Nye Well No. 2 is currently non-operational.
[2] Foster Park Wells Nos. 12 & 13 are mitigation wells for the Matilija Dam Ecosystem Restoration Project

It is anticipated that construction of additional Foster Park Well Facilities (CIP# 97904 – Foster Park Wellfield Production Restoration) and expansion of the Avenue Treatment Plant (CIP# 73009 – Avenue Water Treatment Plant Phase 2) to its maximum capacity will increase the supply from this source in the future. These improvements are anticipated to restore historical production capabilities to produce up to 6,700 AFY with an operational capacity of approximately 10,000 gpm.

Table V-4
Foster Park Future Additional Operational Capacity[1]

City Well Designation	Operational Capacity (GPM)	Peaking Capacity (GPM)
Foster Park No. 14	1,250	1,250
Foster Park No. 15	1,250	1,250

[1] Based on Foster Park Wellfield Design Study by Hopkins Groundwater Consultants, Inc. dated Dec. 2007.

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3. Mound Groundwater Basin (Mound)

The Mound Groundwater Basin has historically provided water for overlying beneficial uses and satisfies agricultural, municipal, and industrial demands. Historical use has been documented to temporarily exceed the yield of the basin and result in water levels that have fallen below sea level and created a threat of seawater intrusion. To abate this threat the city abandoned its historical coastal well facilities and located groundwater extraction near the center of the Mound Basin. A report (Fugro, 1997) compiled as part of a 1996 study of the basin indicated that historical data supports a basin yield of at least 8,000 AFY during drought conditions as long as pumpage is reduced during wet years to allow water levels to recover.

The 1983 to 1996 average annual production from the Mound Basin was approximately 5,000 AFY (Fugro, 1997). While the resulting water levels in the basin over that time period reportedly ranged from significantly below sea level to a sufficient elevation about sea level to control seawater intrusion, the basin water level trend did not indicate an average production significantly above 5,000 AFY could be sustained without creating adverse conditions.

Historical agricultural and private well uses have typically extracted about 2,000 AFY while the City average annual extraction for the last ten years has been approximately 4,000 AFY. The production capacity of the existing Mound Basin wells is shown in Table V-4 and indicates these facilities are presently capable of producing an annual production of approximately 4,400 AFY. The average annual supply from the basin for the last ten years has been approximately 4,000 AFY.

Currently, two wells withdraw water from the Mound Groundwater Basin; Victoria Well No. 2, which was installed in 1995, and Mound Well No. 1, which began production in April 2003. Victoria Well No. 1, which was installed in 1982, is considered an inactive well at this time due to maintenance and water quality issues and is scheduled for destruction.

Table V-5
Mound Basin Current Operational Capacity

City Well Designation	Operational Capacity (GPM)	Peaking Capacity (GPM)
Victoria No. 2	1,500	2,200
Mound No. 1	1,500	2,200
Total	**3,000**	**4,400**

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Water quality is highly mineralized in the Mound Basin and blending with lower TDS water is required by the California Department of Public Health (CDPH). The City intends to review historical demands to determine the accuracy of past projections.

Projected capital improvement projects for the Mound Basin include a new well, Mound Well #2 (CIP 73020) and an upgrade to Victoria Well #2 (CIP 73015). The well design for Mound Well #2 will be similar to future Saticoy Well No. 3 and Golf Course Well No. 7, and is anticipated to have an operational capacity of 2,000 gpm and a peaking capacity of 3,000 gpm.

Table V-6
Mound Basin Future Additional Operational Capacity

City Well Designation	Operational Capacity (GPM)	Peaking Capacity (GPM)
Mound No. 2	2,000	3,000

Table V-7 reflects the past 15 years of production from this water source.

Table V-7
Water Production - Mound Basin

Year	Production (AF) [1]
1995	2,169
1996	2,789
1997 [2]	213
1998 [2]	802
1999	3,955
2000	4,579
2001	4,030
2002	3,720
2003	5,546
2004	4,773
2005	3,716
2006	4,102
2007	3,428
2008	3,481
2009	2,480

[1] Figures are from City annual water production records

[2] Well production for 1997 and 1998 was reduced as more water was taken from Lake Casitas because of the City's Minimum Purchase Agreement and the Victoria Wells were off due to the Bailey Plant Expansion Project.

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4. Oxnard Plain Groundwater Basin (Fox Canyon Aquifer)

Wells near the Buenaventura Golf Course have drawn from the Oxnard Plain Groundwater Basin since 1961. Currently, two wells, Golf Course Wells No. 5 and 6, produce potable water for the City's system with a third well (Golf Course Well No. 3) out of service for major rehabilitation. This third well could be used as an emergency source and will only return to service during a drought, following the replacement of wellhead, pump, electrical and raw water connection. These wells pump from the Fox Canyon aquifer of the Oxnard Plain Groundwater Basin. Average annual yield from the Golf Course wells over the past 10 years has been about 3,750 AFY. However, due to the present water system water supply and operational constraints the last 5 year annual has been 5,500 AFY and will continue until additional facilities are developed at which time it is anticipated that the City will go back to the 2010 reduced historical allocation.

Table V-8
Oxnard Plain Basin Current Operational Capacity

City Well Designation	Operational Capacity (GPM)	Peaking Capacity (GPM)
Golf Course Well 5	2,100	2,100
Golf Course Well 6	2,100	2,100
Total	**4,200**	**4,200**

The Fox Canyon Groundwater Management Agency (GMA) was created by state legislation in 1982 to manage local groundwater resources in a manner to reduce overdraft of the Oxnard Plain and stop seawater intrusion. A major goal of the GMA is to regulate and reduce future extractions of groundwater from the Oxnard Plain aquifers, in order to operate and restore the basin to a safe yield. In August 1990, the GMA passed Ordinance No. 5, which requires existing groundwater users to reduce their extractions by five percent every five years until a 25 percent reduction is reached by the year 2010.

The City's historical allocation was set by the GMA at 5,472 AFY, which was the average extraction from the Golf Course Wells for the base period 1985 to 1989. Beginning in 1992, historical extractions set by the GMA were reduced by five percent (5%) to 5,198 AFY, in 1995 it was reduced to 4,925 AFY, in 2000 it was reduced to 4,651 AFY and further in 2009 to its current allocation of 4,378 AFY. This allocation will be further reduced to 4,104 AFY in 2010.

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The City has identified a new well to be placed in the Oxnard Plain Groundwater Basin, Golf Course Well No. 7 (CIP 73018). This well will provide an operational capacity of 2,000 gpm and a peaking capacity of approximately 3,000 gpm.

Table V-9
Oxnard Plain Future Additional Operational Capacity

City Well Designation	Operational Capacity (GPM)	Peaking Capacity (GPM)
Golf Course Well 7	2,000	3,000

Table V-10 reflects the past 15 years of production from this water source.

Table V-10
Water Production – Oxnard Plain Basin

Year	Production (AF) [1]
1995	2,606
1996	2,774
1997	3,452
1998	4,312
1999	1,621
2000	2,674
2001	1,016
2002	1,112
2003	2,898
2004	2,391
2005	5,379
2006	5,348
2007	5,443
2008	5,517
2009	5,714

[1] Figures are from the Fox Canyon Groundwater Management Agency records.

Conjunctive use strategies, operational practices, and production/treatment facility constraints have allowed the City to store 30,249 AF in the GMA bank as of the end of the calendar year 2009. This storage bank currently makes it possible for the City to use its banked groundwater credits as an additional supply in the event of a drought or operational/production/treatment constraints from other supply sources.

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5. Santa Paula Groundwater Basin

The Saticoy Water Company, acquired by the City in 1968, included Saticoy Well No. 1, which produced from the Santa Paula Basin. Due to casing failure, the well was destroyed and replaced in 1991 with a new well designated as Saticoy Well No. 2. Well No. 2 was placed in the same general location as Well No. 1. In May 2003, Saticoy Well No. 2 was rehabilitated. After rehabilitation, the resulting sustainable well capacity was 1,200 gpm. The original well construction was incapable of pumping properly at higher flows. Water from Saticoy Well No. 2 is treated by an iron/manganese conditioning facility.

Table V-11
Santa Paula Basin Current Operational Capacity

City Well Designation	Operational Capacity (GPM)	Peaking Capacity (GPM)
Saticoy No. 2	800	1,200

The City is moving forward with designing and constructing Saticoy Well No. 3 (CIP 97899), which will improve the water supply to the Saticoy Treatment Plant. It is expected that Saticoy Well No. 3 will have an operational capacity of 2,000 gpm and a peaking capacity of 3,000 gpm.

There are plans to expand the Saticoy Conditioning Facility's (CIP 97521) capacity to allow two wells to run together at the same time. The higher output will provide additional supply to the 430-pressure zone, where demand may increase due to proposed development.

Table V-12
Santa Paula Basin Future Additional Operational Capacity

City Well Designation	Operational Capacity (GPM)	Peaking Capacity (GPM)
Saticoy No. 3	2,000	3,000

Table V-13 reflects the past 14 years of production from this water source.

VEN0006041

Table V-13
Water Production – Santa Paula Basin

Year	Production (AF) [1]
1996	1,594
1997	2,025
1998	1,025
1999	1,578
2000	1,621
2001	1,910
2002	1,157
2003 [2]	316
2004	2,183
2005	2,046
2006	1,068
2007	1,263
2008	986
2009	819

[1] Figures are from the Santa Paula Basin Annual Report records.

[2] Production during 2003 was low due to the rehabilitation of Well No. 2 during that period.

In March 1996, the City ended a five-year stalemate over the use of the Santa Paula Basin. Under an agreement with the United Water Conservation District (United) and the Santa Paula Basin Pumpers Association (an association of ranchers and businesses), the City can pump on average 3,000 AFY from the Santa Paula Basin. The City is not limited to this allocation in any single year, but may produce seven times its average annual allocation (21,000 AF) over any running seven-year period. In addition, the City may pump an additional 3,000 AFY in case of an emergency resulting from a long-term drought situation.

VEN0006042

Table V-14
Summary of Current Water Supply

Water Supply Source	Historical Supply Projection (AFY)	Average Annual Supply (2000-2009) (AFY)	Present Operational Supply Constraint (AFY)
Casitas	4,960 – 8,000	6,200	6,200
Ventura River (Foster Park)	4,200 – 6,700	4,200	4,200
Mound Groundwater Basin	2,500 – 4,000	4,000	5,500 (1)
Oxnard Plain Groundwater Basin	4,100	4,100	6,775 (2)
Santa Paula Groundwater Basin	3,000	1,340	1,600 (3)
Total	**18,760 – 25,800**	**19,840**	**24,275**

[1] Assumes two wells operational, one well at 1,500 gpm and one at 2,000 gpm

[2] Assumes two wells operational at 2,100 gpm each.

[3] Assumes one well operational at 1,000 gpm.

B. POTENTIAL WATER SUPPLY

A water supply capacity evaluation is described later in this report (Section VIII). This section will briefly describe any planned or proposed projects which may affect the water supply sources for the City.

1. State Water Project

The City also has a 10,000 acre-foot per year allocation from the California State Water Project (SWP). The base contractual agreements concerning the City's annual entitlement to 10,000 acre-feet of SWP are: (1) the 1963 State Water Supply Contract of 20,000 acre-feet entitlement of SWP water between the Department of Water Resources (DWR) and Ventura County Watershed Protection District (VCWPD) known formerly as Ventura County Flood Control District (VCFCD); (2) the 1970 agreement between VCFCD and Casitas known formerly as the Ventura Municipal Water District that assigned the 20,000 acre-feet entitlement to Casitas; and (3) the 1971 agreements between Casitas and the City providing the City with an annual entitlement of 10,000 acre-feet and Casitas and United providing United with an annual entitlement of 5,000

VEN0006043

acre-feet. Ventura's 10,000 acre-foot entitlement offers the City the potential future advantage of using the SWP entitlement to augment our water supply. At this time the City does not have the facilities needed to receive SWP water into our distribution system. The City's goal has been to protect and provide the additional water supply for our community, while minimizing the financial impact of keeping this entitlement.

The City pays annual SWP Table A water fees to DWR, which cover construction costs for SWP facilities and administration to deliver allotments of water throughout the state. In addition, the citizens of Ventura voted November 3, 1993 in favor of desalinating seawater over importing water through the SWP, as the preferred supplemental water supply option. However, based on the City Attorney's review of the City's SWP Table A water, the City cannot unilaterally end its involvement in the SWP's financial obligations and SWP Table A water without great risk.

The Monterey Amendment to the State Water Contract in 1999 provided the City a formal mechanism to allow the City to place their SWP water into a "turn back" pool to be purchased by other SWP contractors. The City has taken part in the SWP "turn back" pool over the past several years which has provided a small annual revenue offset. The City has also worked recently with United who requested to receive the City's allocation at the "turn back" pool rate which provided water benefits to the County area as a whole.

Recent changes in the regulations and the current potential market for state water has provided a possible opportunity for the City to recover a more significant revenue offset. However, at the same time the annual costs associated with SWP water are anticipated to increase substantially while the available supply from the state has gone down resulting in a reduction of allocation to SWP Contractors in recent years to 40-50%. The higher costs and lower supplies are due to proposed projects in the Sacramento-San Joaquin Delta because of several years of drought and environmental concerns over protecting endangered species. The City is working with an expert consultant to evaluate the City's existing policy on SWP water and the City's options related to short term and long term leases of its SWP entitlement.

2. Saticoy County Yard Well

In 2004 the County of Ventura proposed relocating their maintenance yard from the existing location to a site within the Saticoy Community contiguous to the City's water system. In exchange for City water service, which required an extraterritorial water

VEN0006044

service agreement, the County provided the City with a new well and pipeline facilities. The new well was provided to offset the County's anticipated water demand, as well as, provide significant additional water supply. The pipeline facilities provided by the County included approximately 2,320 feet of 14" pipeline from the new well to a location where the City would eventually complete the remainder of the raw water pipeline to the City's existing Saticoy Conditioning Facility for treatment.

A domestic pipeline was also provided that tied into the City's existing pipeline system at two locations. The County's' facilities were completed in 2006. The City's Capital Improvement Program (CIP) Plan included the City's portion of the raw water pipeline that connected the County provided raw water pipeline to the City's Saticoy County Yard Well. The City's' portion was completed in 2009. In November 2009 the City Council was to certify the Final EIR for the Saticoy & Wells Community Plan and Development Code. During the certification process the Fox Canyon Groundwater Management Agency (FCGMA) and United voiced concerns regarding the water supply anticipated from the Saticoy Yard Well for the project area. Consequently, the City approved a *Limitation and Tolling Agreement* whereby the parties agreed to a cooperative Operations Testing Plan to provide testing of the impact of the water drawn from the Saticoy County Yard Well. As a result of the testing under the Operations Plan it was determined that the April 2004 County of Ventura Saticoy Operations Yard EIR was not sufficient for the anticipated operations of the Saticoy County Yard Well and therefore additional environmental clearance is warranted for operation of the well.

Therefore, the anticipated future water supply from the Saticoy County Yard Well is unknown at this time. It should be noted that the City's 2005 Urban Water Management Plan (UWMP) and 2008 Biennial Water Supply Report included the Saticoy County Yard Well as a water supply source of up to 2,400 acre-feet per year.

3. Recycled Water

a. Ventura Water Reclamation Facility (VWRF)

Flows from the City's wastewater collection system are treated at the City's Ventura Water Reclamation Facility (VWRF). The reclamation facility has a capacity of 14 MGD, with provisions to be expanded to an ultimate capacity of 16.8 MGD. Average annual flows to the reclamation facility total about 9.3 MGD. Recycled water from the VWRF is used for general irrigation of the two golf courses, a City park and landscape irrigation

VEN0006045

areas located along the existing distribution alignment. A portion of the effluent is pumped to these reclaimed water customers and a portion is lost to evaporation and percolation losses. The reaming effluent is discharged to the Santa Clara River Estuary (Estuary).

The discharge from the VWRF is regulated with a permit issued by the Los Angeles Regional Water Quality Control Board (RWQCB), which is renewed every five years. During the 2008 re-issuance process, controversy arose on whether or not the City should be permitted to continue its current volume of discharge into the Estuary.

While some parties wanted the RWQCB to revoke the existing exemption to State water policy, which allows the discharge, others, including resource agencies such as NOAA Fisheries and California Department of Fish and Game, did not want any decrease in the amount of the current discharge because of its support of the Estuary's endangered species and enhancement of its habitat value.

Therefore, the Discharge Permit issued by the RWQCB allowed continuation of the discharge but required the City to perform three extensive studies which include: 1) Estuary Subwatershed Study; 2) Recycled Water Market Study; and 3) Treatment Wetlands Feasibility Study. The special studies along with the associated stakeholder processes are designed to provide information necessary to support development of a sustainable discharge regime. In the end, these studies will result in the issuance of a Discharge Permit for the future that will allow the City to utilize its recycled water as a valuable resource, balancing this benefit with the additional environmental benefits of sustaining the critical habitat for endangered species in the Estuary.

b. Ojai Valley Sanitary District (OVSD)

The City provides potable water to AERA Energy LLC (Aera) for oil recovery operations in the North Ventura Avenue area of the City. Aera currently purchases about 1,000 AFY of water. In 2007 the City in partnership with the Ojai Valley Sanitary District (OVSD) completed a preliminary feasibility analysis for the re-use of effluent currently discharged from OVSD into the Ventura River. The discharge averages approximately 2 million gallons per day, and enters the river approximately 5 miles upstream of the Pacific Ocean. The first part of the analysis focused on environmental issues primarily related to impacts of reduced discharge flow on the receiving environment, and possible impacts to water quality as a function of reduced flows. The second part of the analysis considered

VEN0006046

engineering and market issues related to different levels of effluent re-use. Ultimately, from an economic perspective, the cost and difficulty of providing the infrastructure necessary to supply recycled water to potential users has to be balanced against the demand for such water, and the willingness of potential users to pay for it.

The engineering and market analysis identified a cost-effective combination of localized users that minimized the additional infrastructure necessary to supply the recycled water. The primary users identified were Aera Energy, and local growers, with Aera accounting for the bulk of the demand. These users, which are currently supplied with a combination of raw and potable water, could utilize approximately half of the current effluent discharge. Collectively, the environment, engineering and market analyses suggested that the re-use of at least a portion of the effluent is sufficiently feasible to justify further consideration, although full CEQA documentation and review will be necessary prior to implementation. The City and OVSD continue to discuss and work together to investigate the potential reuse of OVSD effluent.

C. EMERGENCY INTERCONNECTIONS

The City's Capital Improvement Plan has identified the Ventura/Oxnard Emergency Intertie as a potential project (CIP 73033). This project would provide an interconnection with the City of Oxnard's Booster Station No. 4 and the City of San Buenaventura's 430 Pressure Zone.

Interconnections with neighboring water purveyors are considered a source of emergency supply. Interconnections allow for agencies to share supply and storage in the event of an emergency.

The West County Water Supply Reliability Study, which recommended an emergency connection between the City of Ventura and City of Oxnard water systems, was completed in late 2003. The Final Draft of the West Ventura County Emergency Intertie Initial Study/Mitigated Negative Declaration was completed in June 2007. The Ventura/Oxnard Emergency Water Intertie is a potential project identified in the City's Capital Improvement Project Plan 2008-2013 and is unfunded at this time.

VEN0006047

VI. DISTRIBUTION SYSTEM

The City of San Buenaventura Public Works Department (Water Section) operates and maintains a water distribution system that includes treatment facilities, turnouts, reservoirs, tanks, pumping stations, pressure reducing stations and transmission and distribution pipelines used to meet the potable water demands of its customers. Exhibit VI-4 shows all of the City's distribution system facilities. A description of the City's current distribution system and general operation is described below.

A. PRESSURE ZONES

The City operates a total of 16 individual pressure zones, each with a unique hydraulic gradient that provides water service within acceptable operating pressure ranges. Pressure zones are defined as areas of service that are supplied by a source (or combination of sources and storage) that provide a constant hydraulic gradient. Pressure zone boundaries are determined by ground elevations and facility locations. It is a goal of the City to deliver water to its customers at a minimum pressure of 40 psi. For operation purposes, the City does not want pressures in their system to exceed 150 psi. Several zones have similar elevation heads but may be hydraulically independent from another pressure zone. A hydraulic schematic of the City water system is shown on Exhibit VI-1. The flow schematic shown on Exhibit VI-2 represents the existing system and its typical operation. The pressure zone boundaries are identified on Exhibit VI-3.

Each pressure zone is isolated by boundary conditions, such as pumps, pressure reducing stations, reservoirs, tanks and normally closed valves. The HGL of each pressure zone is generally based on the high-water level of the reservoir(s) serving each respective zone. The HGL of the pressure reduced zones were established based on the design discharge pressure and ground elevation of the pressure reducing station. Table VI-1 lists the pressure zones within the City's system. The pressure zone names are synonymous with the HGL of the zone. Pressure zone names with the suffix "K" represent a zone that has the same HGL as another pressure zone but is separated geographically from the other zone, and pressure zones with the suffix "R" represent pressure zones that are reduced via pressure reducing stations.

VEN0006048

Table VI-1
Pressure Zones

Pressure Zone Name
210
260
330
360R
400
430
430R
466
535
588
605K
605W
605V
660R
860
1035

The following provides a brief description of each pressure zone:

210 Pressure Zone

The 210 Pressure Zone covers the western portion of the City. This pressure zone is the second largest zone in terms of demand. Water is supplied to this zone from the Casitas Municipal Water District (Casitas) Turnouts No. 1 and 2. Turnout No. 2 has a transmission main that connects directly to the Hall Canyon Reservoirs. The Hall Canyon and Power reservoirs provide storage for this zone. Water is boosted from this zone directly into the 260, 330, 400, 430, and 605K Pressure Zones.

260 Pressure Zone

The 260 Pressure Zone spans over portions of downtown Ventura. The Grant Park and Hall Canyon Tanks provide storage for this zone. The zone is fed by the Modella and Hall Canyon booster pump stations. The HGL of the zone is 260 feet.

330 Pressure Zone

The 330 Pressure Zone is located in the southern portions of the City and spans to the east. This is the third largest zone in terms of demand. The Bailey Reservoir provides storage for this zone. The zone is fed by the 330 booster pump station as well as the Golf

VEN0006049

Course pump station. Water is boosted from this zone directly to the 430 and 466 Pressure Zones.

360R Pressure Zone

The 360R Pressure Zone is a small zone located in the northern portion of the City near the downtown area that is supplied via pressure-reduction from the 466 Pressure Zone.

400 Pressure Zone

The 400 Pressure Zone is located in the upper northwest portions of the City and spans to the south. The Valley Vista and Seneca Tanks provide storage for this zone. The zone is fed by the Valley Vista booster pump station.

430 Pressure Zone

The 430 Pressure Zone spans across the central and eastern portions of the City. The pressure zone is the largest zone in terms of demand. The Corbett, Foothill, Long Canyon, and Sexton Tanks provide storage for this zone. The zone is fed by the Foothill, Seaward and Poli, Five Points, and Bailey booster pump stations. It is noted that the inlet elevations of the tanks that provide storage for this zone are at various elevations, ranging from an elevation of 423 feet to 430 feet. These varying inlet elevations impact the operations of this pressure zone, as the tanks in this zone do not balance well with each other due to the large difference in inlet elevations and pipeline flow restrictions.

430R Pressure Zone

The 430R Pressure Zone is a small zone located in the northern portion of the City near the downtown area that is supplied via pressure-reduction from the 588 Pressure Zone.

466 Pressure Zone

The 466 Pressure Zone is located in the north central portion of the City. The Mariano Tanks provide storage for this zone. The zone is fed by the Mariano booster pump station.

535 Pressure Zone

The 535 Pressure Zone spans the northeastern portions of the City. The Elizabeth and Kimball Tanks provide storage for this zone. The zone is fed by the Elizabeth and Kimball booster pump stations. Water is boosted from this zone to directly to the 860 Pressure Zone.

VEN0006050

588 Pressure Zone

The 588 Pressure Zone is a small zone located in the northern portion of the City near the downtown area. The McElrea Tanks provide storage for this zone. The zone is fed by the McElrea booster pump station.

605K Pressure Zone

The 605K Pressure Zone is a small zone located in the western portion of the City. The Kalorama Tanks provide storage for this zone. The zone is fed by the Kalorama booster pump station. This zone has the same hydraulic gradient as the 605 Pressure Zone, however this zone is geographically and hydraulically isolated from the 605 Pressure Zone.

605W Pressure Zone

The 605W Pressure Zone is located in the north central portion of the City. The Willis Tank provides storage for this zone. The zone is fed by the Day Road booster pump station. This zone has the same hydraulic gradient as the 605K and 605V Pressure Zones, however this zone is geographically and hydraulically isolated from the 605K Pressure Zone and hydraulically isolated from the 605V Pressure Zone via a normally closed valve.

605V Pressure Zone

The 605V Pressure Zone is located in the north central portion of the City. The View Park Tank provides storage for this zone. The zone is fed by the View Park booster pump station. This zone has the same hydraulic gradient as the 605K and 605W Pressure Zones, however this zone is geographically and hydraulically isolated from the 605K Pressure Zone and hydraulically isolated from the 605W Pressure Zone via a normally closed valve.

660R Pressure Zone

The 660R Pressure Zone is a small zone located in the northern portion of the City between the 860 and 605 Pressure Zones that is supplied via pressure-reduction from the 860 Pressure Zone.

VEN0006051

860 Pressure Zone

The 860 Pressure Zone is located in the upper north central portions of the City. The Ondulando Tank provides storage for this zone. The zone is fed by the Willis and Ondulando booster pump stations.

1035 Pressure Zone

The 1035 Pressure Zone is located in the upper north central portions of the City. The Nob Hill Tank provides storage for this zone. The zone is fed by the Nob Hill booster pump station. This zone is the highest-pressure zone within the City.

B. TURNOUTS

The City distribution system receives a portion of its potable water supply from two turnout connections to the Casitas Municipal Water District (Casitas) system. Casitas Turnout No. 1 is located at the Avenue Treatment Plant and provides potable water to the 210 Pressure Zone. Casitas Turnout No. 2 is located at the intersection of Olive and Ramona Streets and provides water to the 210 zone via a 24-inch transmission main that fills the Hall Canyon Reservoirs. Both of the turnouts are regulated by Casitas. The City's turnouts are summarized in Table VI-2.

Table VI-2
Turnout Summary

Turnout Name	Location	Source of Supply	HGL	Capacity (GPM)
Casitas No. 1	Avenue Treatment Plant	Casitas Municipal Water District	210	4,300
Casitas No. 2	Intersection of Olive and Ramona Streets	Casitas Municipal Water District	210	8,333

C. RESERVOIRS AND TANKS

The City has a combination of both concrete reservoirs and steel tanks that provide storage for the distribution system. The City currently has four concrete reservoir sites in the distribution system, ranging in storage capacity from 1.12 million gallons (MG) to 14.68 MG, totaling approximately 32 MG. The City currently has 23 steel tanks in the distribution system, ranging in storage capacity from 0.08 MG to 2.54 MG, totaling approximately 20 MG. The reservoirs and tanks provide storage to meet peak demands and emergency storage for fire

VEN0006052

protection. Storage is utilized to minimize pumping requirements during on-peak energy (Southern California Edison) hours. The existing reservoirs and tanks are listed in Table VI-3.

Table VI-3
Existing Potable Reservoirs and Tanks

Reservoir (R) or Tank (T) Name	Bottom of Tank (ft)	Spillway (ft)	Overflow Level (ft above Floor)	Storage at Overflow Elevation (MG)	Pressure Zone (HGL)
Hall Canyon (1) - R	190	205	15	2.00	210
Hall Canyon (2) - R	190	205	15	6.16	
Kingston – R [1]	*195*	*212*	*17*	*10.00*	
Power - R	197	212	15	14.68	
Grant Park (1) - R	244	261	17	1.12	260
Grant Park (2) - R	244	261	17	1.12	
Hall Canyon (1) - T	243	260	17	0.25	
Hall Canyon (2) - T	243	260	17	0.25	
Bailey (1) - R	325	339	14	2.11	330
Bailey (2) - R	325	339	14	2.11	
Bailey (3) - R	325	339	14	3.02	
Seneca - T	383	411	28	1.19	400
Valley Vista - T	369	400	31	1.02	
Corbett - T	398	428	30	1.52	430
Foothill (1) - T	399	430	31	0.75	
Foothill (2) - T	399	430	31	0.75	
Long Canyon (1) - T	402	430	28	1.95	
Long Canyon (2) - T	402	430	28	1.95	
Sexton (1) - T	393	423	30	2.54	
Sexton (2) - T	393	423	30	2.54	
Mariano (1) - T	449	466	17	0.32	466
Mariano (2) - T	449	466	17	0.32	
Elizabeth - T	513	535	22	1.00	535
Kimball - T	495	532	37	1.01	
McElrea (1) - T	572	587	15	0.08	588
McElrea (2) - T	572	587	15	0.08	
Kalorama (1) - T	591	605	15	0.15	605K
Kalorama (2) - T	591	605	15	0.15	
View Park - T	578	601	23	0.25	605V
Willis – T	573	603	31	1.01	605W
Ondulando - T	827	860	34	0.40	860
Nob Hill - T	1004	1035	31	0.30	1035
Total Volume (Potable Water)				**52.11**	-

[1] Kingston is a raw water reservoir that holds untreated Ventura River water, and is not included in the total storage volume.

VEN0006053

When the City converted its disinfection regime to chloramination, they developed a Nitrification Action Plan to deal lower chlorine residuals in the distribution system, and the tanks. For the monitoring sites, the City performs monthly total chlorine residual, nitrite and HPC testing at each site. They also perform weekly total chlorine residuals at sites that occasionally have problems. When the levels reach the "Action Levels" the City begins daily water quality monitoring and aggressively changes the pump operation to "turn over" the tank. If the residual levels reach the next "Action Level" then they chemically treat the tank with both chlorine and ammonia to raise the total chlorine levels. If these actions do not solve the problem and the water quality continues to degrade, the final action will be to take the tank out of service.

A brief description of each potable reservoir and tank is provided below:

Hall Canyon Reservoir

The Hall Canyon Reservoir is fed from the Casitas Municipal Water District (Casitas) Turnout No. 2. The reservoir site consists of two cast in place concrete reservoirs. These reservoirs provide supply for the 210 Pressure Zone as well as supply suction for the Hall Canyon, Foothill and 330 Booster Pump Stations. The Hall Canyon Reservoirs consist of a 2.00 MG rectangular reservoir and a 6.16 MG rectangular reservoir, which are located on the same site but not interconnected.

Power Reservoir

The Power Reservoir is located at the Avenue Treatment Plant and is fed from the Casitas Municipal Water District (Casitas) Turnout No. 1 or from the treated effluent of the treatment plant. The reservoir provides supply for the 210 Pressure Zone as well as supply suction for the Power and Valley Vista Booster Pump Stations. The Power Reservoir is a concrete reservoir with a capacity of 14.68 MG.

Grant Park Reservoir

The Grant Park Reservoir is fed from the Modella Booster Pump Station and/or the Hall Canyon Booster Pump Station. The reservoir site consists of a cast in place concrete reservoir, which has a baffle in the reservoir. The reservoir has had chronic turnover problems, and only one half of the reservoir is currently in service. This reservoir provides supply for the 260 Pressure Zone. The Grant Park Reservoir has a total storage capacity of 2.24 MG.

VEN0006054

Hall Canyon Tanks

The Hall Canyon Tanks are comprised of two (2) 0.25 MG circular welded steel tanks located directly north of the Hall Canyon Reservoir. The reservoirs are filled from the Hall Canyon Booster Pump Station and/or the Modella Booster Pump Station. These reservoirs operate at the same hydraulic gradient as the Grant Park Reservoir.

Bailey Reservoir

The Bailey Reservoir is located at the Bailey Conditioning Facility site and provides storage for the 330 Pressure Zone. The reservoir consists of one cast-in-place concrete reservoir that has three separate compartments, which are interconnected. The reservoir is directly filled by the Golf Course Wells and by the Victoria and Mound Wells once the influent from these two wells go through the Bailey Conditioning Facility. This reservoir has a combined capacity of 7.24 MG. The reservoir provides suction for the Bailey Booster Pump Station.

Seneca Tank

The Seneca Tank is a 1.19 MG circular welded steel tank [redacted] The reservoir is filled at the bottom from the Valley Vista Booster Pump Station. This reservoir provides supply to the 400 Pressure Zone and operates at the same hydraulic gradient as the Valley Vista Tank. A tank mixing pump was recently installed in the Seneca tank to correct the stratification problem.

Valley Vista Tank

The Valley Vista Tank is a 1.02 MG circular welded steel tank [redacted] The reservoir is filled at the bottom from the Valley Vista Booster Pump Station. This reservoir provides supply to the 400 Pressure Zone and operates at the same hydraulic gradient as the Seneca Tank.

Corbett Tank

The Corbett Tank is a 1.52 MG circular welded steel tank [redacted] The reservoir is filled from the Bailey Booster Pump Station and/or Saticoy Well No. 2, after the water has been treated by the Saticoy Conditioning Facility. This reservoir provides supply to the 430 Pressure Zone and operates at the same hydraulic gradient as the Foothill, Sexton, and Long Canyon Tanks.

VEN0006055

Foothill Tanks

The Foothill Tanks are comprised of two (2) 0.75 MG circular welded steel tanks [redacted] The reservoirs are filled from either; the Foothill Booster Pump Station, the Seaward and Poli Booster Pump Station, the Five Points Booster Pump Station, or the Bailey Booster Pump Station or any combination thereof. These tanks provide supply to the 430 Pressure Zone and operate at the same hydraulic gradient as the Corbett, Sexton, and Long Canyon Tanks.

Long Canyon Tanks

The Long Canyon Tanks are comprised of two (2) 1.95 MG circular welded steel tanks [redacted] The tanks are filled from either; the Foothill Booster Pump Station, the Seaward and Poli Booster Pump Station, the Five Points Booster Pump Station, or the Bailey Booster Pump Station or any combination thereof. These tanks provide supply to the 430 Pressure Zone and operate at the same hydraulic gradient as the Corbett, Sexton, and Foothill Tanks. The Long Canyon tanks do not maintain good water quality because the lack of water volume pumping into the tank cannot properly mix the tanks, and the demand in the system is not enough to turn them over. Both tanks are currently out of service.

Sexton Tanks

The Sexton Tanks are comprised of two (2) 2.54 MG circular welded steel tanks [redacted] The tanks are filled from either; the Foothill Booster Pump Station, the Seaward and Poli Booster Pump Station, the Five Points Booster Pump Station, or the Bailey Booster Pump Station or any combination thereof. These tanks provide supply to the 430 Pressure Zone and also provide suction for the Elizabeth Pump Station. These tanks operate at the same hydraulic gradient as the Corbett, Long Canyon, and Foothill Tanks.

Mariano Tanks

The Mariano Tanks are comprised of two (2) 0.32 MG circular welded steel tanks [redacted] The tanks are filled from the Mariano Booster Pump Station. These tanks provide supply to the 466 Pressure Zone as well as the 360R Zone.

Elizabeth Tank

The Elizabeth Tank is a 1.00 MG circular welded steel tank [redacted] The reservoir is filled from the Kimball Booster Pump

VEN0006056

Station and/or the Elizabeth Booster Pump Station. This reservoir provides supply to the 535 Pressure Zone and operates at the same hydraulic gradient as the Kimball Tank.

Kimball Tank

The Kimball Tank is a 1.01 MG circular welded steel tank [redacted] The reservoir is filled from the Kimball Booster Pump Station and/or the Elizabeth Booster Pump Station. This reservoir provides supply to the 535 Pressure Zone and operates at the same hydraulic gradient as the Elizabeth Tank. The Kimball tank was taken out of service because neither Kimball nor Elizabeth would turn over properly. The City could not take Elizabeth out of service because this would create a long dead end pipeline, therefore Kimball was taken out of service. The City is currently in the process of putting Kimball back in service.

McElrea Tanks

The McElrea Tanks are comprised of two (2) 0.08 MG circular welded steel tanks [redacted] The tanks are filled from the McElrea Booster Pump Station. These tanks provide supply to the 588 Pressure Zone as well as the 430R Zone.

Kalorama Tanks

The Kalorama Tanks are comprised of two (2) 0.15 MG circular welded steel tanks [redacted] The tanks are filled from the Kalorama Booster Pump Station. These tanks provide supply to the 605K Pressure Zone. At Kalorama, there is not enough demand to turn both tanks over, even in the summer. One tank has been taken out of service. In the winter, it takes a few days to turn over the tank. In the summer it turns over daily.

View Park Tank

The View Park Tank is a 0.25 MG circular welded steel tank [redacted] The reservoir is filled from the View Park Booster Pump Station. This reservoir provides supply to the 605V Pressure Zone.

Willis Tank

The Willis Tank is a 1.01 MG circular welded steel tank [redacted] The reservoir is filled from the Day Road Booster Pump Station. This reservoir provides supply to the 605W Pressure Zone.

VEN0006057

Ondulando Tank

The Ondulando Tank is a 0.40 MG circular welded steel tank [redacted] The reservoir is filled from the Ondulando Booster Pump Station and/or the Wills Booster Pump Station. This reservoir provides supply to the 860 Pressure Zone and the 660R Zone. The tank also provides suction for the Nob Hill Booster Pump Station.

Nob Hill Tank

The Nob Hill Tank is a 0.30 MG circular welded steel tank [redacted] The reservoir is filled from the Nob Hill Booster Pump Station. This reservoir provides supply to the 1035 Pressure Zone.

A brief description of the City's raw water reservoir is provided below:

Kingston Reservoir

Kingston reservoir is a 10 million gallon concrete raw water reservoir that holds the untreated water from the Ventura River sources that supplies the water to the Avenue Water Treatment Plant.

D. PUMP STATIONS

The City operates twenty one (21) pump stations that supply water to various pressure zones within the City of San Buenaventura. The pumps range in type, size and capacity. Pump stations are used to boost water from a lower hydraulic gradient to a higher hydraulic gradient, as well as to move water from groundwater wells to upper hydraulic gradients. Pump stations are critical elements of the City's distribution system, moving the source water to the higher elevations. Five (5) pump stations are equipped with a diesel powered emergency generator, they include Hall Canyon BPS, Foothill BPS, 330 BPS, Bailey BPS and the Golf Course BPS. It is noted that the Hall Canyon, Foothill and 330 Booster Pumps are all housed within the same building.

Table VI-4 summarizes the existing pump stations.

VEN0006058

Table VI-4
Existing Pump Stations

Discharge Pressure Zone	Pumping Stations within Zone	Number of Pumps	Nominal Pumping Capacity [1] (gpm)
210	Power	2	8,300
260	Modella	3	1,400
	Hall Canyon	2	791
330	330	3	1,095
	Golf Course	4	6,515
400	Valley Vista	3	960
430	Foothill	2	349
	Seaward and Poli	3	2,338
	Five Points	4	6,076
	Bailey	3	4,282
466 and 360R	Mariano	2	827
535	Elizabeth	3	2,389
	Kimball	3	2,323
588 and 430R	McElrea	2	306
605K	Kalorama	2	437
605V	View Park	2	751
605W	Day Road	3	1,125
860 and 660R	Willis	2	533
	Ondulando	2	752
	Gosnell	[2]	[2]
1035	Nob Hill	2	460
Total	**-**	**-**	**42,009**

[1] Nominal Capacity determined from 2006 Southern California Edison test data with largest unit out of service.
[2] Gosnell is currently out-of-service.

E. PRESSURE REDUCING VALVES/STATIONS

The City operates ten (10) pressure-reducing stations, which supply water from a higher pressure gradient to a lower pressure gradient. The pressure reducing stations consist of valves set to maintain a constant downstream pressure. Table VI-5 below shows a summary of the pressure reducing stations.

VEN0006059

Table VI-5
Pressure Reducing Stations

Name	Upstream Pressure Zone	Downstream Pressure Zone	Size (in)
Aliso	588	430R	8” / 4”
Alverstone	860	660R	8” / 8”
Barnard Way	466	360R	8” / 6”
Brodiea	588	430R	6” / 2.5”
Main and Mills (E)	330	210	8”
Palma	330	210	12” / 4”
Petit (E)	430	330	12”
Skyline	860	660R	8” / 8”
Telegraph and Mills - Lower (E)	430	260	8”
Telegraph and Mills - Upper (E)	430	330	12”

(E) – Represents Emergency Station

Aliso

The Aliso Pressure Reducing Station consists of two valves in parallel. The valves reduce the hydraulic gradient of the 588 Pressure Zone to the Reduced 430 Zone (430R). Under normal operating conditions, water flows through the 8-inch main line to maintain a constant downstream pressure and the 4-inch bypass line is not in use.

Alverstone

The Alverstone Pressure Reducing Station consists of two valves in parallel. The valves reduce the hydraulic gradient of the 860 Pressure Zone to the Reduced 660 Zone (660R). Under normal operating conditions, water flows through the 8-inch main line to maintain a constant downstream pressure and the 8-inch bypass line is not in use.

Barnard Way

The Barnard Way Pressure Reducing Station consists of two valves in parallel. The valves reduce the hydraulic gradient of the 466 Pressure Zone to the Reduced 360 Zone (360R). Under normal operating conditions, water flows through the 8-inch main line to maintain a constant downstream pressure and the 6-inch bypass line is not in use.

Brodiea

The Brodiea Pressure Reducing Station consists of two valves in parallel. The valves reduce the hydraulic gradient of the 588 Pressure Zone to the Reduced 430 Zone (430R). Under

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normal operating conditions, water flows through the 6-inch main line to maintain a constant downstream pressure and the 2.5-inch bypass line is not in use.

Main and Mills

The Main and Mills Pressure Reducing Station is used as an emergency connection between the 330 Pressure Zone and the 210 Pressure Zone. The pressure is set at approximately 40 psi in the event of pressure loss to the 210 Pressure Zone. Under normal operating conditions the valve is closed due to sufficient downstream pressure.

Palma

The Palma Pressure Reducing Station consists of two valves in parallel. The valves reduce the hydraulic gradient of the 330 Pressure Zone to the 210 Pressure Zone. Under normal operating conditions, water flows through the 12-inch main line to maintain a constant downstream pressure and the 4-inch bypass line is not in use.

Petit

The Petit Pressure Reducing Station is used as an emergency connection between the 430 Pressure Zone and the 330 Pressure Zone. The pressure is set at approximately 60 psi in the event of pressure loss to the 330 Pressure Zone. Under normal operating conditions the valve is closed due to sufficient downstream pressure.

Skyline

The Skyline Pressure Reducing Station consists of two valves in parallel. The valves reduce the hydraulic gradient of the 860 Pressure Zone to the Reduced 660 Zone (660R). Under normal operating conditions, water flows through the 8-inch main line to maintain a constant downstream pressure and the 8-inch bypass line is not in use.

Telegraph and Mills - Lower

The Telegraph and Mills - Lower Pressure Reducing Station is used as an emergency connection between the 430 Pressure Zone and the 260 Pressure Zone. The pressure is set at approximately 35 psi in the event of pressure loss to the 260 Pressure Zone. Under normal operating conditions the valve is closed due to sufficient downstream pressure.

Telegraph and Mills - Upper

The Telegraph and Mills – Upper Pressure Reducing Station is used as an emergency connection between the 430 Pressure Zone and the 330 Pressure Zone. The pressure is set

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at approximately 70 psi in the event of pressure loss to the 330 Pressure Zone. Under normal operating conditions, the valve opens during high demand conditions to supplement the 330 Pressure Zone.

F. PIPELINES

The City's distribution system is comprised of pipelines ranging in size from 2-inches to 36-inches. The majority of pipelines are 6, 8 and 12-inches in diameter. There are approximately 380 miles of pipeline within the distribution system.

There are several pipe materials that are used in the system. The largest amount of pipe used is Asbestos Cement Pipe (ACP) followed by Cast Iron Pipe (CIP). Figure VI-1 shows the approximate length of pipe in feet of each pipe material used in the distribution system. Pipes are listed as unknown where records of pipe construction were not found.

See Exhibit VI-5, which shows the City's entire distribution system with each pipe diameter color-coded.

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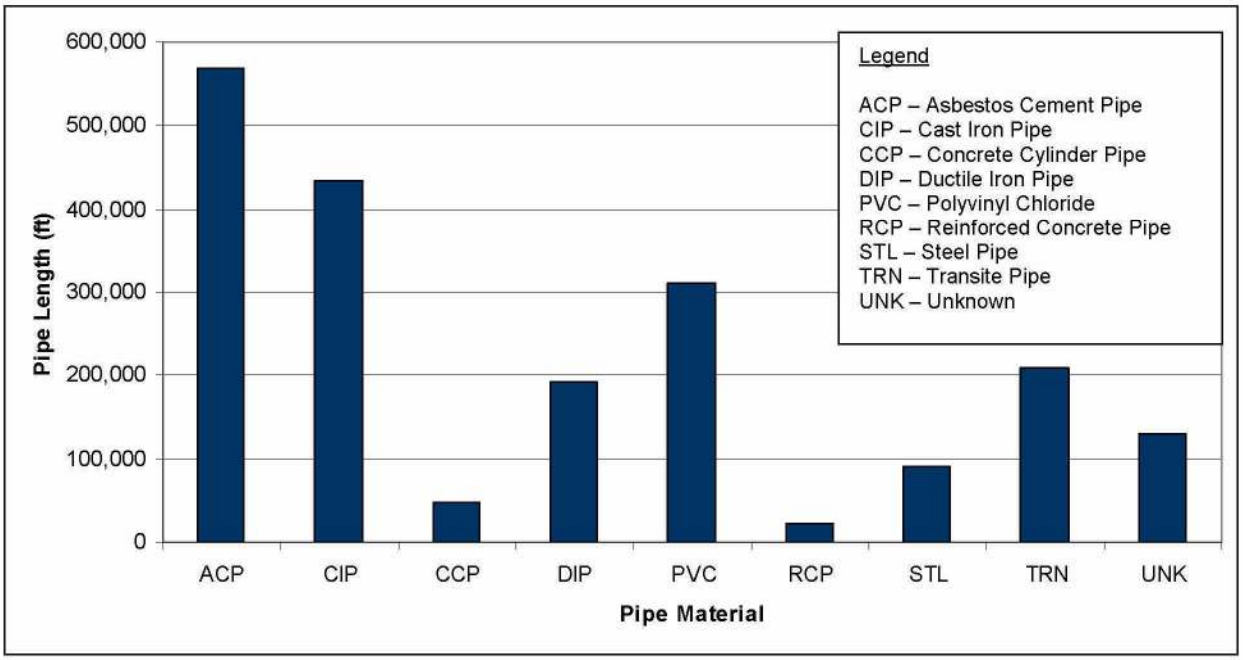
Figure VI-1
Pipe Main Material



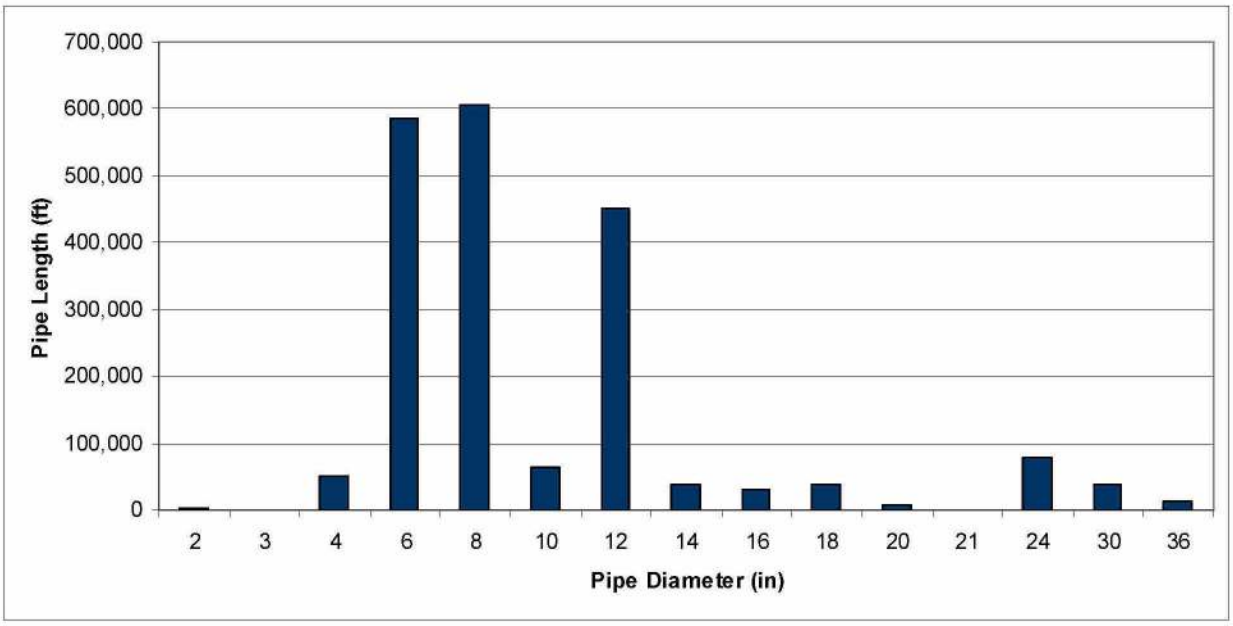
ACP was commonly used in water distribution construction during the 1960's and 1970's. ACP pipe is known for its' resilience to corrosion and long lasting service life in particular soils. Federal regulations in the late 1970's made ACP pipe fabrication very expensive. The City started using PVC, ductile iron pipe and coated steel pipe in the late 1970's. The City uses these pipeline materials for optimal water quality, long service life and for their economical costs. Coated steel pipe and PVC have indefinite service life depending on the corrosivity of the soils and quality of linings and coatings. Several portions of the city's distribution system were constructed with ductile iron pipeline. Ductile iron pipeline is generally more expensive and requires an additional dielectric coating in corrosive soils, compared to steel and PVC. Pipelines less than 12-inches in diameter are typically constructed of PVC. Steel is commonly used for pipeline diameters greater than 12-inches.

The age of the pipeline in the system varies from 1 to 101 years old. On average, the pipeline age is approximately 42 years old.

Figure VI-2 displays the range in pipe diameter and the corresponding length of said diameter.

VEN0006063

Figure VI-2
Pipe Diameter



G. TREATMENT PLANTS AND CONDITIONING FACILITIES

The City owns, operates and maintains the Avenue Treatment Plant, the Bailey Conditioning Facility and the Saticoy Conditioning Facility.

The Avenue Treatment Plant is the City's main water treatment facility, treating and disinfecting water derived from the Ventura River. [redacted] The Avenue Treatment Plant recently underwent a major upgrade, which was completed in June of 2007. The new treatment plant consists of a state of the art in-line ultrafiltration membrane filter system that is capable of producing up to 10 MGD. The updated treatment process was designed to meet current and anticipated drinking water regulations and is expandable up to 15 MGD.

The Bailey Conditioning Facility is one of two iron and manganese conditioning facilities within the distribution system. The Bailey Conditioning Facility conditions water derived from the Mound groundwater basin. [redacted] The Bailey Conditioning Facility has an existing capacity of 11.5 MGD and has space for an additional filter, which would increase the capacity to about 13.8 MGD.

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The Saticoy Conditioning Facility is the other conditioning facility operated by the City. The Saticoy Conditioning Facility is an iron/manganese removal facility which conditions water derived from the Santa Paula and Oxnard Forebay groundwater basins. [redacted] The facility has an existing capacity of 3.5 MGD, and the City is anticipating an upgrade of this facility (CIP 97521), which would double the capacity.

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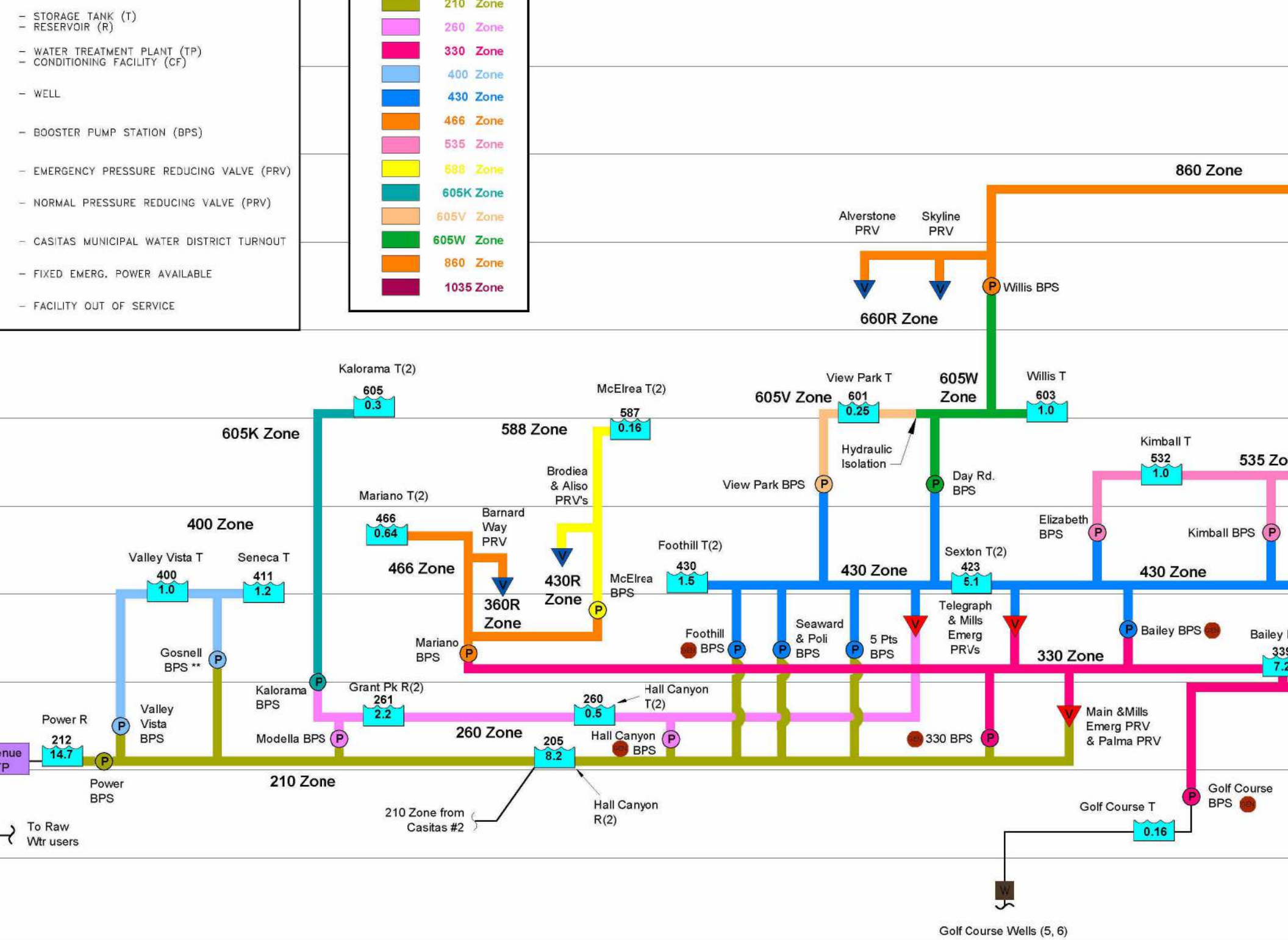
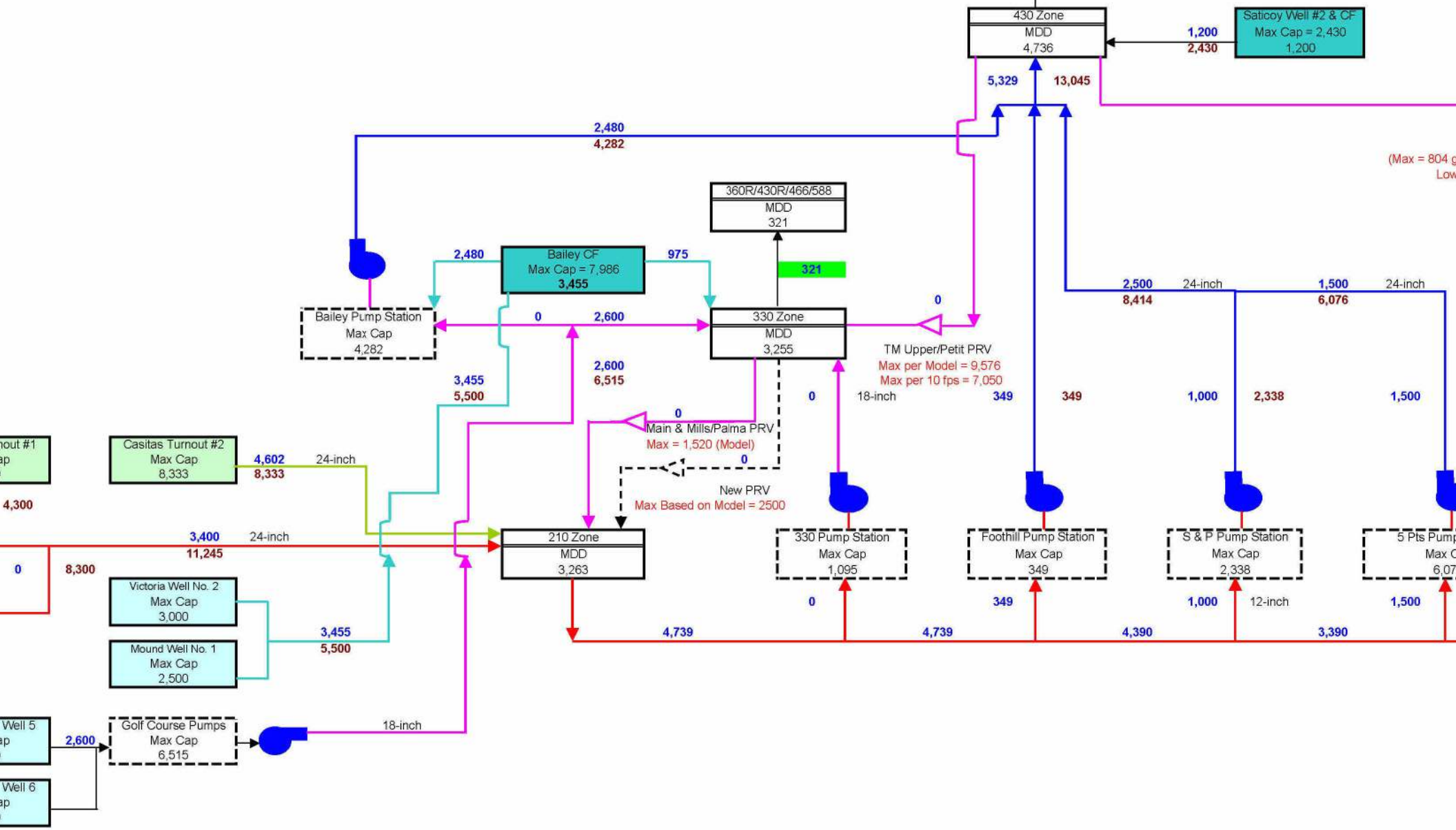
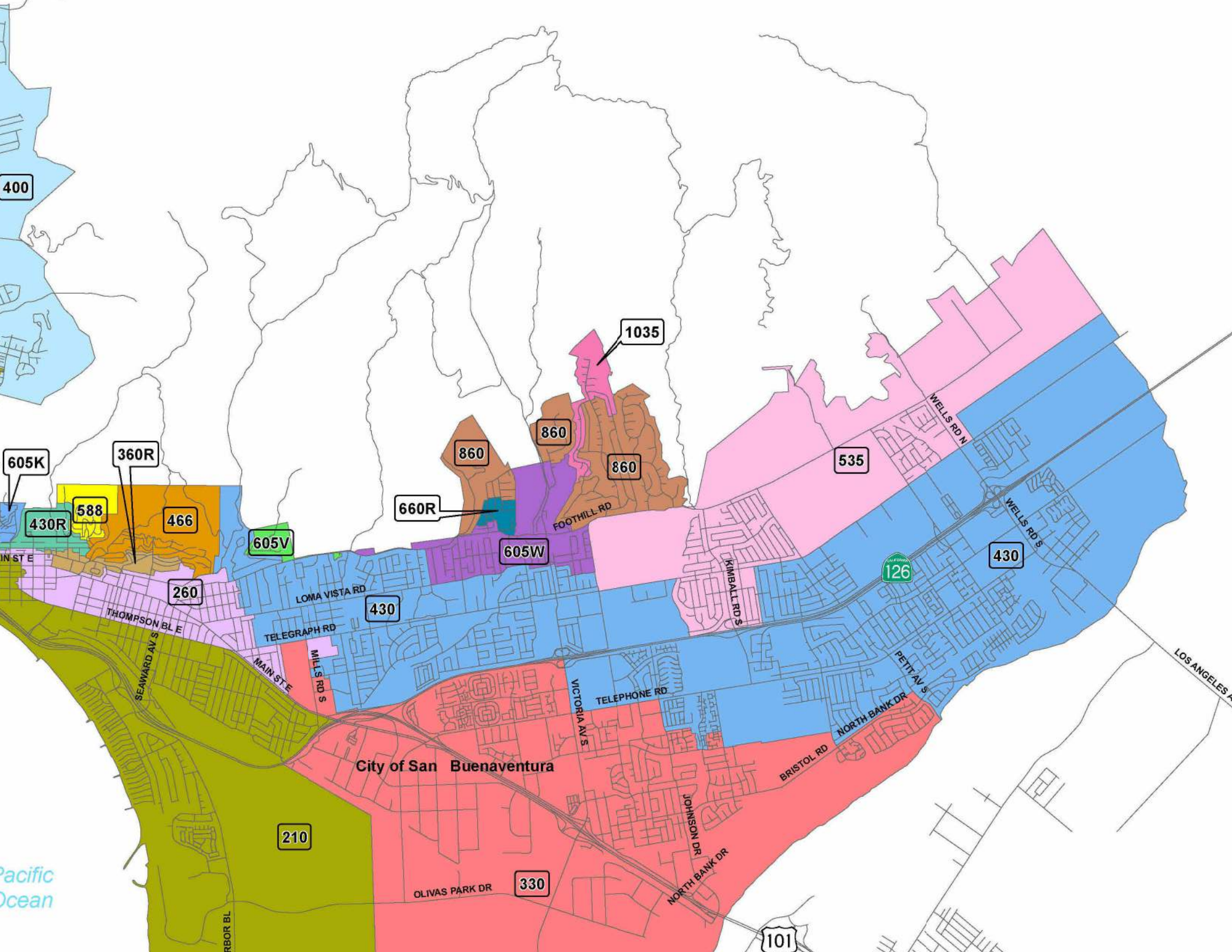

STORAGE TANK (T)
RESERVOIR (R)
WATER TREATMENT PLANT (TP)
CONDITIONING FACILITY (CF)
WELL
BOOSTER PUMP STATION (BPS)
EMERGENCY PRESSURE REDUCING VALVE (PRV)
NORMAL PRESSURE REDUCING VALVE (PRV)
CASITAS MUNICIPAL WATER DISTRICT TURNOUT
FIXED EMERG. POWER AVAILABLE
FACILITY OUT OF SERVICE
210 Zone
260 Zone
330 Zone
400 Zone
430 Zone
466 Zone
535 Zone
588 Zone
605K Zone
605V Zone
605W Zone
860 Zone
1035 Zone
860 Zone
Alverstone PRV
Skyline PRV
Willis BPS
660R Zone
Kalorama T(2)
605
0.3
605K Zone
McElrea T(2)
587
0.16
588 Zone
605V Zone
View Park T
601
0.25
605W Zone
Willis T
603
1.0
Hydraulic Isolation
Kimball T
532
1.0
535 Zo
Brodiea & Aliso PRV's
View Park BPS
Day Rd. BPS
Mariano T(2)
466
0.64
Barnard Way PRV
400 Zone
Elizabeth BPS
Kimball BPS
Valley Vista T
400
1.0
Seneca T
411
1.2
466 Zone
360R Zone
430R Zone
McElrea BPS
Foothill T(2)
430
1.5
430 Zone
Sexton T(2)
423
5.1
430 Zone
Telegraph & Mills Emerg PRVs
Mariano BPS
Foothill BPS
Seaward & Poli BPS
5 Pts BPS
Bailey BPS
Bailey
339
7.2
330 Zone
Gosnell BPS **
Kalorama BPS
Grant Pk R(2)
261
2.2
260
0.5
Hall Canyon T(2)
Main &Mills Emerg PRV & Palma PRV
Power R
212
14.7
Valley Vista BPS
Modella BPS
260 Zone
205
8.2
Hall Canyon BPS
330 BPS
Power BPS
210 Zone
210 Zone from Casitas #2
Hall Canyon R(2)
Golf Course BPS
Golf Course T
0.16
To Raw Wtr users
Golf Course Wells (5, 6)



PREPARED BY:

CITY OF SAN BUEN


400
1035
860
860
860
605K
360R
588
430R
466
660R
605V
605W
535
430
260
430
210
330
FOOTHILL RD
WELLS RD N
WELLS RD S
KIMBALL RD S
LOMA VISTA RD
TELEGRAPH RD
THOMPSON BL E
SEAWARD AV S
MAIN ST E
MILLS RD S
VICTORIA AV S
TELEPHONE RD
PETIT AV S
NORTH BANK DR
BRISTOL RD
JOHNSON DR
OLIVAS PARK DR
City of San Buenaventura
126
101
LOS ANGELES A
Pacific
Ocean

VII. RESERVOIR STORAGE ANALYSIS

A. INTRODUCTION

Storage is a critical component of a water distribution system as it provides fire protection and operational flexibility. This section will analyze the City's existing storage capacity and determine if it's adequate to meet the minimum specified criteria based on existing demands and near-term demands. It should be noted that the City will seasonally change the operations and status of certain storage facilities in order to address the water quality issues that arise during times of lower demand.

B. STORAGE CRITERIA

As discussed in Section III, the existing storage criteria are as follows:

Total Operational Storage= Regulatory Storage + Emergency Storage

1. Total Operational storage represents the reservoir volume at the maximum operating level (elevation). The operating level should not be confused with the overflow elevation. The reservoir volume at the overflow elevation is considered the full available storage; however, the City operates their reservoirs at the 'operating level,' a level below that of the overflow elevation. The operating storage is used for analysis purposes.

2. Regulatory storage is based on a certain percentage of the maximum day demand. Under the current (2007) storage criteria, regulatory storage is 175% of the maximum day demand.

3. Emergency storage is the volume necessary to supply the maximum required fire flow in the pressure zone for a specified duration in accordance with the Insurance Services Office (ISO), and/or the City of San Buenaventura Fire Department. In areas outside the City limits that are served by the City's water system, the Ventura County Fire Protection District's criteria should be met.

VEN0006069

C. EXISTING SYSTEM STORAGE EVALUATION

This storage analysis evaluates the existing reservoirs to determine if they have adequate storage volume based on the current storage criteria for each pressure zone. This evaluation will also analyze whether the existing storage capacity is adequate to meet near-term development conditions.

1. Available Reservoir Storage (Total Operational Storage)

The available storage within a reservoir assumes a water height equal to the operational level. The operational storage is defined as the volume based on the reservoir's dimensions and the maximum operational water level within the tank. Refer to Table VII-1 for the calculated operational storage within each reservoir.

VEN0006070

Table VII-1
Existing Reservoir Storage (Potable Water)

Reservoir Name	Circular Config.	Rectangular/Square Configuration		Bottom of Tank	Operational Level	Operational Storage	Total Zone Operational Storage	Overflow Level	Storage at Overflow Elevation	Pressure Zone
	Dia. (ft)	Length (ft)	Width (ft)	Elevation (ft)	(ft above floor)	(MG)	(MG)	(ft above floor)	(MG)	(HGL)
Hall Canyon (1) - R	-	124	144	190	13.5	1.80	19.87	15	2.00	210
Hall Canyon (2) - R	-	208	264	190	13.5	5.55		15	6.16	
Power - R	-	347	594	197	13	12.52		15	14.68	
Grant Park (1) - R	-	84	105	244	12.5	0.82	1.91	17	1.12	260
Grant Park (2) – R *	-	84	105	244	12.5	0.82		17	1.12	
Hall Canyon (1) - T	50	-	-	243	9	0.13		17	0.25	
Hall Canyon (2) - T	50	-	-	243	9	0.13		17	0.25	
Bailey (1) - R	-	168	120	325	10	1.51	5.17	14	2.11	330
Bailey (2) - R	-	168	120	325	10	1.51		14	2.11	
Bailey (3) - R	-	120	240	325	10	2.15		14	3.02	
Seneca - T	85	-	-	383	25	1.06	2.02	28	1.19	400
Valley Vista - T	75	-	-	369	29	0.96		31	1.02	
Corbett – T	93	-	-	398	26	1.32	10.09	30	1.52	430
Foothill (1) - T	64	-	-	399	20	0.48		31	0.75	
Foothill (2) - T	64	-	-	399	20	0.48		31	0.75	
Long Canyon (1) – T *	109	-	-	402	22	1.54		28	1.95	
Long Canyon (2) – T *	109	-	-	402	22	1.54		28	1.95	
Sexton (1) - T	120	-	-	393	28	2.37		30	2.54	
Sexton (2) - T	120	-	-	393	28	2.37		30	2.54	
Mariano (1) - T	57	-	-	449	13.5	0.26	0.52	17	0.32	466
Mariano (2) - T	57	-	-	449	13.5	0.26		17	0.32	
Elizabeth - T	88	-	-	513	19	0.86	1.82	22	1.00	535
Kimball – T *	68	-	-	495	35	0.95		37	1.01	
McElrea (1) - T	30	-	-	572	12.5	0.07	0.13	15	0.08	588
McElrea (2) - T	30	-	-	572	12.5	0.07		15	0.08	
Kalorama (1) - T	42	-	-	591	12	0.12	0.25	15	0.15	605K
Kalorama (2) – T *	42	-	-	591	12	0.12		15	0.15	
View Park - T	43	-	-	578	19	0.21	0.87	23	0.25	605V & 605W
Willis - T	75	-	-	573	20	0.66		31	1.01	
Ondulando - T	45	-	-	827	25	0.30	0.30	34	0.40	860
Nob Hill - T	40.5	-	-	1004	28	0.27	0.27	31	0.30	1035

* Indicates tank is typically taken out of service in the winter.

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The storage analysis evaluates the operational storage within each pressure zone. Therefore, pressure zones that have multiple reservoirs that operate at the same (similar) hydraulic gradient are combined together for the purposes of this analysis.

2. Required Emergency (Fire Flow) Storage

Emergency (or Fire Flow storage) requirements are determined by the critical land use located within each pressure zone. The critical fire flow is determined based on land uses identified on the City of San Buenaventura 2005 General Plan map.

School or commercial buildings are usually the controlling fire flow in a pressure zone. Based on information received by the City, the minimum fire flow for a school is 4,500 gpm for a duration of four (4) hours.

Refer to Table VII-2 for the calculated fire flow storage required within each pressure zone.

Table VII-2
Required Emergency (Fire Flow) Storage

Pressure Zone	Service Area Land Use [1]	Fire Flow Requirement (GPM)	Duration (Hours)	Required Fire Flow Storage (MG)
210	Commerce/Industry/Public & Institutional	4,500	4	1.08
260	Commerce/Industry/Public & Institutional	4,500	4	1.08
330	Commerce/Industry/Public & Institutional	4,500	4	1.08
400	Commerce/Industry/Public & Institutional	4,500	4	1.08
430	Commerce/Industry/Public & Institutional	4,500	4	1.08
466	Neighborhood Medium/Neighborhood High	1,500	2	0.18
535	Commerce/Industry/Public & Institutional	4,500	4	1.08
588	Neighborhood Medium/Neighborhood High	1,500	2	0.18
605K	Neighborhood Medium/Neighborhood High	1,500	2	0.18
605V & 605W	Commerce/Industry/Public & Institutional	4,500	4	1.08
860	Neighborhood Low	1,000	2	0.12
1035	Neighborhood Low	1,000	2	0.12

[1] Land Use per 2005 General Plan.

VEN0006072

3. Available Regulatory Storage

The available regulatory storage within each pressure zone is determined by subtracting the required fire flow storage determined in Table VII-2 from the operational storage determined in Table VII-1. Refer to Table VII-3 for the available regulatory storage.

Table VII-3
Available Regulatory Storage

Pressure Zone	Total Zone Operational Storage (MG)	Required Fire Flow Storage (MG)	Available Regulatory Storage (MG)
210	19.87	1.08	18.79
260	1.91	1.08	0.83
330	5.17	1.08	4.09
400	2.02	1.08	0.94
430	10.09	1.08	9.01
466	0.52	0.18	0.34
535	1.82	1.08	0.74
588	0.13	0.18	-0.05
605K	0.25	0.18	0.07
605V & 605W	0.87	1.08	-0.21
860	0.30	0.12	0.18
1035	0.27	0.12	0.15
Total	**43.21**	**8.34**	**-**

VEN0006073

4. Existing Reservoir Capacity Evaluation

To determine if a reservoir's storage capacity is adequate or deficient based on the existing water demand, the "required" regulatory storage was subtracted from the "available" regulatory storage (as listed in Table VII-3). The current City reservoir sizing criteria identifies the "required" regulatory storage as 175% of maximum day demand. Table VII-4 evaluates whether the "available" regulatory storage identified in Table VII-3 is adequate to meet the "required" regulatory storage of 175% maximum day demand.

Table VII-4
Capacity Evaluation – Existing Demand Storage Requirements

Pressure Zone	Available Regulatory Storage (MG)	Existing Maximum Day Demand (GPM)	Required Regulatory Storage (175% of Max Day Demand) (MG)	Excess or Deficient Capacity (MG)
210	18.79	3,263	8.22	10.56
260	0.83	770	1.94	-1.11
330	4.09	3,255	8.20	-4.11
400	0.94	1,086	2.74	-1.80
430	9.01	4,736	11.94	-2.92
466	0.34	233	0.59	-0.25
535	0.74	800	2.02	-1.28
588	-0.05	87	0.22	-0.27
605K	0.07	34	0.09	-0.02
605V & 605W	-0.21	351	0.89	-1.10
860	0.18	554	1.40	-1.22
1035	0.15	87	0.22	-0.07

VEN0006074

5. Reservoir Capacity Evaluation – Near-Term Demand Requirements

The existing storage capacity was also evaluated based on the projected near-term demand and the existing storage criteria. Table VII-5 identifies the storage capacity within each zone under the near-term demand condition.

Table VII-5
Capacity Evaluation – Near-Term Demand Storage Requirements

Pressure Zone	Available Regulatory Storage (MG)	Near Term Maximum Day Demand (GPM)	Required Regulatory Storage (175% of Max Day Demand) (MG)	Excess or Deficient Capacity (MG)
210	18.79	3,479	8.77	10.02
260	0.83	774	1.95	-1.12
330	4.09	3,882	9.78	-5.69
400	0.94	1,157	2.92	-1.98
430	9.01	5,354	13.49	-4.48
466	0.34	237	0.60	-0.26
535	0.74	856	2.16	-1.42
588	-0.05	87	0.22	-0.27
605K	0.07	34	0.09	-0.02
605V & 605W	-0.21	358	0.90	-1.12
860	0.18	559	1.41	-1.23
1035	0.15	87	0.22	-0.07

D. CONCLUSIONS AND RECOMMENDATIONS

The results of both the existing system storage capacity evaluation and the near-term storage capacity evaluation indicate that all pressure zones, with the exception of the 210 Pressure Zone, are deficient in capacity. In the near-term demand condition, the citywide storage deficiency is 7.64 MG, assuming that the excess capacity in the 210 Pressure Zone can be utilized in other areas. The excess capacity available is all located in the 210 Zone, which is the lowest HGL in the system. Therefore to utilize the excess storage, there must be excess pumping capacity available to move the water to the higher zones in need.

Since the storage deficiencies in the 605K and 1035 Zones are negligible, the existing storage in those zones is deemed to be adequate. The deficiencies in the 466 Zone and the 588 Zone

VEN0006075

are considered minor and not the most critical. All other zones (7 total) are considered to have significant deficiencies that require further evaluation and potential action.

In order for the excess storage in the 210 Zone to be used by the higher zones, a reliable pumping supply with adequate excess pumping capacity must be available. To be conservative, it is assumed that those zones that can directly take suction from the 210 Zone will be able to tap into the excess storage available. Utilizing data from Section IX – Pump Station Analysis, the following Table VII-6 was prepared to evaluate if and where the excess capacity in 210 Zone reservoirs could be utilized.

Table VII-6
Utilization of Excess Pumping Capacity

Suction Zone	Deficient Zone	Deficient Capacity (MG)	Excess Pumping Capacity to Zone		Time Required to Pump Deficient Volume (hrs)	Utilized 210 Zone Capacity (MG)
			Pump Station(s)	Flow (gpm)		
210	260	-1.12	Modella/Hall Canyon	1,383	13.5	1.12
210	330	-5.69	330	-3,811	N/A	0
210	400	-1.98	Valley Vista	-197	N/A	0
210	430	-4.48	Foothill/Seaward and Poli/Five Points	4,226	17.7	4.48

Note: The excess pumping capacity for the 430 Pressure Zone was determined from the excess capacity of the Foothill, Seaward and Poli, and Five Points excess capacity after deducting half of the 430 Zone near-term maximum day demands and all of the pump through demands.

As shown In Table VII-6, existing available pumping capacity can be utilized to help distribute the excess storage capacity from the 210 Zone to the 260 and 430 Zones, thereby eliminating the need to construct storage in each of those zones. The 330 Zone and 400 Zone remain deficient and capital improvements are recommended.

As discussed in detail in Section XIII.A.2, the City has had to deal with water quality issues in several zones, due to a difficulty in turning water over in the reservoirs during times of low demand. This has led the City to develop a Nitrification Action Plan, which requires changes to the system operations in the winter months. The 400 Zone is a zone that requires consistent operator action to achieve water turnover in the reservoirs. Adding more storage to

VEN0006076

the 400 Zone would increase the potential for water quality problems, and require more manual operation of the facilities. An option to mitigate the storage deficiency in the zone, and help circulate water through the reservoirs, is to put the Gosnell Pump Station back into service. The Gosnell Pump Station would require a complete reconstruction of the piping, valving, pumps, motors and electrical/telemetry equipment. Also, access to the existing site needs improvement. Rehabilitation of the Gosnell PS is currently listed in existing CIP 97887. It is recommended that, in order to mitigate the storage deficiency of the 400 Zone and improve water quality, the Gosnell PS rehabilitation project should be implemented as its own individual CIP:

- Rehabilitate the Gosnell Pump Station

The 330 Zone is deficient by 5.7 MG in the near-term demand condition. Although the 330 Zone does not have adequate pumping capacity to tap into the excess 210 Zone storage, it does have access to the groundwater. Groundwater is considered reliable storage, provided the delivery facilities have back-up power capabilities. In lieu of constructing storage facilities in 330 Zone, the City could develop additional wells with back-up power. The City's current CIP has outlined projects to develop two new wells that will supply the 330 Zone, with a combined capacity of 5,000 – 6,000 gpm. It is recommended that the City proceed with plans for the following projects:

- Mound Well No. 2 (CIP 97907)
- Golf Course Well No. 7 (CIP 97908)

The City's current capital improvement program recommends adding storage in the 605 Zone (Arroyo Verde Park). The project is recommended to remain in the capital improvement program, however it is recommended that the project description be adjusted so that the proposed capacity mitigates the storage deficiencies of the 535, 605 and 860 Zones.

- CIP 97879 – Upsize to 3.8 MG (New Tank in 605 Zone)

In the future, if large developments are proposed within the City's service area, the developer shall evaluate the storage requirements on an individual project basis at that time.

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VIII. WATER SUPPLY ANALYSIS

A. INTRODUCTION

This section evaluates the City's existing water supply capacity to determine if it is adequate to meet the existing and future demands of the City. This section will also evaluate several scenarios that examine the effects on the distribution system if a particular facility is out of service, or if one or more of the supply capacities are reduced due to drought conditions.

The City has three main sources of supply; Lake Casitas, the Ventura River, and three groundwater basins. The water from Lake Casitas is delivered to the City by the Casitas Municipal Water District (Casitas) through two turnout connections. Water is derived from the Ventura River via surface diversion, subsurface collector and shallow wells, and treated at the Avenue Treatment Plant. Water from the Mound Groundwater Basin is conditioned at the Bailey Conditioning Facility and water from the Oxnard Plain Groundwater Basin is disinfected and blended at the Bailey Conditioning Facility. Water from the Santa Paula and Oxnard Forebay Groundwater Basins are conditioned at the Saticoy Conditioning Facility.

B. EXISTING WATER SUPPLY ADEQUACY

This section summarizes the City's existing supply sources, and their available capacities.

Water from Lake Casitas is treated by the Casitas Municipal Water District (Casitas) and delivered to the City at two turnouts, Casitas No.1 and Casitas No. 2. Casitas No. 1 is located at the Avenue Treatment Plant and Casitas No. 2 is located at the intersection of Olive and Ramona Streets and fills the Hall Canyon Reservoir. Table VIII-1 contains a summary of the maximum supply capacity from Casitas.

Table VIII-1
Casitas Supply

Potable Water Source	Maximum Capacity (gpm)	Maximum Capacity (mgd)
Casitas No. 1	4,300	6.2
Casitas No. 2	8,333	12.0
Total	**12,633**	**18.2**

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Water from the Ventura River is treated by the Avenue Treatment Plant, which is located on North Ventura Avenue. Upgrades at the Avenue Treatment Plant were completed in August 2007. The current treatment capacity of the Plant is 10 MGD (6,944 gpm) and is expandable up to 15 MGD (10,417 gpm). This facility treats all water from the Ventura River subsurface extraction system at Foster Park. Table VIII-2 contains a summary of the current supply capacity to the Avenue Treatment Plant. As Table VIII-2 shows, the Avenue Treatment Plant is currently under utilized due to the fact that several of the groundwater wells in the Ventura River area were destroyed during a 2005 storm event.

Table VIII-2
Avenue Treatment Plant Supply

Avenue Supply Sources	Maximum Capacity (gpm)	Maximum Capacity (mgd)
Nye 2*	400	0.58
Nye 7	1200	1.73
Nye 8	750	1.08
Nye 11	150	0.22
Subsurface Intake	1,000	1.44
Total Supply (Un-Treated)	**3,500**	**5.05**
Avenue Maximum Capacity	**6,944**	**10.0**

* Indicates well is currently out of service

Water from the Mound Groundwater Basin is conditioned by the Bailey Conditioning Facility, which is located off of Fremont Street. The Bailey Conditioning Facility has a current capacity of 11.5 MGD (7,986 gpm) and has space for one additional filter, which would increase the capacity of the facility to approximately 13.8 MGD (9,600 gpm). This facility conditions water from Victoria Well No. 2 and Mound Well No. 1. Table VIII-3 contains a summary of the current supply capacity to the Bailey Conditioning Facility. As Table VIII-3 shows, the Bailey Conditioning Facility is currently under utilized, and has an available capacity of approximately 2,500 gpm.

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Table VIII-3
Bailey Conditioning Facility Supply

Bailey Supply Sources	Maximum Capacity (gpm)	Maximum Capacity (mgd)
Victoria 2	3,000	4.3
Mound 1	2,500	3.6
Total Supply (Un-Treated)	**5,500**	**7.9**
Bailey Max. Capacity	**7,986**	**11.5**

Water from the Santa Paula and Oxnard Forebay Groundwater Basins are conditioned by the Saticoy Conditioning Facility, which is located at the intersection of Telephone and Wells Road. The Saticoy Conditioning Facility has a current treatment capacity of 3.5 MGD (2,430 gpm) and is slated for expansion (Existing CIP 97521), which will double the capacity. This facility conditions water from Saticoy Well No. 2 and is anticipated to condition water from the Saticoy County Yard Well. Table VIII-4 contains a summary of the supply capacity to the Saticoy Conditioning Facility. As Table VIII-4 shows, the Saticoy Conditioning Facility is currently under utilized, and has an available capacity of approximately 1,200 gpm.

Table VIII-4
Saticoy Conditioning Facility Supply

Saticoy Supply Sources	Maximum Capacity (gpm)	Maximum Capacity (mgd)
Saticoy 2	1,200	1.73
Saticoy County Yard Well	2,400	3.46
Total Supply (Un-Treated)	**3,600**	**5.18**
Saticoy Max Capacity	**2,430**	**3.50**

C. SUPPLY REDUCTION AND OUTAGE SCENARIOS

The City has expressed interest in improving the reliability of the system supply sources in the event one or more of these supplies is unavailable or the available capacities are reduced due to drought

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conditions. Of particular interest to the City is the ability to transfer water throughout the distribution system from the various supply sources available.

Seven operational scenarios were analyzed to determine the effects on the distribution system when particular supplies are unavailable or the capacities of the supply sources are reduced. Four of the scenarios are "outage" scenarios, which examine the system when specific supply sources are out of service. The remaining three scenarios are "capacity reduction" scenarios, which examine the system when supply sources have reduced capacities due to drought conditions, as described in the 2005 Urban Water Management Plan.

1. Avenue Treatment Plant Out of Service

Water is extracted from the Ventura River using both subsurface wells and a subsurface intake, which deliver the untreated water to the Avenue Treatment Plant. The treatment plant treats the water to meet current drinking water standards, and the treated water is stored within the Power Reservoir. The water is then fed into the 210 Pressure Zone by gravity from the Power Reservoir; from which the water is also transferred to higher hydraulic gradients throughout the distribution system by various pump stations. The Avenue Treatment Plant was recently upgraded (completed in August 2007) and has a current capacity of 10 MGD. The plant was designed to be fully expandable up to 15 MGD.

Although the Avenue Treatment Plant has undergone major renovations, the supply from the Ventura River is susceptible to environmental impacts, which has reduced the supply available to the City. For this reason, an analysis was conducted to examine the impacts on the distribution system if the Avenue Treatment Plant or the Ventura River supply were unavailable. Based on discussions with City staff, a reasonable duration that the City expects to be without this supply is approximately four months. See Exhibit VIII-1 for a schematic representation of the supply sources and distribution system under this condition.

<u>System Impacts</u>

Based on the results of the analysis, it appears that the distribution system would be able to function adequately for an extended duration with the Avenue Treatment Plant out of service. Impacts to the system include:

- Casitas supply increased by approximately 650 AFY, with the Avenue Treatment Plant out of service for a four month duration.

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Recommendations

There are no recommended improvements required to enable the system to operate with the Avenue Treatment Plant out of service.

2. Casitas Turnout No. 2 Transmission Main Out of Service

The Casitas Municipal Water District (Casitas) supplies potable water to the City from Lake Casitas, which is approximately 10 miles northwest of the City. The City signed an agreement with Casitas in 1995, which requires the City to purchase a minimum of 6,000 acre-feet per year (AFY), which is subject to an allocation program during periods of drought. The water from Casitas is delivered to the City and enters the City distribution system through two turnouts, Casitas Turnout No.1 located at the Avenue Treatment Plant and Casitas Turnout No. 2 [redacted]

Casitas Turnout No. 2, via a 24-inch steel transmission main that runs east along Ramona Street, south along Cedar Street, east along Poli Street, and northeast along Hall Canyon Road, connects directly into the Hall Canyon Reservoir which supplies the City distribution system. The 24-inch transmission main is approximately 17,000 feet long and does not have any service connections along its length.

The Casitas supply is considered to be reliable, however the 24-inch transmission main is approximately 50-years old and may be susceptible to failure. In the event the 24-inch transmission main fails, the City will lose the ability to supply the distribution system from Casitas Turnout No. 2, which is one of the City's largest sources of supply. For this reason, an analysis was conducted to examine the impacts on the distribution system if the Casitas No. 2 supply were unavailable for a duration of three days (72-hours). This duration represents the assumption that it would take three days to make emergency repairs to the pipeline and restore service.

Two types of analyses were performed, an analysis that examines the mass flow of supplies within the distribution system and an evaluation utilizing the hydraulic model.

Mass Flow Evaluation

The mass flow evaluation examined the ability of the major facilities to provide supply under a maximum day demand. This analysis was performed to help

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identify which facilities would be required to provide additional flow with the Casitas No. 2 supply unavailable. Exhibit VIII-2 contains the results of this analysis. Based on the results from this evaluation, it appears that the distribution system would be able to function adequately for a duration of 72-hours. Exhibit VIII-2 indicates that the following facilities may be required to provide additional supply or be called into service to meet the maximum day demands.

- Casitas Turnout No. 1
- Golf Course Pump Station
- Victoria Well No. 2
- Mound Well No. 1
- Main and Mills Pressure Reducing Station Fully Activated
- Palma Pressure Reducing Station Fully Activated

Model Evaluation and Observations

The model evaluation specifically examined the hydraulic impacts within the 210 Pressure Zone and its facilities including; the Hall Canyon Reservoir Site and the suction pressures at pump stations that take suction from the 210 Pressure Zone. These facilities were examined due to the fact that the Casitas No. 2 Turnout feeds the Hall Canyon Reservoirs directly. The following assumptions and initial settings were used in the model evaluation:

- Maximum Day Demands repeated for a duration of 72-hours
- Casitas Turnout No. 2 Off
- Casitas Turnout No. 1 Capacity Increased
- Hall Canyon Reservoir Levels at 80% Full (12-ft of water)
- Power Reservoir Level at 70% Full (11-ft of water)

Based on the results from the hydraulic model, the following observations were made:

- The average pressure within the 210 Pressure Zone decreased by approximately 10 psi with the Casitas Turnout No. 2 supply unavailable.

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- Suction pressures at the Hall Canyon, Foothill, and 330 Pump Stations were observed to be approximately 3 psi. With the Casitas No. 2 supply available, pressures are typically 7 psi.
- The Seaward and Poli Pump Station did not experience a significant pressure drop on the suction side of the station.
- The Five Points Pump Station did not experience a significant pressure drop on the suction side of the station.
- The Hall Canyon Reservoir levels dropped to a level of approximately 3.75 ft at the end of the 72-hour simulation.
- The Main and Mills and Palma Pressure Reducing Stations are required to provide a combined flow of approximately 1,100 gpm.

Conclusions and Recommendations

Based on the results of both the mass flow analysis and the hydraulic evaluation, the distribution would be able to function for a duration of 72-hours without the Casitas Turnout No. 2 supply. However, the system would experience lower pressures throughout the 210 Pressure Zone, and the Hall Canyon Reservoir level would drop to a level of approximately 4 feet at the end of the third day. It is recommended that the City perform a thorough inspection of the 24-inch transmission main to assess its current condition.

3. Victoria Well No. 2 and Mound Well No.1 Transmission Main Out of Service

The Victoria Well No. 2 and Mound Well No. 1 supply untreated groundwater derived from the Mound Groundwater Basin to the nearby Bailey Conditioning Facility, where the water is conditioned and then blended with water from the Oxnard Plain Groundwater Basin. The water from both wells is pumped through 1,300 feet of 30-inch transmission main that runs in Webster Street before transitioning to a 24-inch ductile iron main that runs north in Hill Road for approximately 3,700 feet where it then terminates at the Bailey Conditioning Facility.

The Victoria Well No. 2 and Mound Well No. 1 are both reliable sources of supply, but they produce highly mineralized water. However, in the event the transmission main fails, the City will lose the ability to supply the Bailey Conditioning Facility from these wells, which is one of the City's larger sources of supply. For this reason, an analysis was conducted to examine the impacts on the distribution system if the supply from the Victoria Well No. 2 and Mound Well No. 1 were unavailable for a duration of three days (72-hours). This duration represents

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the assumption that it would take three days to make emergency repairs to the pipeline and restore service.

Two types of analyses were performed, an analysis that examines the mass flow of supplies within the distribution system and an evaluation utilizing the hydraulic model.

Mass Flow Evaluation

The mass flow evaluation examined the ability of the major facilities to provide supply under a maximum day demand. This analysis was performed to help identify which facilities would be required to provide additional flow if the groundwater supply from the Victoria and Mound wells were unavailable. Exhibit VIII-3 contains the results of this analysis. Based on the results from this evaluation, it appears that the distribution system would be able to function adequately for a duration of 72-hours. Exhibit VIII-3 indicates that the following facilities may be required to provide additional supply to meet the maximum day demands.

- Casitas Turnout No. 2
- Golf Course Pump Station
- Seaward and Poli Pump Station

Model Evaluation and Observations

The model evaluation specifically examined the hydraulic impacts within the 330 Pressure Zone and its facilities including the Bailey Reservoir and Bailey Pump Station. These facilities were examined due to the fact that the Victoria and Mound wells feed the Bailey Reservoir. The following assumptions and initial settings were used in the model evaluation:

- Maximum Day Demands repeated for a duration of 72-hours
- The Main & Mills, Palma, Petit, and Telegraph and Mills Upper PRV were turned off
- Bailey Reservoir Levels at 75% Full (10.5-ft of water)
- Power Reservoir Level at 70% Full (11-ft of water)

Based on the results from the hydraulic model, the following observations were made at the end of the model run:

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- The Power Reservoir level drops to 7.4 ft (45 % full)
- The Bailey Reservoir level drops to 1.4 ft (10 % full)
- Suction pressures at the Bailey Pump Station site drop approximately four psi over the 72-hour duration

Conclusions and Recommendations

Based on the results of both the mass flow analysis and the hydraulic evaluation, the distribution would be able to function for a duration of 72-hours without the Mound and Victoria wells. However, the Bailey Reservoir level will drop to a level of approximately 1.4 feet, which may impact the Bailey Pump Station capacity, as well as the pressures within the 330 Pressure Zone.

4. Golf Course Pump Station Transmission Main Out of Service

The Golf Course Well No. 5 and Golf Course Well No. 6 pump untreated groundwater from the Oxnard Groundwater Basin to the nearby Golf Course Reservoir. The Golf Course Pump Station then pumps the untreated groundwater from this reservoir to the Bailey Conditioning Facility. The water from the Oxnard Plain Groundwater Basin does not go through the conditioning process at the Bailey Conditioning Facility, but is disinfected and blended in the Bailey Reservoir with water from the Mound and Victoria wells. The transmission main, which runs within Golf Course Drive, Victoria Avenue, Woodland Street and Hill Road, consists of concrete cylinder pipe, cast iron pipe and ductile iron pipe ranging in diameters from 18-inches to 24-inches. The transmission main also crosses both the 101 Freeway as well as the 126 Freeway. The transmission main is approximately 17,000 feet long and does not have any services connect along its length.

The Golf Course supply is considered to be a reliable supply, however many portions of the transmission main are constructed of concrete cylinder pipe and are approximately 50-years old and may be susceptible to failure. In the event the transmission main fails, the City will lose the ability to supply the 330 Pressure Zone from these facilities. For this reason, an analysis was conducted to examine the impacts on the distribution system if the supply from the Golf Course wells were unavailable for a duration of three days (72-hours). This duration represents the assumption that it would take three days to make emergency repairs to the pipeline and restore service.

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Two types of analyses were performed, an analysis that examines the mass flow of supplies within the distribution system and an evaluation utilizing the hydraulic model.

Mass Flow Evaluation

The mass flow evaluation examined the ability of the major facilities to provide supply under a maximum day demand. This analysis was performed to help identify which facilities would be required to provide additional flow with the groundwater supply from the Golf Course wells unavailable. Exhibit VIII-4 contains the results of this analysis. Based on the results from this evaluation, it appears that the distribution system would be able to function adequately for a duration of 72-hours. Exhibit VIII-4 indicates that the following facilities may be required to provide additional supply to meet the maximum day demands.

- Casitas Turnout No. 2
- Victoria Well No. 2
- Mound Well No.1
- 330 Pump Station

Model Evaluation and Observations

The model evaluation specifically examined the hydraulic impacts within the 330 Pressure Zone and its facilities including the Bailey Reservoir and Bailey Pump Station. These facilities were examined due to the fact that the Golf Course wells feed the Bailey Reservoir. The following assumptions and initial settings were used in the model evaluation:

- Maximum Day Demands repeated for a duration of 72-hours
- The Main & Mills, Palma, Petit, and Telegraph and Mills Upper PRV were turned off
- Bailey Reservoir Levels at 75% Full (10.5-ft of water)
- Power Reservoir Level at 70% Full (11-ft of water)

Based on the results from the hydraulic model, the following observations were made:

- The Power Reservoir level drops to 7.3 ft (44 % full)
- The Bailey Reservoir level drops to 1.4 ft (10 % full)

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- Suction pressures at the Bailey Pump Station site drop approximately four psi over the 72-hour duration

Conclusions and Recommendations

Based on the results of both the mass flow analysis and the hydraulic evaluation, the distribution would be able to function for a duration of 72-hours without the Golf Course wells. However, the Bailey Reservoir level will drop to a level of approximately 1.4 feet, which may impact the Bailey Pump Station capacity, as well as the pressures within the 330 Pressure Zone.

5. Casitas Supply Reduced to Stage 5 Drought Conditions

The Casitas Municipal Water District (Casitas) supplies potable water to the City from Lake Casitas, which is approximately 10 miles northwest of the City. The water from Casitas is delivered to the City and enters the City distribution system through two turnouts, Casitas Turnout No. 1 located at the Avenue Treatment Plant and Casitas Turnout No. 2 located at the intersection of Olive and Ramona Streets. The City signed an agreement with Casitas in 1995, which requires the City to purchase a minimum of 6,000 acre-feet per year (AFY), which is subject to an allocation program during periods of drought.

The drought allocation program was established by Casitas in 1992, and has a total of five stages, with Stage 1 corresponding with a wet or average year and Stage 5 corresponding with extremely dry conditions. This analysis examines the effects on the distribution system if the City were to enter a Stage 5 drought condition, which is initiated when the levels in Lake Casitas drop below 65,000 AF. Under Stage 5 conditions, Casitas would be required to deliver 4,960 AFY (3,075 gpm) to the City.

This analysis was performed to identify the significant impacts on the City's facilities during a Stage 5 drought condition. Two evaluations were performed, an analysis that examines the mass flow of supplies within the distribution system and an evaluation utilizing the hydraulic model.

Mass Flow Evaluation

The mass flow evaluation examined the ability of the major facilities to provide supply under a maximum day demand. This analysis was performed to help identify which facilities would be required to provide additional flow with the

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Casitas supply reduced to Stage 5 drought conditions. Exhibit VIII-5 contains the results of this analysis. Based on the results from this evaluation, it appears that the distribution system would be able to function adequately. Exhibit VIII-5 indicates that the following facilities may be required to provide additional supply to meet the maximum day demands.

- Golf Course Pump Station
- Victoria Well No. 2
- Mound Well No.1
- Bailey Pump Station
- Main and Mills Pressure Reducing Station Activated
- Palma Pressure Reducing Station Activated
- New Pressure Reducing Facility located at Hall Canyon Reservoir Site Activated

Model Evaluation and Observations

Due to the fact that there is a significant Capital Improvement Project that may impact this analysis (CIP 97895 as identified by the City in the 2008-2013 CIP Plan), the model evaluation examined a condition without CIP 97895 and with CIP 97895. CIP 97895 consists of approximately 8,400 linear feet of 18-inch pipe that will connect to the existing 18-inch 330 zone transmission main located in Main and Callens and extend it to the 30-inch distribution main located in Telephone and Victoria.

The model evaluation specifically examined the hydraulic impacts within the 210 and 330 Pressure Zones and those facilities within these pressure zones including the Power Reservoir, Hall Canyon Reservoir, Bailey Reservoir, Bailey Pump Station and the Mariano Pump Station. The following assumptions and initial settings were used in the model evaluation without CIP 97895 in place:

- Maximum Day Demands repeated for a duration of 24-hours
- The Capacity at Casitas Turnout No. 1 was reduced to 860 gpm
- The Capacity at Casitas Turnout No. 2 was reduced to 2,214 gpm
- Bailey Reservoir Levels at 75% Full (10.5-ft of water)
- Power Reservoir Level at 70% Full (11-ft of water)
- Hall Canyon Reservoir Levels at 80 % Full (12-ft of water)

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Based on the results from the hydraulic model, the following observations were made:

- The Power Reservoir level drops to 8.5 ft (52% full)
- The Hall Canyon Reservoir level appears to recover
- The Bailey Reservoir level appears to recover
- The Telegraph and Mills Pressure Reducing Station supplies an average of 635 gpm and a maximum flow of 2,200 gpm
- The Main and Mills Pressure Reducing Station supplies 380 gpm at the peak hour
- The Palma PRV supplies an average of 640 gpm and a maximum flow of 1,130 gpm

The following assumptions and settings were used in the model evaluation with CIP 97895 in place as well as the new PRV located at the Hall Canyon site in place:

- Maximum Day Demands repeated for a duration of 24-hours
- The Capacity at Casitas Turnout No. 1 was increased to 2,200 gpm
- The Capacity at Casitas Turnout No. 2 was reduced to 370 gpm
- Bailey Reservoir Levels at 75% Full (10.5-ft of water)
- Power Reservoir Level at 70% Full (11-ft of water)
- Hall Canyon Reservoir Levels at 80% Full (12-ft of water)
- New Pressure Reducing Facility allowed to flow 2,500 gpm

Based on the results from the hydraulic model, the following observations were made:

- The Hall Canyon Reservoir level appears to recover
- The Power Reservoir level appears to recover
- The Bailey Reservoir level drops to 8.5 ft (61 % full)
- Mariano and McElrea suction pressures drop to 11.5 psi
- New 18-inch pipe (CIP 97895) flows average of 2,280 gpm, maximum flow of 2,800 gpm

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Conclusions and Recommendations

Based on the results of both the mass flow analysis and the hydraulic evaluations, the distribution system would be able to function during Stage 5 drought conditions. It is recommended that the City construct the 18-inch pipe line (CIP 97895) as well as a flow control facility or pressure reducing facility capable of moving water from the 330 Pressure Zone to the 210 Pressure Zone. A hydraulic analysis of the 330 Pump Station should be conducted to evaluate the impact of the construction of the 18-inch pipeline (CIP 97895) on the total dynamic head at this pump station.

6. Groundwater Supply Reduced to Stage 5 Drought Conditions

The City draws water from three groundwater basins, the Mound, Oxnard Plain, and Santa Paula Groundwater Basins. Water from the Mound Groundwater Basin is conditioned at the Bailey Conditioning Facility. Water from the Oxnard Plain Groundwater Basin is disinfected and then blended with the discharge water from the Bailey Conditioning Facility. Water from the Santa Paula Basin is conditioned at the Saticoy Conditioning Facility and then pumped directly into the 430 Pressure Zone. As indicated in Chapter V, the Saticoy County Yard Well supply is unknown at this time.

It is assumed that all groundwater basins will be affected equally during drought conditions. Per the 2005 Urban Water Management Plan, the Mound Groundwater Basin is expected to yield a minimum of 8,000 AFY (4,960 gpm) during drought conditions. The Oxnard Plain Groundwater Basin, managed by the Fox Canyon Groundwater Management Agency (GMA), has set restrictions on future extractions from the basin. By the year 2010, the City must reduce its extractions to 4,094 AFY (2,538 gpm); therefore an extraction flow of 4,094 AFY was used for this analysis. The City is allowed to pump an average of 3,000 AFY (1,860 gpm) from the Santa Paula Basin, and is able to use up to an additional 3,000 AFY (1,860 gpm) in an emergency resulting from a long-term drought condition. However, for the purposes of this analysis, the Santa Paula Basin yield is assumed to be 3,000 AFY (1,860 gpm).

This analysis was performed to identify the significant impacts on the City's facilities during a drought condition that would reduce the groundwater supplies.

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See Exhibit VIII-6 for a schematic representation of the supply sources and distribution system under this drought condition.

System Impacts

Based on the results of the analysis, it appears that the distribution system would be able to function adequately for an extended duration with the groundwater supplies reduced. Impacts to the system include:

- Casitas Supply Increased

Based on an emergency resulting from a long-term drought, it should be noted that the increase of supply is limited by Municipal Water Code Section 71611 ("within the district for use within the district"), which is that deliveries are not to exceed the City's in-district demand.

Recommendations

It is recommended that the City construct additional wells within the Santa Paula Groundwater Basin to fully utilize its capacity. This groundwater basin has a minimum capacity of 3,000 AFY (1,860 gpm) available during periods of drought and has an additional capacity of 3,000 AFY (1,860 gpm) in the event of an emergency resulting from a long-term drought situation. Currently, the City has one existing well (Saticoy Well No. 2) that withdraws water from the Santa Paula Basin at approximately 1,940 AFY (1,200 gpm). The City plans to construct an additional well, CIP 97899 Saticoy Well No. 3. The Saticoy Well No. 3 project will include a new well with an anticipated maximum capacity of 2,500 gpm (approximately 4,000 AFY). In order for the City to utilize the additional well capacity, the City must expand the existing Saticoy Conditioning Facility. The City has identified the expansion of the Saticoy Conditioning Facility in the Current CIP (CIP 97521 – Saticoy Conditioning Facility Renovation), and it is recommended that the City proceed with the project.

Although the Mound Groundwater Basin has two wells that are capable of providing the maximum allowable extraction during periods of drought (8,000 AFY/4,960 gpm), additional wells in this basin would aid the City in the event one of the two existing wells was under repair or out of service. The City has identified one project in the 2008-2013 CIP Plan, CIP 97907 – Mound Well No. 2,

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that will provide reliability for the Mound Groundwater Basin supply. The project plans for a new well with an anticipated capacity of 2,500 gpm. It is recommended that the City proceed with the project.

Although the Oxnard Plain Groundwater Basin has two wells that are each capable of providing the maximum allowable extraction during periods of drought (4,094 AFY/2,538 gpm), the City should consider adding one additional well in this groundwater basin to provide redundant supply from this basin in the event one of the two existing wells is out of service. The 2008-2013 CIP plans for a project, CIP 97908 – Golf Course Well No. 7, that will include a new well with an anticipated capacity of 2,500 gpm. It is recommended that the City proceed with the project.

7. Long Term Drought Conditions with Both Casitas and Groundwater Reductions

The effects of a long-term drought that would reduce the supply from both Casitas delivered water and the four groundwater basins were examined. As previously mentioned, Casitas established a drought allocation program in 1992 which has a total of five stages, with Stage 1 corresponding with a wet or average year and Stage 5 corresponding with extremely dry conditions. This analysis examines the effects on the distribution system if the City were to enter a Stage 5 drought condition. Under Stage 5 conditions, Casitas could allocate up to 4,960 AFY (3,075 gpm) to the City, which would be balanced by the City's in-district water demand. The groundwater supply is derived from three different groundwater basins; the Mound, Oxnard Plain, and Santa Paula. As previously discussed, each groundwater basin will experience extraction reductions based on information provided in the 2005 Urban Water Management Plan. The Mound Groundwater Basin will be capable of supplying 8,000 AFY (4,960 gpm), the Oxnard Plain Groundwater Basin will supply 4,094 AFY (2,538 gpm), and the Santa Paula Groundwater Basin which will yield 3,000 AFY (1,860 gpm) during drought conditions.

See Exhibit VIII-7 for a schematic representation of the supply sources and distribution system under this condition.

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System Impacts

Based on the results of the analysis, it appears that the distribution system will not be able to function adequately with Casitas and groundwater supply reductions. Impacts to the system include:

- Lack of adequate supply (deficient 3,484 gpm) under maximum day demand conditions

Recommendations

Many projects have been previously identified that will provide the City with increased supply reliability. Of the projects previously identified, it is recommended to prioritize CIP 97899 so that the City will have access to the additional 3,000 AFY in the Santa Paula Groundwater basin that they are entitled to as soon as possible. Similarly, the City must expand the capacity of the Saticoy Conditioning Facility in order to fully utilize the groundwater supply from the basin.

D. CONCLUSIONS AND RECOMMENDATIONS

The water supply analysis concluded that the City will need additional facilities to provide reliability and redundancy for the distribution system when particular facilities or their associated supply source is unavailable and/or reduced. Many projects currently planned by the City will provide for the additional supply capacity. It is recommended that the City implement the following projects to help improve supply reliability in the future.

- It is recommended that the City perform a thorough inspection of the 24-inch transmission main downstream of the Casitas No. 2 turnout to assess the current condition of the pipeline.

- It is recommended that the City construct the 18-inch pipeline (CIP 97895) to move water west to east and visa versa during drought or supply deficit conditions.

- Construct a flow control facility/pressure reducing facility at the site of Hall Canyon/330/Foothill Booster Pump Stations, capable of moving 2,500-gpm of water from the 330 Pressure Zone to the 210 Pressure Zone.

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- Proceed with plans to construct Saticoy Well No. 3 with a maximum capacity of 2,500 gpm (CIP 97899).
- Proceed with the expansion of the Saticoy Conditioning Facility (CIP 97521).
- Proceed with plans to construct Mound Well No. 2, with a capacity of 2,500 gpm. (CIP 97907).
- Proceed with plans to construct Golf Course Well No. 7, with a capacity of 2,500 gpm (CIP 97908).

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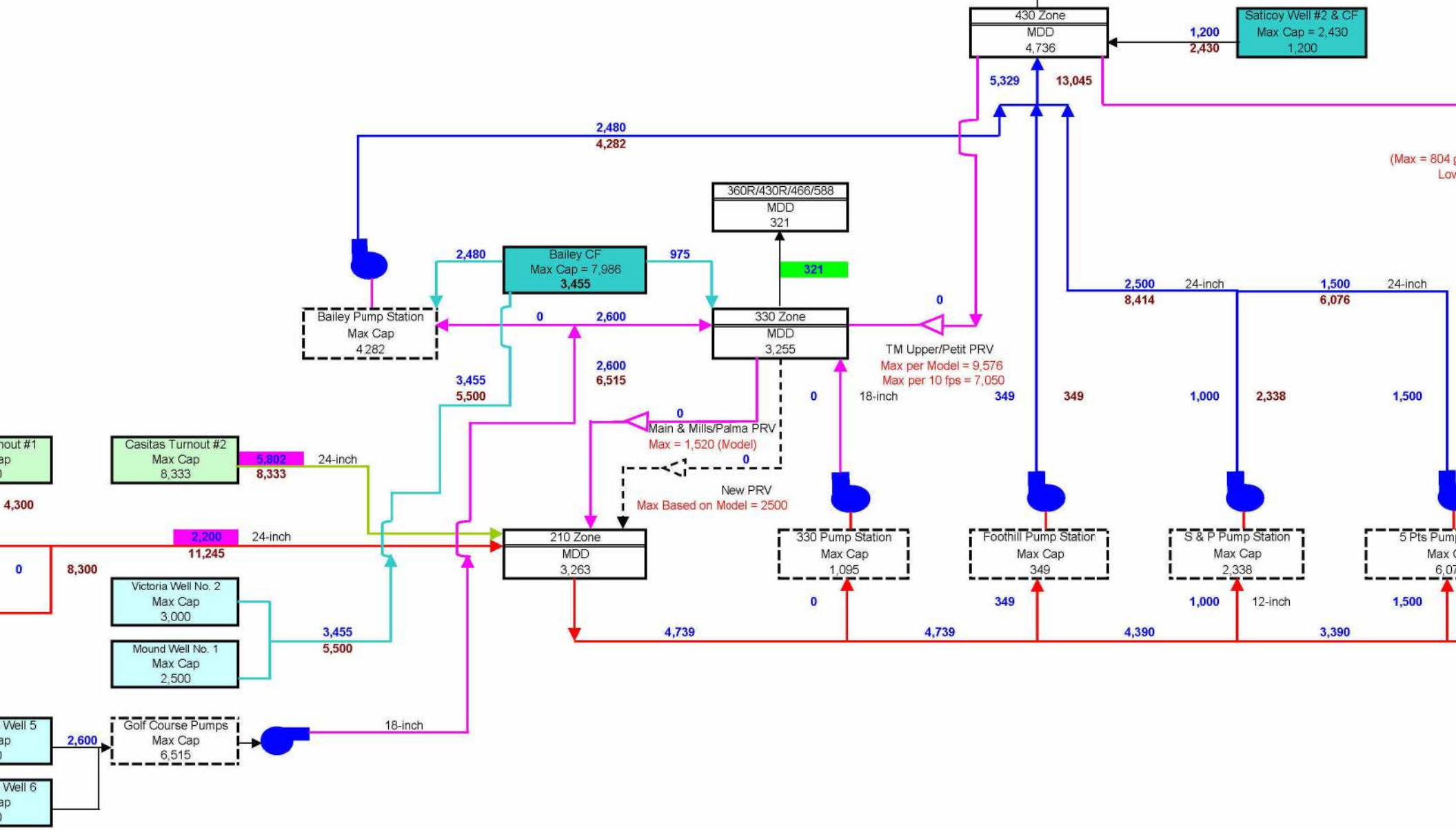

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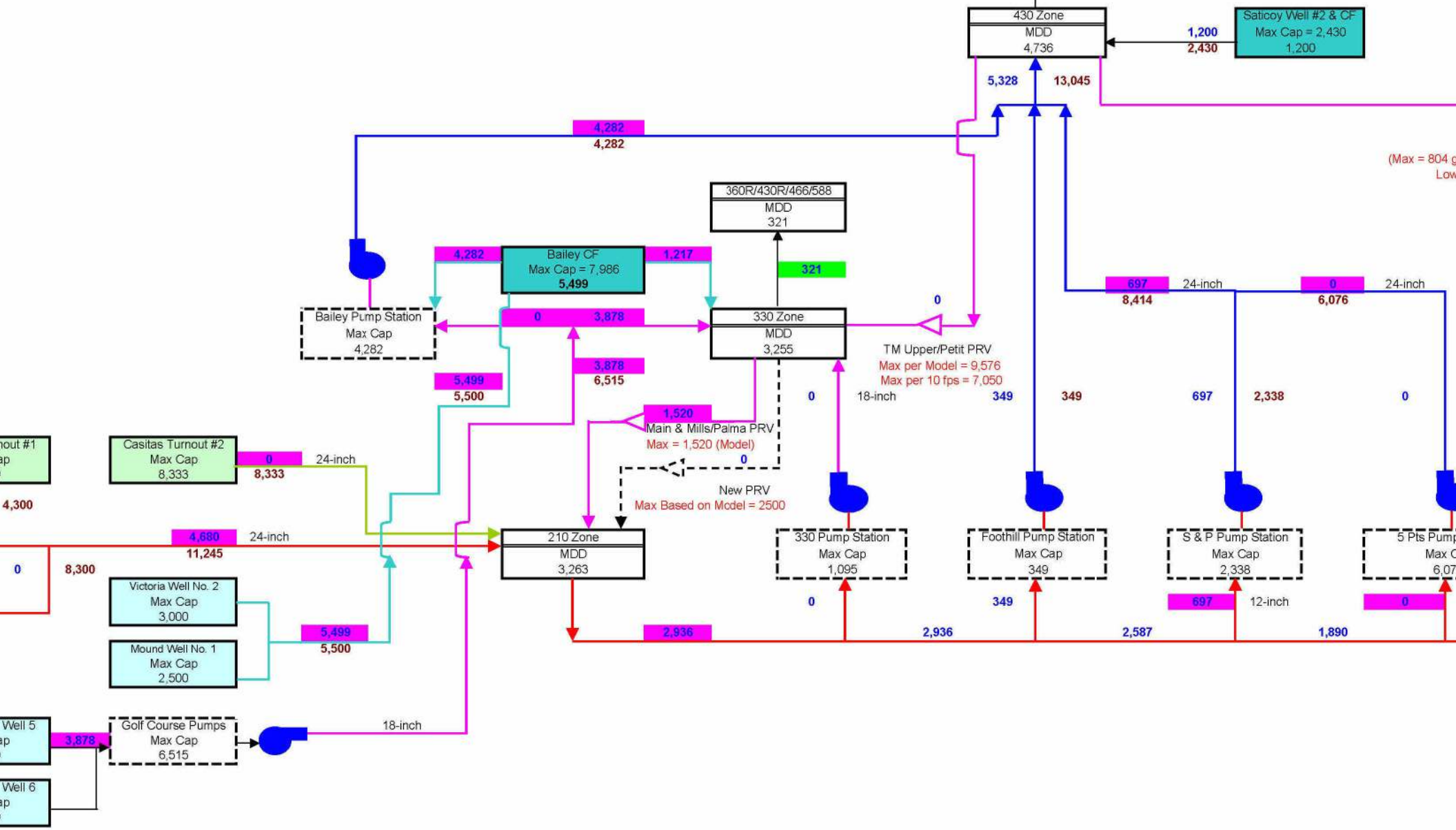

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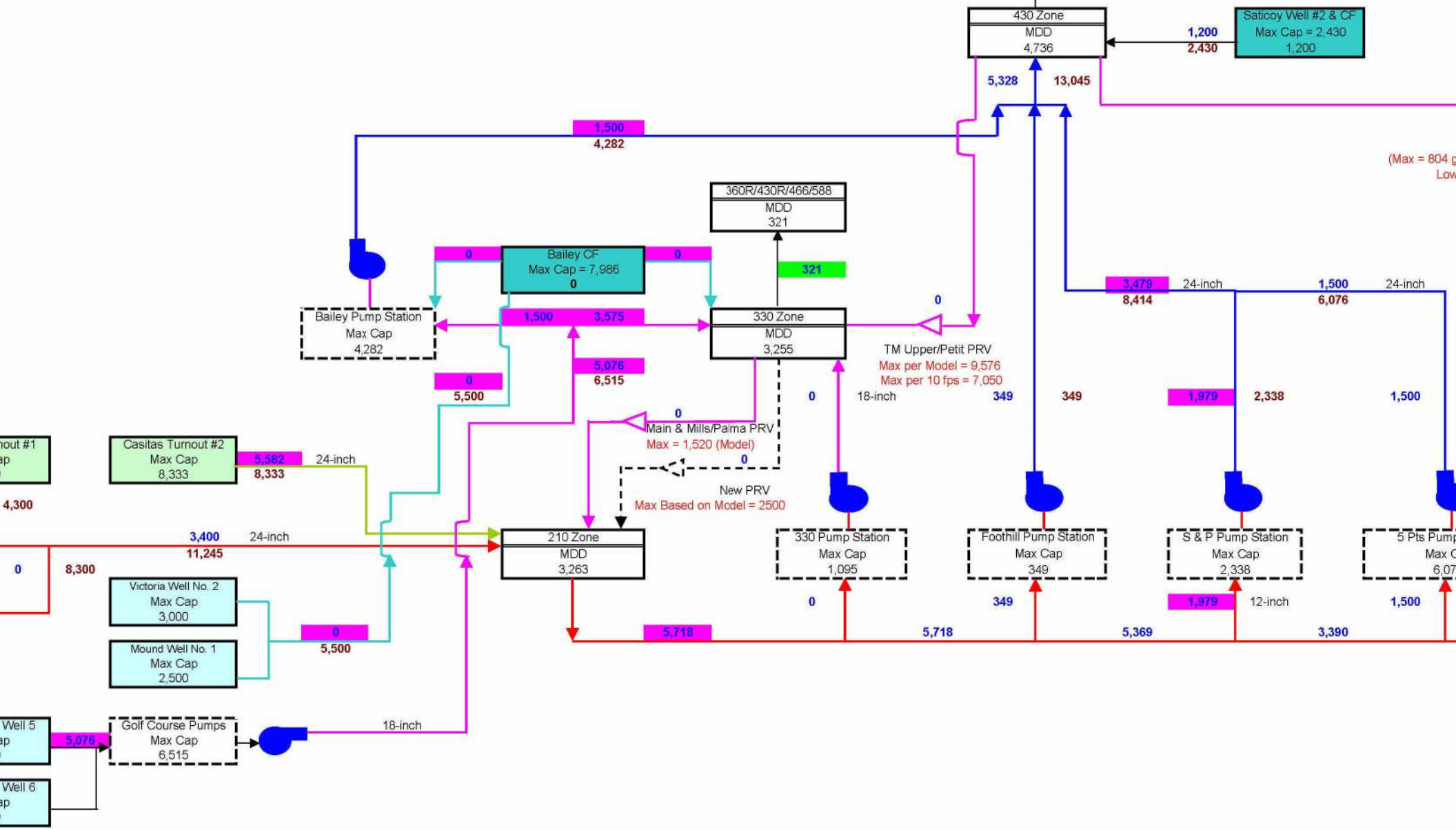

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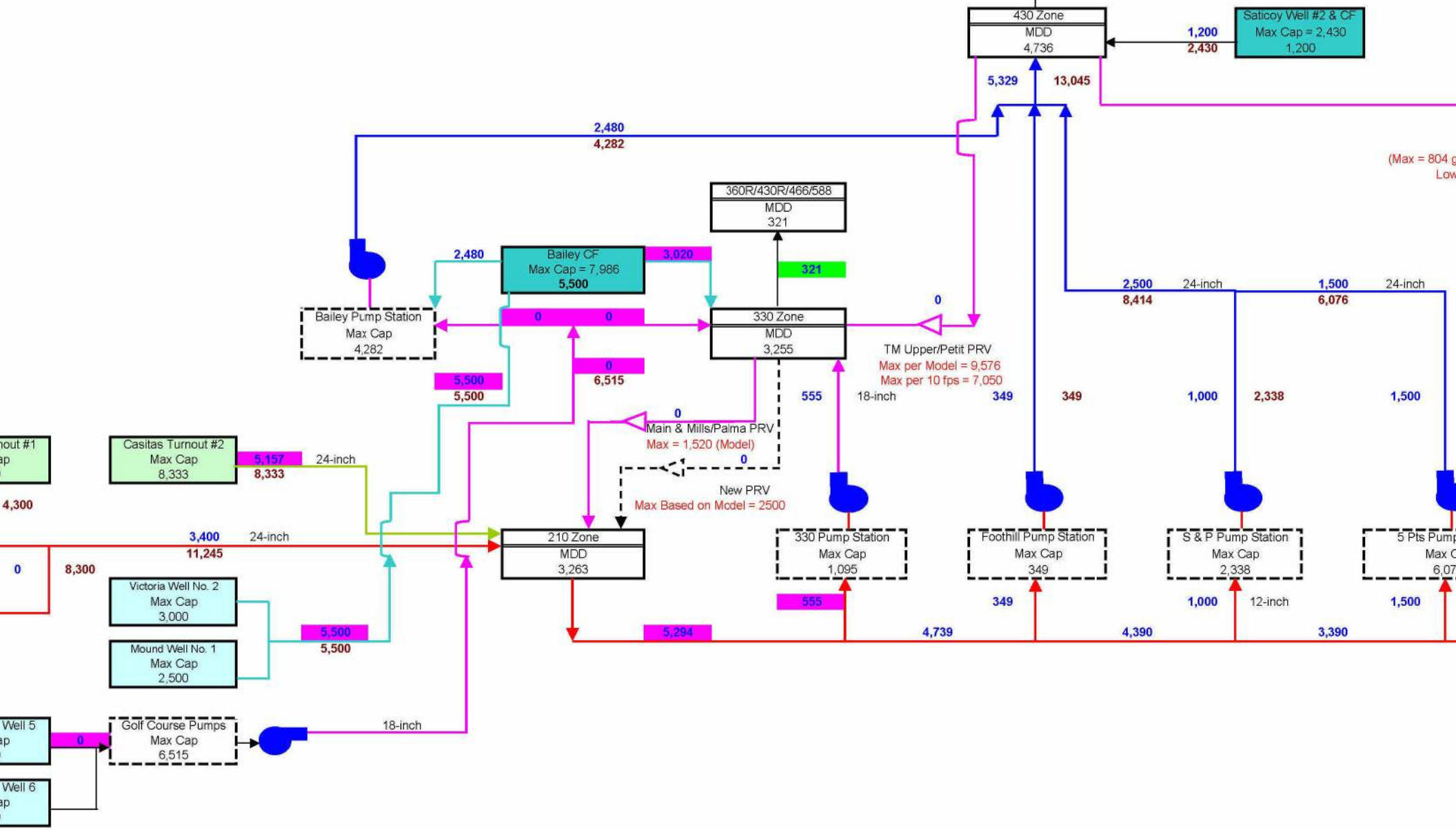

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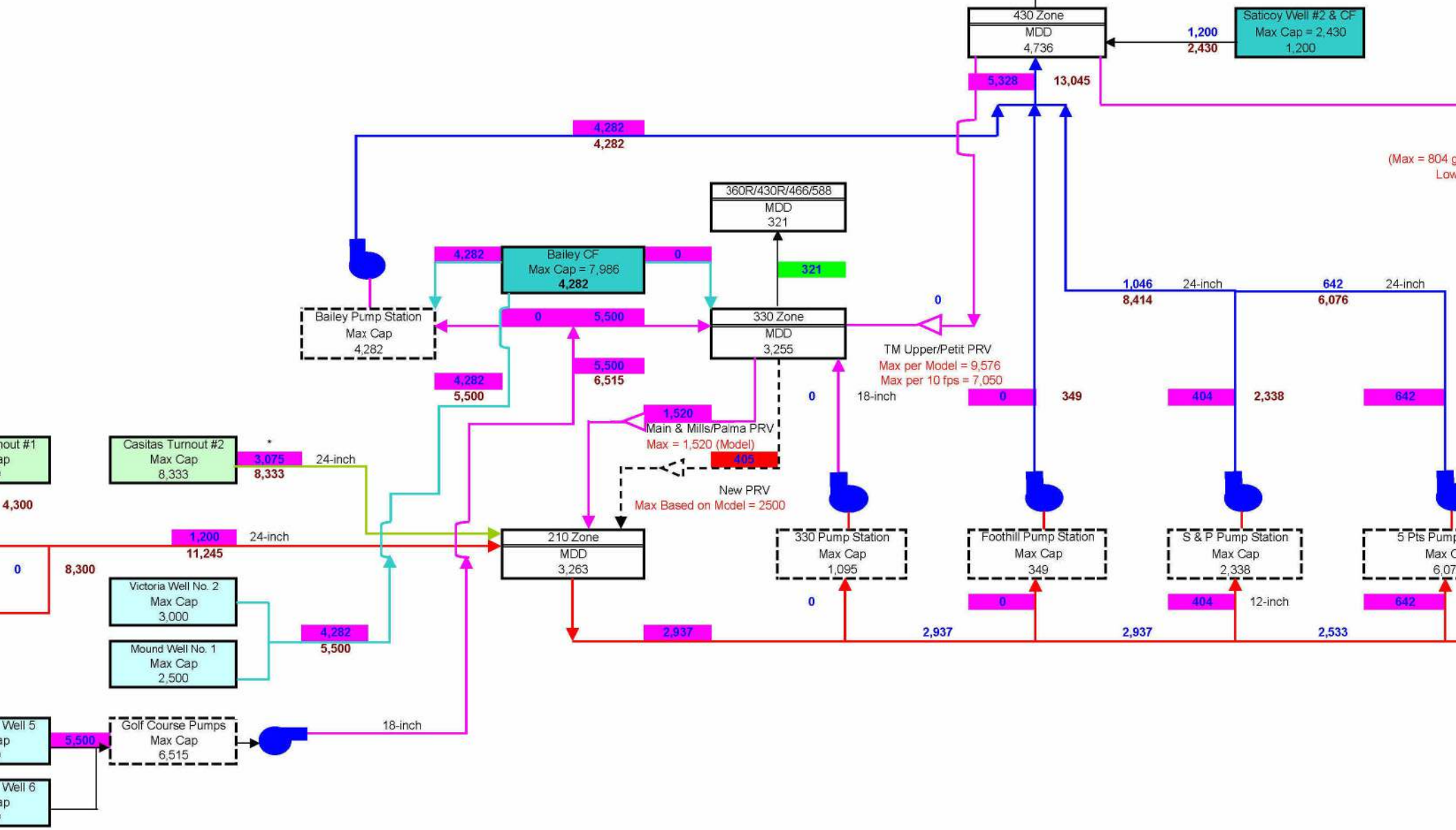
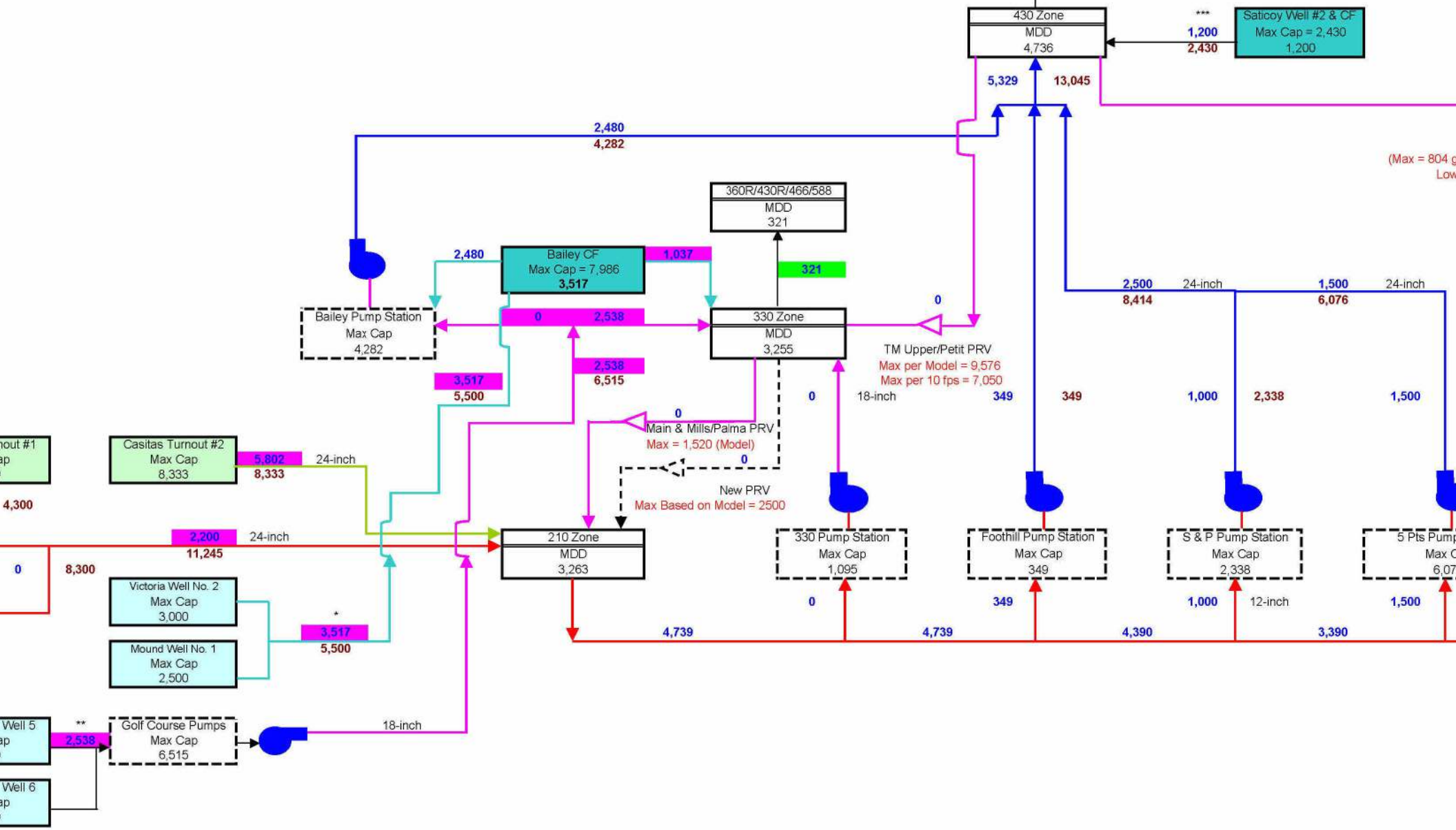


strict during Stage 5 drought conditions is limited to 4,960 AFY (3,075 gpm) per 2005 Urban Water Management Plan.

PREPARED BY:

CITY OF SAN BUEN



(Max = 804 gpm) during drought conditions per 2005 Urban Water Management Plan.

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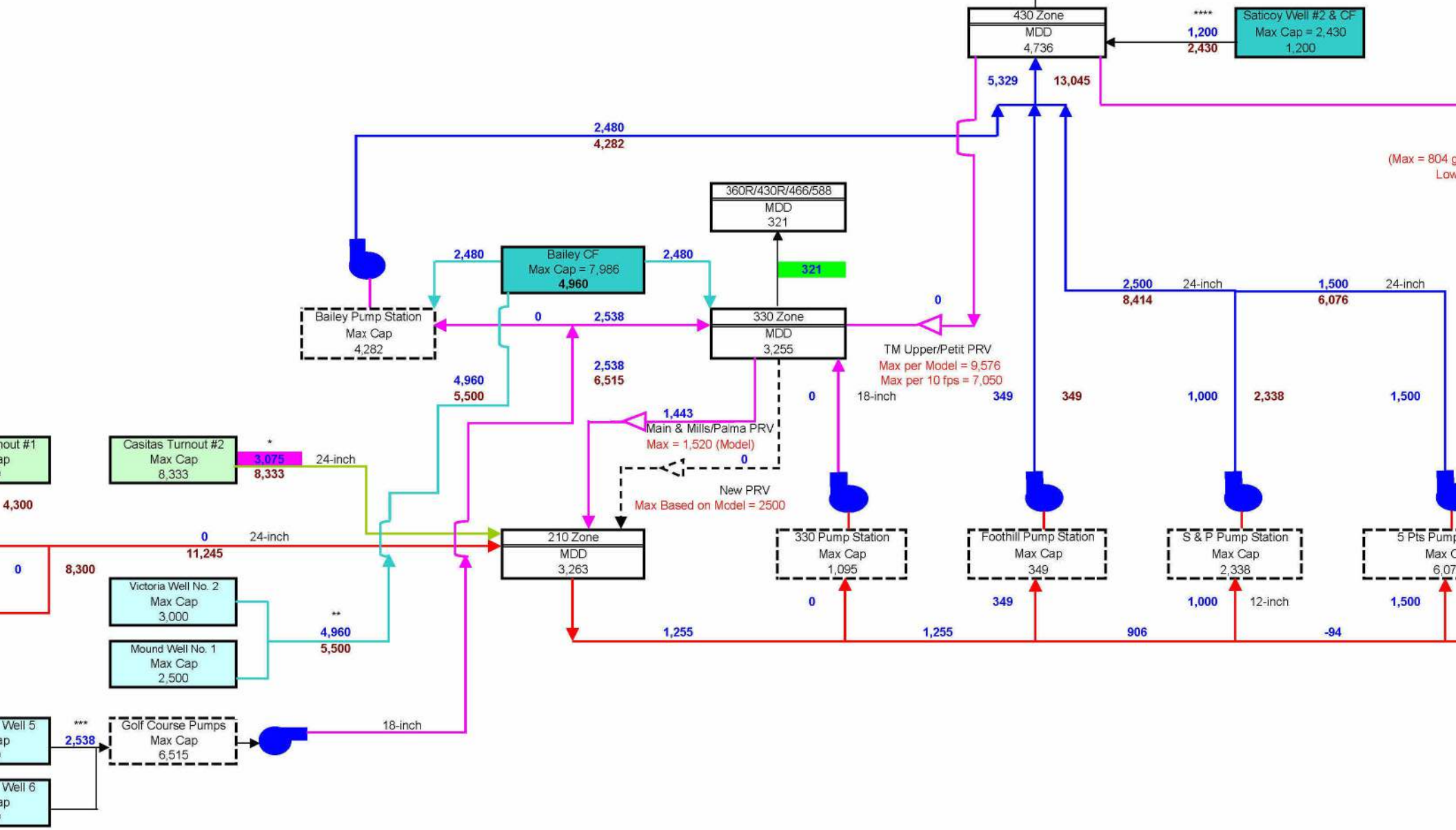

strict during Stage 5 drought conditions is limited to 4,960 AFY (3,075 gpm) per 2005 Urban Water Management Plan.

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IX. PUMP STATION ANALYSIS

A. INTRODUCTION

Pump stations are located throughout the City's distribution system in order to provide adequately pressurized water to the City's customers and to fill the reservoirs and tanks located at higher gradients.

This section will evaluate the following three items in regards to the existing pump stations and existing operations:

- Pumping Capacity with Existing Demands
- Pumping Capacity with Near Term Demands
- Energy Usage

B. EXISTING CAPACITY EVALUATION

The City has a total of twenty-one (21) existing pump stations. The pump stations were evaluated to determine if the existing capacity is adequate to pump the existing maximum day demand of the pressure zone(s) with the largest pumping unit out-of-service. The results of the analysis are shown on Table IX-1.

VEN0006103

Table IX-1
Pump Station Capacity Evaluation – Existing Demands

Pressure Zone	Pumping Stations within Zone	Number of Pumps	Nominal Pumping Capacity[1] (gpm)	Maximum Day Demand	Adequacy (Capacity > Demand)
210	Power	2	8,300	3,263	Adequate
260	Modella	3	1,400	770	Adequate
	Hall Canyon	2	791		
330	330	3	1,095	3,255	Adequate
	Golf Course	4	6,515		
400	Valley Vista	3	960	1,086	-126
	Gosnell	[2]	[2]		
430	Foothill	2	349	4,736	Adequate
	Seaward and Poli	3	2,338		
	Five Points	4	6,076		
	Bailey	3	4,282		
466 and 360R	Mariano	2	827	233	Adequate
535	Elizabeth	3	2,389	800	Adequate
	Kimball	3	2,323		
588 and 430R	McElrea	2	306	87	Adequate
605K	Kalorama	2	437	34	Adequate
605V & 605W	View Park	2	751	351	Adequate
	Day Road	3	1,125		
860 and 660R	Willis	2	533	554	Adequate
	Ondulando	2	752		
1035	Nob Hill	2	460	87	Adequate
Total	-	-	**42,009**	**15,257**	-

[1] Nominal capacity determined from 2006 Southern California Edison Test data with largest pumping unit out-of-service.
[2] Gosnell pump station currently out-of-service.

The pump station capacity evaluation revealed that the Valley Vista Pump Station, with the largest pump out-of-service, does not have sufficient capacity to meet the existing maximum day demands of the 400 Pressure Zone. If this pump station is out-of-service, the 400 Pressure Zone does not have a redundant pumping supply.

Most pump stations are relied upon not only to meet the demands of its own pressure zone, but also to move water to the higher gradients (pump-through water). Each pump station was also analyzed to determine if it had adequate capacity to provide water to the upper hydraulic gradients. Table IX-2 contains the results of this analysis.

VEN0006104

Table IX-2
Pump Station Capacity Evaluation (Pump-Through) – Existing Demands

Pump Station	Excess Capacity (gpm) [2]	Upper Gradient Pressure Zones	Upper Gradient Demand (gpm)	Adequacy	Notes
Nob Hill	-	-	-	Adequate	
Willis	731	1035	87	Adequate	
Ondulando					
View Park	5,437	660R, 860, 1035	641	Adequate	
Day Road					
Elizabeth					
Kimball					
Foothill	8,309	535, 605, 660R, 860, 1035	1,792	Adequate	
Seaward and Poli					
Five Points					
Bailey					
330	4,355	360R, 430, 430R, 466, 535, 588, 605, 660R, 860, 1035	6,849	-2,494	[1]
Golf Course					
Modella	1,421	605K	34	Adequate	
Hall Canyon					
Mariano	594	430R, 588	87	Adequate	
McElrea	-	-	-	Adequate	
Kalorama	-	-	-	Adequate	
Valley Vista	-	-	-	-126	

[1] Saticoy Conditioning Facility, Mound Well No. 1 and Victoria Well No. 2 provide a supply of approximately 6,700 gpm to assist these zones.
[2] Excess capacity is determined by subtracting the "Maximum Day Demand" from the "Nominal Pumping Capacity" in Table IX-1.

Table IX-2 groups the pump stations together based on the upper gradients to which they pump, and lists the excess capacity of the pump station, or combination of pump stations, after the deduction of the in-zone demands. The upper gradient demand is the total maximum day demand of the upper pressure zones that rely on the lower pressure zone pump station supply (also known as the "pump-through" demand).

Adequacy is determined if the pump station, or combination of pump stations, have enough excess capacity to meet or exceed the upper gradient maximum day demands.

Based on the results shown in Table IX-2, there are three pump stations that are identified as deficient; the 330 Pump Station, Golf Course Pump Station and the Valley Vista Pump Station. However, the pressure zones supplied by the 330 Pump Station and Golf Course

VEN0006105

Pump Station are also supplied by the Saticoy Conditioning Facility, Mound Well No. 1 and Victoria Well No. 2, which have adequate supply to meet the maximum day demands of these pressures zones. However, the Valley Vista Pump Station is deficient by 126 gpm under the existing maximum day demands.

C. NEAR-TERM CAPACITY EVALUATION

The pump stations were also evaluated to determine if the existing pumping capacity is adequate to pump near-term demands. The criteria established for this analysis is such that each pump station must meet the projected near-term maximum day demand of the pressure zone(s) with the largest pumping unit out-of-service. The results of the analysis are shown on Table IX-3.

Table IX-3
Pump Station Capacity Evaluation – Near-Term Demands

Pressure Zone	Pumping Stations within Zone	Number of Pumps	Nominal Pumping Capacity[1] (gpm)	Near Term Maximum Day Demand (gpm)	Adequacy (Capacity > Demand)
210	Power	2	8,300	3,479	Adequate
260	Modella	3	1,400	774	Adequate
	Hall Canyon	2	791		
330	330	3	1,095	3,882	Adequate
	Golf Course	4	6,515		
400	Valley Vista	3	960	1,157	-197
430	Foothill	2	349	5,354	Adequate
	Seaward and Poli	3	2,338		
	Five Points	4	6,076		
	Bailey	3	4,282		
466 and 360R	Mariano	2	827	237	Adequate
535	Elizabeth	3	2,389	856	Adequate
	Kimball	3	2,323		
588 and 430R	McElrea	2	306	87	Adequate
605K	Kalorama	2	437	34	Adequate
605	View Park	2	751	358	Adequate
	Day Road	3	1,125		
860 and 660R	Willis	2	533	559	Adequate
	Ondulando	2	752		
1035	Nob Hill	2	460	87	Adequate
TOTAL	-	-	**42,009**	**16,864**	-

[1] Nominal capacity determined from 2006 Southern California Edison test data with largest pumping unit out-of-service.

VEN0006106

The pump station capacity evaluation revealed that the Valley Vista Pump Station, with the largest pump out-of-service, does not have sufficient capacity to meet the near-term maximum day demands of the 400 Pressure Zone. If this pump station is out-of-service, the 400 Pressure Zone does not have a redundant pumping supply. The City has identified Valley Vista Pump Station (CIP 97887) as one of several pump stations to receive upgrades. The CIP indicates that the Valley Vista Pump Station will receive a complete upgrade. It is recommended that the capacity of this pump station be increased by at least 200 gpm to accommodate the near-term maximum day demands. An additional recommendation from Section VII is to rehabilitate the Gosnell Pump Station as its own CIP, which will provide additional pumping capacity to the 400 Zone.

Each pump station was also analyzed to determine if it had adequate capacity to provide water to the upper hydraulic gradients (pump-through pumping). Table IX-4 contains the results of this analysis.

Table IX-4
Pump Station Capacity Evaluation (Pump-Through) – Near-Term Demands

Pump Station	Excess Capacity (gpm) [2]	Upper Gradient Pressure Zones	Upper Gradient Demand (gpm)	Adequacy	Notes
Nob Hill	-	-	-	Adequate	
Willis	726	1035	87	Adequate	
Ondulando					
View Park	5,374	660R, 860, 1035	646	Adequate	
Day Road					
Elizabeth					
Kimball					
Foothill	7,691	535, 605, 660R, 860, 1035	1,860	Adequate	
Seaward and Poli					
Five Points					
Bailey					
330	3,728	360R, 430, 430R, 466, 535, 588, 605, 660R, 860, 1035	7,539	-3,811	[1]
Golf Course					
Modella	1,417	605K	34	Adequate	
Hall Canyon					
Mariano	590	430R, 588	87	Adequate	
McElrea	-	-	-	Adequate	
Kalorama	-	-	-	Adequate	
Valley Vista	-	-	-	-197	

[1] Saticoy Conditioning Facility, Mound Well #1 and Victoria Well #2 provide a supply of approx. 6,700 gpm to assist these zones.

[2] Determined by subtracting the "Near-Term Max Day Demand" from the "Nominal Pumping Capacity" in Table IX-3.

VEN0006107

Table IX-4 groups the pump stations together based on the upper gradients to which they pump, and lists the excess capacity of the pump station, or combination of pump stations, after the deduction of the in-zone demands. The upper gradient demand is the total maximum day demand of the upper pressure zones that rely on the lower pressure zone pump station supply (also known as the "pump-through" demand).

Adequacy is determined if the pump station, or combination of pump stations, have excess capacity to meet or exceed the upper gradient maximum day demands.

Based on the results shown in Table IX-4, there are three pump stations that are identified as deficient; the 330 Pump Station, Golf Course Pump Station and the Valley Vista Pump Station. However, the pressure zones supplied by the 330 Pump Station and Golf Course Pump Station are also supplied by the Saticoy Conditioning Facility, Mound Well No. 1 and Victoria Well No. 2, which have adequate supply to meet the maximum day demands of these pressures zones. However, the Valley Vista Pump Station is deficient by 197 gpm under the near-term maximum day demands.

D. ENERGY ANALYSIS

Pumping stations require energy to operate, and energy costs money. This analysis utilized the calibrated hydraulic model to determine if the City can utilize different rate structures in order to achieve a more energy-efficient operation at each pump station. It is noted that the existing SCE rates are based on service accounts during the actual operation of the City's facilities while meeting the hydraulic demand of the system.

Southern California Edison (SCE) is the energy provider for the City. SCE has developed several rate schedules that apply charges based on varying energy demands and time of usage. Details of each rate schedule were obtained from SCE, last revised March 2007, and are described below. The City's energy billing data was used to analyze and evaluate pump schedule efficiency for each pump station. The hydraulic model evaluated the efficiencies of the pump stations at each rate schedule to find the most cost effective plan. The analysis process is as follows:

1. Input current rate schedules into the model and run the energy management tool under current operating schedules.
2. Compare the model output data to actual SCE bills.

VEN0006108

3. Re-analyze the hydraulic model using different rate structures at each pump station.
4. Make recommendations for pump station operating hours and rate structures.

1. Existing Rate Schedules

SCE offers a selection of rate schedules that are based on demand usage, peak pumping and connected load. Seven common rate schedules implemented by SCE that are pertinent to the City's operating system, effective March 2007, are listed below and were used in the pump station energy analysis.

- PA-1
- PA-2
- TOU-PA-A
- TOU-PA-B
- TOU-PA-5
- TOU-PA-SOP
- TOU-8

Below are brief descriptions of each of the seven SCE rate schedules.

PA-1: This rate structure is designed for agricultural and pumping customers who use 70 percent or more of their electricity to provide power for agricultural purposes or water pumping, and none of the remaining load is used for domestic purposes. This schedule is not applicable when the monthly registered demand has, or is expected to, exceed 500 kW three times in any 12-month period.

PA-2: This rate structure is a basic rate schedule for customers who use 70 percent or more of their electricity for agricultural purposes or water pumping, and where none of the remaining load is used for domestic purposes. Except for large water pumping customers where 70 percent or more of the water pumped is used for agricultural purposes, this schedule is not applicable when the monthly registered demand is expected to exceed 500 kW or has exceeded 500 kW three times in any 12-month period.

TOU-PA-A: This rate structure is a time-of-use schedule with a connected load option, and is available for customers who use 70 percent or more of their electricity for agricultural, or for water pumping, and none of the remaining electrical consumption for domestic purposes. Maximum demand must not exceed 500 kilowatts (kW), unless the customer pumps large amounts of water, with 70 percent or more of the water used for agricultural purposes.

VEN0006109

TOU-PA-B: This rate structure is a time-of-use schedule with a demand metered option, and is available for customers who use 70 percent or more of their electricity for agricultural, or for water pumping, and none of the remaining electrical consumption for domestic purposes. Maximum demand must not exceed 500 kilowatts (kW), unless the customer pumps large amounts of water, with 70 percent or more of the water used for agricultural purposes.

TOU-PA-5: This rate structure is a time-of-use schedule with an option for customers who use 70 percent or more of their electricity for agriculture, or for water pumping, and none of their remaining electrical consumption for domestic purposes. To be eligible for this rate, a customer must have a minimum of 35 horsepower (hp) of total power connected to the SCE system or 35 kilowatts (kW) of maximum power demand. Maximum power demand must not exceed 500 kW, unless the customer pumps large amounts of water, with 70 percent or more of the water used for agricultural purposes.

TOU-PA-SOP: This rate schedule is a time-of-use schedule with an option for customers who use 70 percent or more of their electricity for agriculture, or for water pumping, and none of their remaining electrical consumption for domestic purposes. Maximum power demand must not exceed 500 kilowatts (kW), unless the customer pumps large amounts of water, with 70 percent or more of the water used for agricultural purposes. Electrical usage during the Super-Off Peak (SOP) hours, between midnight and 6 a.m., is priced at the lowest rate.

TOU-8: This rate structure is the basic time-of-use rate schedule for large-sized industrial customers who register demands greater than 500 kilowatts.

Each of the above-mentioned rate structures also includes a basic customer charge, typically a daily or monthly charge. The charges will also vary based on the time of year, or season. Typically, the rates will decrease slightly during the winter season (first Sunday in October to the first Sunday in June). The summer time periods are defined as follows:

On-Peak: Noon – 6 p. m. (weekdays except holidays)
Mid-Peak: 8 a.m. – Noon, 6 p.m. – 11p.m. (weekdays except holidays)
Off-Peak: All other hours

The current SCE rate schedule for the City's pump stations are listed in Table IX-5. The existing rates are based on years of operational experience, SCE rate models and the limitation that one SCE meter supplies power to multiple pump stations.

VEN0006110

Table IX-5
Current Rate Structure

Pump Station	SCE Rate Structure
Bailey	TOU-PA-5
Day Road	TOU-PA-B
Elizabeth	TOU-PA-SOP-1
Five Points	TOU-PA-SOP-1
Golf Course	TOU-8
Kalorama	TOU-PA-SOP-1
Kimball	PA-2
Modella	PA-2
Nob Hill	PA-2
Ondulando	TOU-PA-B
Power	TOU-GS3-B
Seaward and Poli	TOU-PA-B
Valley Vista	TOU-GS3-B
View Park	PA-2
Willis	TOU-PA-SOP-1
330/Foothill/Hall Canyon	TOU-PA-B
Mariano/McElrea	TOU-PA-B

The existing rate schedules were analyzed using the calibrated hydraulic model. Results of the model were compared to actual energy billing data. Based on the results of the model, various rate schedules were analyzed at each pump station to determine the optimal schedule.

It is noted that the Power and Valley Vista Pump Stations are located at the Avenue Treatment Plant and are served power from a common meter for the facility, therefore it is not anticipated that these two pump stations can change rate structures unless a separate meter is installed for the pumping units. The Bailey Pump Station is located at the Bailey Plant and is served from one common meter for the site, therefore the rate structure must account for the electrical usage at the entire site. The 330, Foothill and Hall Canyon pumping units are all housed within one building, and are served from a common electrical service. Therefore, all pumping units must be on the same rate schedule. The Mariano and McElrea pumping units are both housed within one building, and are served from a common electrical service. Therefore, both of these pumping units must be on the same rate schedule.

VEN0006111

2. Rate Schedule Recommendations

Each rate schedule was applied to each pump station to determine if a different schedule would better match the pump station's typical usage. Based on the typical pump station operation, flow rate and hydraulic model results, the ideal rate schedule was determined. Most of the pump stations were found to be running on an efficient and cost effective rate schedule. The hydraulic model analysis concluded that six pump stations may benefit from switching rate structures. The recommended pump station rate schedules can be seen in Table IX-6.

Table IX-6
Recommended Rate Structure

Pump Station	Maximum Demand (kW)[1]	Current Rate Structure	Recommended Rate Structure
Bailey	246	TOU-PA-5	**TOU-PA-A**
Day Road	90	TOU-PA-B	TOU-PA-B
Elizabeth	119	TOU-PA-SOP-1	TOU-PA-SOP-1
Five Points	312	TOU-PA-SOP-1	TOU-PA-SOP-1
Golf Course	849	TOU-8	TOU-8
Kalorama	60	TOU-PA-SOP-1	TOU-PA-SOP-1
Kimball	138	PA-2	**PA-1**
Modella	42	PA-2	**TOU-PA-SOP-1**
Nob Hill	50	PA-2	**PA-1**
Ondulando	133	TOU-PA-B	TOU-PA-B
Power	-	TOU-GS3-B	TOU-GS3-B
Seaward and Poli	156	TOU-PA-B	TOU-PA-B
Valley Vista	-	TOU-GS3-B	TOU-GS3-B
View Park	79	PA-2	**TOU-PA-SOP-1**
Willis	84	TOU-PA-SOP-1	TOU-PA-SOP-1
330/Foothill/Hall Canyon	169	TOU-PA-B	**TOU-PA-SOP-1**
Mariano/McElrea	135	TOU-PA-B	TOU-PA-B

[1] Max Power per SCE billing information from 2006 thru 2007 for summer months. Valley Vista and Power Pump Station information not available.

The recommended rate schedules are based on the City operating the pump stations during off peak hours to realize the full cost savings available. Based on the results from the hydraulic model, all pump stations identified as candidates to modify their rate structures can operate efficiently and maintain reservoir levels in the distribution system while not operating during on-peak hours. It should be noted that the energy analysis performed within the model is based on "best-case" operating conditions. The recommended rate structures should be closely evaluated by City operations staff in conjunction with SCE before switching

VEN0006112

rate structures. Limitations with the actual system operations may support the current SCE rate structure for each pump station.

E. CONCLUSIONS AND RECOMMENDATIONS

All existing pump stations, with the exception of the Valley Vista Pump Station, have adequate capacity to meet the existing and near term-demands. The energy analysis indicated that six of the existing pump stations may benefit from switching to a different rate structure. The pump station analysis resulted in the following recommendations:

- The Valley Vista Pump Station is recommended for a complete upgrade in the current CIP list (CIP 97887), including relocation of the pump station, which is currently located at the Avenue Treatment Plant. As a part of this upgrade, the pump station should have a minimum design capacity of 1,200 gpm with the largest pumping unit out-of-service to meet the near-term demands.

- Rehabilitate (and relocate) Gosnell Pump Station as its own CIP.

- Evaluate operational characteristics and investigate changing the SCE rate structures for the Bailey, Kimball, Modella, Nob Hill, View Park, and 330/Foothill/Hall Canyon pump stations for potential cost savings.

- The City should fully utilize the pump stations during off-peak hours to fill reservoirs to reduce electrical costs whenever possible.

VEN0006113

X. PIPELINE ANALYSIS

A. INTRODUCTION

The City maintains a distribution system that consists of approximately 380 miles of pipeline that vary in size, age and material. It is important for the City to provide a reliable and redundant water distribution system, and one way to achieve this goal is to be proactive in maintaining and replacing the pipeline network. This section will describe the evaluation of the City's pipeline network and makes recommendations for upgrading the pipe network and increasing the system's reliability.

In August 2004, the Boyle Engineering Corporation completed a comprehensive condition assessment of the City's water distribution system, titled Water System Corrosion Protection Study. The project recommended the implementation of a distribution infrastructure management program. The program was based on numerous factors, such as pipe age, material, soil corrosivity, pipe leaks/breaks, a consequence/risk analysis and water quality. The recommendations made in the 2004 Study are still valid and should continue to be implemented by the City. The analysis conducted herein is intended as a supplement to the 2004 Study and all recommendations made herein should be coordinated with the recommendations made in the 2004 Study.

B. SMALL WATERLINE REPLACEMENT PROGRAM

In Section III.2.a of General Order 103, the Public Utilities Commission of California mandates that distribution system pipelines should not be less than 6-inches in diameter. In order to provide adequate fire protection, a minimum of 8-inch diameter pipe is often required. The City is currently implementing or planning several projects to replace some of the small diameter pipe within the distribution system. Projects currently listed in the CIP will replace approximately 13,820 feet of 4-inch main and 20,350 feet of 6-inch main with new 8-inch mains.

Data from the hydraulic model indicate that the following lengths of small diameter piping remain in the City's distribution system at the time this report was written (excluding the lengths currently accounted for in the CIP).

2-inch diameter = 1,597 linear feet
3-inch diameter = 829 linear feet
4-inch diameter = 37,667 linear feet
6-inch diameter = 564,902 linear feet

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It is recommended that the City annually replace the remaining small diameter pipe until all pipe is at least 6-inch in diameter, or 8-inch as needed to meet fire flow requirements.

C. DISTRIBUTION MAIN REPLACEMENT

1. Hydraulic Evaluation

The hydraulic model was analyzed to determine if any of the existing distribution and transmission pipelines appeared to be undersized. The model was evaluated by simulating a peak hour demand condition and identifying pipelines with velocities in excess of 10 feet per second and/or pipelines that exceed 10ft/1000ft of frictional headloss. The results of this analysis indicated that there are several pipelines in the system that exceed this criteria. See Exhibits X-1, X-1A, X-1B and X-1C for the locations of the deficient pipelines.

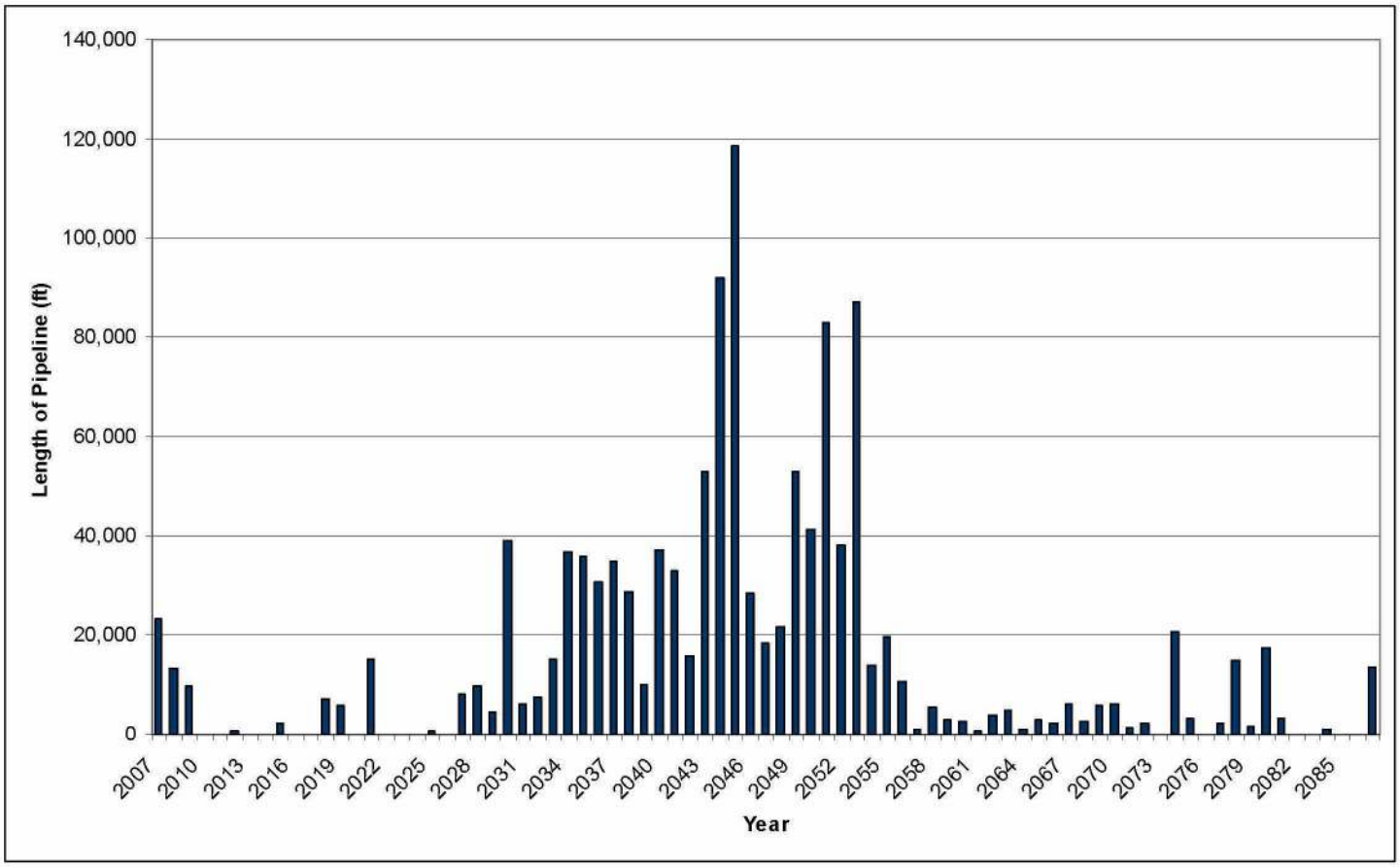
The existing pipeline between the Golf Course Pump Station and the Bailey Treatment Plant is a critical pipeline that provides supply for the system. The City has expressed concerns about the condition of the pipeline. With an additional golf course well proposed, the pipeline capacity is also a concern. It is recommended that a detailed condition assessment be performed on the pipeline to determine its' useful life and available capacity.

2. Age Evaluation

As pipelines age, the performance of the pipe tends to deteriorate, which may ultimately lead to pipeline failure. The average age of the pipelines in the City system is 42 years old, with the oldest pipes around 90 to 100 years old. Most of the pipe is made of asbestos cement (AC), cast iron (CI) and polyvinyl chloride (PVC). The life expectancy of most pipe materials, although theoretically are infinite, are typically assumed to be between 70 and 100 years. The 2004 Study provides average life expectancies based on pipe age and material ranging from 60 years to 100 years. For this analysis it is assumed that the minimum pipeline age required for replacement is 80 years old based on the median age used in 2004 Study. Based on the date of installation, Figure X-1 depicts the year and length of pipeline that will need to be replaced.

VEN0006115

Figure X-1
80-Year Pipeline Life – Replacement Projection



The projection of replacing 80-year old pipe shows a large amount to be replaced between the Year 2043 and 2053. It is recommended that the City begin to plan and budget for a comprehensive pipeline replacement program that should begin around the Year 2020.

Other factors that will play an important role in establishing replacement priority in a pipeline replacement program are soil corrosivity, water quality and pipe break history. This data was included as a part of the analysis performed in the 2004 Study.

D. LOOPING ANALYSIS

Looped water systems provide more reliability, improved fire flow and improved water quality for the customers. The looping analysis focused on identifying areas within the system that are supplied through a single pipeline and/or areas that have dead end pipelines. After identifying such areas, the potential for looping the system in order to increase circulation and fire flow availability, decrease water age and provide redundant and reliable supply sources was explored. Criteria were

VEN0006116

established to determine the potential connection points for looping of the system. Those criteria are listed below:

- Looping should occur within the same pressure zone.
- Looping should be located through existing roads and easements, if possible.
- Looping should avoid major road and freeway crossings.

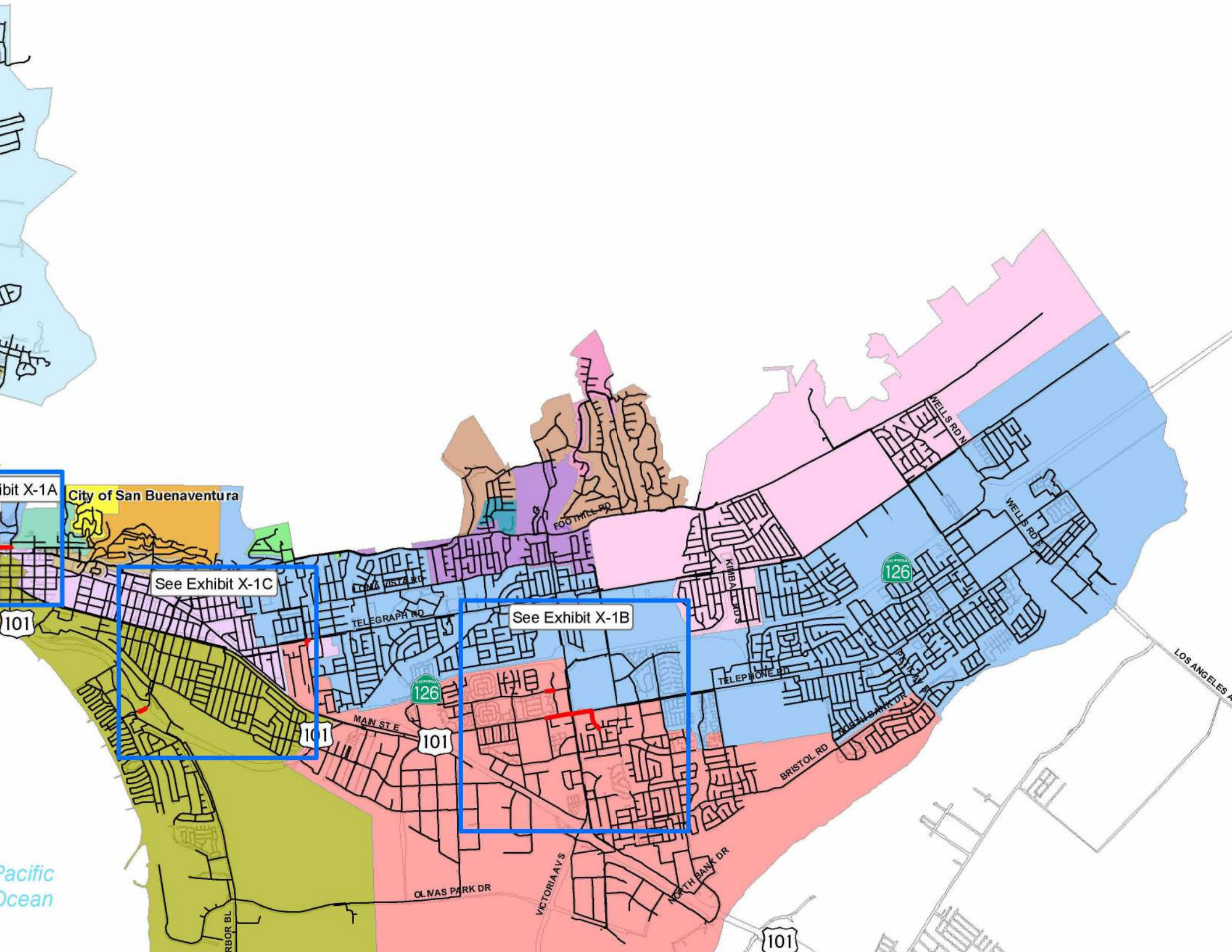
Using the criteria listed above, fourteen possible looping locations were identified. It is recommended to evaluate if these fourteen locations should be included in the City's CIP Plan. See Exhibits X-2, X-2A, X-2B, X-2C and X-2D for the proposed locations and proposed pipe diameters.

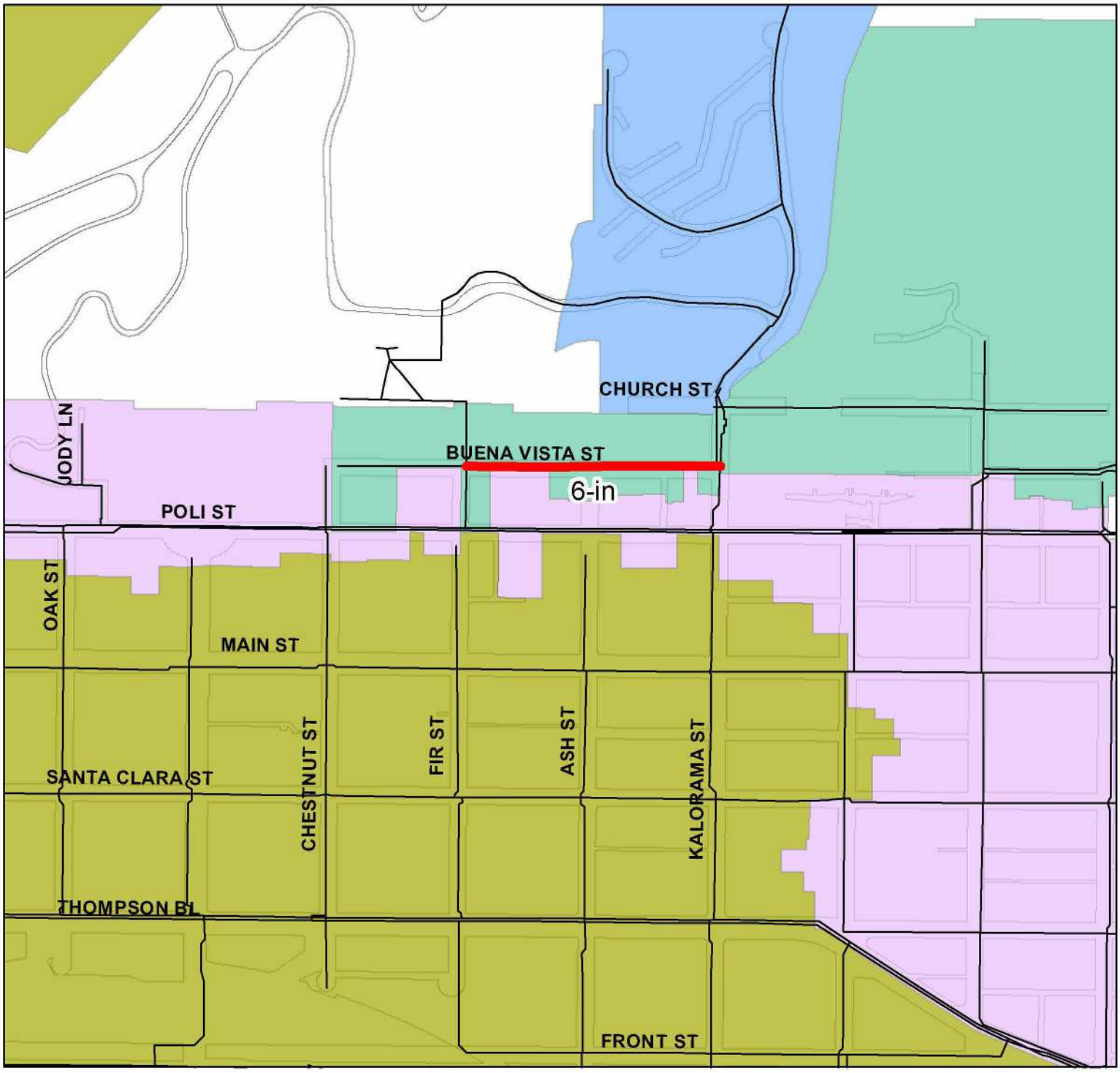
E. CONCLUSIONS AND RECOMMENDATIONS

The results of the pipeline analysis conducted as a part of this project identified several pipelines that require replacement, upsizing or paralleling. The projects identified herein should be incorporated into the Distribution Infrastructure Management Program identified in the 2004 Water System Corrosion Study. The following conclusions and recommendations resulted from this analysis:

- The City shall continue the program to replace all 2-inch, 3-inch, 4-inch and 6-inch pipelines with a minimum of 6-inch pipeline.
- Upsize the hydraulically deficient pipelines identified on Exhibits X-1 through X-1C.
- Evaluate the condition of the transmission pipeline between the Golf Course Pump Station and the Bailey Treatment Plant.
- Begin planning and budgeting for a pipeline replacement program.
- Investigate including the pipeline looping projects shown on Exhibits X-2 through X-2D in the existing City's CIP Plan.
- Continue with implementation of the projects identified in the 2004 Water System Corrosion Protection Study.

VEN0006117


ibit X-1A
City of San Buenaventura
See Exhibit X-1C
See Exhibit X-1B
101
126
TELEGRAPH RD
LOMA VISTA RD
FOOTHILL RD
KIMBALL RD
WELLS RD N
WELLS RD S
TELEPHONE RD
MAIN ST E
BRISTOL RD
NORTH BANK DR
OLIVAS PARK DR
VICTORIA AV S
LOS ANGELES A
Pacific
Ocean



Deficient Pipes

Pipelines

Pressure Zones

- 210
- 260
- 430R
- 605K

Notes:
1. Pipes identified as deficient exhibit friction losses greater than 10-feet per 1000-ft and/or velocities exceeding 10 feet per second under peak hour demands.

0 500 1,000
Feet

RBF CONSULTING GIS

CITY OF SAN BUENAVENTURA

DEFICIENT PIPELINES

EXHIBIT X-1A

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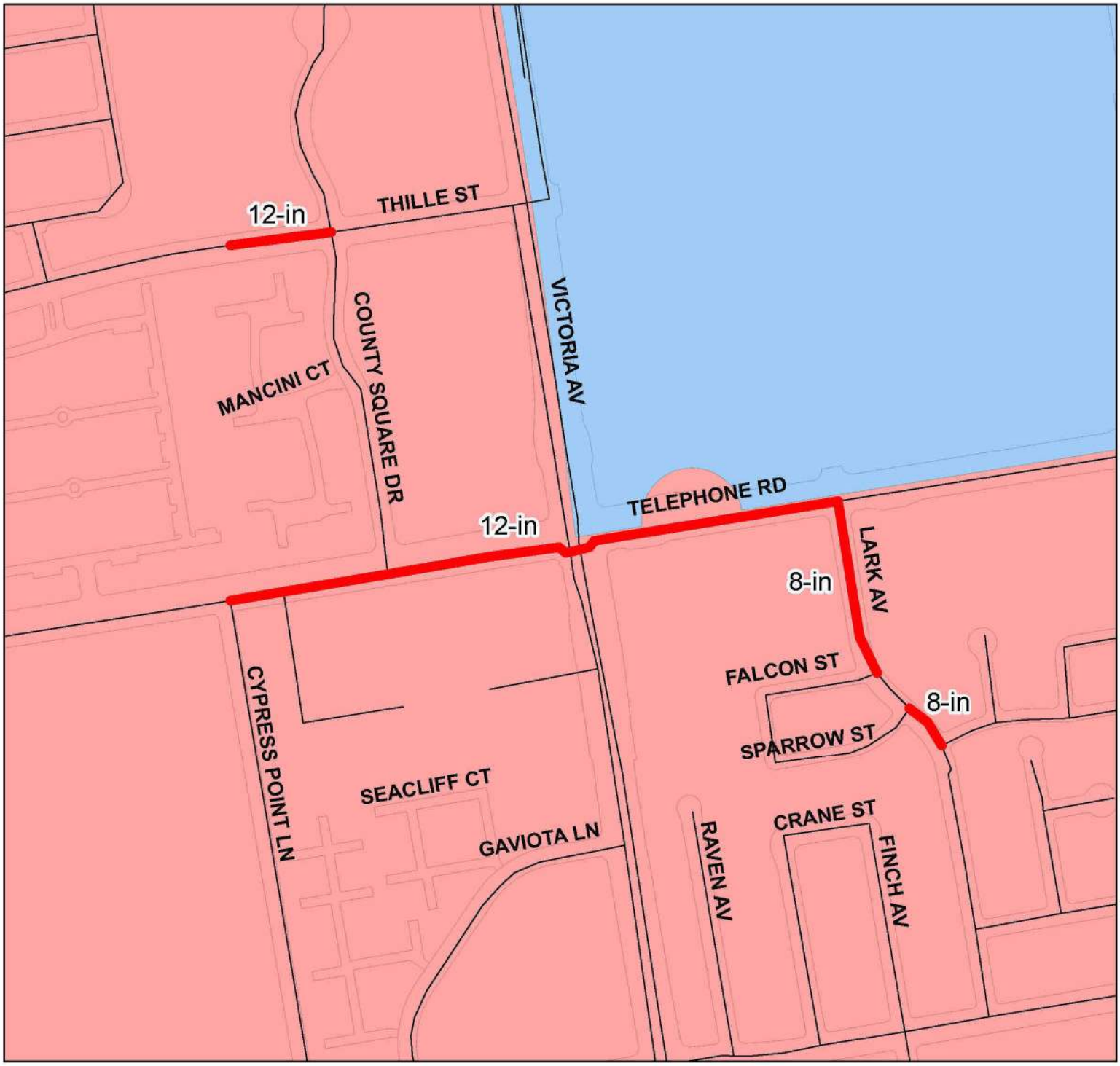

Deficient Pipes

Pipelines

Pressure Zones

330

430

Notes:
1. Pipes identified as deficient exhibit friction losses greater than 10-feet per 1000-ft and/or velocities exceeding 10 feet per second under peak hour demands.

0 500 1,000
Feet

RBF CONSULTING GIS

CITY OF SAN BUENAVENTURA

DEFICIENT PIPELINES

EXHIBIT X-1B

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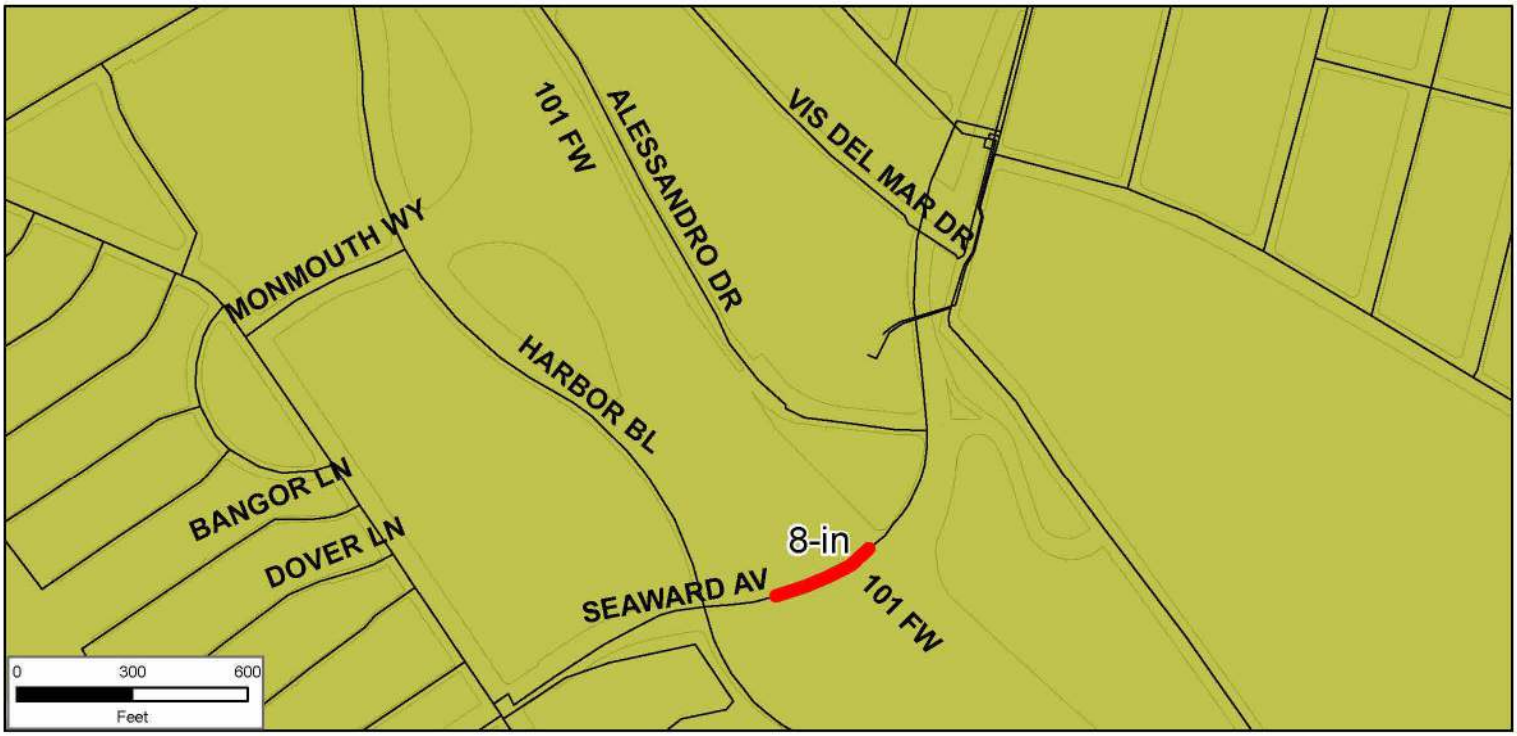

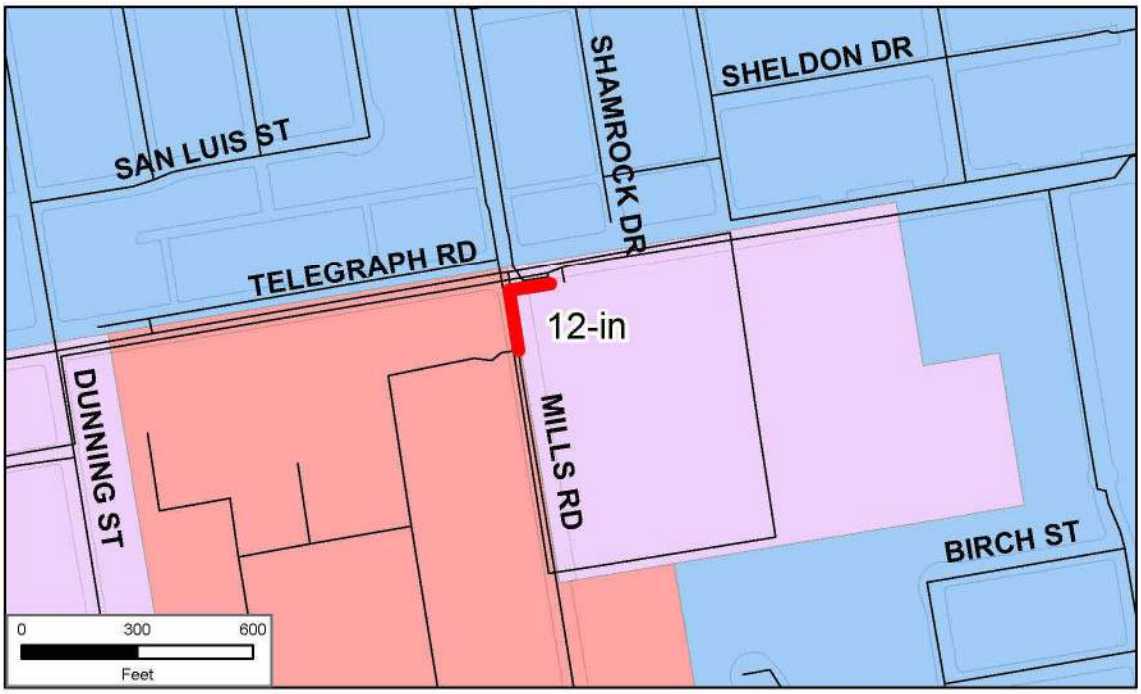

Deficient Pipes

Pipelines

Pressure Zones

- 210
- 260
- 330
- 430

Notes:
1. Pipes identified as deficient exhibit friction losses greater than 10-feet per 1000-ft and/or velocities exceeding 10 feet per second under peak hour demands.

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CITY OF SAN BUENAVENTURA

DEFICIENT PIPELINES

EXHIBIT X-1C

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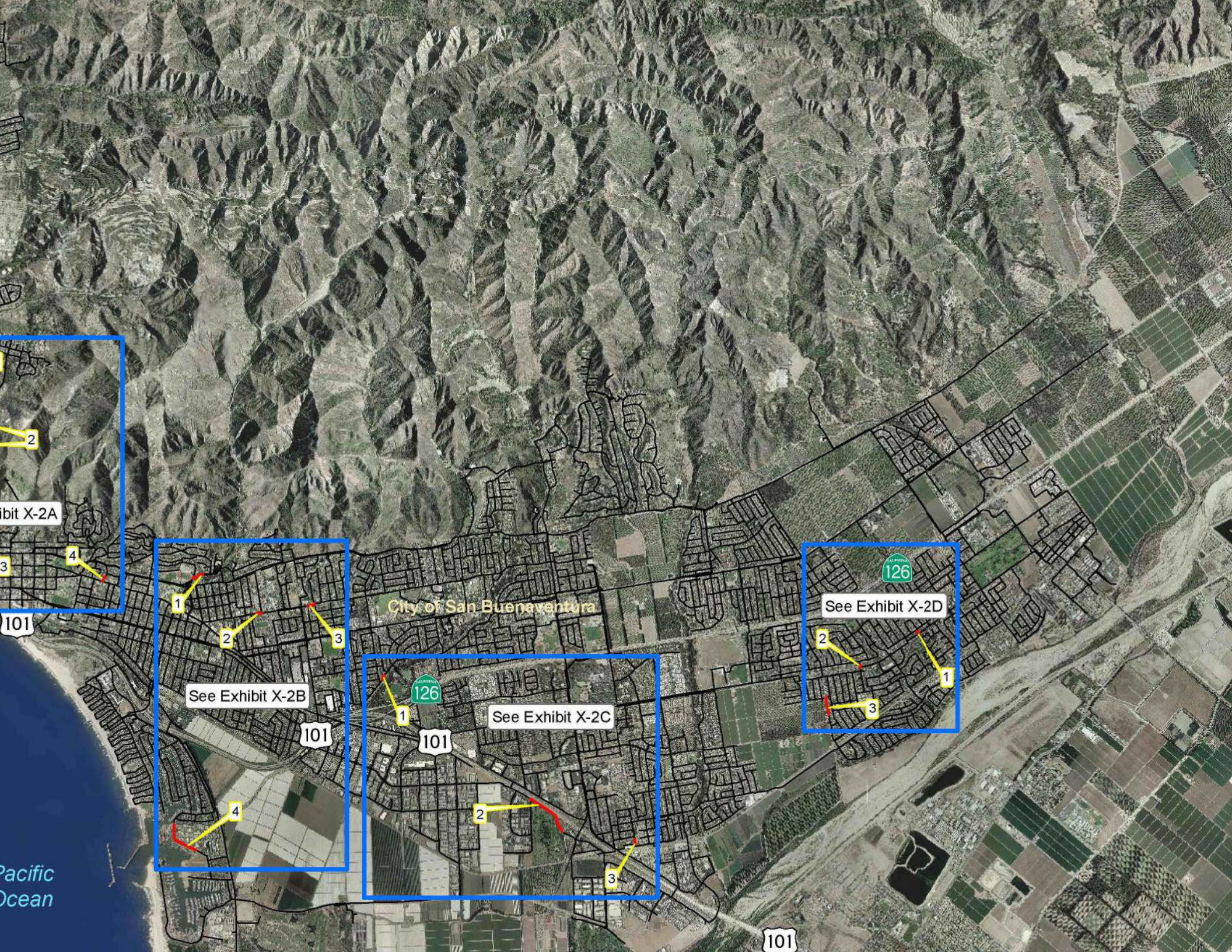
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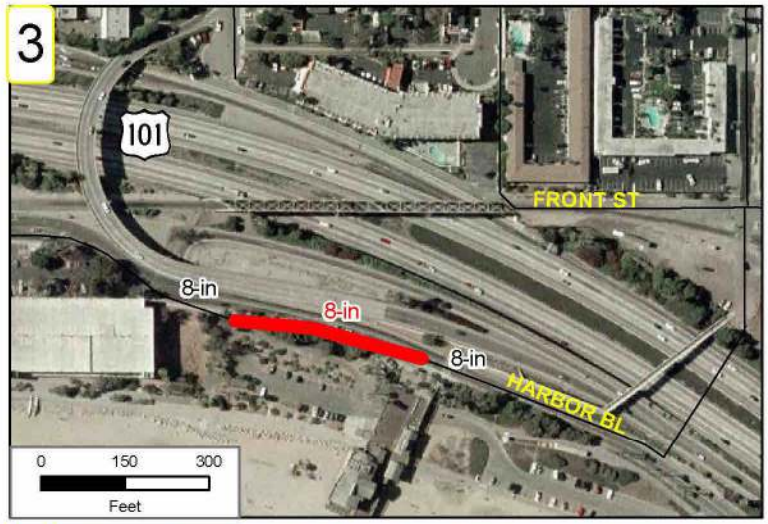

Proposed Looping Pipelines

Existing Pipelines

RBF CONSULTING GIS

CITY OF SAN BUENAVENTURA

Pipeline Looping Locations

EXHIBIT X-2A

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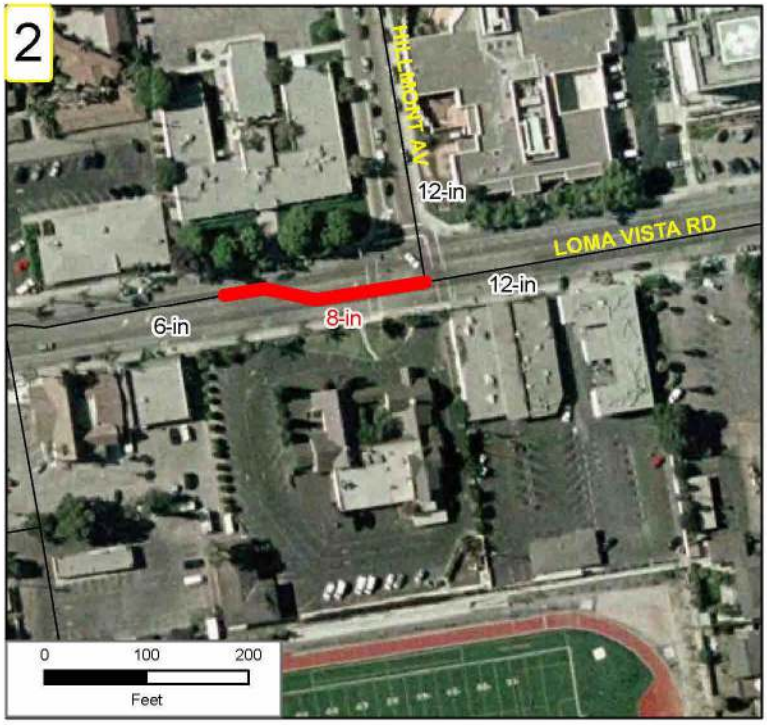

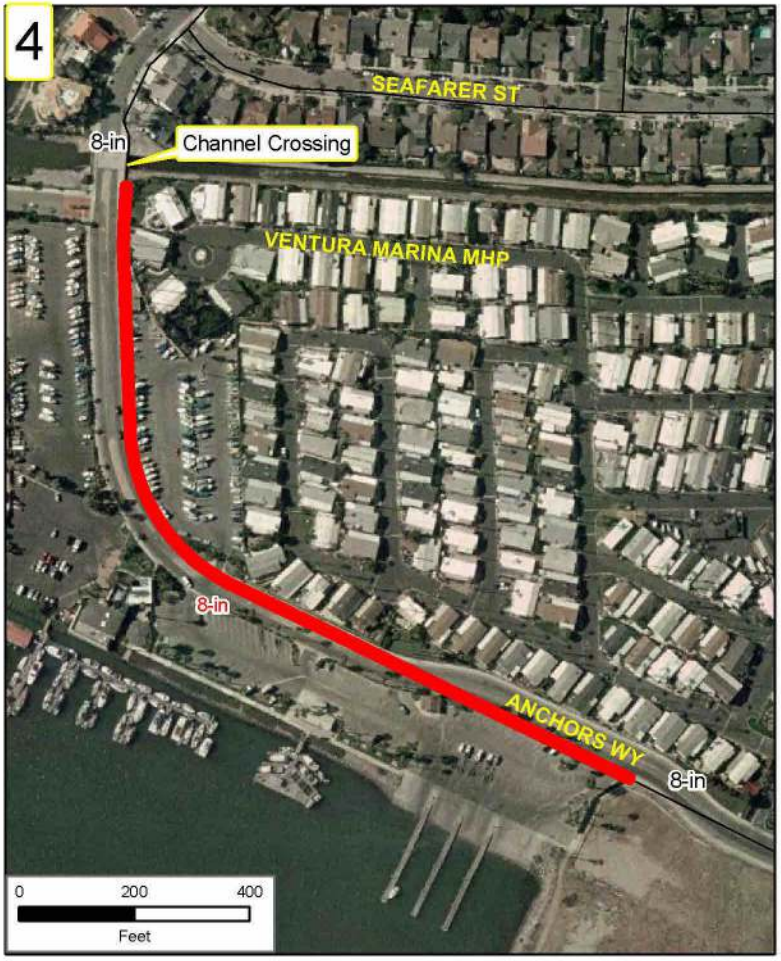

Proposed Looping Pipelines

Existing Pipelines

CITY OF SAN BUENAVENTURA

Pipeline Looping Locations

EXHIBIT X-2B

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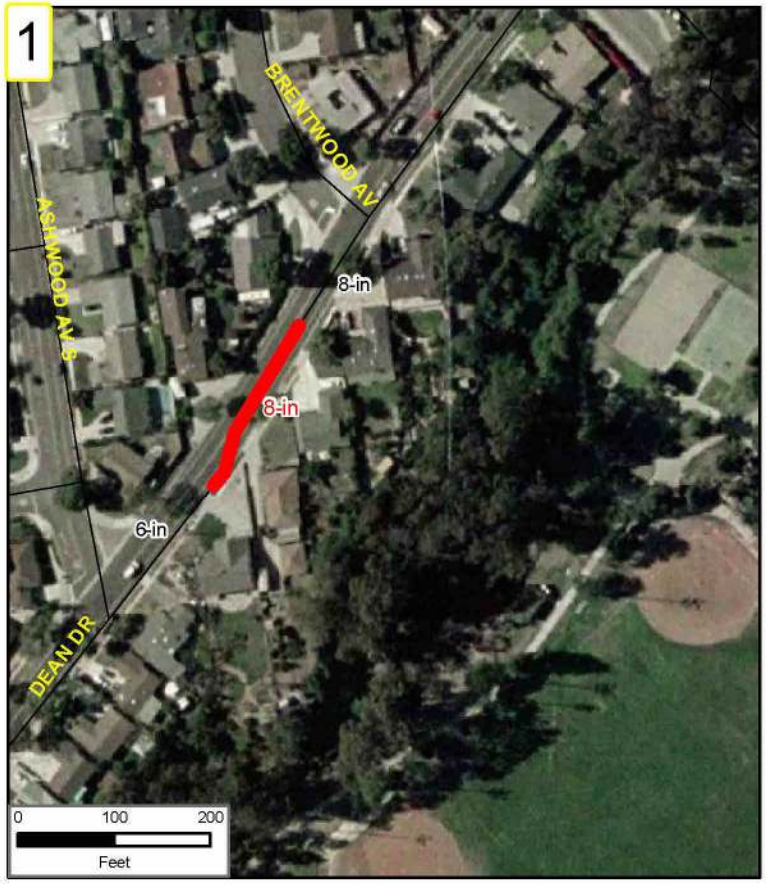

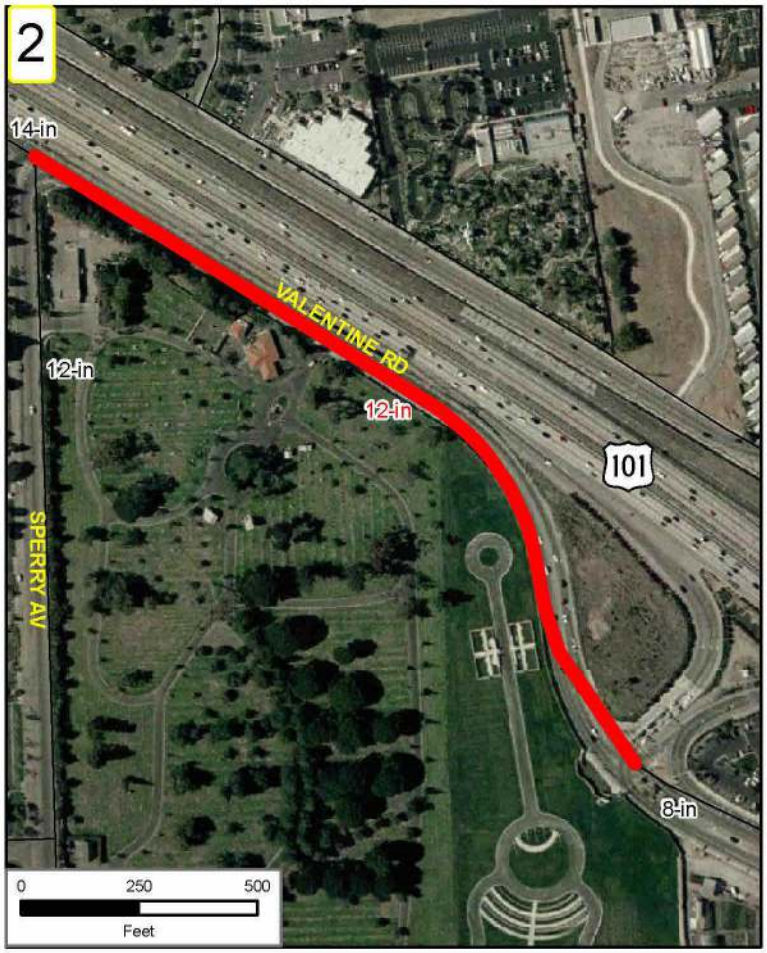

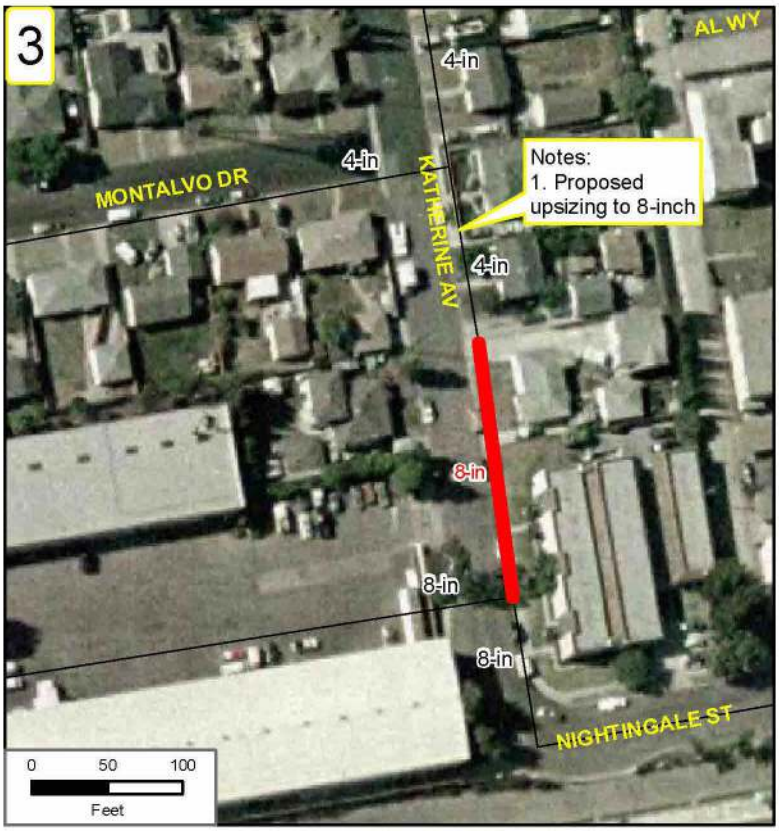

Proposed Looping Pipelines

Existing Pipelines

RBF CONSULTING GIS

CITY OF SAN BUENAVENTURA

Pipeline Looping Locations

EXHIBIT X-2C

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Proposed Looping Pipelines

Existing Pipelines

CITY OF SAN BUENAVENTURA

Pipeline Looping Locations

EXHIBIT X-2D

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VEN0006126

XI. HYDRAULIC EVALUATION

A. INTRODUCTION

The City strives to provide its customers with a reliable, adequate water supply at adequate service pressures. The calibrated hydraulic model was used to evaluate operational pressures throughout the distribution system under varying demand and operational conditions. For areas identified with pressures below or above the City's stated criteria, alternative solutions were evaluated. Possible solutions include adjusting pressure zone boundaries to improve system pressures and operational efficiencies. The adjustment of existing zone boundaries may require modifications to existing facilities or the installation of new facilities. The results of this analysis are discussed herein.

B. HYDRAULIC MODEL

1. Development

A hydraulic model, representing the City's water distribution system, was created as a part of this project. The model includes every pipeline and facility in the distribution system. The model was created in the software program H2OMAP Water, created by MWH Soft, Inc.

The pipelines were digitized into the model from the City's existing GIS system (AutoCAD files). Nodes were generated at every pipeline intersection, change in material or change in diameter. Elevations were allocated to the nodes from the City's LIDAR data. The water demands were allocated throughout the system based on the water billing data and a parcel map. For the large users, water demands and diurnal patterns were allocated by hand to specific nodes. The major system facilities, such as reservoirs, tanks, treatment plants, valves and turnouts, were created in the model from existing physical data. The hydraulic parameters were input into the model based on discussions with City staff and SCADA data.

Scenarios were created in the model to simulate varying demand and operational conditions. The scenarios include 24-hour extended period simulations for existing demand conditions and future demand conditions. Scenarios were created to simulate summer and winter demand conditions, varying supply conditions, and fire flow conditions.

VEN0006127

2. Calibration

Model calibration is an important step that must be completed prior to the hydraulic analysis to ensure that the model is producing consistent and accurate results. The calibration process involved an extensive fire hydrant flow testing program that included 25 individual flow tests. The flow tests involve the flowing of a selected hydrant, at least one in each pressure zone, and measuring the flow rate and corresponding pressure drops in the field. The hydrant test results and corresponding SCADA monitoring information were simulated in the model. The model calibration process consisted of the detection of anomalies, diurnal pattern and valve setting adjustments, and pipe roughness adjustments so that the model results accurately simulated the results measured in the field. A map of the flow testing locations and the result sheets are included in the Appendix D.

3. Analysis

The calibrated model was then used to analyze the distribution system for deficiencies. Specific analyses included a low pressure analysis, high pressure analysis, the identification of deficient pipelines, pump energy evaluation and a fire flow analysis. The criteria and results of each analyses are described throughout this Report.

4. Updates and Maintenance

The model should be a living document, constantly being updated as changes are made in the distribution system. It is recommended that City assign model upkeep to one staff member with one backup staff member, or consultant, so model updates can be properly organized and recorded. It is recommended to update the physical elements of the model (pipes, reservoirs, pump stations, valves, etc.) at the completion of a construction project or the record drawings. Operational and demand changes should be made on a less frequent basis, around every six months. It is recommended that several City staff members are educated in the modeling software and are capable of operating and analyzing the model.

VEN0006128

The City should maintain at least one current license of the modeling software and subscribe to the vendors maintenance package so the City will have access to technical support and software updates.

C. EXISTING SYSTEM EVALUATION

1. Low Pressure Areas

The City strives to provide water to its customers at a minimum pressure of 40 psi during peak hour demand conditions. Results from the hydraulic model confirmed areas of low pressure exist in several locations throughout the City, as shown on Exhibit XI-1. There are three main "groupings" of low pressures where there may be opportunities to resolve the low-pressure problems. The areas are described below.

- In the 210 Pressure Zone at the zone boundary between the 210 and 400 Pressure Zones near Ventura Avenue
- In the 210 Pressure Zone at the zone boundary between the 210 and 260 Pressure Zones along Main and Thompson Streets
- In the 330 Pressure Zone at the zone boundary between the 330 and 430 Pressure Zones along Telephone Road

These three areas were analyzed to determine if there are any feasible solutions to increase the low pressures in these areas.

<u>Results and Recommendations</u>

- After a detailed evaluation, it was determined that it would not be feasible to shift the zone boundary between the 210 and 400 Pressure Zones near Ventura Avenue due to the fact that the low pressure areas would experience extremely high pressures (above 120 psi) in several locations. There are no recommended operational improvements or facility improvements in this area.
- It is recommended to reconfigure the zone boundary between the 210 and 260 Pressure Zones to alleviate low pressures along Main Street. Recommended improvements include the following:

VEN0006129

- Reconfigure the 260 Pressure Zone boundary to move southward from Main and Thompson Streets to reach to the 101 Freeway.
- Install approximately 5,400 linear feet of 16-inch pipe and approximately 1,300 linear feet of 12-inch pipe per CIP 97889.
- Open the closed valves along Thompson Boulevard.
- Reconfigure the valves and pipes at the intersection of Seaward Avenue and Channel Drive
- Possibly adjust the pressure setting of the Main and Mills Pressure Reducing Station

Moving the 260 Pressure Zone boundary down to encompass this low-pressure area will alleviate the majority of the low-pressure areas. In addition, this change will increase the residual pressure available for fire flows along portions of Thompson Boulevard. See Exhibit XI-3 for the area impacted by the pressure zone boundary adjustment.

- After a detailed evaluation, it was determined that it would not be feasible to shift the zone boundary between the between the 330 and 430 Pressure Zones to alleviate low pressures along Telephone Road due to the fact that there are not a significant amount of low pressure locations to make this an economical project. In addition, several of these areas are nearly 40 psi. There are no recommended operational improvements or facility improvements in this area.

2. High Pressure Areas

For areas where pressures of 120 psi or greater exist, there may be opportunities to serve those areas from lower pressure zones, which would reduce the overall pumping volume throughout the City. The hydraulic model was used to identify areas of high pressure within the distribution system, as shown on Exhibit XI-2. The model indicated several nodes in these areas experience pressures above 120 psi under minimum hour demands. There are six main “groupings” of high pressures where there may be opportunities to serve the customers from a lower hydraulic gradient. The areas are described below:

VEN0006130

- In the 400 Pressure Zone at the zone boundary between the 210 and 400 Pressure Zones near Ventura Avenue
- The 605K Pressure Zone
- Areas in the 430 Pressure Zone bounded by Loma Vista Road, Mills Road, Telegraph Road and Dunning Street
- In the 430 Pressure Zone at the zone boundary between the 330 and 430 Pressure Zones near Main and Mills Roads
- The southern portions of the 860 Pressure Zone
- In the 430 Pressure Zone near the zone boundary between the 330 and 430 Pressure Zones near the Petit Pressure Reducing Station

These six areas were analyzed to determine if there are any feasible solutions to reduce the high pressures in these areas.

Results and Recommendations

- After a detailed evaluation, it was determined that it would not be feasible to shift the zone boundary between the 210 and 400 Pressure Zones near Ventura Avenue due to the fact that the high pressure areas would experience extremely low pressures (below 40 psi) if boundaries were shifted. Therefore, no improvements are recommended for this area.
- The 605K Pressure Zone experiences very high-pressures due to the fact that the supply reservoirs are more than 280-ft (120 psi) above the highest service connection. Due to the geographical location of this pressure zone, there are no recommended operational improvements or facility improvements in this area.
- After a detailed evaluation, it was determined that the benefit does not outweigh the cost of improvements to shift the zone boundary in the 430 Pressure Zone bounded by Loma Vista Road, Mills Road, Telegraph Road and Dunning Street.
- Reconfiguring the zone boundary between 330 and 430 Pressure Zones near Main and Mills Roads has been analyzed, and the following recommendations have been made:
    - Reconfigure the 330 Pressure Zone boundary to move eastward to Ashwood Avenue.

VEN0006131

- Install approximately 8,500 linear feet of 18-inch pipe per CIP 97895.
- Open valves at Mills Road and Maple Street and at Dean Drive and Chapel Drive.
- Close valves at Maple Street and Brentwood Avenue, Ashwood Avenue and Madison Street, Redwood Avenue and Madison Street, and Telegraph Road and College Drive.

Moving the 330 Pressure Zone boundary to the east to encompass this high-pressure area will alleviate the majority of the high-pressure areas. This zone reconfiguration will result in pressures for this area ranging from 68 to 79 psi during peak hour demands with an average pressure in the reconfigured area of approximately 80 psi under peak hour demands. See Exhibit XI-4 for the area impacted by the pressure zone boundary adjustment.

- High-pressure areas in the southern portions of the 860 Pressure Zone exist due to the fact that this zone experiences large elevation changes ranging from 415 feet to 830 feet. Due to the geographical location and the adjacent pressure zones, there are no recommended operational improvements or facility improvements in this area.
- After a detailed evaluation, it was determined that it would not be beneficial to shift the zone boundary between the 330 and 430 Pressure Zones near the Petit Pressure Reducing Station due to the fact that this zone adjustment may reduce existing looped regions within the 430 Pressure Zone and reduce the reliability and redundancy of the existing area.

3. Redundancy and Reliability

The City is committed to providing its customers with an uninterrupted supply of high quality water. Providing a redundant and reliable supply of water is a primary goal of the City and is essential to customer satisfaction. With constant demands on the system, it is of the utmost importance to have a reliable supply at all times. In the unanticipated event of a primary facility outage, a redundant supply source can be called upon to help provide continued service to the City customers.

Reliability is defined as the ability of the primary supply source to provide the maximum day demand. Redundancy is defined as the ability of the secondary or back-up supply source to provide the maximum day demand with the primary supply out of service.

VEN0006132

The reliability and redundancy analysis conducted herein evaluated the supply sources for each pressure zone to determine if a reliable source exists, identified as the primary supply. A redundant supply is a second source of supply, independent from the primary supply, capable of supplying the maximum day demand.

For this analysis, a pump station or turnout is considered to be a primary supply source and a secondary supply source is considered as any other independent source including; reservoirs, other pump stations, Casitas turnouts, and pressure reducing stations connected to other pressure zones. Typically, the largest pump station for a pressure zone was identified as the primary supply while additional pump stations within the pressure zone were identified as back-up supplies. A critical pressure zone is defined as a pressure zone that does not have on-site emergency power available at the primary supply source and does not have a hydraulically activated emergency back-up supply. Table XI-1 identifies the primary and secondary sources of supply to each pressure zone.

VEN0006133

Table XI-1
Redundant Supply Source

Pressure Zone	Pressure Zone Maximum Day Demand (gpm)	Primary Supply (Pump Station)	Primary Supply Capacity (gpm)	Emergency Power @ Primary Supply	Secondary Supply (Reservoir)	Secondary Supply (Pump Station)	Secondary Supply (Pumped) Capacity (gpm)	Emergency Backup Supply	Emergency Backup Supply Capacity (gpm)	PRV's for Reduced Zones	OK ?
210	3,263	Casitas Turnout No. 2	8,333	-	Power	Power	8,300	Main and Mills and Palma PRV	1,520	-	Yes
260	770	Modella	1,400	No	Grant Park and Hall Canyon	Hall Canyon	791	Telegraph-Mills PRV	1,567	-	Yes
330	3,255	Golf Course	6,515	Yes	Bailey	330	1,095	Telegraph and Petit PRV	7,050	-	Yes
360R	90	Mariano	827	No	Mariano	None	-	None	-	Barnard Way	No
400	1,086	Valley Vista	960	No	Valley Vista and Seneca	None	-	None	-	-	No
430	4,736	Five Points	6,076	No	Foothill, Sexton, Corbett and 430	Foothill, Seaward & Poli and Bailey	6,969	Saticoy Conditioning Facility	1,225	-	Yes
430R	46	McElrea	306	No	McElrea	None	-	None	-	Brodea & Aliso	Yes
466	144	Mariano	827	No	Mariano	None	-	None	-	-	No
535	800	Elizabeth	2,389	No	Kimball and Elizabeth	Kimball	2,323	None	-	-	Yes
588	42	McElrea	306	No	McElrea	None	-	None	-	-	No
605K	34	Kalorama	437	No	Kalorama	None	-	None	-	-	No
605V & 605W	351	Day Road	1,125	No	Willis and View Park	View Park	751	None	-	-	Yes
660R	35	Ondulando	752	No	Ondulando	Willis	533	None	-	Alverstone & Skyline	Yes
860	519	Ondulando	752	No	Ondulando	Willis	533	None	-	-	Yes
1035	87	Nob Hill	460	No	Nob Hill	None	-	None	-	-	No

The 360R, 400, 466, 588 and 605K Pressure Zones currently do not have a redundant source of supply. The following projects are proposed to remedy the issue:

- Install an additional PRV in the 360R Zone.
- Add fixed emergency power at the Valley Vista Pump Station.
- Add fixed emergency power at the Mariano Pump Station per CIP 97898.
- Add fixed emergency power at the McElrea Pump Station per CIP 97898.
- Add fixed emergency power at the Kalorama Pump Station.
- Add fixed emergency power at the Nob Hill Pump Station per CIP 97898.

VEN0006134

D. CONCLUSIONS AND RECOMMENDATIONS

The results of the hydraulic evaluation resulted in the following recommendations:

- Reconfigure the zone boundary between the 210 and 260 Pressure Zones to alleviate low pressures along Main Street. Improvements include:
  - Install approximately 5,400 linear feet of 16-inch pipe and approximately 1,300 linear feet of 12-inch pipe per CIP 97889.
  - Open the closed valves along Thompson Boulevard.
  - Reconfigure the valves and pipes at the intersection of Seaward Avenue and Channel Drive
  - Possibly adjust the pressure setting of the Main and Mills Pressure Reducing Station
- Reconfigure the zone boundary between 330 and 430 Pressure Zones near Main and Mills Roads to reduce high pressures. Improvements include:
  - Install approximately 8,500 linear feet of 18-inch pipe per CIP 97895.
  - Open valves at Mills Road and Maple Street and at Dean Drive and Chapel Drive.
  - Close valves at Maple Street and Brentwood Avenue, Ashwood Avenue and Madison Street, Redwood Avenue and Madison Street, and Telegraph Road and College Drive.
- Install an additional PRV in the 360R Zone.
- Add fixed emergency power at the Valley Vista Pump Station.
- Add fixed emergency power at the Mariano Pump Station per CIP 97898.
- Add fixed emergency power at the McElrea Pump Station per CIP 97898.
- Add fixed emergency power at the Kalorama Pump Station.
- Add fixed emergency power at the Nob Hill Pump Station per CIP 97898.
- As noted in Section B.4, updates and maintenance to the model should be implemented into City policy and procedures.

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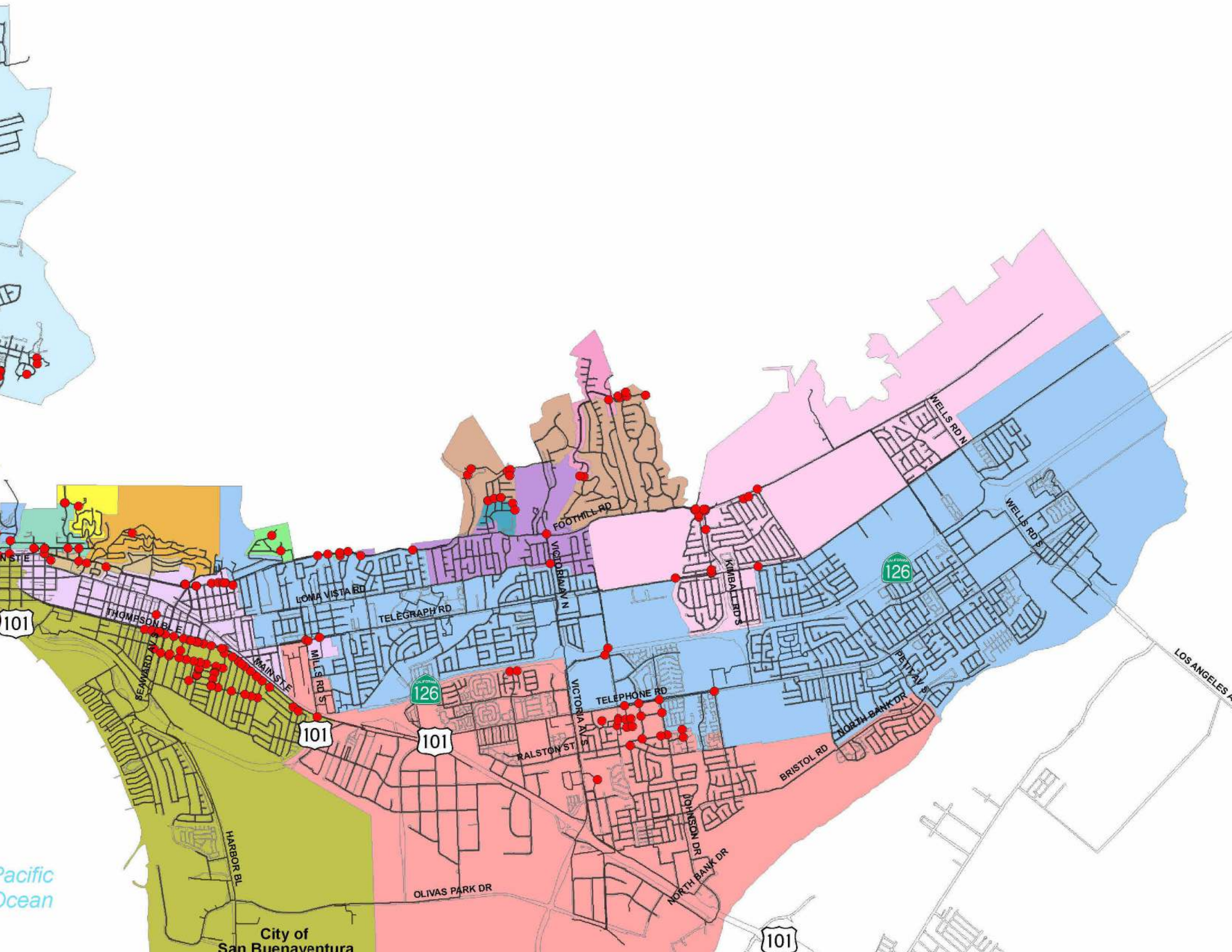
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San Buenaventura
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MAIN ST E
MILLS RD S
LOMA VISTA RD
TELEGRAPH RD
FOOTHILL RD
VICTORIA AV N
VICTORIA AV S
TELEPHONE RD
RALSTON ST
KIMBALL RD S
WELLS RD N
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PETIT AV S
NORTH BANK DR
BRISTOL RD
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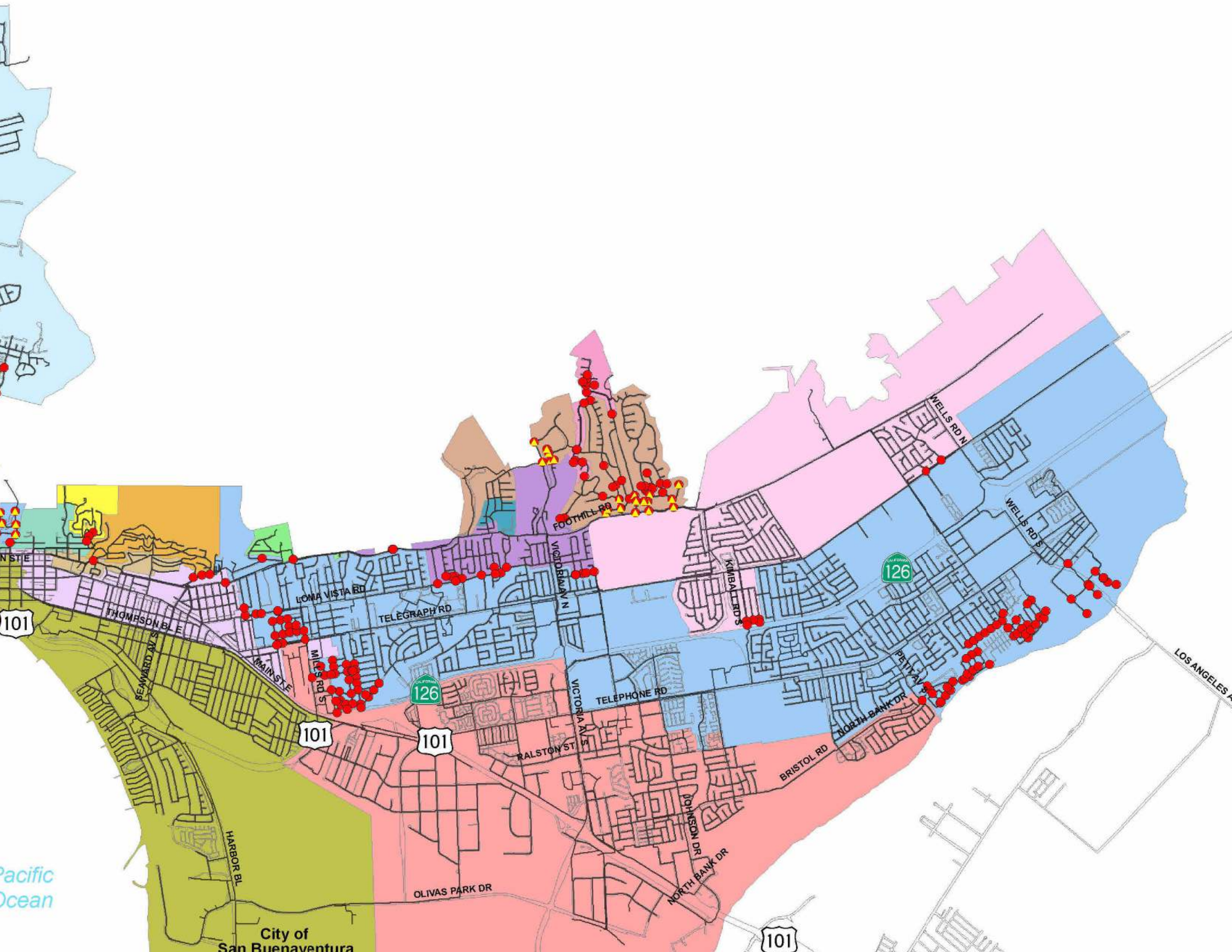
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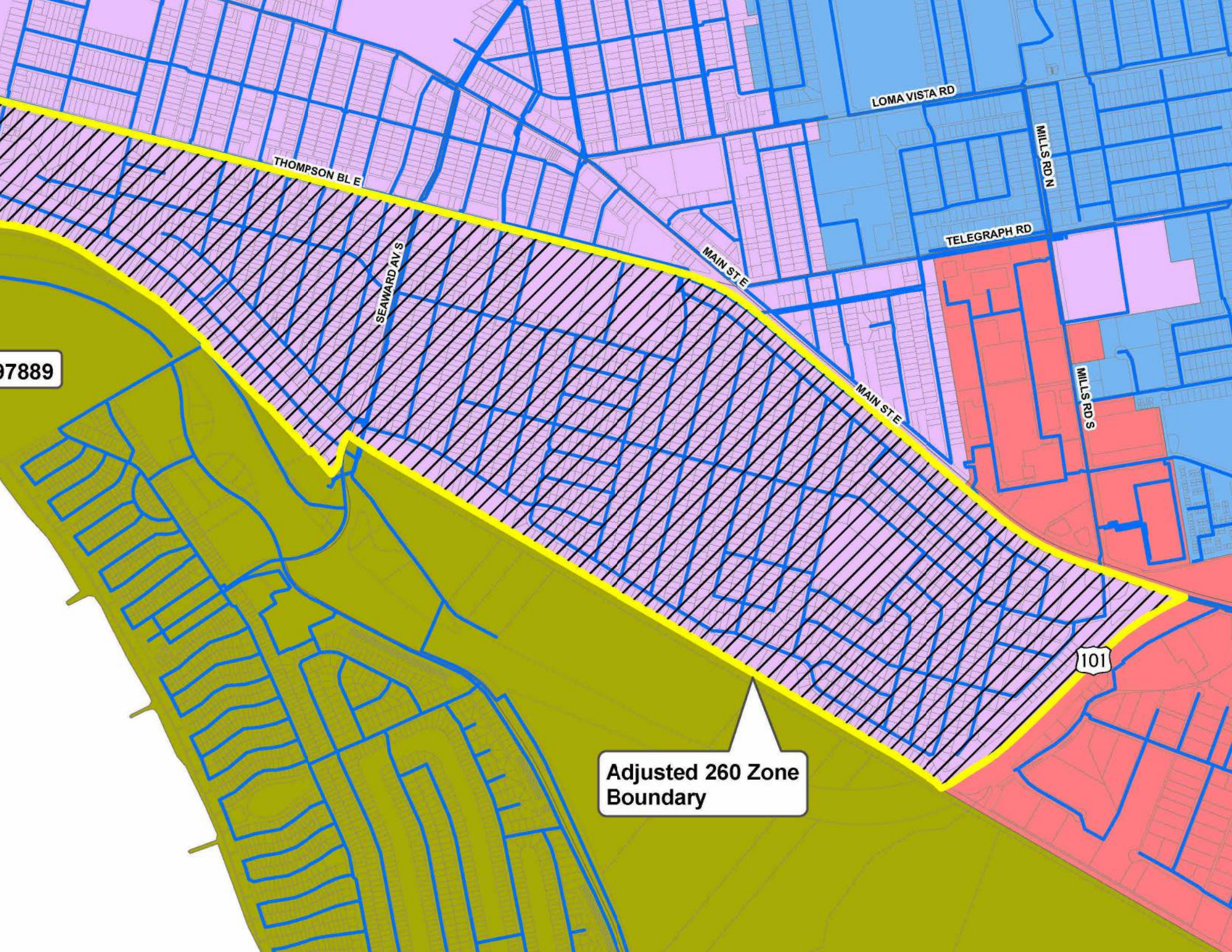
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97889
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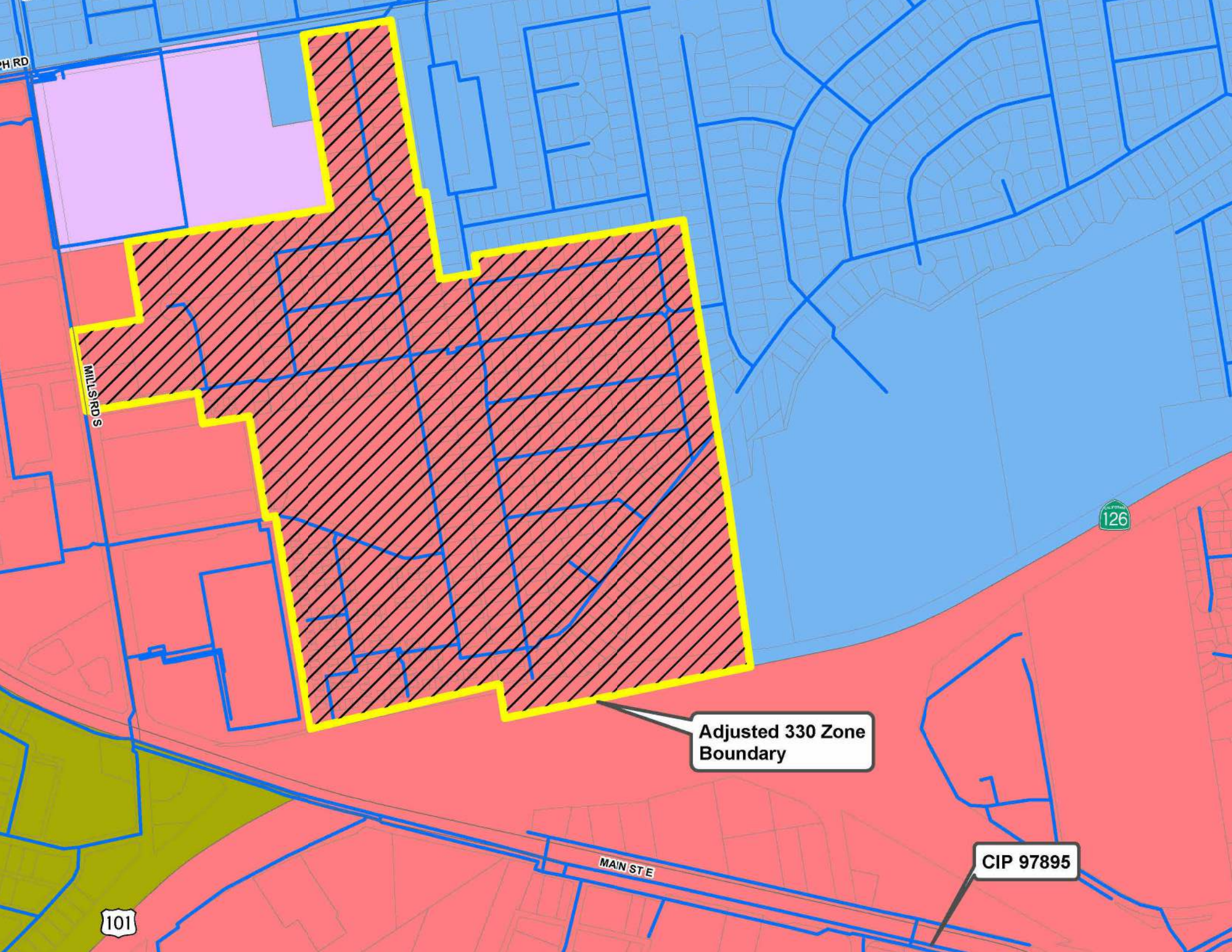
Adjusted 260 Zone Boundary


PH RD
MILLS RD S
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Adjusted 330 Zone Boundary
MAIN ST E
CIP 97895
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XII. FIRE FLOW ANALYSIS

A. INTRODUCTION

The public water system not only provides a reliable source of high quality water to the customers, it also provides a critical component for public safety: fire protection. It is imperative that the City's water system be able to provide the minimum fire flow requirements. This section will discuss the results of the analysis conducted to assess the system's capabilities to meet fire flow requirements.

The system wide fire flow analysis follows the criteria established by the City of San Buenaventura Fire Department. Per discussions with the City Water Department and the City Fire Department, the water system shall be capable of providing the maximum day demand plus the required fire flow at a single location with a minimum residual pressure of 20 psi. All locations within City limits must meet minimum criteria as set forth by the City Fire Department. All locations outside of the City limits must meet the requirements of the Ventura County Fire Department.

B. EXISTING SYSTEM ANALYSIS

The analysis was performed using the calibrated hydraulic model and the fire flow analysis tool available in the modeling software. The hydraulic model analyzed fire flow availability at pre-selected nodes (fire flow nodes) that represented actual fire hydrant locations. At each fire flow node, a fire flow demand (see Section III.F) was allocated based on the existing land use per the 2005 General Plan. Each fire flow node was analyzed on an individual basis with model results reporting the residual pressure at the node, the available flow at that residual pressure, as well as the maximum flow available at the node with a minimum residual of 20 psi.

Based on the results from the fire flow analysis, the following was observed:

- Fire Flow availability at the Multi-Family Residential, Commercial, Industrial and Public Institutional land use areas in the 210 Pressure Zone near the 400 and 210 Pressure Zone boundary are deficient.
- Several areas within the 210 Pressure Zone near the Downtown area with pipes smaller than 8-inches in diameter are deficient in fire flow.
- Deficiencies occur in the Commercial areas in the 210 Pressure Zone near the Harbor District.

VEN0006140

- Commercial areas along Thompson Avenue (bottom of the 260 zone) are deficient in fire flow. The majority of the pipes that are in this area are less than 8-inches and are not capable of delivering the maximum day demand plus the required fire flow.
- Commercial and Industrial areas in the 330 Pressure Zone are deficient in fire flow.
- Medium Density Residential areas in the 430 Pressure Zone near Telegraph Road are deficient in fire flow.
- Industrial areas in the 430 Pressure Zone near southeast boundary of the City are deficient in fire flow.
- All 4-inch diameter pipelines (or smaller) are not capable of delivering the minimum fire flow of 1,000 gpm.

The fire flow analysis identified 220 nodes that exhibited residual pressures less than 20 psi at the required fire flows. Figure XII-1 contains a summary of the deficient fire nodes in each pressure zone. This graphs illustrates that of the 220 nodes that were identified as deficient, nearly thirty-five percent of these deficiencies exist within the 210 Pressure Zone, while the 260 Pressure Zone contains more than twenty percent of the deficient nodes.

Figure XII-1
Deficient Fire Flow Nodes by Pressure Zone

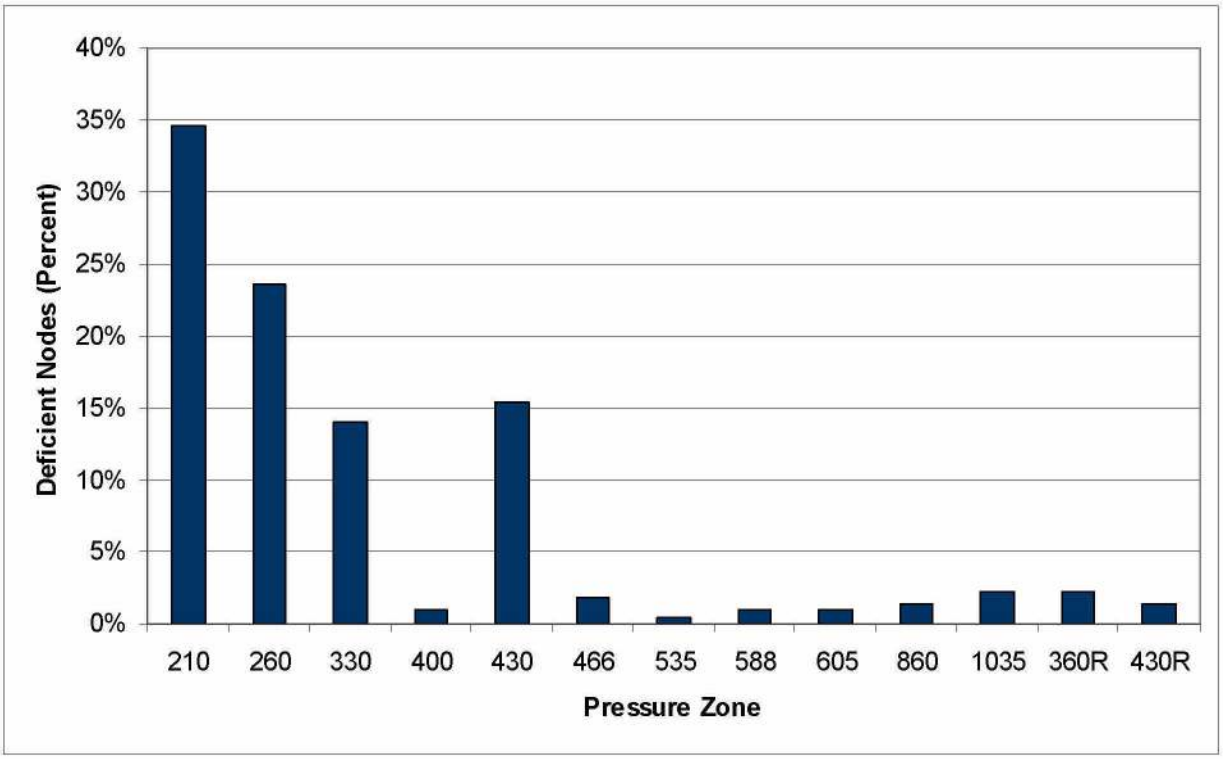

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Exhibit XII-1 displays the locations of the deficient fire flow node throughout the entire distribution system.

C. CONCLUSIONS AND RECOMMENDATIONS

The fire flow analysis indicated that the City's distribution system could not provide the minimum fire flow required at 220 locations throughout the distribution system. Individual improvement at each deficient location is not an economically feasible solution. However, some projects and programs recommended earlier in this Report will help to solve some fire flow deficiencies. The following recommendations are made as a result of this analysis:

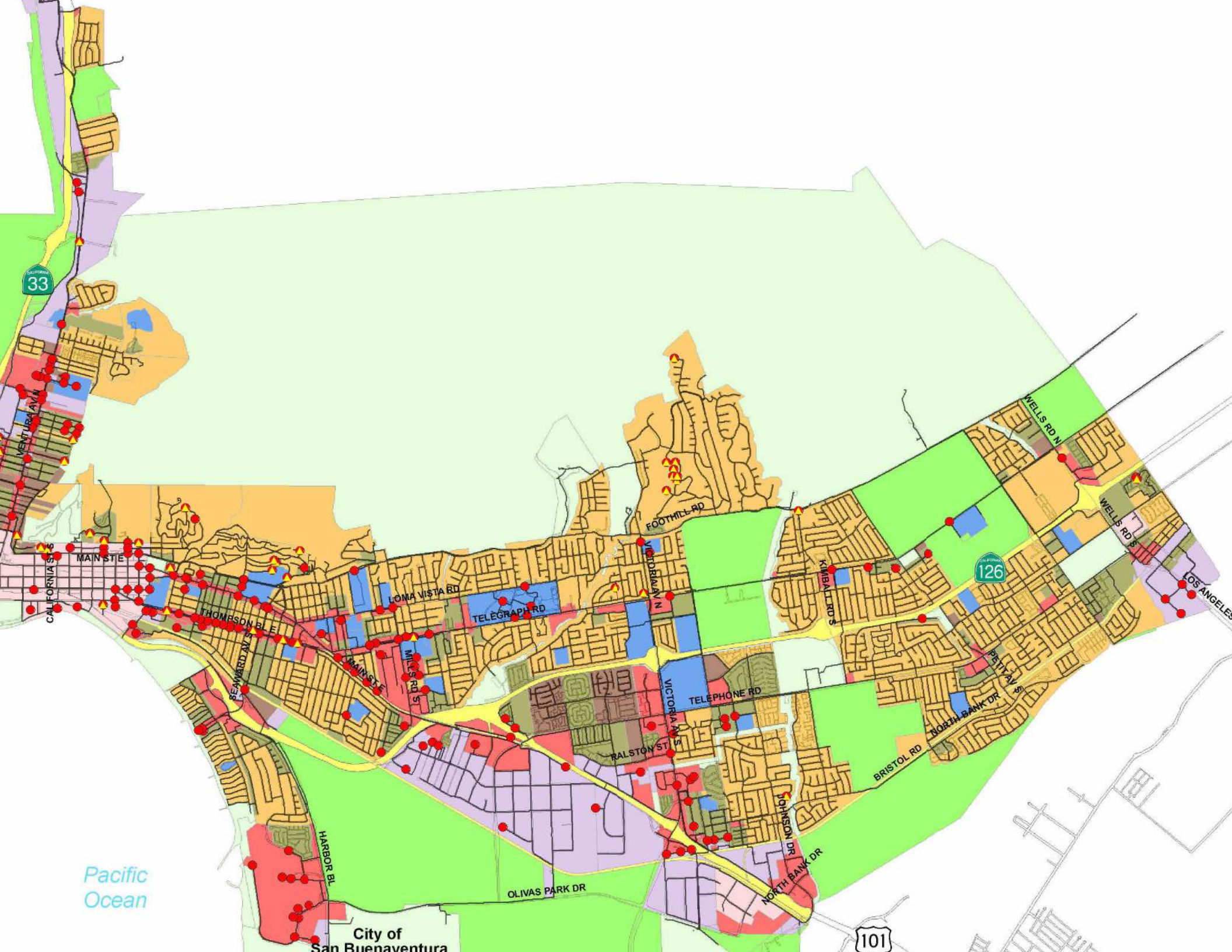
- Implement the small diameter pipeline replacement program as described in Section X. Increase all small diameter pipe (smaller than 6-inches) to a minimum of 6-inch diameter pipe.

- By implementing the 210 to 260 pressure zone boundary adjustment described in Section XI, fire flow availability will improve at approximately 12 nodes.

- Implement the pipe looping projects identified in Section X.

It should be noted that the model does not take into consideration if valves are unknowingly closed, or partially closed. It is recommended that the City utilize the hydraulic model to conduct individual fire flow simulations when new developments or redevelopments are proposed. Actual fire flow tests should be conducted in the field to verify model results.

VEN0006142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FOOTHILL RD
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TELEPHONE RD
RALSTON ST W
KIMBALL RD S
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WELLS RD N
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PETIT AV S
NORTH BANK DR
BRISTOL RD
JOHNSON DR
NORTH BANK DR
HARBOR BL
OLIVAS PARK DR
Pacific Ocean
City of San Buenaventura
101

XIII. WATER QUALITY ANALYSIS

A. POTABLE WATER REGULATORY REVIEW

1. Introduction

The United States Environmental Protection Agency (EPA) is authorized by the Safe Drinking Water Act (SDWA) to set national health-based standards for drinking water and its sources. The SDWA was originally passed in Congress in 1974 and has since been amended twice, in 1986 and 1996. These national standards are set to protect against both naturally occurring and man-made contaminants that may be found in drinking water.

The SDWA applies to every public water system in the United States. Individual states may choose to accept the responsibility for oversight and enforcement of the national drinking water regulations. A state may also choose to enforce standards above and beyond those established by the EPA. The State of California Department of Public Health (CDPH) has been granted responsibility by the EPA to enforce the standards set by the EPA. CDPH drinking water regulations are identified in Titles 17 and 22 of the California Code of Regulations.

The EPA has established the National Primary Drinking Water Regulations (NPDWRs) for contaminants occurring in drinking water. NPDWRs are established and enforced to protect the public from adverse health effects resulting from a drinking water contaminant. Included in these regulations are the drinking water standards which set either 1) treatment techniques to control a contaminant, or 2) the Maximum Contaminant Level (MCL) allowable for the contaminant in drinking water.

The City's water system is operating in compliance with the primary standards referenced above; however, there are several regulations that are currently under review by the EPA and CDPH, which may be enforced at a later date.

The City does consistently exceed the secondary MCL regarding the upper contaminant drinking water standard of 1,000-ppm for total dissolved solids (TDS) on the east side of the City. Blending is acceptable by CDPH to keep the TDS below the short-term SMCL of 1,500 ppm on a continual basis as an interim measure pending construction of treatment facilities or development of acceptable new sources [Title 22, CCR Sec. 64449 (d)(3)].

VEN0006144

Blending TDS below this SMCL has not been completely attainable due to the high TDS in the Mound Well when other wells are inoperable. The annual average on the east side of the City is about 1,300 ppm. The west side of the City is in compliance with the upper TDS limit and generally between 500 to 700 ppm. CDPH Water Supply Permit issued August 3, 2007 has required a TDS reduction study and a preliminary plan and schedule for complying with the upper contaminant level of 1,000 ppm in the water delivered to the public and apply for a waiver for the TDS secondary standards.

Casitas Municipal Water District operates Lake Casitas and treats their wholesale water and sells it to the City. Common lake turnover has been the source of short-term taste and odor concerns for our customers. CDHP does not consider this biannual change in water quality to be a health hazard. The City has no direct control over the water received from CMWD. The City has no feasible or cost effective treatment capability or processes to improve the taste and odor.

2. Recent Changes/Future Regulations

Future drinking water regulations are of paramount importance to a water purveyor. Changes in EPA and CDPH regulations may require major changes in treatment and distribution operations. Below is a summary of recent regulatory modifications and future water regulations under development by the EPA and CDPH, as well as a discussion of the City's operations and some general monitoring results. Annual water quality reports for both the City and Casitas Municipal Water District (Casitas) compiled from 2006 data were reviewed during this analysis.

- Nitrification - When the City converted its disinfection regime to chloramination, they developed a Nitrification Action Plan to deal with lower chlorine residuals in the distribution system, specifically at the tanks and pipelines. For the tank sites and pipelines, the City performs monthly total chlorine residual, nitrite and HPC testing at each designated site. They also perform weekly total chlorine residuals at sites that occasionally have problems. When the levels reach the "Action Levels" the City begins daily water quality monitoring and aggressively changes the pump operation to "turn over" the tank and initiates flushing of the distribution system If these actions do not solve the problem and the chlorine residual continues to degrade, the final action will be to take the tank out of service. Some of the tank operational actions taken by the City to control nitrification include:

VEN0006145

In the 400 Zone, the City was not getting adequate turn over in the Valley Vista tank and Seneca tank. The Valley Vista tank has a top feed inlet with an altitude valve. The Seneca tank has a bottom feed inlet. The City changed the pump control at the Valley Vista Pump Station to have two pumps running to provide enough water to fill the tanks. With one pump running, the flow would match demand and neither tank would turn over. Also, a tank mixing pump was recently installed in the Seneca tank to correct the stratification problem.

At Kalorama, there is not enough demand in the 605K-pressure zone to turn both tanks over, even in the summer. One tank has been taken out of service. In the winter, it takes a few days to turn over one tank. In the summer it turns over daily.

The Grant Park, a two sided reservoir was having trouble maintaining chlorine residual. The City thought the water quality issue was a result of the check valves on the inlet and outlet piping. The check valves were removed, but the chlorine residual continued to remain low. One side of the reservoir was taken out of service for maintenance, and this helped with water turn over in the other side. The one side of the reservoir has remained out of service. The pump control at the Hall Canyon Booster Station was adjusted to lower the water level in the Hall Canyon tanks. If the water level in the Hall Canyon tanks were too high, water in the Grant Park reservoir would be hydraulically locked, and the water quality would deteriorate. With these actions, the Grant Park reservoir turns over about once about every day and a half.

The Kimball tank had been taken out of service because neither Kimball nor Elizabeth would turn over. Elizabeth has a long supply pipeline and it feeds the Edison facility near the tank. The City could not take Elizabeth out of service because this would create a long dead end pipeline, therefore Kimball was taken out of service. Kimball tank was placed back in service in May 2008. The water quality was monitored through the summer and fall months and was acceptable. Occasionally the water quality in Elizabeth tank fell below action levels and the water level in the tank had to be aggressively turned over to improve quality.

The Long Canyon tanks will not maintain good water quality because the lack of pressure and water volume pumping into the tank cannot properly mix the tanks, and the demand in the system is not enough to turn them over. Both tanks are currently out of service. There is no elevation valve on Corbett tank, so the water from

VEN0006146

Seaward & Poli, Five Points, and Bailey booster stations will fill Corbett, and not the Long Canyon tanks.

- Corrosivity – The 2004 Corrosion Study provides a recommendation to improve the corrosivity of the drinking water supply to aid in reducing lead and copper at the customers tap by installing pH control at the three treatment plants. The pH control measures include the addition of caustic soda to achieve a pH target of 7.6 to 7.7. The City will continue to add polyphosphate. The Avenue Water Treatment Plant was recently upgraded and includes pH control measures. The planned upgrades at the Saticoy Water Treatment Plant include provisions to include pH control. The City plans to install pH control measures at the Bailey Treatment Plant in the future. The triennial Lead & Copper Rule sampling results indicate there are generally very low levels of lead at the customers tap and some higher copper levels but still below the 90th percentile required by the USEPA. Effective pH control may lower the copper levels further at the customers tap.

- Lead and Copper - The Lead and Copper Rule was promulgated by the EPA in 1991, and subsequently updated on January 2000. Minor corrections were made to the rule in 2004, which added information that was inadvertently removed from the rule during previous revisions. The final rule was recently published on October 10th, 2007 in the Federal Register.

  EPA is proposing targeted regulatory changes to the existing national primary drinking water regulations (NPDWRs) for lead and copper. The purpose of the Lead and Copper Rule (LCR) is to protect public water system consumers from exposure to lead and copper in drinking water. The proposed regulatory changes will enhance the implementation of the LCR in the areas of monitoring, treatment, customer awareness, lead service line replacement; and improve compliance with the public education requirements of the LCR and ensure drinking water consumers receive meaningful, timely, and useful information needed to help them limit their exposure to lead in drinking water.

  The City collected 55 lead and copper samples in 2006, and reported one sample above the regulatory action level for both lead and copper. Casitas collected 80 lead and copper samples in 2005, and reported zero samples above the regulatory action level for both lead and copper. The current regulatory action levels for lead and copper are 1.3 mg/L for copper and 15 ppb for lead.

VEN0006147

- Microbial and Disinfection Byproducts - A major challenge for water suppliers is how to balance the risks from microbial pathogens and disinfection byproducts. It is important to provide protection from these microbial pathogens while simultaneously ensuring decreasing health risks to the population from disinfection byproducts. The Safe Water Drinking Act requires EPA to develop rules to achieve these goals.

  EPA published the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) in the Federal Register on January 5th 2006. The purpose of this rule is to reduce disease incidence associated with Cryptosporidium and other pathogenic microorganisms in drinking water. The LT2ESWTR will supplement existing regulations by targeting additional Cryptosporidium treatment requirements to higher risk systems. This regulation also contains provisions to mitigate risks from uncovered finished water storage facilities and to ensure that systems maintain microbial protection as they take steps to reduce the formation of disinfection byproducts. The LT2ESWTR will apply to all systems that use surface water or ground water under the direct influence of surface water.

  This rule will require both the City and Casitas ensure that treatment operations at the Casitas Treatment Plant and the Avenue Treatment Plant meet the treatment requirements. Additionally, Casitas and/or the City are required to temporarily monitor for Cryptosporidium to be classified into a risk bin, which would determine if additional monitoring or treatment is required. The Avenue WTP upgrades are expected to meet and exceed the requirements of the LT2ESWTR.

  Concurrently with the LT2ESWTR, the EPA published the Stage 2 Disinfectants and Disinfection Byproducts Rule (DBPR) on January 4th, 2006, which focuses on public health protection by limiting exposure to DBPs, specifically total trihalomethanes (TTHM) and five haloacetic acids (HAA5), which can form in water as a by-product of disinfectants used to control microbial pathogens. Stage 1 of this rule, now in effect, established system-wide average Maximum Residual Disinfectant Level (MRDL) limits for disinfectant residuals and disinfectant by-product levels, including:

  - Free chlorine or chloramines maximum residual of 4 mg/L
  - Total Trihalomethane (TTHM) maximum level of 0.080 mg/L
  - Haloacetic Acids (HAA5) maximum level of 0.060 mg/L

VEN0006148

- Chlorite maximum level of 1.0 mg/L
- Bromate maximum level of 0.01 mg/L

Based on 2006 monitoring by the City, system-wide average levels are, 35 ppb for HAA5, and 35 ppb for TTHMs, all in compliance with the Stage 1 requirements.

Under the Stage 2 DBPR, the City will conduct an evaluation of their distribution system, known as an Initial Distribution System Evaluation (IDSE), to identify the locations with high disinfection byproduct concentrations. These locations will then be used by the City as the sampling sites for Stage 2 DBPR compliance monitoring.

Compliance with the maximum contaminant levels for two groups of disinfection byproducts (TTHM and HAA5) will be calculated for each monitoring location in the distribution system. This approach, referred to as the locational running annual average (LRAA), differs from current requirements, which determine compliance by calculating the running annual average of samples from all monitoring locations across the system.

The Stage 2 DBPR also requires each system to determine if they have exceeded an operational evaluation level, which is identified using their compliance monitoring results. The operational evaluation level provides an early warning of possible future MCL violations, which allows the system to take proactive steps to remain in compliance. A system that exceeds an operational evaluation level is required to review their operational practices and submit a report to their state that identifies actions that may be taken prior to the next scheduled quarterly sampling to mitigate an exceedance of the MCL regarding high DBP levels, particularly those that may jeopardize their compliance.

Water samples taken in areas of the City that receive groundwater are not indicating any Stage 2 DBPR compliance issues. A few areas of the City that receive surface water have experienced elevated levels of TTHM and HAA5. Coagulation for TOC removal at the Avenue WTP may be an operational tool to help meet the Stage 2 DBPR LRAA, due to the influence of surface water. Altering tank detention time in areas of concern or covering the Kingston Reservoir are also options to reduce DBPs

Based upon these results reported in the 2007 Water Quality Confidence Report, it appears that the City may have compliance concerns with the proposed Stage 2

VEN0006149

requirements, as both the TTHM and HAA5 distribution system ranges were above the MCL at a few sample locations during some quarterly sampling events. The City is currently completing the IDSE evaluation of its system to determine necessary monitoring locations within its distribution system. This will identify areas at higher risk for high DBP levels, such as dead ends or areas with long residence time, and require monitoring at these locations to ensure compliance throughout the system.

- MTBE - EPA has placed Methyl-Tertiary-Butyl Ether (MTBE) on the drinking water Contaminant Candidate List (CCL) for further evaluation to determine whether or not regulation with a National Primary Drinking Water Regulation (NPDWR) is necessary. The CCL divided the contaminants among those which are priorities for additional research, those which need additional occurrence data, and those which are priorities for consideration for rulemaking. The Agency determined that MTBE needs more health effects research and occurrence data before a regulatory determination can be made. It is noted that the California Department of Public Health has a primary MCL for MTBE of 13 micrograms per liter, established in 2000. The City has not detected any MTBE in its monitoring program to date.

- Perchlorate - Perchlorate is now a regulated drinking water contaminant in California, with a maximum contaminant level (MCL) of 6 micrograms per liter (µg/L), effective October 18, 2007. Perchlorate and its salts are used in solid propellant for rockets, missiles, and fireworks, and elsewhere (e.g., production of matches, flares, pyrotechnics, ordnance, and explosives). Their use can lead to releases of perchlorate into the environment. Perchlorate's interference with iodide uptake by the thyroid gland can decrease production of thyroid hormones, which are needed for prenatal and postnatal growth and development, as well as for normal metabolism and mental function in the adult. The City has not detected any perchlorate in its monitoring program to date.

- Chromium 6 - Chromium-6, a specific form of the chromium ion in water, is regulated under the 50 ppb maximum contaminant level (MCL) for total chromium. CDPH will be adopting an MCL that is specific for chromium-6. California's Health and Safety Code guides the development of an MCL for chromium and requires CDPH to establish an MCL at a level as close as is technically and economically feasible to the contaminant's PHG. PHGs are contaminant concentrations that do not pose a significant risk to health; they are developed by the Office of Environmental Health Hazard Assessment (OEHHA). OEHHA's PHG for chromium-6 is anticipated soon.

VEN0006150

Because the PHG for chromium-6 is not yet available, CDPH cannot proceed with the MCL process. The City has not detected any chromium-6 in its monitoring program to date.

- Radon Rule - Radon is a naturally occurring radioactive gas that may cause cancer, and may be found in drinking water and indoor air. Some people who are exposed to radon in drinking water may have increased risk of getting cancer over the course of their lifetime, especially lung cancer. Radon in soil under homes is the biggest source of radon in indoor air, and presents a greater risk of lung cancer than radon in drinking water. As required by the Safe Drinking Water Act, EPA has developed a proposed regulation to reduce radon in drinking water. The proposed rule applies to all water systems that use groundwater or mixed ground and surface water. The City has not detected any radon in its monitoring program to date.

  Mound Well does have uranium level that is generally near the MCL. All other well sources have low levels of uranium. The uranium content in the distribution system contributed from Mound Well is easily reduced with the same TDS and sulfate blending reduction operations currently in place. Quarterly monitoring in the Mound Well, Bailey reservoir effluent and the 330 zone is conducted to verify the blending operations are effective.

- Sulfate Rule - Sulfate is a substance that occurs naturally in drinking water. Health concerns regarding sulfate in drinking water have been raised because of reports that diarrhea may be associated with the ingestion of water containing high levels of sulfate. Sulfate in drinking water currently has a secondary maximum contaminant level (SMCL) of 250 milligrams per liter (mg/L), based on aesthetic effects (i.e., taste and odor). The Safe Drinking Water Act (SDWA), as amended in 1996, directs the EPA and the Centers for Disease Control and Prevention (CDC) to jointly conduct a study to establish a reliable dose-response relationship for the adverse human health effects from exposure to sulfate in drinking water, including the health effects that may be experienced by sensitive subpopulations (infants and travelers). The study was completed in January 1999. Sulfate is currently being reviewed by EPA as a potential contaminant for regulation; however, no decision has been made on this rule as yet. The City has detected elevated levels of sulfate in the Mound Basin, in the range of 600 to 700 mg/L. Blending for sulfate reduction at the Bailey Reservoir effluent is easily achieved as a result of the same TDS and uranium blending reduction operations currently in place.

VEN0006151

- TDS – TDS is a secondary water quality standard related to aesthetic aspects of water quality, because the excessive mineral constituents may adversely affect the taste, odor or appearance of drinking water. Customer satisfaction with the drinking water may need to be determined by the water purveyor including a study of feasible treatment alternatives and costs and a survey reporting the findings and gaining an understanding of the customer's willingness to pay for improvement to water quality or apply to CDPH for a waiver of the compliance with the SMCL for TDS [Title 22, CCR; Sec. 64449.2 (b)(d)(e)(g)].

  Section 64449 of Title 22, CCR lists the SMCLs for TDS as follows: Recommended SCML less than 500 mg/l is desirable; Upper SCML less than 1,000 mg/l is acceptable if it is neither reasonable nor feasible to provide more suitable waters; and the Short-Term SMCL less than 1,500 mg/l is acceptable on a temporary basis pending construction of treatment facilities or development of acceptable new sources.

  The CDPH requires the City to implement TDS reduction for water treated at the Bailey TP below upper SMCL of 1,000 mg/l or below the short-term limit of 1,500 mg/L on a continual basis on the east side of the City as a temporary measure pending construction of treatment facilities or development of acceptable new sources. Groundwater in the Mound Basin and Oxnard Plain Forebay are high in TDS and sulfate.

  The City does consistently exceed the secondary upper MCL of 1,000-ppm total dissolved solids (TDS) on the east side of the City but not on the west side. Blending TDS below the 1,500-ppm limit has not been completely attainable due to the high TDS in the Mound Well when other wells are inoperable. The annual average on the east side of the City is about 1,300 ppm. The west side of the City is in compliance with the upper TDS limit and generally between 500 to 700 ppm. CDPH Water Supply Permit issued August 3, 2007 has required a TDS reduction study and a preliminary plan and schedule for complying with the upper contaminant level of 1,000 ppm in the water delivered to the public on the east side of the City and apply for a waiver for the TDS secondary standards.

  The permit also states the City will consider making capital improvements to lower TDS near 800 ppm system wide when a new supplemental water source is considered by City Council such as state water and seawater desalination.

VEN0006152

Title 22, CCR Section 64449(e) states that new services serving water which carries TDS constituent concentrations between the upper and short term SCMLs shall be approved only if adequate progress is being demonstrated toward providing water of improved mineral quality or for compelling reasons approved by the CDPH.

Water Quality Improvement Program – A program to reduce TDS below the upper limit may take ten years to complete for the eastside of the City. Compliance with the regulations pertaining to the application of a secondary MCL waiver for TDS is the first major step in the program. To apply for a waiver of a secondary MCL, the City shall conduct and submit a study to the CDPH.

- Unregulated Contaminant Monitoring Rule - EPA published the Unregulated Contaminant Monitoring Rule September 17, 1999 and supplemented the rule on March 2, 2000 and January 11, 2001. EPA uses the data generated by the new UCMR to evaluate and prioritize contaminants on the Drinking Water Contaminant Candidate List, a list of contaminants EPA is considering for possible new drinking water standards. These data help to ensure that EPA has the high quality scientific data it needs to make decisions about future drinking water standards. Under this rule, Casitas and/or the City are required to monitor for various unregulated contaminants and report to the EPA. Current UCMR 2 compliance is sampled at the Avenue TP, Bailey TP, Saticoy TP and sample station #2 at Ashwood.

- Public Health Goals and MCLG - The California Office of Environmental Health Hazard Assessment (OEHHA), part of the California Environmental Protection Agency, establishes PHGs and the United States Environmental Protection Agency establishes MCLGs. These drinking water health goals are based solely on public health risk factors and are set at a level at which no known or anticipated adverse health effects would occur to consumers exposed to a chemical over their lifetime. Many regulated chemicals do not have a PHG or a MCLG.

PHGs and MCLGs are not mandatory or enforceable limits. Ventura's water system complies with all of the required primary drinking water standards, including the Maximum Contaminant Levels (MCLs) and Regulatory Action Levels (RALs) mandated and regulated by the California Department of Public Health (CDPH) and the United States Environmental Protection Agency (EPA), respectively. However, MCLG and PHG are often a pre-cursor

VEN0006153

for setting future regulations. Therefore it is important to keep them in mind as our long-term planning proceeds.

A comparison of the City's drinking water quality data with the PHGs and MCLGs was completed and the results presented. Only chemicals that have a California primary drinking water standard and for which a PHG or MCLG has been set and was exceeded were addressed. If OEHHA does not set a PHG for a primary drinking water standard then state law requires the use the EPAs Maximum Contaminant Level Goals instead (MCLGs).

The information required in the bi-annual report includes the following:

- Chemicals that were detected in Ventura's water supply at a level exceeding an applicable PHG or MCLG;
- Numerical public health risk associated with the PHG or MCLG;
- Category or type of risk to health that could be associated with a chemical;
- Best treatment technology available that could be used to reduce the amount of the chemical (i.e., pH adjustment, reverse osmosis, disinfection chemicals or TOC removal); and
- Estimate of the cost to install and operate treatment.

Findings:

This report considered Ventura's 2004, 2005 and 2006 CCR water quality and disinfection/disinfectant byproduct data regarding any exceedances of the PHGs or MCLGs. Out of 83 PHGs and 87 MCLGs only ten chemicals were identified that exceed the goals and information is summarized below:

VEN0006154

Chemicals (units)	OEHHA (EPA) PHG or (MCLG)	CDPH (EPA) MCL or (RAL)	City Level
		(Mandates)	
Lead 90th Percentile (ppb)	2	(15)	9
Copper 90th Percentile (ppb)	170	(1300)	1100
Arsenic (ppb)	0.004	10	ND - 3.2
Uranium (pCi/L)	0.43	20	2.0 - 6.8
Gross Alpha Particles (pCi/L)	(0)	15	0.3 - 17.5
Gross Beta Particles (pCi/L)	(0)	50	ND - 15.8
Radium 226 (pCi/L)	(0)	5	ND - 0.89
Bromodichloromethane (ppb)	(0)	< 80	ND - 24
Bromoform (ppb)	(0)	< 80	ND - 33
Dichloroacetic Acid (ppb)	(0)	< 60	1 – 56

Ventura's drinking water exceeded four (4) PHGs including lead, copper, arsenic and uranium, and six (6) MCLGs including gross alpha & beta particles, radium 226, bromodichloromethane, bromoform and dichloroacetic acid.

Lead and copper can accumulate in drinking water as a corrosion by-product that occurs as the result of the corrosion of plumbing fixtures and pipes that remain in contact with water for a prolonged period of time. Lead, a silverish metal, is often used by plumbing fixture manufacturers for bathroom and kitchen valves to extend their use for many years. Copper, a reddish-brown metal, is often used in water pipes for residential and commercial plumbing. When sampled for lead and copper, Ventura's water sources including groundwater wells, the Ventura River and Casitas Municipal Water District (CMWD), have concentrations well below the RAL for lead and copper.

Arsenic, a semi-metal, is odorless and tasteless. It enters the drinking water supplies from natural deposits in the earth or from agricultural and industrial practices. Arsenic is almost

VEN0006155

exclusively a contaminant found in groundwater. Arsenic has not been detected in the surface and groundwater sources used by the City of Ventura. Arsenic was detected in the CMWD sources.

Gross alpha & beta particles and radium 226 and uranium are naturally occurring radioactive isotopes in the environment that typically occur in the drinking water by the erosion of natural deposits in all City sources. Although the gross alpha particles exceeded the MCL (only at Victoria Well No. 2), follow up samples required for radium 226 & 228 and uranium were below the MCLs, and the water supply is deemed in compliance with the CDPH radiological monitoring requirements. Gross alpha & beta particles are screening tools for the presence of regulated radionuclides.

Bromodichloromethane, bromoform, and dichloroacetic acid are disinfection byproducts (DBPs) formed during the drinking water treatment disinfection process that occur when natural organic matter (NOM) also know as dissolved organic carbon (DOC) or total organic carbon (TOC) in the raw water supplies come in contact with the free chlorine used in the treatment process to kill bacteria (disinfection). Surface water sources generally contain about 10 times more NOM than groundwater sources. The Avenue Water Treatment Plant (AWTP) treats surface water from the Ventura River at Foster Park and the Bailey and Saticoy Plants treat eastside groundwater from deep wells. Water systems that use chlorine have DBPs in the water supplies. The levels of DBPs are incompliance with the system wide quarterly averages regulated by the CDPH. Some sample locations in the city have quarterly levels that exceed the MCL, but the locational averages are below the MCLs.

- Long Term II Enhanced Surface Water Treatment Rule (LT2ESWTR)
  This rule applies to all public water systems that use surface water or groundwater under the direct influence of surface water. The purpose of the LT2ESWTR is to improve drinking water quality by reducing the occurrence of disease-causing pathogens in drinking water, such as Cryptosporidium and Giardia. The rule consists of monitoring requirements, bin classification of water systems based on their source water quality, and removal/inactivation requirements.

  Rule Requirements - Source Water Monitoring Source water monitoring is conducted to assess the mean level of Cryptosporidium contamination in the water supply. The source water monitoring requirements depend on the size of the public water system (PWS) and whether or not filtration is employed by the PWS.

VEN0006156

PWS Size

Systems that serve	(1) At least 100,000 people
1st round of source water monitoring	October 1, 2006
2nd round of source water monitoring	April 1, 2015
Treatment Compliance Deadline	April 1, 2012

Log Removal Rates - Refer to minimum total Cryptosporidium removal and inactivation. The total Cryptosporidium removal required for plants in Bins 2, 3, and 4 is 4.0-log removal, 5.0-log removal and 5.5-log removal respectively.

Removal Credit for Treatment Plant Types –

Plant Type	Treatment Credit
Conventional, diatomaceous earth filtration, slow sand filtration	3 log
Direct filtration	2.5 log
Alternative filtration technologies	Determine by the State

While the City has installed advanced treatment (UF Membranes) for pathogens **removal**, regulatory change may require a minimum **inactivation** credit (Ex. 0.5 log)

3. Summary

Based on the proposed future regulations developed under the EPA and CDPH, the City's water source is within acceptable levels or non-detectable levels, except for TDS on the east side of the City. The City should continue monitoring for the aforementioned contaminants and for unregulated contaminants, in the event they are added to the contaminants list in future drinking water standards.

The City should consider implementing a long-term water quality improvement program. The City currently experiences TDS levels in excess of 1,000 mg/L on a daily basis in the eastern portions of the system. Specific actions can be taken to help with the overall water quality within the system. A water quality improvement program can be used to combine many of the City's current actions (blending, nitrification plan, etc.) into one comprehensive coordinated plan. A water quality improvement program can identify the

VEN0006157

specific actions and projects that should be implemented within the distribution system, at the well, tank and booster station sites, and at the treatment plant.

B. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations resulted from the above evaluation:

- Continue monitoring contaminants and unregulated contaminants on the top of the Drinking Water Contaminant Candidate List.
- Maintain a blending plan to reduce the levels of TDS and sulfate in the product water leaving Bailey TP, per CDPH.
- Develop new wells in the Mound Basin with lower levels of TDS and sulfate.
- Develop a Water Quality Improvement Program

VEN0006158

XIV. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The City initiated this Water Master Plan project to gauge the current condition and operation of the water distribution system, as well as create a roadmap to properly plan for future growth and improvements. Some of the primary purposes of this project were to evaluate current water usage; evaluate future development/redevelopment within the City water service area; create a hydraulic model of the water system; analyze the model and identify system deficiencies; identify operational changes within the system which may result in more efficient operations; evaluate opportunities to fully utilize water sources; assess the condition of existing water facilities; and evaluate future water quality regulations.

The primary goal of the City is to provide an adequate, reliable and safe water supply at adequate service pressure that can be used for individual use, community use and fire protection. The analyses performed herein evaluated the capacity and operation of the City's distribution system network with regards to meeting the existing and future water demands during various water supply conditions within a defined set of standards and criteria. The system analyses can be categorized into one of the following:

- Storage
- Supply
- Pumping Capacity and Efficiency
- Transmission and Distribution
- Hydraulics
- Fire Flow

In general, the City's distribution system is in good physical condition, adequately sized and operated efficiently. The results of the analysis of the distribution system identified some deficiencies that require improvements in order to meet the minimum standards and criteria. The recommended improvements are discussed later in the Section, however a brief description of the conclusions for each category is described herein.

<u>Storage</u>

The City currently has 43.2 MG of operational storage citywide. Of that storage volume, approximately 46% is located in the lowest pressure (210 Pressure Zone), and approximately 23% in located in the 430 Pressure Zone. Based on the City's storage criteria requirements, only

VEN0006159

one pressure zone has adequate storage capacity (210 Pressure Zone). Including the projected near-term water demand increase, the City's storage capacity is deficient by 7.6 MG.

An existing operational issue noticed during the storage evaluation, is that the storage facilities in the 430 Pressure Zone have varying overflow elevations, which reduces the operational storage in the zone and creates challenges achieving water turn over in the tanks during low demand periods. CIP 97891 is intended to improve tank mixing and turnover.

Supply

The City has a diverse portfolio of supply sources. The City purchases treated local surface water from Casitas Municipal Water District that is delivered through two existing connections. The City can withdraw water from three local groundwater basins and the City can withdraw surface water from the Ventura River.

The Casitas supply and the groundwater supply have historically been reliable water supply sources. The Ventura River supply has proved to be less reliable in recent years. Flooding on the river in 2005 caused damage to several City wells, which has greatly reduced the City's available supply from the River. Since the floods, supply from the river is approximately 33% of what was available prior to the floods. Installing new wells, or repairing the damaged wells and pipelines, is proving to be a lengthy process due to environmental regulations.

The City has additional rights to groundwater, and also some stored groundwater credits that can be utilized in times of drought. In order to access the additional groundwater, the City will need to construct additional wells and increase the well treatment plant capacity.

Pumping Capacity and Efficiency

The City has 15 pressure zones that provide service to an elevation range of over 1,000 feet. Since the water supply is primarily located in the lowest hydraulic gradients, the City relies on an extensive amount of pumping to move water to the higher gradients. The nominal capacity of the City's pumping facilities is over three times the maximum day demand. The pump station capacity evaluation concluded that there is adequate pumping capacity in all of the City's pressure zones with the exception of the 400 Pressure Zone.

An evaluation of the pumping schedules and rate structures using the calibrated hydraulic model concluded that the City may be able to save on the monthly electricity bills if system improvements are made so rate schedules at six pump stations can be adjusted to match the

VEN0006160

pumping requirements of the station. More savings may be possible if the City is not currently utilizing the off-peak energy charge window caused by infrastructure constraints.

For those pump stations that are the sole supply to a single pressure zone, it is critical that the pump station be equipped with on-site back-up power in case of an emergency. There are a total of five pump stations that require on-site back-up power units.

Transmission and Distribution

Some deficiencies, such as inadequate fire flow availability and low pressures, exist because of undersized or aging distribution infrastructure. The City system contains approximately 40,000 feet of distribution pipeline that is less than 6-inches in diameter. It is recommended that the minimum pipe size of a City distribution pipe is 6-inches or 8-inches as appropriate.

The average age of a City pipeline is 42 years old. Based on the median pipeline life expectancy identified in the 2004 Water System Corrosion Study, the average life expectancy of a City pipeline is 80 years. A majority of the pipelines in the City were constructed in 1950's and 1960's. With a life expectancy of 80 years, a large amount of pipe would require replacement between the years 2030 and 2050. Although a majority of the pipe replacement required in the City is over 20 years away, due to the large quantity, approximately 900,000 feet, that requires replacement, the City should start planning and budgeting for a comprehensive pipe replacement program to begin in Year 2020.

The distribution system is pretty well looped; however there are opportunities to provide additional looping that will further increase the reliability, water quality and fire protection within the system.

Hydraulics

Maintaining a minimum residual pressure of 40 psi throughout the distribution system will help to provide adequate fire flow capacity, as well as increase customer satisfaction. Keeping system pressures below 120 psi will help to avoid unnecessary leaks and breaks and avoid damage to private water systems. Some areas of low pressure, less than 40 psi, and high pressure, greater than 120 psi, were identified within the distribution system by the hydraulic model. Of the areas identified, there are two specific areas where adjusting a pressure zone boundary will help to alleviate the pressure problems, and provide some operational benefit to the City.

The 210 Pressure Zone experiences an area of low pressure, and subsequent low fire flow availability. Serving the area from the 260 Pressure Zone will greatly improve pressure and fire

VEN0006161

flow availability. The added demand to the zone will help to turn water over in the 260 Zone reservoirs, which have been a problem during low demand periods.

An area of the 430 Pressure Zone is experiencing pressure in excess of 120 psi. Serving the area from the 330 Pressure Zone will reduce the operating pressure into a normal operating range of 70 – 80 psi, and it will also remove some demand from a higher hydraulic gradient, thus reducing some pumping demand. Prior to commencing the project, the City must evaluate the consequences of lowering water service pressure to some customers, and initiate a public relations program if deemed necessary.

Fire Flow

Based on analysis conducted with the hydraulic model, insufficient fire flows were noted at approximately 220 locations throughout the City. Some of those areas will see fire flow improvement as the aging and undersized pipelines are replaced and upsized and zone boundaries are adjusted.

B. RECOMMENDATIONS

The following projects and recommendations resulted from the distribution system analysis:

Storage Analysis:

Storage deficiencies in the 330 Zone, 400 Zone, 535 Zone, 605 Zone and 860 Zone can be mitigated by implementing the following recommendations:

- Rehabilitate the Gosnell Pump Station
- Proceed with CIP 97907 – Mound Well No. 2
- Proceed with CIP 97908 – Golf Course Well No. 7
- Proceed with CIP 97879 – Upsize to 3.8 MG (New Tank in 605 Zone)

Supply Analysis:

The water supply recommendations are centered on expanding the groundwater capacity, ensuring a reliable transmission system from the Casitas turnouts and implementing projects that would allow for better water movement from east to west, and vice versa. The recommended projects include:

VEN0006162

- Perform a thorough inspection and assessment of the 24-inch transmission main downstream of the Casitas No. 2 turnout to assess the current condition of the pipeline.
- Construct the 18-inch pipeline described in CIP 97895.
- Construct a flow control facility/pressure reducing facility at the site of Hall Canyon/330/Foothill Booster Pump Stations, capable of moving 2,500-gpm of water from the 330 Pressure Zone to the 210 Pressure Zone.
- Proceed with plans to construct Saticoy Well No. 3 with a maximum capacity of 2,500 gpm (CIP 97899).
- Proceed with the expansion of the Saticoy Conditioning Facility (CIP 97521).
- Proceed with plans to construct Mound Well No. 2, with a capacity of 2,500 gpm (CIP 97907).
- Proceed with plans to construct Golf Course Well No. 7, with a capacity of 2,500 gpm (CIP 97908).

Pumping Capacity, Energy Efficiency and Reliability Analysis:

The City's total pumping capacity is adequate throughout the system, with the exception of the 400 Zone. It is recommended to increase the pumping capacity and reliability to the 400 Zone. The hydraulic model analysis concluded that six existing pump stations may be able to reduce the energy usage by switching to a different rate structure. Permanent on-site back-up power systems should be installed a four pump stations for reliability. The recommended projects include:

- Proceed with the upgrade of the Valley Vista Pump Station (part of CIP 97887). The pump station should have a minimum design capacity of 1,200 gpm with the largest pumping unit out-of-service to meet the near-term demands. Add fixed emergency power at the pump station.
- Evaluate changing the SCE rate structures for the Bailey, Kimball, Modella, Nob Hill, View Park, and 330/Foothill/Hall Canyon pump stations for economic efficiency.
- Utilize the pump stations during off-peak hours to fill reservoirs to reduce electrical costs.
- Add fixed emergency power at the Mariano Pump Station per CIP 97898.
- Add fixed emergency power at the McElrea Pump Station per CIP 97898.
- Add fixed emergency power at the Nob Hill Pump Station per CIP 97898.
- Add fixed emergency power at the Kalorama Pump Station.

VEN0006163

Distribution and Transmission Piping Analysis:

A majority of the City's distribution system was constructed in the 1950s and 60s, when demands were lower and standards were different. Some of those pipelines are undersized to meet today's criteria and many of the pipelines are expected to reach the end of their useful life in the next 20-30 years. The recommended projects as a result of the pipeline analysis include:

- Continue a program to replace all 2-inch, 3-inch, and 4-inch distribution pipelines with a minimum of 6-inch pipe or 8-inch as appropriate.
- Upsize the hydraulically deficient pipelines identified on Exhibits X-1 through X-1C.
- Evaluate the condition of the transmission pipeline between the Golf Course Pump Station and the Bailey Treatment Plant.
- Begin planning and budgeting for a pipeline replacement program to begin in Year 2020.
- Include the pipeline looping projects shown on Exhibits X-2 through X-2D in the Dead End Water Main Connections Project (CIP 97897).
- Continue implementation of the recommendations of the 2004 Water System Corrosion Protection Study.

Hydraulic Analysis:

A hydraulic model of the City's distribution system was built and calibrated to analyze various operational and demand conditions. The model was used to evaluate system pressures, identify areas where pressures do not meet the minimum or maximum criteria, and evaluate projects to improve the operations and meet the criteria. The recommended projects include:

- Reconfigure the zone boundary between the 210 and 260 Pressure Zones to alleviate low pressures along Main Street. Improvements include:
    - Install approximately 5,400 linear feet of 16-inch pipe and approximately 1,300 linear feet of 12-inch pipe per CIP 97889.
    - Open the closed valves along Thompson Boulevard.
    - Reconfigure the valves and pipes at the intersection of Seaward Avenue and Channel Drive.
    - Adjust the pressure setting of the Main and Mills Pressure Reducing Station.
- Reconfigure the zone boundary between 330 and 430 Pressure Zones near Main and Mills Roads to reduce high-pressure areas. Improvements include:
    - Install approximately 8,500 linear feet of 18-inch pipe per CIP 97895.

VEN0006164

  - Open valves at Mills Road and Maple Street and at Dean Drive and Chapel Drive.
  - Close valves at Maple Street and Brentwood Avenue, Ashwood Avenue and Madison Street, Redwood Avenue and Madison Street, and Telegraph Road and College Drive.
- Install an additional PRV in the 360R Zone.
- Establish a hydraulic model update and maintenance program.

Fire Flow Analysis:

The calibrated hydraulic model was used to conduct a system-wide fire flow evaluation. The evaluation was conducted under a maximum day demand condition, to determine if areas of the distribution have difficulty in meeting the minimum required fire flows. The model results indicated that there are a number of areas in the system that may not meet the minimum required fire flow during a maximum day demand. Specific projects are not recommended to improve city-wide fire flows, however many of the projects recommended herein provide an added benefit of improving flow and pressure throughout the system, including the following recommendations:

- Implement the small diameter pipeline replacement program as described in Section X. Increase all small diameter pipe (smaller than 6-inches) to a minimum of 6-inch diameter pipe.
- By implementing the 210 and 260 pressure zone boundary adjustment described in Section XI, fire flow availability will improve at approximately 12 nodes.

Each of the above-mentioned projects and recommendations is included in the Capital Improvement Program (CIP). Refer to the CIP (Section XV) for a more detailed description and implementation of the projects.

VEN0006165

XV. CAPITAL IMPROVEMENT PROGRAM

A. INTRODUCTION

Each year the City prepares an updated and comprehensive Capital Improvement Project Plan that outlines the capital needs of the City for the upcoming 5-year period. The Capital Improvement Project Plan identifies project requirements for all City provided services, including the domestic water system.

This Section describes the projects that have been identified throughout the course of the Water Master Plan project and are recommended for inclusion in the City's Capital Improvement Project Plan (or Capital Improvement Program - CIP). The recommended projects include the confirmation of projects currently listed in the CIP, the construction of new facilities to mitigate system deficiencies, and the implementation of operations and maintenance programs. A write-up was prepared for each project that includes the project identification number, project name, description, priority, and estimated capital cost.

B. PROJECT IDENTIFICATION NUMBER

The City assigns a five-digit project number to each project in the CIP. Preliminary project numbers begin with a "7" and final project numbers begin with a "9." The projects have been given a Master Plan CIP number as well, beginning with -001.

C. PROJECT DETERMINATION

The projects recommended as a result of this report were determined from one of three different evaluations: the hydraulic analysis of the existing system to determine deficiencies, the validation of the current CIP projects, the results of the on-site condition assessments of the reservoirs, pump stations and wells.

1. Hydraulic Analysis

The hydraulic analysis performed as a part of this project identified several deficiencies in the existing system and opportunities to improve efficiency. The results of the hydraulic analyses identified several projects that are recommended to be included in the CIP. The projects recommended are new projects.

VEN0006166

2. Validation of Existing CIP's (2008-2013)

As a part of this project, the existing projects listed in the CIP were evaluated for validation. Most projects currently in the CIP are still recommended, however the scope of some of the existing projects are recommended to change based on the results of this evaluation.

3. Condition Assessment

An on-site condition assessment was performed for each of the City's reservoir, pump station and well facilities by registered civil, electrical and structural engineers. The condition assessments included a physical evaluation of the condition of each facility. The results of the condition assessment are documented in a separate report under separate cover. The recommendations resulting from the condition assessments are included in a separate report.

D. PRIORITY CRITERIA

Each project was assigned an implementation window based on its priority. The implementation window is the time span within project completion is recommended to occur. There are four implementation windows defined as follows:

- Immediate – projects to be implemented within 0-2 years
- Short Term – projects to be implemented within 2-5 years
- Medium Term – projects to be implemented within 6-10 years
- Long Term – projects forecasted to be implemented beyond 10 years

The project priority was established based on a combination of the following factors:

- Public health and safety
- System deficiency
- Facility condition
- Projected development (increased demands)
- Cost & available funding

Each recommended project was evaluated based on the above criteria and classified within one of the four implementation windows.

VEN0006167

E. COST BASIS PARAMETERS

The estimates prepared herein are planning-level estimates. Detailed estimates should be prepared at the preliminary design level and final design level. All cost estimates have been prepared using present day U.S. dollars. Cost estimates for the capital improvement projects are based on the general criteria shown in Table XV-1.

A construction contingency of 20 percent was added to each capital improvement project to account for the unknown factors which accompany every project. An additional mark-up of 25 percent has been added to the cost estimates to cover engineering, administration and legal fees.

F. RECOMMENDED 10-YEAR CAPITAL IMPROVEMENT PROGRAM

The proposed improvements are based on system deficiencies and operational inefficiencies identified in the hydraulic analysis or identified by City staff. Each recommended project is described on its own CIP Potential Project Sheet. The CIP Potential Project Sheets describe the project and identify the project ID, name, description, priority, cost and provide for critical elements and stakeholder information.

The recommended projects are summarized in Table XV-2 to be included in the City's Capital Improvement Project plan. A more detailed project cost breakdown is included as Table XV-3. Attached at the end of the section are the CIP Potential Project Sheets.

VEN0006168

Table XV-1
City of San Buenaventura
Water Master Plan

CIP Construction Cost Basis Parameters

Description	Unit Cost	
Pipeline Installation - Estimate of cost to construct a new pipeline in an existing City street at a standard depth of cover of 4-feet. Cost includes pipe material and installation, all standard fittings and appurtenances, excavation, backfill, and compaction. Costs do not include special circumstances such as deep construction, shoring, jack and boring, major utility relocations, or extensive traffic control. Repaving costs are included separately.	$15/inch diameter (for 12" and larger), $20/inch diameter (for 6" and 8")	/LF
6-inch	$120	/LF
8-inch	$160	/LF
10-inch	$170	/LF
12-inch	$180	/LF
14-inch	$210	/LF
16-inch	$240	/LF
18-inch	$270	/LF
20-inch	$300	/LF
24-inch	$360	/LF
Pipeline Abandonment	$20	/LF
Reconnect Services	$2,500	/EA
Jack and Bore Pit Construction (12' W x' 15' L x 15' D)	$50,000	/EA
Steel Casing Installation (J&B)	$250	/LF
Reservoirs - Estimate of cost to construct a new reservoir. Cost includes basic site grading, paving, drainage, lighting and electrical, excavation, subgrade preparation, footings, the reservoir structure and basic appurtenances, on-site piping and basic appurtenances. It does not include costs for reservoir mixing systems, treatment, pumping, or valve controls. Land acquisition costs are included spearately.		
Above-grade Concrete	$2.00	/GAL
Below-grade Concrete	$3.00	/GAL
Above-grade Steel	$1.50	/GAL
Seismic Upgrades	$250,000	/LS
Exterior Re-coating of Existing Steel Tank	$50,000	/EA
Interior Re-coating of Existing Steel Tank	$65,000	/EA
Pump Stations - Estimate includes the material and labor cost to install pumps, motors, valving, yard piping, site grading, pavement and drainage, foundation, building, electrical, and telemetry. Costs do not include property acquisition, extensive earthwork, shoring and surge tanks. Generator costs are included separately.	$1,500,000	/LS
Pump Station Retrofit (new pumps, motors, valves, piping and electrical)	$750,000	/LS
Structural Evaluation	$30,000	/LS
Wells - Estimate includes separate costs for well drilling and well equipping. Well drilling costs includes drilling of the well to an assumed depth and installation of a 16-inch steel casing and screen. Well equipping costs include the installation of the pump, motor, foundation, piping, valves, meter, electrical, telemetry, and miscellaneous grading. The costs do not include property acquisition or a building. Generator costs are included separately.		
Drilling (1,000 foot depth)	$1,000,000	/LS
Equipping (2,500 gpm pump and motor)	$1,250,000	/LS
Replace MCC	$75,000	/EA
Destruction of Existing Well	$50,000	/EA
Pressure Reducing Stations - Estimate includes the material and labor costs to construct a pressure reducing vault with one main line (8" or 10") and a bypass line (3" or 4"). Costs include the earthwork, a pre-cast vault, one hatch, site piping, site valving, electrical and telemetry. Costs do not include extensive traffic control, deep construction (beyond 8-feet) or property acquisition.	$150,000	/EA
Treatment Facility Renovations - Estimate includes the material and labor costs to increase the capacity of an existing water conditionaing facility from 3.2 MG to 7 MG, including new filters, piping, valves, disinfection, site improvements, security improvements, electrical and SCADA upgrades, and abuilding improvements.	$6,000,000	/LS
Miscellaneous Items		
Pavement Replacement (4" AC/8" AB)	$8	/SF
Land Acquisition	$500,000	/AC
Generator Installation (assumed 250 kW w/ enclosure)	$80,000	/EA
Well Treatment	$1,500,000	/LS
Site Wall Improvements	$50,000	/LS
Fees and Contingencies		
Construction Contingency	20%	
Engineering, Administration, and Legal Fees	25%	

Table XV-2
City of San Buenaventura
Water Master Plan

10-year Capital Improvement Program

le	Priority	Fiscal Year Budget Projection								
		2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	201
e the Gosnell Pump Station	Immediate	$258,000	$1,032,000							
e PS 18" Transmission Main Condition Assessment	Immediate	$105,000								
- Arroyo Verde (605 Zone) (Upsize to 3.8 MG)	Medium Term					$2,325,000	$7,301,000			
. 2 Turnout 24-inch transmission main inspection	Immediate	$103,000								
Extension - Telephone (210/330)	Short Term		$807,000	$3,228,000						
Pressure Zone flow control / pressure reducing facility	Short Term		$45,000	$180,000						
Saticoy Well No. 3 (2,500-gpm)	Medium Term						$925,000	$2,700,000		
nditioning Facility Renovation	Medium Term							$1,800,000	$7,200,000	
Mound Well No. 2 (2,500-gpm)	Short Term			$1,285,000	$4,140,000					
Golf Course Well No. 7 (2,500-gpm)	Short Term				$1,285,000	$4,140,000				
alley Vista Pump Station	Short Term		$249,000	$996,000						
ump Station fixed emergency power	Immediate	$120,000								
ump Station fixed emergency power	Immediate	$120,000								
mp Station fixed emergency power	Immediate	$120,000								
Pump Station fixed emergency power	Immediate	$120,000								
eplacement Program - Small diameter pipelines (40,000 LF)	Immediate	$2,880,000	$2,880,000	$2,880,000						
eplacement Program - Deficient Pipelines (5,500 LF)	Medium Term				$845,500	$845,500				
eplacement Program - General	Long Term									
ooping Program (11,290 LF)	Medium Term				$1,129,000	$1,129,000	$1,128,000			
dary adjustment between the 210 and 260 Pressure Zones	Immediate	$556,000	$2,222,000							
dary adjustment between the 330 and 430 Pressure Zones	Short Term		$0	$0						
dditional PRV in the 360R Zone	Immediate	$225,000								
		$4,607,000	**$7,235,000**	**$8,569,000**	**$7,399,500**	**$8,439,500**	**$9,354,000**	**$4,500,000**	**$7,200,000**	

ollars
ny grant funding or reimbursement programs provide assistance

Table XV-3
City of San Buenaventura
Water Master Plan

Individual Project Cost Breakdown Table

WMP Project ID	Exist. CIP Project ID	Project Title	Description	Quantity	Unit Cost	Total Cost
001	-	Rehabilitate the Gosnell Pump Station	Install New Pumps, Motors, MCC and Piping	1 /LS	$750,000 /LS	$750,000
			Install Generator	1 /EA	$80,000 /EA	$80,000
			Structural Evaluation	1 /LS	$30,000 /LS	$30,000
			Subtotal Construction Cost			*$860,000*
			Construction Contingency		20%	$172,000
			Total Construction Cost			**$1,032,000**
			Engineering, Administration, and Legal Fees		25%	$258,000
			Total Soft Costs			**$258,000**
002	-	Golf Course PS 18" Transmission Main Condition Assessment	Pipeline Inspection	17,500 /LF	$4.00 /LF	$70,000
			Subtotal Construction Cost			*$70,000*
			Construction Contingency		20%	$14,000
			Total Construction Cost			**$84,000**
			Engineering, Administration, and Legal Fees		25%	$21,000
			Total Soft Costs			**$21,000**
003	97879	New Tank - Arroyo Verde (605 Zone) (Upsize to 3.8 MG)	Above-grade Steel Reservoir	3,800,000 /GAL	$1.50 /GAL	$5,700,000
			Install 16" Pipeline	1,600 /LF	$240 /LF	$384,000
			Subtotal Construction Cost			*$6,084,000*
			Construction Contingency		20%	$1,216,800
			Total Construction Cost			**$7,301,000**
			Engineering, Administration, and Legal Fees		25%	$1,825,250
			Property Acquisition	1 /AC	$500,000 /AC	$500,000
			Total Soft Costs			**$2,325,000**

VEN0006171

Table XV-3
City of San Buenaventura
Water Master Plan

Individual Project Cost Breakdown Table

WMP Project ID	Exist. CIP Project ID	Project Title	Description	Quantity	Unit Cost	Total Cost
004	-	Casitas No. 2 Turnout 24-inch transmission main inspection	Pipeline Inspection	17,000 /LF	$4.00 /LF	$68,000
			Subtotal Construction Cost			*$68,000*
			Construction Contingency		20%	$13,600
			Total Construction Cost			**$82,000**
			Engineering, Administration, and Legal Fees		25%	$20,500
			Total Soft Costs			**$21,000**
005	97895	Waterline Extension - Telephone (210/330)	Install 18-inch Pipeline	8,400 /LF	$270 /LF	$2,268,000
			Pavement Replacement	25,200 /SF	$8 /SF	$201,600
			Pipeline Connections	6 /EA	$20,000 /EA	$120,000
			Modify Existing 330 Pumps	1 /LS	$100,000 /LS	$100,000
			Subtotal Construction Cost			*$2,689,600*
			Construction Contingency		20%	$537,920
			Total Construction Cost			**$3,228,000**
			Engineering, Administration, and Legal Fees		25%	$807,000
			Total Soft Costs			**$807,000**
006	-	330 to 210 Pressure Zone flow control / pressure reducing facility	Install PRV Station	1 /EA	$150,000 /EA	$150,000
			Subtotal Construction Cost			*$150,000*
			Construction Contingency		20%	$30,000
			Total Construction Cost			**$180,000**
			Engineering, Administration, and Legal Fees		25%	$45,000
			Total Soft Costs			**$45,000**
007	97899	Construct Saticoy Well No. 3 (2,500-gpm)	Install New Well (Drilling)	1 /LS	$1,000,000 /LS	$1,000,000
			Install New 2,500 gpm Well (Equipping)	1 /LS	$1,250,000 /LS	$1,250,000
			Subtotal Construction Cost			*$2,250,000*
			Construction Contingency		20%	$450,000
			Total Construction Cost			**$2,700,000**
			Engineering, Administration, and Legal Fees		25%	$675,000
			Property Acquisition	0.5 /AC	$500,000 /AC	$250,000
			Total Soft Costs			**$925,000**

VEN0009172

Table XV-3
City of San Buenaventura
Water Master Plan

Individual Project Cost Breakdown Table

WMP Project ID	Exist. CIP Project ID	Project Title	Description	Quantity	Unit Cost	Total Cost
008	97521	Saticoy Conditioning Facility Renovation	Facility Renovation	1 /LS	$6,000,000 0	$6,000,000
			Subtotal Construction Cost			*$6,000,000*
			Construction Contingency		20%	$1,200,000
			Total Construction Cost			**$7,200,000**
			Engineering, Administration, and Legal Fees		25%	$1,800,000
			Total Soft Costs			**$1,800,000**
009	97907	Construct Mound Well No. 2 (2,500-gpm)	Install New Well (Drilling)	1 /LS	$1,000,000 /LS	$1,000,000
			Install New 2,500 gpm Well (Equipping)	1 /LS	$1,250,000 /LS	$1,250,000
			Install 16" Pipeline	5,000 /LF	$240 /LF	$1,200,000
			Subtotal Construction Cost			*$3,450,000*
			Construction Contingency		20%	$690,000
			Total Construction Cost			**$4,140,000**
			Engineering, Administration, and Legal Fees		25%	$1,035,000
			Property Acquisition	0.5 /AC	$500,000 /AC	$250,000
			Total Soft Costs			**$1,285,000**
010	97908	Construct Golf Course Well No. 7 (2,500-gpm)	Install New Well (Drilling)	1 /LS	$1,000,000 /LS	$1,000,000
			Install New 2,500 gpm Well (Equipping)	1 /LS	$1,250,000 /LS	$1,250,000
			Install 16" Pipeline	5,000 /LF	$240 /LF	$1,200,000
			Subtotal Construction Cost			*$3,450,000*
			Construction Contingency		20%	$690,000
			Total Construction Cost			**$4,140,000**
			Engineering, Administration, and Legal Fees		25%	$1,035,000
			Property Acquisition	0.5 /AC	$500,000 /AC	$250,000
			Total Soft Costs			**$1,285,000**
011	97887	Upgrade Valley Vista Pump Station	Retrofit Valley Vista Pump Station	1 /LS	$750,000 /LS	$750,000
			Install Generator	1 /LS	$80,000 /EA	$80,000
			Subtotal Construction Cost			*$830,000*
			Construction Contingency		20%	$166,000
			Total Construction Cost			**$996,000**
			Engineering, Administration, and Legal Fees		25%	$249,000
			Total Soft Costs			**$249,000**

VEN0006173

Table XV-3
City of San Buenaventura
Water Master Plan

Individual Project Cost Breakdown Table

WMP Project ID	Exist. CIP Project ID	Project Title	Description	Quantity	Unit Cost	Total Cost
012	97898	Mariano Pump Station fixed emergency power	Install Generator	1 /LS	$80,000 /EA	$80,000
			Subtotal Construction Cost			*$80,000*
			Construction Contingency		20%	$16,000
			Total Construction Cost			**$96,000**
			Engineering, Administration, and Legal Fees		25%	$24,000
			Total Soft Costs			**$24,000**
013	97898	McElrea Pump Station fixed emergency power	Install Generator	1 /LS	$80,000 /EA	$80,000
			Subtotal Construction Cost			*$80,000*
			Construction Contingency		20%	$16,000
			Total Construction Cost			**$96,000**
			Engineering, Administration, and Legal Fees		25%	$24,000
			Total Soft Costs			**$24,000**
014	97898	Nob Hill Pump Station fixed emergency power	Install Generator	1 /LS	$80,000 /EA	$80,000
			Subtotal Construction Cost			*$80,000*
			Construction Contingency		20%	$16,000
			Total Construction Cost			**$96,000**
			Engineering, Administration, and Legal Fees		25%	$24,000
			Total Soft Costs			**$24,000**
015	-	Kalorama Pump Station fixed emergency power	Install Generator	1 /LS	$80,000 /EA	$80,000
			Subtotal Construction Cost			*$80,000*
			Construction Contingency		20%	$16,000
			Total Construction Cost			**$96,000**
			Engineering, Administration, and Legal Fees		25%	$24,000
			Total Soft Costs			**$24,000**

VEN0006174

Table XV-3
City of San Buenaventura
Water Master Plan

Individual Project Cost Breakdown Table

WMP Project ID	Exist. CIP Project ID	Project Title	Description	Quantity	Unit Cost	Total Cost
016	-	Pipeline Replacement Program - Small diameter pipelines (40,000	Install minimum 6-inch pipeline	40,000 /LF	$120 /LF	$4,800,000
			Pavement Replacement	120,000 /SF	$8 /SF	$960,000
			Subtotal Construction Cost			*$5,760,000*
			Construction Contingency		20%	$1,152,000
			Total Construction Cost			**$6,912,000**
			Engineering, Administration, and Legal Fees		25%	$1,728,000
			Total Soft Costs			**$1,728,000**
017	-	Pipeline Replacement Program - Deficient Pipelines (5,500 LF)	Install 8-inch pipeline	1,790 /LF	$160 /LF	$286,400
			Install 10-inch pipeline	816 /LF	$170 /LF	$138,720
			Install 12-inch pipeline	1,278 /LF	$180 /LF	$230,040
			Install 14-inch pipeline	1,577 /LF	$210 /LF	$331,170
			Install 16-inch pipeline	39 /LF	$240 /LF	$9,360
			Pavement Replacement	16,500 /SF	$8 /SF	$132,000
			Subtotal Construction Cost			*$1,127,690*
			Construction Contingency		20%	$225,538
			Total Construction Cost			**$1,353,000**
			Engineering, Administration, and Legal Fees		25%	$338,250
			Total Soft Costs			**$338,000**
018	-	Pipeline Replacement Program - General				
		BEGIN IN YEAR 2020 WITH AN ANNUAL BUDGET				*N/A*
019	-	Pipeline Looping Program (11,290 LF)	Install 8-inch pipeline	8,368 /LF	$160 /LF	$1,338,880
			Install 10-inch pipeline	721 /LF	$170 /LF	$122,570
			Install 12-inch pipeline	2,831 /LF	$180 /LF	$509,580
			Pavement Replacement	35,760 /SF	$8 /SF	$286,080
			Subtotal Construction Cost			*$2,257,110*
			Construction Contingency		20%	$451,422
			Total Construction Cost			**$2,709,000**
			Engineering, Administration, and Legal Fees		25%	$677,250
			Total Soft Costs			**$677,000**

VEN0006175

Table XV-3
City of San Buenaventura
Water Master Plan

Individual Project Cost Breakdown Table

WMP Project ID	Exist. CIP Project ID	Project Title	Description	Quantity	Unit Cost	Total Cost
020	97889	Zone boundary adjustment between the 210 and 260 Pressure Zones	Install 12-inch pipeline	1,300 /LF	$180 /LF	$234,000
			Install 16-inch pipeline	5,400 /LF	$240 /LF	$1,296,000
			Pavement Replacement	20,100 /SF	$8 /SF	$160,800
			Subtotal Construction Cost			*$1,851,600*
			Construction Contingency		20%	$370,320
			Total Construction Cost			**$2,222,000**
			Engineering, Administration, and Legal Fees		25%	$555,500
			Total Soft Costs			**$556,000**
021	97895	Zone boundary adjustment between the 330 and 430 Pressure Zones		/LF	/LF	$0
				/SF	/SF	$0
		INCLUDED IN CIP 005	*Subtotal Construction Cost*			*$0*
			Construction Contingency		20%	$0
			Total Construction Cost			**$0**
			Engineering, Administration, and Legal Fees		25%	$0
			Total Soft Costs			**$0**
022	-	Install an additional PRV in the 360R Zone	Install PRV Station	1 /EA	$150,000 /EA	$150,000
			Subtotal Construction Cost			*$150,000*
			Construction Contingency		20%	$30,000
			Total Construction Cost			**$180,000**
			Engineering, Administration, and Legal Fees		25%	$45,000
			Total Soft Costs			**$45,000**

VEN0006176

2009-2019 CIP Potential Project

Project Title	**Rehabilitate Gosnell Pump Station**	**Originating Department**	
Program Area		**Priority**	Immediate
Project Coordinator		**Requested Start**	2009/2010
Project Cost (Range)	$1,290,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

The project consists of rehabilitating the existing Gosnell Pump Station. The project will include the design and construction of new mechanical and electrical equipment, an evaluation of the current site access, and a structural evaluation of the condition of the existing building. The new pump station shall be capable of providing the near-term maximum day demand of the zone (1,150 gpm) with one pump operating, and second pump of the same capacity as a back-up pump and fire pump. The electrical service and SCADA system shall be provided to meet current City standards and integrate into the existing system. A permanent on-site generator shall be provided for reliability.

Justification / Source Document / Visioning Element

The 400 Pressure Zone is deficient in storage. The 400 Zone takes suction from the 210 Zone, which has an excess of storage. The 400 Zone has two existing storage tanks with 2.2 MG of storage, however the water does not turn over during times of low demand, creating water quality problems. Constructing additional storage will only exacberate the problem. The existing Valley Vista Pump Station does not have excess pumping capacity to provide fire flow, therefore it is recommended to rehabilitate the Gosnell Pump Station to provide additional pumping capacity and fore flow capacity to the 400 Zone. The pump station will also help to move water through the Seneca Tank.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	Yes
Does it require ROW / property acquisition? (If yes, has a site been selected?)	Maybe
Is an EIR required?	
Can the project be completed in phases?	No
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	Yes
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	Yes
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	Yes
Information Technology	
Maintenance: Facilities / Street / Drainage	Yes
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN0006177

2009-2019 CIP Potential Project

Project Title	**GC BPS 18" TM Condition Assessment**
Program Area	
Project Coordinator	
Project Cost (Range)	$105,000
Funding Source(s)	

Originating Department	
Priority	Immediate
Requested Start	2009/10
Project Request	
Potential	X
CIP Plan	

Project Description / Problem Identification

This project consists of the thorough inspection and assessment of the 18-inch transmission main between the Golf Course Pump Station and the Bailey Treatment Plant to assess the current condition of the pipeline. The inspection should include testing for leaks, internal corrosion and external corrosion. Possible technologies to be utilized are CCTV and sonar detection.

Justification / Source Document / Visioning Element

The Golf Course Pump Station provides a large groundwater supply for the City. The existing 18-inch transmission main that is used to transport the water is old and may be susceptible to failure. Inspection of this transmission main is recommended. The inspection should be scheduled for low demand period so the pipe could be taken out service is required.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	

VEN0006178

2009-2019 CIP Potential Project

		Originating Department	
Project Title	**New Tank - Arroyo Verde (605 Zone)**	**Priority**	Medium-term
Program Area		**Requested Start**	2013/14
Project Coordinator			
Project Cost (Range)	$9,626,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

The current CIP recommends the construction of additional storage in the 605 Zone at Arroyo Verde Park. This project recommends to proceed with the storage construction as described in the existing CIP, however, it is recommended that the storage volume be increased to 3.8 MG to meet the storage deficiencies of other zones. The project will require the construction of approximately 1,600 LF of 16-inch piping.

Justification / Source Document / Visioning Element

The increased storage volume is recommended in order to mitigate the storage deficiencies of the 535, 605, and 860 Zones as identified in the storage analysis.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	Yes
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	Yes
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN0006179

2009-2019 CIP Potential Project

Project Title	**Casitas No.2 turnout 24-inch main inspection**	**Originating Department**	
Program Area		**Priority**	Immediate
Project Coordinator		**Requested Start**	2009/10
Project Cost (Range)	$103,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

This project consists of the thorough inspection and assessment of the 24-inch transmission main downstream of the Casitas No. 2 turnout to assess the current condition of the pipeline. The inspection should include testing for leaks, internal corrosion and external corrosion. Possible technologies to be utilized are CCTV and sonar detection.

Justification / Source Document / Visioning Element

The Casitas Turnout No. 2 is one of the largest supplies for the City. The 24-inch transmission main that is used to transport the water is approximately 50-years old and may be susceptible to failure. Inspection of this transmission main is recommended based on the water supply analysis that found that a supply disruption would result in undesirable pressures and reservoir levels in the system. The inspection should be scheduled for low demand period so the pipe could be taken out service is required.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	No
Does it require ROW / property acquisition? (If yes, has a site been selected?)	No
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	

VEN0006180

2009-2019 CIP Potential Project

Project Title	**Waterline Extension - Telephone (210/330)**	**Originating Department**	
Program Area		**Priority**	Short-term
Project Coordinator		**Requested Start**	2010/11
Project Cost (Range)	$4,035,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

Construct the approximately 8,400 LF of a new 18-inch diameter water transmission main from Main/Callens to Telephone/Victoria to connect the existing 18" and 30" 330 Zone transmission mains. Install four connections to the existing distribution system along the way. The 330 Zone pumps may require modifications for revised head conditions.

Justification / Source Document / Visioning Element

The project will allow for more efficient operation of the 330 Zone Pump Station and allow for full utilization of the capacity. The installation of this pipeline improves the reliabiltiy of the City's system in the event of a supply outage by allowing water to move from west to east more easily.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	Yes
Does it require ROW / property acquisition? (If yes, has a site been selected?)	No
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN0006181

2009-2019 CIP Potential Project

Project Title	**330 to 210 Zone FC / PR facility**
Program Area	
Project Coordinator	
Project Cost (Range)	$225,000
Funding Source(s)	

Originating Department	
Priority	
Requested Start	
Project Request	
Potential	X
CIP Plan	

Project Description / Problem Identification

Construct a flow control facility/pressure reducing facility at the site of Hall Canyon/330/Foothill Booster Pump Stations, capable of moving 2,500-gpm of water from the 330 Pressure Zone to the 210 Pressure Zone. The facility should be connected into the City's SCADA system for monitoring and control.

Justification / Source Document / Visioning Element

The installation of a new pressure reducing station will improve the reliability and redundancy of the City's distribution system and ater supply. The pressure reducing station will allow for water to move from the 330 Zone to the 210 Zone (from east to west).

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	Yes
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN0006182

2009-2019 CIP Potential Project

Project Title	**Construct Saticoy Well No. 3**	**Originating Department**	
Program Area		**Priority**	Medium-term
Project Coordinator		**Requested Start**	2014/15
Project Cost (Range)	$3,625,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

The project involves siting, drilling and equipping a new well in the Santa Paula Groundwater Basin. The well pump, motor, mechanical equipment and piping shall be planned for a 2,500 gpm capacity. The facility design shall minimc the Mound Well No. 1.

Justification / Source Document / Visioning Element

The project will provide the City with an increased local water supply that will provide reliability to the system. The redundant supply source will allow for greater operational flexibility.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	Yes
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	Yes
Operations Enhancement	Yes
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN0006183

2009-2019 CIP Potential Project

Project Title	**Saticoy Conditioning Facility Renovation**	**Originating Department**	
Program Area		**Priority**	Medium-term
Project Coordinator		**Requested Start**	2015/16
Project Cost (Range)	$9,000,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

The capacity of the existing Saticoy Conditioning Facility should be increased from 3.2 MGD to 7 MGD. The improvements required include new iron and manganese filters, replacement of the disinfection system, new piping and mechanical equipment, new electrical controls and SCADA upgrades, site improvements, building improvements, and security improvements.

Justification / Source Document / Visioning Element

The capacity of the existing Saticoy Conditioning Facility should be increased to provide for additional supply reliability and redundancy. The project will allow the City to utilize more groundwater from the Santa Paula Basin.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	Yes
Does it require ROW / property acquisition? (If yes, has a site been selected?)	No
Is an EIR required?	Yes
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	Yes
Operations Enhancement	Yes
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	Yes
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN00061 84

2009-2019 CIP Potential Project

Project Title	**Construct Mound Well No. 2**	**Originating Department**	
Program Area		**Priority**	Short-term
Project Coordinator		**Requested Start**	2011/12
Project Cost (Range)	$5,425,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

The project involves siting, drilling and equipping a new well in the Mound Groundwater Basin. The well pump, motor, mechanical equipment and piping shall be planned for a 2,500 gpm capacity. The facility design shall minimc the Mound Well No. 1. The project also will require the construction of approximately 5,000 LF of new 16-inch piping.

Justification / Source Document / Visioning Element

The project will provide the City with an increased local water supply that will provide reliability to the system. It will also provide for access to fire flow for the 330 Zone which was found to be deficient in storage. The redundant supply source will allow for greater operational flexibility.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	Yes
Is an EIR required?	
Can the project be completed in phases?	No
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	Yes
Operations Enhancement	Yes
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN0006185

2009-2019 CIP Potential Project

Project Title	**Construct Golf Course Well No. 7**	**Originating Department**	
Program Area		**Priority**	Short-term
Project Coordinator		**Requested Start**	2012/13
Project Cost (Range)	$5,425,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

The project involves siting, drilling and equipping a new well near the Buenaventura Golf Course. The well pump, motor, mechanical equipment and piping shall be planned for a 2,500 gpm capacity. The facility design shall minimc the Mound Well No. 1. The project also will require the construction of approximately 5,000 LF of new 16-inch piping. The project should include an evaluation of the operation and capacity of the existing Golf Course Pump Station

Justification / Source Document / Visioning Element

The project will provide the City with an increased local water supply that will provide reliability to the system. It will also provide for access to fire flow for the 330 Zone which was found to be deficient in storage. The redundant supply source will allow for greater operational flexibility.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	Yes
Is an EIR required?	
Can the project be completed in phases?	No
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	Yes
Operations Enhancement	Yes
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN0006186

2009-2019 CIP Potential Project

Project Title	**Upgrade Valley Vista Pump Station**	**Originating Department**	
Program Area		**Priority**	Short-term
Project Coordinator		**Requested Start**	2010/11
Project Cost (Range)	$1,245,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

The Valley Vista Pump Station capacity should be increased to a minimum of 1,200-gpm firm capacity. The existing pump station is located at the Avenue Treatment Plant. The pumps, motors and MCC are aging and need replacement. The project would involve installation of new pumps, motors, valving and control equipment. The site may remain at the ATP, however access to the facilities should be improved.

Justification / Source Document / Visioning Element

The project will increase the pumping capacity to the 400 Zone to meet the pumping capacity deficiency and provide increased reliability to the zone.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	Yes
Does it require ROW / property acquisition? (If yes, has a site been selected?)	
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	

VEN0006187

2009-2019 CIP Potential Project

Project Title	**Mariano Pump Station fixed emergency power**	**Originating Department**	
Program Area		**Priority**	Immediate
Project Coordinator		**Requested Start**	2009/10
Project Cost (Range)	$120,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

Install an on-site generator at the Mariano Pump Station to provide back-up power in case of an emergency.

Justification / Source Document / Visioning Element

The Mariano Pump Station is the only supply source for the 466 and 360R Zones. If a power failure were to occur, the zone would rely on the available storage to meet demands. An on-site generator would provide for additional reliability to meet the demands and fire flow requirements of the zone in case of an emergency.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	Yes
Does it require ROW / property acquisition? (If yes, has a site been selected?)	No
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	Yes
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	Yes
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN0006188

2009-2019 CIP Potential Project

Project Title	**McElrea Pump Station fixed emergency power**	**Originating Department**	
Program Area		**Priority**	Immediate
Project Coordinator		**Requested Start**	2009/10
Project Cost (Range)	$120,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

Install an on-site generator at the McElrea Pump Station to provide back-up power in case of an emergency.

Justification / Source Document / Visioning Element

The McElrea Pump Station is the only supply source for the 588 and 430R Zones. If a power failure were to occur, the zone would rely on the available storage to meet demands. An on-site generator would provide for additional reliability to meet the demands and fre flow requirements of the zone in case of an emergency.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	Yes
Does it require ROW / property acquisition? (If yes, has a site been selected?)	No
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	Yes
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	Yes
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN0006189

2009-2019 CIP Potential Project

Project Title	**Nob Hill Pump Station fixed emergency power**	**Originating Department**	
Program Area		**Priority**	Immediate
Project Coordinator		**Requested Start**	2009/10
Project Cost (Range)	$120,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

Install an on-site generator at the Nob Hill Pump Station to provide back-up power in case of an emergency.

Justification / Source Document / Visioning Element

The Nob Hill Pump Station is the only supply source for the 1035 Zone. If a power failure were to occur, the zone would rely on the available storage to meet demands. An on-site generator would provide for additional reliability to meet the demands and fire flow requirements of the zone in case of an emergency.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	Yes
Does it require ROW / property acquisition? (If yes, has a site been selected?)	No
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	Yes
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	Yes
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN00061 90

2009-2019 CIP Potential Project

Project Title	**Kalorama Pump Station fixed emergency power**	**Originating Department**	
Program Area		**Priority**	Immediate
Project Coordinator		**Requested Start**	2009/10
Project Cost (Range)	$120,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

Install an on-site generator at the Kalorama Pump Station to provide back-up power in case of an emergency.

Justification / Source Document / Visioning Element

The Kalorama Pump Station is the only supply source for the 605K Zone. If a power failure were to occur, the zone would rely on the available storage to meet demands. An on-site generator would provide for additional reliability to meet the demands and fire flow requirements of the zone in case of an emergency.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	Yes
Does it require ROW / property acquisition? (If yes, has a site been selected?)	No
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	Yes
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	Yes
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Yes

VEN0006191

2009-2019 CIP Potential Project

Project Title	**Pipeline Replacement Prog - Small diam**	**Originating Department**	
Program Area		**Priority**	Immediate
Project Coordinator		**Requested Start**	2009/10
Project Cost (Range)	$8,640,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

Approximately 40,000 LF of pipeline existi throughout the distribution system that are less than 6-inches in diameter. These pipelines should be upsized to a minimum of 6-inch diameter. The projects can be spread out over a 3-year period to minimize the cost.

Justification / Source Document / Visioning Element

Provides better system operation, fire flow and pressure.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	Yes
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	Yes
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	Tes

VEN0006192

2009-2019 CIP Potential Project

Project Title	**Pipeline Replacement Prog - Def Pipelines**	**Originating Department**	
Program Area		**Priority**	Medium-term
Project Coordinator		**Requested Start**	2012/13
Project Cost (Range)	$1,691,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

Approximately 5,500 LF of existing pipelines within the distribution are under-sized. This project will upsize those pipelines to meet current criteria. It is recommended to spread the project costs across two years.

Justification / Source Document / Visioning Element

Provides for increased fire flow and operational efficiency.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	

VEN0006193

2009-2019 CIP Potential Project

Project Title	**Pipeline Replacement Program - General**	**Originating Department**	
Program Area		**Priority**	Long-term
Project Coordinator		**Requested Start**	
Project Cost (Range)	n/a	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

A large amount of the existing distribution pipelines will exceed their useful life in the decades of the 2030s and 2040s. Replacing pipelines as they expire will result in a huge capital cost over a few years. It is recommended that the City begin planning and funding for a pipeline replacement program. It is recommened to begin the program in Year 2020 to help spread the cost across many years.

Justification / Source Document / Visioning Element

Prevent major pipeline leaks and/or breaks.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	

VEN00061

2009-2019 CIP Potential Project

Project Title	**Pipeline Looping Program**	**Originating Department**	
Program Area		**Priority**	Medium-term
Project Coordinator		**Requested Start**	2012/13
Project Cost (Range)	$3,386,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

Construct approximately 11,000 LF of piping to loop the existing system and eliminate dead-end mains. It is recommended to spread the project costs over 3 years.

Justification / Source Document / Visioning Element

Opportunities to loop the existing distribution will provide increased reliability and water quality in the system.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	

VEN0006195

2009-2019 CIP Potential Project

Project Title	**Zone bdy adjustment b/w 210 & 260 Zones**	**Originating Department**	
Program Area		**Priority**	Immediate
Project Coordinator		**Requested Start**	2009/10
Project Cost (Range)	$2,778,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

Construct approximately 3,650 LF of 16" waterline in Harbor Blvd. Between Sanjon and San Pedro Street, construct approximately 1,300 LF of 12" water line between Harbor Blvd. And Pierpont, and construct approximately 1,750 LF of 16" waterline in Sanjon Road between Thimpson Blvd. and Harbor Blvd. Open the closed valves along Thompson Blvd., reconfigure the valving and piping at Seaward and Channel, and adjust the PRV setting at Main and Mills.

Justification / Source Document / Visioning Element

This project will provided added reliability and redundancy to the 210 zone and improve pressures along Main Street.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	

VEN0006196

2009-2019 CIP Potential Project

Project Title	**Zone bdy adjustment b/w 330 & 430 Zones**
Program Area	
Project Coordinator	
Project Cost (Range)	$0
Funding Source(s)	

Originating Department	
Priority	
Requested Start	
Project Request	
Potential	X
CIP Plan	

Project Description / Problem Identification

This project should be implemented with CIP 005. Open existing valves at Mills Road, Maple Street, Dean Drive and Chapel Drive. Close valves at Maple Street and Brentwood Avenue, Ashwood Avenue and Madison Street, Redwood Avenue and Madison Street, and Telegraph Road and College Drive.

Justification / Source Document / Visioning Element

The project will eliminate high pressures near Main and Mills Road.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	

VEN0006197

2009-2019 CIP Potential Project

Project Title	**Install an additional PRV in the 360R Zone**	**Originating Department**	
Program Area		**Priority**	Immediate
Project Coordinator		**Requested Start**	2009/10
Project Cost (Range)	$225,000	**Project Request**	
Funding Source(s)		**Potential**	X
		CIP Plan	

Project Description / Problem Identification

Construct a new pressure reducing facility to feed the 360R Zone.

Justification / Source Document / Visioning Element

The facility will provided added reliability, redundancy and fire protection to the zone.

Other Impacts / Issues

Other Agency Coordination

Project Information

Does it include a remodel of an existing facility?	
Does it require ROW / property acquisition? (If yes, has a site been selected?)	
Is an EIR required?	
Can the project be completed in phases?	
Is grant funding required to fund the project? (If yes, is a grant approved?)	
Is the project Public Art eligible?	

Critical Elements

Community Enhancement	
Community Problem Solving Connection	
Council or Commission Supported	
Deferred Maintenance	
Development Obligation	
Economic Development	
Emergency Repairs	
Mandated Improvement or Maintenance	
Operations Cost Increase	
Operations Enhancement	
Public Safety Service Enhancement	
Redevelopment Agency (RDA) Area	
Refurbishment of Existing Facility or Equipment	
Safety Correction	

Stakeholder Coordination

City Manager	
Economic Development / RDA	
Engineering / Traffic / Transportation	
Fire / Building Safety	
Information Technology	
Maintenance: Facilities / Street / Drainage	
Park Maintenance	
Planning / Land Development	
Police	
Public Art / Cultural Affairs	
Recreation	
Utilities: Water / Wastewater	

VEN0006198

APPENDICES

Appendix A: **Pending Projects – January 2006**

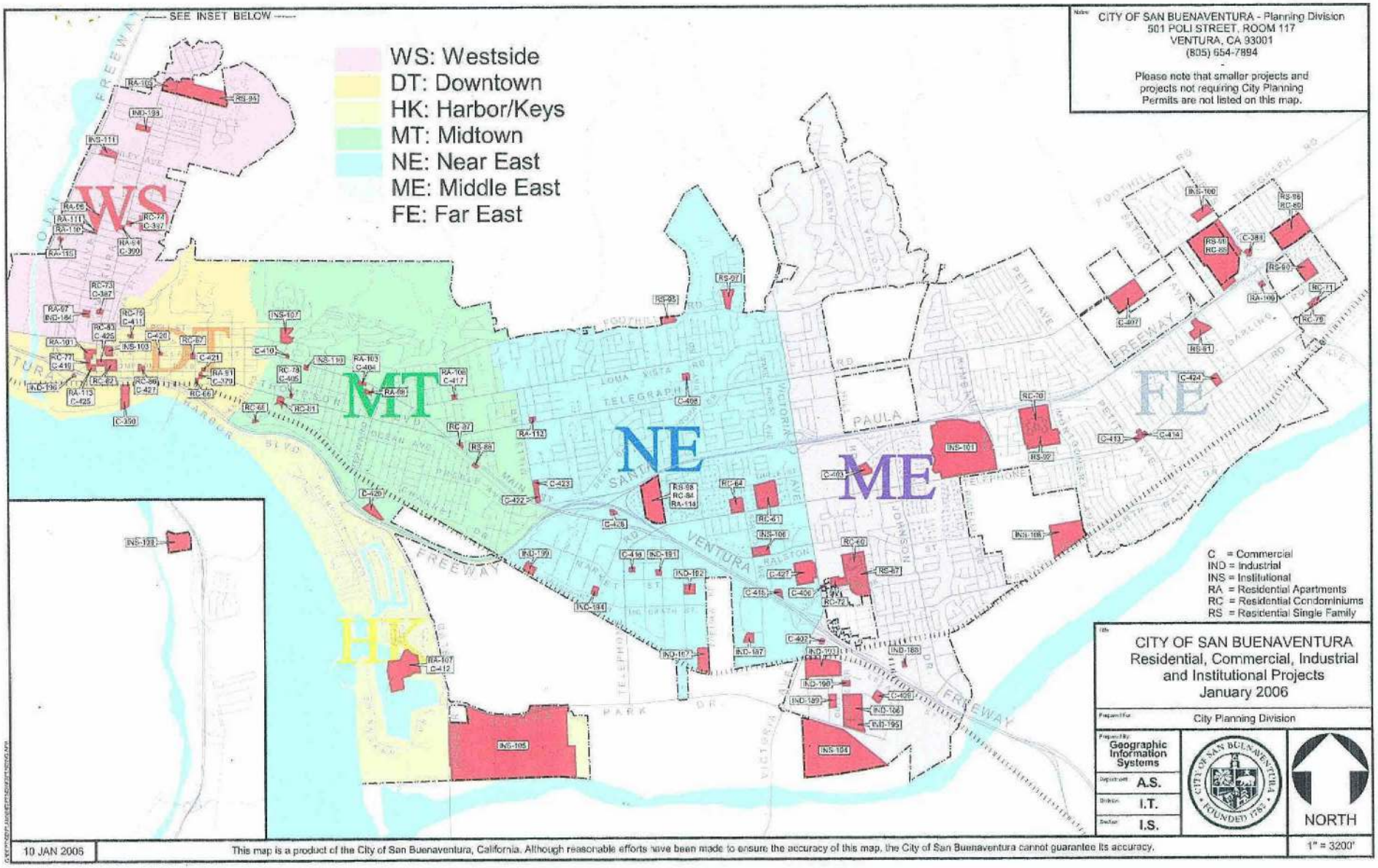
Appendix B: **Technical Memorandum No. 1, Wastewater Planning Data** (prepared by K/J Consultants, July 27, 2006)

Appendix C: **Memorandum, Seasonal Demands and Diurnal Patterns** (prepared by RBF Consulting, October 30, 2006)

Appendix D: **Fire Flow Test Locations and Results**

Appendix A:

Pending Project List – January 2006



NEAR TERM PROJECT LOCATIONS

VEN0006201

CITY OF SAN BUENAVENTURA
COMMUNITY DEVELOPMENT DEPARTMENT
Pending Project Status[1]
January 2006

SUMMARY

	Building Permits Issued/Under Construction		In Plan Check		All Planning Approvals		In Planning Process		Total	
RESIDENTIAL	Number Of Units	Projected Population	Number Of Units	Projected Population	Number Of Units	Projected Population	Number Of Units	Projected Population	Number Of Units	Projected Population
Building Type:										
Single Family	124	310	172	430	42	105	578	1,445	916	2,290
Condominiums	414	1,035	76	190	215	538	630	1,575	1,335	3,338
Apartments	17	43	29	73	75	188	471	1,178	592	1,480
Totals*	555	1,388	277	693	332	830	1,679	4,198	2,843	7,108
COMMERCIAL										
Number of Projects	9	93,876	6	28,768	6	24,051	12	393,108	33	539,803
(Square Feet of Building Area)										
INDUSTRIAL										
Number of Projects	2	315,488	7	156,859	2	111,030	4	222,156	15	805,533
(Square Feet of Building Area)										
INSTITUTIONAL										
Number of Projects										
(Square Feet of Building Area)	2	99,949	1	593	1	19,000	1	22,470	5	142,012

[1] Project status between January 2005 to December 2005

***Totals do not include completed units.**

VEN00620

Pending Project Report

Prepared by the City of San Buenaventura

DEFINITIONS OF APPROVAL STATUS CATEGORIES

Step 1: **"IN PLANNING PROCESS"** - Project application has been filed for one or more discretionary planning approvals (Planned Development Permit, Change of Zone, Tentative Tract Map, etc.). Residential projects of fewer than four units are not included unless Planning Commission approval is required, nor are non-residential projects that do not result in new development (e.g., new church use in an existing building).

Step 2: **"ALL PLANNING APPROVALS"** - The project has received all major discretionary and planning approvals from the City, with no appeals pending.

Step 3: **"IN PLAN CHECK"** - The project has received all planning approvals; final plans have been submitted to the Inspection Services Division.

Step 4: **"BUILDING PERMITS ISSUED"** - The project has received all planning approvals; final plans approved; building and other permits have been issued; may be under construction.

POPULATION IS CALCULATED AT 2.5 PERSONS PER UNIT UNDER THE CITY'S RESIDENTIAL GROWTH MANAGEMENT PROGRAM

NOTE: Information contained in this report is intended to provide general information to the City Council, Planning Commission, and public on the types of development being processed. This report is not intended for commercial use. Information on "Approval Status" is based on the best available information, and shall in no way be construed to affect approval status or legal requirements of any project.

In compliance with the Americans with Disabilities Act, if any individual needs special assistance in understanding this document, please contact the Planning Division office at (805) 654-7893 or through the (TDD), California Relay Service. Notification in advance will enable the City to make reasonable arrangements to accommodate your needs.

VEN00603

PENDING RESIDENTIAL PROJECTS

SINGLE FAMILY

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT NAME AFFORDABLE STATUS	DU* ACRES DU/AC POP	STATUS	CASE NO.
RS-87 ME Also See RC-60	136-0-020-495 & 605	R-P-D-13U Neighborhood Medium	04/02/01	Westwood Communities 134 S Gunston Dr Los Angeles, CA 90049 (805) 650-8991	Northwest corner of Hill Rd & Moon Dr Montalvo	Island View	120 DU 26.85 Acres 8.34 DU/AC 300 POP	Building Permits Issued	PCN-2528 EIR-2356 Z-881 S-4129 DA-29 PD-799 ARB-2808
RS-88 MT	075-0-201-085	C-1 Neighborhood Low	07/16/02	The Mattey Group 1757 Mesa Verde Av #240 Ventura, CA 93003-6531 (805) 652-2115	3091 Porter Ln Preble		4 DU .43 Acres 9.3 DU/AC 10 POP	Building Permits Issued	PCN-2416 EIR-2376 Z-892 LD-888 PD-812 ARB-2835
RS-90 FE	090-0-081-220 & 240	R-P-D-8U Neighborhood Low	06/11/03	The Mattey Group 1757 Mesa Verde Av#240 Ventura, CA 93003-6531 (805) 652-2115	North of Darling Rd, East of Wells Rd Saticoy	Aldea Hermosa	64 DU 7.39 Acres 8.6 DU/AC 160 POP	In Planning Process	PCN-3031 EIR-2401 Z-900 S-5433 PD-827
RS-91 FE	089-0-032-095	R-1-6 Neighborhood Low	06/11/03	The Mattey Group 1757 Mesa Verde Av #240 Ventura, CA 93003-6531 (805) 652-2115	Southwest corner of Henderson & Saticoy Av Saticoy	The Cottages	38 DU 6.2 Acres 4.6 DU/AC 95 POP	All Planning Approvals	PCN-2666 EIR-2402 Z-902 S-5427 PD-830 ARB-2962
RS-92 FE Also See RC-70	087-0-040-205 087-0-075-015	R-P-D Neighborhood Low	07/17/03	The Olson Company 333 Lantana #277 Camarillo, CA 93010 (805) 384-0100	Henderson Rd, West of Montgomery Serra	Hails	172 DU 40.11 Acres 5.8 DU/AC 430 POP	In Plan Check	PCN-4196 RGMP-193 EIR-2404 MP-145 A-321 Z-901 S-5447 PD-829

*DU = Dwelling Units; DU/AC = Approximate Gross Density; POP = Projected Population

VEN00604

PENDING RESIDENTIAL PROJECTS

SINGLE FAMILY

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT NAME AFFORDABLE STATUS	DU* ACRES DU/AC POP	STATUS	CASE NO.
RS-94 WS Also See RA-105	069-0-020-050	R-P-D Proposed Neighborhood Medium	04/30/04	Centex Homes 27200 Tourney Rd #200 Valencia, CA 91355 (661) 288-5777	2686 N Ventura Av Avenue	The Renaissance	113 DU 27.3 Acres 6 DU/AC 283 POP	In Planning Process	PCN-4154 EIR-2428 A-322 Z-906 S-5489-1 PD-840 ARB-2922
RS-95 NE	078-0-050-320	R-P-D Proposed Neighborhood Low	04/27/05	Renaissance Holdings 233 Wilshire Bl. #800 Santa Monica, CA 90410 Michael Faulconer (805) 648-2394	4949 Foothill Rd Arroyo Verde		4 DU 2.57 Acres 1.6 DU/AC 10 POP	All Planning Approvals	PCN-1109 Z-912 LD-957 PD-856
RS-96 FE Also See RC-80 RA-116	090-0-250-275 090-0-022-125	R-P-D Proposed Neighborhood Low	05/23/05	Island Coast, LLC 1833 Portola Rd. Ste. A2 Ventura, CA 93003 Tom Crozier (805) 639-0350	East Ventura corner of Citrus Dr & Peach Av Wells	Citrus Place	64 DU 23.3 Acres 7.9 DU/AC 160 POP	In Planning Process	PCN-3232 A-325 Z-913 LD-958 EIR-2451
RS-97 NE	067-0-060-120	R-P-D Proposed Neighborhood Low	07/14/05	La Barranca Company P. O. Box 31197 Santa Barbara, CA 93130 Tom Condon (805) 302-5991	5533 Foothill Rd Arroyo Verde		10 DU 3.82 Acres 2.6 DU/AC 25 POP	In Planning Process	PCN-4291 EIR-2453 Z-914 S-5631
RS-98 NE Also See RC-84 RA-114	079-0-240-035	R-P-D Proposed Neighborhood Medium	08/11/05	John S. Broome 3319 Telegraph Rd. #201 Ventura, CA 93003 Kioren Moss (805) 339-0613	Copland Dr & Telephone Rd Thille	The Grove	75 DU 25.6 Acres 8.1 DU/AC 188 POP	In Planning Process	PCN-723 PD-860 A-326 Z-915 S-5626 ARB-2983 DA-37 EIR-2457

*DU = Dwelling Units; DU/AC = Approximate Gross Density; POP = Projected Population

VEN006205

PENDING RESIDENTIAL PROJECTS

SINGLE FAMILY

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT NAME AFFORDABLE STATUS	DU* ACRES DU/AC POP	STATUS	CASE NO.
RS-99 FE Also See RC-85	089-0-012-045 089-0-012-140 089-0-012-160 089-0-012-185 089-0-012-195 089-0-012-200 089-0-012-080	R-P-D Proposed Neighborhood Medium	08/12/05	Westwood Communities 1263 Westwood Blvd. #120 Los Angeles, CA 90024 John Ashkar (805) 676-1533	Southwest corner of Wells Rd & Telegraph Rd South to 126 Freeway Wells	Parklands	252 DU 66.7 Acres 7.3 DU/AC 630 POP	In Planning Process	PCN-3829 SP-6 PD-861 A-327 Z-916 LD-5632 ARB-2985 DA-38 EIR-2459

*DU = Dwelling Units; DU/AC = Approximate Gross Density; POP = Projected Population

VEN00309

PENDING RESIDENTIAL PROJECTS

CONDOMINIUMS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT NAME AFFORDABLE STATUS	DU* ACRES DU/AC POP	STATUS	CASE NO.
RC-60 ME Also See RS-87	135-0-020-495 & 605	R-P-D-13U Neighborhood Medium	04/02/01	Westwood Communities Corp 134 S Gunston Dr Los Angeles, CA 90049 (310) 479-3300	Northwest corner of Hill Rd & Moon Dr Montalvo	Bella Vista **10 LOW-INCOME UNITS (SENIOR)**	104 DU 26.85 Acres 8.34 DU/AC 260 POP	Building Permits Issued	PCN-2528 EIR-2356 Z-881 S-4129 DA-29 PD-799 ARB-2808
RC-61 NE	083-0-050-340	R-P-D-12U Neighborhood High	05/11/01	Lennar Communities 25129 The Old Road #316 Stevenson Ranch, CA 91381 (888) 514-9392	South of Thille Rd @ Ringo St Thille	Harmony **10 MODERATE-INCOME UNITS**	182 DU 15.8 Acres 11.5 DU/AC 455 POP	Building Permits Issued	PCN-3088 EIR-2359 Z-882 S-5313 PD-801 ARB-2812
RC-64 NE	083-0-050-630	R-P-D-16U Neighborhood High	02/19/03	Lennar Communities 25129 The Old Road #316 Stevenson Ranch, CA 91381 (888) 514-9392	Northwest corner of Telephone Rd & Saratoga Av Thille	Melody **7 MODERATE-INCOME UNITS**	74 DU 4.7 Acres 15.7 DU/AC 185 POP	Building Permits Issued	PCN-4130 EIR-2392 Z-896 S-5417 DA-33 PD-822
RC-66 DT	073-0-142-270	CR DTSP	06/09/03	Joe Risi 1224 Coast Village Ci #20 Montecito, CA 93108 (805) 565-2288	Northeast corner of Ash St & Front St Downtown		6 DU .17 Acres 35.3 DU/AC 15 POP	All Planning Approvals	PCN-4110 EIR-2400 AM-4611 CDP-454 ARB-2888
RC-67 DT	073-0-046-080	CR DTSP	11/7/03	Mayfair Property, LLC P. O. Box 43 Ventura, CA 93002 www.mayfairlofts.com	793 E Santa Clara St Downtown	Mayfair Lofts **2 VERY LOW-INCOME** **1 MODERATE-INCOME UNIT**	18 DU .42 Acres 42.9 DU/AC 45 POP	Building Permits Issued	PCN-2832 DP-29 AM-4678 CDP-462 LD-918 ARB-2903

*DU = Dwelling Units; DU/AC = Approximate Gross Density; POP = Projected Population

VEN00062

PENDING RESIDENTIAL PROJECTS

CONDOMINIUMS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT NAME AFFORDABLE STATUS	DU* ACRES DU/AC POP	STATUS	CASE NO.
RC-69 MT	076-0-021-040	R-P-D-20U Neighborhood Medium	5/17/04	John T. Chamberlain 930 La Vuelta Pl Santa Paula, CA 93060 (805) 708-0364	1525 Vista Del Mar Dr Catalina		4 DU .25 Acres 16 DU/AC 10 POP	Building Permits Issued	PCN-839 LD-924 PD-849 CDP-477 ARB-2912
RC-70 FE Also See RS-92	087-0-040-205 087-0-075-015	R-P-D-6U Neighborhood Low	07/17/03	The Olson Company 333 Lantana #277 Camarillo, CA 93010 (805) 384-0100	Henderson Rd, West of Montgomery Serra	Hails	60 DU 40.11 Acres 5.8 DU/AC 150 POP	In Plan Check	PCN-4196 RGMP-193 EIR-2404 MP-145 A-321 Z-901 S-5447 PD-829
RC-71 FE	090-0-290-075	M-X-D Neighborhood Medium	2/24/04	MJ Land LLC 4171 Market St, Ste 4A Ventura, CA 93003 Don Jensen (805) 654-6977	Southeast corner of Snapdragon & Jonquil Saticoy	Chapel Lane Courtyards (Phase 1)	16 DU .83 Acres 19.3 DU/AC 40 POP	All Planning Approvals	PCN-1189 LD-939 ARB-2916 AM-4643
RC-72 ME	136-0-020-625	R-P-D Proposed Commerce	05/28/04	Ventura Heritage Corp 134 S Gunston Dr Los Angeles, CA 90049 John Ashkar (310) 479-3300	East of Alameda Av @ 8th St (within Montalvo Shopping Center) Montalvo		72 DU 3.91 Acres 18.4 DU/AC 180 POP	In Planning Process	PCN-4032 EIR-2430 Z-908 S-5512 PD-841 ARB-2921
RC-73 WS Also See C-387	071-0-180-380 & 390	M-X-D DTSP	10/03/02	Harvey Champlin 333 Kalorama St Ventura, CA 93001 Curtis Cormane (805) 652-2115	285 N Ventura Av Avenue		32 DU .57 Acres 56.1 DU/AC 80 POP	Building Permits Issued	PCN-4036 PD-815 ARB-2844 LD-921

*DU = Dwelling Units; DU/AC = Approximate Gross Density; POP = Projected Population

VEN00608

PENDING RESIDENTIAL PROJECTS

CONDOMINIUMS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT NAME AFFORDABLE STATUS	DU* ACRES DU/AC POP	STATUS	CASE NO.
RC-74 WS Also See C-397	069-0-111-225	C-2 Commerce	06/19/03	1150 N Ventura, L.P. 333 N Kalorama Dr Ventura, CA 93001 Kara Davis (805) 652-2115	1150 N Ventura Av Avenue		12 DU .34 Acres 35.3 DU/AC 30 POP	In Plan Check	PCN-767 PD-828 ARB-2890 LD-920
RC-78 MT Also see C-405	073-0-212-270	C-2 Commerce	05/12/04	Patrick McCarthy 633 E Ventura Blvd Oxnard, CA 93030 (805) 485-4646	1625 E Thompson Bl Catalina		4 DU .15 Acres 26.7 DU/AC 10 POP	In Plan Check	PCN-1786 AM-4709 ARB-2925 LD-945
RC-75 DT Also See C-411	071-0-194-405 071-0-194-415	DC DTSP	07/22/04	Palm & Poli Asociates 750 W Gonzales Rd #110 Oxnard, CA 93036 Lee Sehon (805) 983-8674	Southwest corner of Palm St & Poli St Downtown	**1 VERY LOW-INCOME** **2 MODERATE-INCOME**	22 DU .4 Acres 55 DU/AC 55 POP	In Planning Process	PCN-3676 EIR-2438 AM-4730 CDP-475 ARB-2936 LD-932
RC-77 DT Also See C-419	073-0-111-160	DR DTSP	11/15/04	Santa Clara Street Urban Renewal Partners 750 W Gonzales Rd #110 Oxnard, CA 93036 Lee Sehon (805) 983-8674	72 W Santa Clara St Downtown	**1 VERY LOW-INCOME** **2 MODERATE-INCOME**	21 DU .43 Acres 48.8 DU/AC 53 POP	All Planning Approvals	PCN-4263 AM-4764 CDP-485 ARB-2950 LD-943
RC-79 FE	090-0-290-685 090-0-290-695 090-0-290-705	M-X-D Neighborhood Medium	05/04/05	MJ Land LLC 4171 Market St, Ste 4A Ventura, CA 93003 Don Jensen (805) 654-6977	Southwest corner of Snapdragon & Jonquil Saticoy	Chapel Lane Courtyard (Phase II)	15 DU .64 Acres 23.4 DU/AC 38 POP	In Planning Process	PCN-4420 PD-265 ARB-2965

*DU = Dwelling Units; DU/AC = Approximate Gross Density; POP = Projected Population

VEN00696

PENDING RESIDENTIAL PROJECTS

CONDOMINIUMS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT NAME AFFORDABLE STATUS	DU* ACRES DU/AC POP*	STATUS	CASE NO.
RC-80 FE Also See RS-96 RA-116	090-0-250-275 090-0-022-125	R-P-D Proposed Neighborhood Low	05/23/05	Island Coast, LLC 1833 Portola Rd. Ste. A2 Ventura, CA 93003 Tom Crozier (805) 639-0350	East Ventura corner of Citrus Dr & Peach Av Wells	Citrus Place	60 DU 23.3 Acres 7.9 DU/AC 150 POP	In Planning Process	PCN-3232 A-325 Z-913 LD-958 EIR-2451
RC-81 MT	075-0-070-040 075-0-070-050	C-2 Commerce	0720/05	V2V Ventures 2212 Elise Way Santa Barbara, Ca 93109 Leon Bidlow (805) 901-8021	1570 East Thompson Bl Catalina		29 DU (5 Live/ Work Units) 1.11 Acres 26.1 DU/AC 73 POP	In Planning Process	PCN-1520 PD-859 CDP-500 LD-970 ARB-2976
RC-82 DT	073-0-116-010	DR DTSP	08/02/05	The Olson Company 333 N. Lantana #277 Camarillo, CA 93010 Paul Dashevsky (805) 384-0136	120 E. Santa Clara St Downtown	Renaissance Walk **11 Very Low** **15 Moderate**	172 DU 3.6 Acres 47.8 DU/AC 430 POP	All Planning Approvals	PCN-4356 EIR-2456 S-5660 AM-4797 ACDP-474 ARB-2980
RC-83 DT Also See C-425	073-0-114-080 073-0-114-115	DR DTSP	08/09/05	Ventura Coast Partnership 116 N. Oak St Ventura, CA 93001 Jeff Becker (805) 653-6794	24 E Santa Clara Downtown	13 Live-Work Units **3 Very Low** **6 Moderate**	56 DU 1.15 Acres 48.7 DU/AC 140 POP	In Planning Process	PCN-823 ARB-2982 LD-975

*DU = Dwelling Units; DU/AC = Approximate Gross Density; POP = Projected Population

VEN006210

PENDING RESIDENTIAL PROJECTS

CONDOMINIUMS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT NAME AFFORDABLE STATUS	DU* ACRES DU/AC POP	STATUS	CASE NO.
RC-84 NE Also See RS-98 RA-114	079-0-240-035	R-P-D Proposed Neighborhood Medium	08/11/05	John S. Broome 3319 Telegraph Rd. #201 Ventura, CA 93003 Kioren Moss (805) 339-0613	Copland Dr & Telephone Rd Thille	The Grove	88 DU 25.6 Acres 8.1 DU/AC 220 POP	In Planning Process	PCN-723 EIR-2457 A-326 DA-37 Z-915 S-5626 PD0860 ARB-2983
RC-85 FE Also See RS-99	089-0-012-045 089-0-012-140 089-0-012-165 089-0-012-185 089-0-012-195 089-0-012-200 089-0-012-080	R-P-D Proposed Neighborhood Low	08/12/05	Westwood Communities 1263 Westwood Bl #120 Los Angeles, CA 90024 John Ashkar (805) 676-1533	Southwest corner of Wells Rd & Telegraph Rd Wells	Parklands	235 DU 66.7 Acres 7.3 DU/AC 588 POP	In Planning Process	PCN-3829 EIR-2459 A-327 Z-916 DA-38 SP-6 S-5632 ARB-2985 PD-861
RC-86 DT Also See C-427	073-0-123-130 & 230	DC DTSP	10/11/05	Buenaventura Homes 721 Buena Vista St Ventura. CA 93001 Phil Naumoff (805) 653-1345	Northwest corner of E Thompson Bl & S Oak St Downtown	Thompson Oak Court **3 Very Low** **3 Moderate**	38 DU .73 Acres 52.1 DU/AC 95 POP	In Planning Process	PCN-3528 AM-4804 CDP-502 LD-974 ARB-2990
RC-87 MT	077-0-072-010	C-2 Commerce	10/03/05	Patrick McCarthy 633 E Ventura Blvd Oxnard, CA 93030 (805) 485-4646	3065 E Main St	Main/Central Condos	15 DU .62 Acres 24.2 DU/AC 38 POP	In Planning Process	PCN-4284 ARB-2989

Dwelling Units; AC = Acres; DU/AC = Approximate Gross Density; POP = Projected Population

VEN00621

PENDING RESIDENTIAL PROJECTS

APARTMENTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT NAME AFFORDABLE STATUS	DU* ACRES DU/AC POP	STATUS	CASE NO.
RA-91 DT Also See C-379	073-0-142-030	CR DTSP	07/30/02	Mark Draganchuck 1509 E. Main St Ventura, CA 93001 James Armstrong (805) 644-8180	828-836 E Thompson Bl Downtown		12 DU .39 Acres 30.8 DU/AC 30 POP	Building Permits Issued	PCN-3444 DP-14 AM-4456 ARB-2813 CDP-426 LD-946
RA-96 WS	068-0-112-020 & 030	C-2 Commerce	01/15/03	Bob Bronson 1155 N Olive St Ventura, CA 93001 Steve Bovee (805) 649-9104	1155 N Olive St Avenue		5 DU .18 Acres 27.8 DU/AC 13 POP	Building Permits Issued	PCN-4120 PD-820 ARB-2861
RA-97 WS Also See IND-184	071-0-180-170 & 180	M-X-D DTSP	01/23/03	Matilija Investment Property P. O. Box 23277 Ventura, CA 93002 (805) 653-6794	221 N Garden St Avenue		14 DU .88 Acres 15.9 DU/AC 35 POP	In Plan Check	PCN-3865 PD-821 CDP-444 ARB-2863
RA-98 MT	075-0-013-020	R-1-7 Neighborhood Low	02/27/03	Mark Sussman 322 Walnut Dr Ventura, CA 93003 Ted Temple (805) 653-5071	Coronado St Catalina		7 DU .42 Acres 16.7 DU/AC 18 POP	All Planning Approvals	PCN-4034 Z-897 PD-823 ARB-2872
RA-109 FE	089-0-080-360	R-P-D Neighborhood Low	09/19/03	Raul Orozco 312 Camarillo Dr Camarillo, CA 93010 Mark Shellnut (805) 649-2056	10980 Henderson Rd Saticoy		4 DU .53 Acres 7.5 DU/AC 10 POP	All Planning Approvals	PCN-4214 EIR-2407 Z-903 PD-833 ARB-2898
RA-101 DT	073-0-021-200	DR DTSP	09/22/03	Spriggs & Company 3585 Telegraph Rd #B Ventura, CA 93003 Bill/Martha Spriggs (805) 644-5503	44 S Garden St Downtown	**1 VERY LOW-INCOME** **1 MODERATE-INCOME**	11 DU 2.1 Acres 5.2 DU/AC 28 POP	In Plan Check	PCN-1176 DP-27 ACDP-458 ARB-2900

*DU = Dwelling Units; DU/AC = Approximate Gross Density; POP = Projected Population

VEN00621

PENDING RESIDENTIAL PROJECTS

APARTMENTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT NAME AFFORDABLE STATUS	DU* ACRES DU/AC POP	STATUS	CASE NO.
RA-103 MT Also See C-404	075-0-012-225	C-1 Commerce	02/24/04	Stagen Properties 4478 Market Street #4A Ventura, CA 93003 Don Jensen (805) 654-6977	2170 E Main St Catalina		10 DU .49 Acres 20.4 DU/AC 25 POP	All Planning Approvals	PCN-687 ARB-2915 PD-800 LD-950
RA-105 WS Also See RS-94	069-0-020-050	R-P-D Neighborhood Medium	04/30/04	Centex Homes 27200 Tourney Rd #200 Valencia, CA 91355 (661) 288-5777	2686 N Ventura Av Avenue	The Renaissance **AFFORDABLE UNITS (SENIOR)**	50 DU 27.3 Acres 6 DU/AC 125 POP	In Planning Process	PCN-4154 EIR-2428 A-322 Z-906 S-5489-1 PD-840 ARB-2922
RA-107 HK Also See C-412	080-0-240-125 & 245	HC Commerce	07/22/04	Sondermann Ring Partners 14160 Panay Wy Marina del Rey, CA 90292 Michael B. Sondermann (310) 827-6714	Ventura Harbor adjacent to Anchors Wy & Navigator Dr Parcels 15, 16 & 18 Pierpont Keys		300 DU 26.9 Acres 11.2 DU/AC 750 POP	In Planning Process	PCN-4326 EIR-2436 MP-148 PD-844 CDP-473 ARB-2931
RA-108 MT Also See C-417	074-0-154-220 & 230	C-1 Commerce	10/22/04	Dove Properties LLC 301 E Colorado Bl #714 Pasadena, CA 91101 Michael Faulconer (805) 648-2394	2991 Loma Vista Rd Loma Vista	Mixed Use 4 Residential Apartments with Commercial	4 DU .35 Acres 11.4 DU/AC 10 pop	In Plan Check	PCN-4371 ARB-2948
RA-110 WS	068-0-122-065	C-2 Commerce	06/06/05	Exceptional Properties 3911 N. Ventura Ventura, CA 93001 Mark Judson (805) 643-9306	901 Olive St Avenue		4 DU .18 Acres 22.2 DU/AC 10 POP	In Planning Process	PCN-4429 AM-4787 ARB-2971

*DU = Dwelling Units; DU/AC = Approximate Gross Density; POP = Projected Population

VEN006213

PENDING RESIDENTIAL PROJECTS

APARTMENTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT NAME AFFORDABLE STATUS	DU* ACRES DU/AC POP	STATUS	CASE NO.
RA-111 WS	068-0-122-055	C-2 Commerce	06/06/05	Exceptional Properties 3911 N. Ventura Ventura, CA 93001 Mark Judson (805) 643-9306	943 Olive St Avenue		4 DU .18 Acres 22.2 DU/AC 10 POP	In Planning Process	PCN-4430 AM-4788 ARB-2972
RA-112 NE	078-0-202-250	C-1 Commerce	06/28/05	Rasmussen & Associates 248 S. Mills Rd Ventura, CA 93003 L. Rasmussen (805) 644-7347	3585 Telegraph Rd Loma Vista		4 DU .53Acres 7.5 DU/AC 10 POP	In Planning Process	PCN-694 ARB-1551
RA-113 DT Also See C-426	073-0-111-120 073-0-111-130 073-0-111-140 073-0-111-090 073-0-111-100 073-0-111-110	DR DTSP	08/11/05	Artspace Projects, Inc. 250 3rd Ave North Ste 500 Minneapolis, MN 55401 Chris Velasco (612) 333-9012	Northwest corner of Ventura Av and Thompson Bl	Artspace **48 Affordable Units**	54 DU .98 Acres 55.1 DU/AC 135 POP	All Planning Approvals	PCN-4445 AM-4798 CDP-499 ARB-2984 DIR-134 EIR-2458
RA-114 NE Also See RS-98 RC-84	079-0-240-035	R-P-D Proposed Neighborhood Medium	08/11/05	John S. Broome 3319 Telegraph Rd #201 Ventura, CA 93003 Kioren Moss (805) 339-0613	Copland Dr & Telephone Rd Thille	The Grove	45 DU 25.6 Acres 8.1 DU/AC 113 POP	In Planning Process	PCN-723 PD-860 A-326 Z-915 S-5626 ARB-2983 DA-37 EIR-2457
RA-115 WS	071-0-040-170 071-0-270-165	R-P-D Proposed Neighborhood Medium	10/14/05	Riverside Properties 633 E Ventura Bl Oxnard, CA Brady Roark (805) 641-0815	751 Riverside St Avenue		4 DU .208 Acres 19.2 DU/AC 10 POP	In Planning Process	PCN-62 ARB-2992
RA-116 FE Also See RS-96 RC-80	090-0-250-275 090-0-022-125	R-P-D Proposed Neighborhood Low	05/23/05	Island Coast, LLC 1833 Portola Rd. Ste. A2 Ventura, CA 93003 Tom Crozier (805) 639-0350	East Ventura corner of Citrus Dr & Peach Av Wells	Citrus Place **100% Affordable**	60 DU 23.3 Acres 7.9 DU/AC 150 POP	In Planning Process	PCN-3232 A-325 Z-913 LD-958 EIR-2451

*DU = Dwelling Units; DU/AC = Approximate Gross Density; POP = Projected Population

VEN00621

PENDING COMMERCIAL PROJECTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT DESCRIPTION	BLDG. SIZE SQ. FT. (Square feet) LOT AREA	STATUS	CASE NO.
C-350 DT	073-0-240-040, 050, 065, 130	C-T-O DTSP	10/30/98	Dominion Equity 1106 N Highway 360 Grand Prairie, TX 75050 (972) 641-6641	Southeast corner of Harbor Bl & Figueroa St Downtown	162 Room, 4-Story Hotel with Restaurant (Hilton)	150,000 2.76 Acres	In Planning Process	PCN-3253 EIR-2278 PD-755 CDP-391 ALD-829 ARB-2737
C-379 DT Also See RA-91	073-0-142-030	CR DTSP	07/30/02	Mark Draganchuck 1509 E. Main St Ventura, CA 93001 James Armstrong (805) 644-8180	844 E Thompson Bl Downtown	Mixed Use Commercial/Apartments	1,072 .4 Acres	Building Permits Issued	PCN-3444 DP-14 AM-4456 ARB-2813 CDP-426
C-387 WS Also See RC-73	071-0-180-380 & 390	M-X-D DTSP	10/03/02	Harvey Champlin 333 Kalorama St Ventura, CA 93001 Curtis Cormane (805) 652-2115	285 N Ventura Av Avenue	Commercial/Residential Condominiums - Mixed Use	2,330 .57 Acres	Building Permits Issued	PCN-4036 PD-815 ARB-2844
C-388 FE	090-0-250-285	C-P-D Commerce	10/24/02	SSA Enterprises Inc 2664 Kirsten Lee Dr Westlake Village, CA 91361 Leon Felus (310) 821-2725	11008 Citrus Dr Wells	Carwash Addition (1,440 sq.ft.) Addition to Existing Service Station Building (420 sq.ft.)	1,860 .79 Acres	Building Permits Issued	PCN-3422 PD-1 CUP-1093 ARB-300
C-397 WS Also see RC-74	069-0-111-225	C-2 Commerce	6/19;/03	1150 N Ventura, L.P. 333 N Kalorama Dr Ventura, CA 93001 Kara Davis (805) 652-2115	1150 N Ventura Av Avenue	Commercial/ Residential Condominiums - Mixed Use	1,430 .34 Acres	In Plan Check	PCN-767 PD-828 ARB-2890
C-402 ME	138-0-042-030	C-2 Commerce	11/26/03	Jim & Nancy Salzer 5801 Valentine Rd Ventura, CA 93003 David Bury (805) 646-4817	5840 Valentine Rd Olivas	2-Story Office/ Warehouse Building	8,574 .37 Acres	Building Permits Issued	PCN-176 ARB-2907

VEN006215

PENDING COMMERCIAL PROJECTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT DESCRIPTION	BLDG. SIZE SQ. FT. (Square feet) LOT AREA	STATUS	CASE NO.
C-403 ME	083-0-270-195	C-P-D Commerce	12/04/03	Ventura Professionals 101 Hodencamp Rd #200 Thousand Oaks, CA 91360 John Muller (805) 983-7411	855 Partridge Dr Montalvo	3-Story Office Building	54,785 2.8 Acres	Building Permits Issued	PCN-1932 ARB-2909
C-404 MT Also see RA-103	075-0-012-225	C-1 Commerce	02/24/04	Stagen Properties 4478 Market Street #4A Ventura, CA 93003 Don Jensen (805) 654-6977	2170 E Main St Catalina	Mixed Use Commercial/Apartments	5,368 .49 Acres	All Planning Approvals	PCN-687 ARB-2915
C-405 MT Also see RC-78	073-0-212-270	C-2 Commerce	05/12/04	Patrick McCarthy 633 E Ventura Blvd Oxnard, CA 93030 (805) 485-4646	1625 E Thompson Bl Catalina	Mixed Use Commercial/Apartments	374 .15 Acres	In Plan Check	PCN-1786 AM-4709 ARB-2925
C-406 ME	135-0-062-095	C-P-D Commerce	03/26/04	Allan Ghitterman 610 Anacapa St Santa Barbara, CA 93101 Chad Henderson (805) 652-0824	1900 S Victoria Av Montalvo	2-Story Commercial Office Building	4,400 .17 Acres	Building Permits Issued	PCN-4282 EIR-2421 Z-905 PD-838 ARB-2918
C-407 FE	089-0-011-175	P-O Public & Institutional	04/19/04	DesignARC, Inc 27231 Burbank #201 Foothill Ranch, CA 92610 Scott Holland (949) 581-3241	10180 Telegraph Rd Wells	Commercial Office Addition for Southern California Edison	5,560 18.9 Acres	Building Permits Issued	PCN-4289 EIR-2426 PD-839 ARRB-195
C-408 NE	078-0-050-360	R-1-7 Public & Institutional	05/24/04	Gyzen & Associates 4 Park Plaza #200 Irvine, CA 92614 Jeffrey Gyzen (949) 252-8178	65 Day Road Arroyo Verde	New Community Access Center Building	8,849 .841 Acres	Building Permits Issued	PCN-2786 AM-2926 ARB-1185
C-409 ME	138-0-230-340	C-P-D Auto Center S.P.	06/23/04	Ventura Toyota 6360 Leland St Ventura, CA 93003 Karen Wintringham (805) 650-0510	Northeast corner of Hofer Dr & King Dr Olivas	New Auto Dealership	7,160 2.2 Acres	All Planning Approvals	PCN-4320 EIR-2434 PD-842 ARB-2929

VEN006216

PENDING COMMERCIAL PROJECTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT DESCRIPTION	BLDG. SIZE SQ. FT. (Square feet) LOT AREA	STATUS	CASE NO.
C-410 MT	073-0-072-110	C-1 Commerce	05/07/04	James Beatty 1529 E Main St Ventura, CA 93001 (805) 653-5033	1529-1535 E Main St Catalina	Mixed Use Commercial/Apartments (3)	801 .11 Acres	All Planning Approvals	PCN-4305 AM-4707 ARB-2924
C-411 DT Also See RC-75	071-0-194-405	DC DTSP	07/22/04	Palm & Poli Asociates 750 W Gonzales Rd #110 Oxnard, CA 93036 Lee Sehon (805) 983-8674	SWC Palm St & Poli St Downtown	Mixed Use Commercial/Residential Condominiums	1,200 .23 Acres	In Planning Process	PCN-3676 EIR-2438 AM-4730 CDP-475 ARB-2936 LD-932
C-412 HK Also See RA-107	080-0-240-125 & 245	HC Neighborhood Medium	07/22/04	Sondermann Ring Partners 14160 Panay Wy Marina del Rey, CA 90292 Michael B. Sondermann (310) 827-6714	Ventura Harbor adjacent to Anchors Wy & Navigator Dr Parcels 15, 16 & 18 Pierpont Keys	Mixed Use Marina Retail, 104 Boat Slips and 300 Residential Apartments	20,000 26.9 Acres	In Planning Process	PCN-4326 EIR-2436 MP-148 PD-844 CDP-473 ARB-2931
C-413 FE	087-0-152-020	C-1A Commerce	08/03/04	Petite Enterprises LLC 1525 S Sepulveda Bl #G Los Angeles, CA 90025 Mitch Bramlitt (901) 495-8714	9459 Telephone Rd Serra	1-Story Commercial Building	6,446 .61 Acres	Building Permits Issued	PCN-777 ARB-2939
C-414 FE	087-0-153-015	C-1A Commerce	10/04/04	9493 LLC 3653 E Thousand Oaks Bl Thousand Oaks, CA 91362 Jason Schmetz (805) 413-1040	9493 Telephone Rd Serra	Commercial Addition	4,666 .92 Acres	In Plan Check	PCN-2171 ARB-2226
C-415 NE	137-0-030-385	C-P-D Commerce	10/07/04	Cal Coast Motorsports 5455 Walker St Ventura, CA 93003 Craig Adams (805) 340-1389	5455 Walker St Thille	Commercial Addition	12,000 .99 Acres	In Plan Check	PCN-4341 PD-795A ARB-2654

VEN00621

PENDING COMMERCIAL PROJECTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT DESCRIPTION	BLDG. SIZE SQ. FT. (Square feet) LOT AREA	STATUS	CASE NO.
C-416 NE	084-0-081-245	M-P-D Industry	10/15/04	F-2 Development P. O. Box 6025 Woodland Hills, CA 91365 Roy Colbert (805) 650-9590	4628 Telephone Rd Arundell	New Automotive Repair Building	5,198 .92 Acres	In Plan Check	PCN-4098 PD-817A CUP-1169 ARB-2846
C-417 MT Also See RA-108	074-0-154-220 & 230	C-1 Commerce	10/22/04	Dove Properties LLC 301 E Colorado Bl #714 Pasadena, CA 91101 Michael Faulconer (805) 648-2394	2991 Loma Vista Rd Loma Vista	Mixed Use 4 Residential Apartments with Commercial	5,100 .35 Acres	In Plan Check	PCN-4371 ARB-2948
C-419 DT Also See RC-77	073-0-111-160	DR DTSP	11/15/04	Santa Clara Street Urban Renewal Partners 750 W Gonzales Rd #110 Oxnard, CA 93036 Lee Sehon (805) 983-8674	72 W Santa Clara St Downtown	Mixed Use 21 Residential Condominiums with Commercial	3,000 .43 Acres	All Planning Approvals	PCN-4263 AM-4764 CDP-485 ARB-2950 LD-943
C-420 DT	073-0-042-210	DC DTSP	03/21/05	60 California LLC 2151 Alessandro Dr, Ste 100 Ventura, CA 93001 Dan Frederickson (805) 648-6448 x 103	60 California St Downtown	Four story multi-use commercial/retail building	21,295 .14 Acres	In Planning Process	PCN-4408 ARB-2959 EIR-2449
C-421 DT	073-0-141-120	DR DTSP	05/17/05	Tender Life 844 East Thompson Blvd Ventura, CA 93001 Jim De Arkland (805) 650-1967	871 E Thompson Bl Downtown	New accessory quarters consisting of 4 bedrooms, living room, office and cooking area	6,400 .14 Acres	In Planning Process	PCN-699 CUP-963 CDP-198 ARB-2967
C-422 NE	079-0-010-385	C-1A Commerce	05/19/05	Ventura All Hand Carwash 1489 Stubbing Tr. Los Angeles, CA 90069 Steve Fishman (310) 801-2841	Southeast corner of S Mills Rd & Dean Dr Camino Real	Construction of a retail/carwash building on a prepared pad site.	4,712 13.35 Acres	In Planning Process	PCN-829 CUP-1193 ARB-2968
C-423 NE	079-0-010-385	C-1A Commerce	05/26/05	MJL Capital Partners, LLC 2659 Townsgate Dr., #246 Westlake Village, CA 91361 Steve Olshan (310) 458-9868	Southeast corner of S Mills Rd & Dean Dr Camino Real	Proposed two one-story buildings	14,000 13.35 Acres	In Planning Process	PCN-829 CUP-1194 ARB-2969

VEN006218

PENDING COMMERCIAL PROJECTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT DESCRIPTION	BLDG. SIZE SQ. FT. (Square feet) LOT AREA	STATUS	CASE NO.
C-424 FE	089-0-100-080	C-1A Commerce	07/01/05	Loyal Order of Moose #1394 P.O. Box 4517 Ventura, CA 93007-0517 Larry Graves (805) 659-4017	10269 Telephone Rd Saticoy	One story addition of recreation room	1,087 1.92 Acres	All Planning Approvals	PCN-4437 ARB-2973
C-425 DT Also See RC-83	073-0-114-080 073-0-114-11	DR DTSP	08/09/05	Ventura Coast Partnership, LLC 116 N. Oak St Ventura, CA 93001 Jeff Becker (805) 653-6794	24 E Santa Clara Downtown	Mixed-Use project with 750 sq ft of commercial space.	750 1.15 Acres	In Planning Process	PCN-823 ARB-2982
C-426 DT Also see RA-113	073-0-111-120 073-0-111-130 073-0-111-140 073-0-111-090 073-0-111-110	DR DTSP	08/11/05	Artspace Projects, Inc. 250 3rd Ave. North Suite 500 Minneapolis, MN 55401 Chris Velasco (612) 333-9089	Northwest corner of Ventura Ave and Thompson Blvd Downtown	Mixed-Use Project	6,635 1.6 Acres	All Planning Approvals	PCN-4445 AM-4798 CDP-499 ARB-2984 DIR-134 EIR-2458
C-427 DT Also See RC-86	073-0-123-230 & 130	DC DTSP	10/11/05	Buenaventura Homes 721 Buena Vista St Ventura. CA 93001 Phil Naumoff (805) 653-1345	Northwest corner of E Thompson Bl & S Oak St Downtown	Mixed-Use Project	3,474 .73 Acres	In Planning Process	PCN-3528 AM-4804 CDP-502 LD-974 ARB-2990
C-428 NE	137-0-021-020	C-1A Commerce	10/13/05	Wal-mart Stores, Inc. 2001 SE 10th Street Bentonville, AR 72716-0550 Brian Anderson (714) 560-8200	1739 S Victoria Av Thille	New retail building with garden center (7,700 sq.ft.)	101,200 with 12.41 Acres	In Planning Process	PCN-2759 EIR-2463 CUP-614 ARB-2991
C-429 MT	079-0-280-255	C-2 Commerce	11/16/05	VOOV, LLC 660 Rose Ave #4 Venice, CA 90291 D. Joshua Staub (310) 576-7770	4107 E Main St Arundell	New 2-Story Commercial Office/Condo	6,400 sq.ft. .57 Acres	In Planning Proces	PCN-3864 ARB-2994
C-430 MT	080-0-230-245	C-T-O Commerce	11/28/05	Extended Stay Hotels 12819 SE 38th St Bellevue, WA 98006 Allen Wyttenback/LPN Architects (206) 230-6648	770 S Seaward Av Preble	New 4-Story Hotel	63,677 sq.ft. 130 rooms 3.71 Acres	In Planning Process	PCN-2835 ARB-2995

VEN006219

PENDING INDUSTRIAL PROJECTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT DESCRIPTION	BLDG. SIZE SQ. FT. (Square feet) LOT AREA	STATUS	CASE NO.
IND-184 WS Also see RA-97	071-0-180-170 & 180	M-X-D DTSP	01/23/03	Matilija Investment Property P. O. Box 23277 Ventura, CA 93002 Neal Subic (805) 644-7340	221 N Garden Av Avenue	14 Mixed-Use (Industrial/ Residential) Units	27,000 approx .88 Acres	In Plan Check	PCN-3865 PD-821 CDP-444 ARB-2863
IND-199 NE	138-0-170-240	M-1 Industry	07/24/03	Sally Crain 1595 S Arundell Av Ventura, CA 93003 Ed Campbell (805) 648-1859	3660 Arundell Ci Arundell	Warehouse Building	40,000 2.51 Acres	In Plan Check	PCN-1009 ARB-2170
IND-186 ME	138-0-230-520	M-P-D Industry	09/29/03	MBL Golf Course LLC 7204½ Melrose Los Angeles, CA 90046 Vincent Dyer (818) 882-5250	3200 Golf Course Dr 6050 King Dr Olivas	2 Warehouse/ Manufacturing Buildings	276,445 14.6 Acres	Building Permits Issued	PCN-3742 EIR-2408 LD-908 PD-834 ARB-2901
IND-187 NE	084-0-051-105	M-P-D Industry	06/24/04	J.T. Rogers 1880 Teal Club Rd Oxnard, CA 93030 Vincent Dyer (818) 882-5250	2359 Knoll Dr Arundell	New One-Story Industrial Building	14,780 .09 Acres	In Plan Check	PCN-4321 EIR-2435 PD-843 ARB-2930
IND-188 ME	135-0-290-175	M-1 Industry	07/20/04	Karim Gorbanov 3700 Dean Dr #2101 Ventura, CA 93003 Brad Beckham (805) 984-3372	6508 Beene Rd Montalvo	New Two-Story Industrial Building	3,241 .39 Acres	In Plan Check	PCN-4333 ARB-2933
IND-189 ME	138-0-243-045 & 055	M-P-D Industry	08/03/04	Grigor Eddie Atoian P. O. Box 8926 Calabasas, CA 91302 Vincent Dyer (818) 882-5250	3000 Bunsen Av Olivas	New One-Story Industrial Building	39,043 2.38 Acres	Building Permits Issued	PCN-2011 EIR-2439 PD-847 ARB-2938
IND-190 ME	138-0-250-125	M-P-D Industry	07/29/04	David Gregory 22 N Ventura Av Ventura, CA 93001 James A. Lichty (913) 341-2356	2900 Golf Course Dr Olivas	New One-Story Industrial Building	13,810 .78 Acres	In Plan Check	PCN-4339 PD-846 ARB-2937

VEN000220

PENDING INDUSTRIAL PROJECTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT DESCRIPTION	BLDG. SIZE SQ. FT. (Square feet) LOT AREA	STATUS	CASE NO.
IND-191 NE	084-0-083-075	M-P-D Industry	08/04/04	Las Palmas Industrial 4864 Market St Ventura, CA 93003 (805) 642-4773	1601 Eastman Av Arundell	New Two-Story Industrial Building	20,528 .52 Acres	In Plan Check	PCN-2281 PD-848 ARB-2940
IND-192 NE	084-0-142-035 & 045	M-P-D Industry	09/02/04	458 No Hayworth Apt LLC 7204 ½ Melrose Av #A Los Angeles, CA 90046 Vince Dyer (818) 882-5250	1834 Palma Dr Arundell	Two New One-Story Industrial Buildings	37,500 2.66 Acres	In Plan Check	PCN-4350 PD-850 ARB-2943
IND-193 ME	138-0-241-035	M-P-D Industry	11/02/04	Bill Gerard P. O. Box 1296 Buelton, CA 93427 (805) 886-9453	NWC of Nicolle St & Golf Course Dr Olivas	Six New Industrial Buildings Including Self-Storage	191,249 19.56 Acres	In Planning Process	PCN-3202 PD-852 ARB-2949
IND-194 NE	084-0-102-065	M-P-D Industry	01/13/05	Hart Ventures LLC 159 E Manchester Av Los Angeles, CA Vince Dyer (818) 882-5250	NWC Transport St & Donlon St Arundell	New Two-Story Industrial Building	20,640 1.13 Acres	In Planning Process	PCN-4399 PD-853 ARB-2956
IND-195 ME	138-0-230-520	M-P-D Industry	01/20/05	Vincent Dyer 10761 Eton Ave Chatsworth, CA 91311 (818) 882-5250	Olivas Park Dr Olivas	Five new one story industrial buildings	67,850 20.48 Acres	All Planning Approvals	PCN-3742 PD-854 ARB-2955
IND-196 DT	073-0-107-115	M-X-D DTSP	03/28/05	Nature's Purebody Inst. 230 S Olive St Ventura, CA 93001 Tamara Frazier (805) 797-3782	230 S Olive St Downtown	Temporary steel structures for wholesale space	1,500 .14 Acres	In Planning Process	PCN-3311 PD-855 CUP-1200 CDP-504 ARB-2622
IND-197 NE	084-0-144-295	M-P-D Industry	05/10/05	Vincent Dyer 10761 Eton Ave Chatsworth, CA 91311 (818) 882-5250	4880 Colt St Arundell	Addition to existing industrial building	43,180 7.41 Acres	All Planning Approvals	PCN-402 PD-361 ARB-1942
IND-198 WS	068-0-150-405	M-X-D Commerce	11/18/05	Ventura Ave Self Storage 4864 Market St #B Ventura, CA 93003 W. Kendall (805) 642-4773	2261 N Ventura Av Avenue	New Personal Storage Building	8,767 1.65 Acres	In Planning Process	PCN-1809 PD-765A ARB-2359

VEN006221

PENDING INSTITUTIONAL PROJECTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT DESCRIPTION	BLDG. SIZE SQ. FT. (Square feet) LOT AREA	STATUS	CASE NO.
INS-101 ME	087-0-030-060	P Parks & Open Space	04/02/04	City of Ventura 501 Poli St Ventura, CA 93001 Greg Gilmer (805) 658-4727	901 S Kimball Rd Serra	Ventura Community Park. Aquatics Complex, 3 Soccer Fields, Bathhouse, Pool Equipment Building, Restrooms and Storage Building	9,550 94.98 Acres	Building Permits Issued	PCN-3904 MP-141 EIR-2334 A-319 AM-4511 ARB-2815
INS-103 DT	073-0-022-200	P DTSP	12/02/04	AC Martin Partners, Inc. 444 S Flower, Ste 1200 Los Angeles, CA 90071 Carey McLeod (213) 614-6149	100 E Main St Downtown	Expansion of Ventura County Museum of History and Art	19,000 5 Acres	All Planning Approvals	PCN-1195 EIR-2386 PD-819 CDP-442 ARB-2854
INS-104 ME	138-0-212-105	P Parks & Open Space	02/03/04	City of Ventura Buenaventura Golf Course 501 Poli St Ventura, CA 93001 Greg Gilmer (805) 658-4727	5882 Olivas Park Dr Olivas	Construction of a new maintenance building and restroom and addition to the existing pro shop building	22,450 92 Acres	Building Permits Issued	PCN-1471 CUP-1176 FP-20 ARB-2866
INS-105 HK	138-0-050-050	P & R-1-7 Parks & Open Space	02/03/04	City of Ventura Olivas Golf Course 501 Poli St Ventura, CA 93001 Greg Gilmer(805) 658-4727	3750 Olivas Park Dr Olivas	Construction of a new clubhouse, maintenance building and restroom	26,586 253.5 Acres	Building Permits Issued	PCN-2211 CUP-1174 FP-21C DP-449 ARB-2867
INS-106 NE	137-0-014-015	R-3-5 Neighborhood Medium	04/03/04	Ventura Baptist Church 5415 Ralston St Ventura, CA 93003 Mark Craig (805) 644-7191	5415 Ralston St Thille	Auditorium Addition	13,270 4.19 Acres	Building Permits Issued	PCN-4151 CUP-1179 ARB-2880
INS-107 MT	072-0-181-150 & 090	R-1-7 Neighborhood Low	10/13/03	Community Presbyterian Church 1555 Poli St Ventura, CA 93001 Ted Temple (805) 653-5071	1555 Poli St Catalina	Multipurpose Auditorium	5,180 4 Acres	All Planning Approvals	PCN-3682 CUP-214 ARB-1195

VEN000222

PENDING INSTITUTIONAL PROJECTS

PROJECT NO. MAP ZONE	ASSESSOR'S PARCEL NO.	ZONE LAND USE	DATE FILED	DEVELOPER	PROJECT LOCATION COMMUNITY	PROJECT DESCRIPTION	BLDG. SIZE SQ. FT. (Square feet) LOT AREA	STATUS	CASE NO.
INS-108 FE	131-0-060-145	R-1-1AC Neighborhood Low	11/03/04	First Assembly of God of Ventura 346 N Kimball Rd Ventura, CA 93004 Judy Hoffman (805) 647-2004	1184 Bristol Rd Serra	Recreational Fields	25.6 Acres	In Planning Process	PCN-1191 EIR-2385 A-320 CUP-1183 ARB-2904
INS-109 WS	063-0-040-025	R-1-1AC Industry	05/21/04	City of Ventura 501 Poli St Ventura, CA 93001 Joe McDermott (805) 654-7828	5895 N. Ventura Av North Avenue	3 New Buildings at Water Treatment Plant	18,619 12.54 Acres	Building Permits Issued	PCN-3056 ARB-373
INS-100 FE	086-0-020-815	C-1A Neighborhood High	08/01/00	Holiday Retirement Corporation P. O. Box 14111 Salem, OR 97309 Michael Fuller (805) 671-9700	111 N. Wells Rd Wells	New Assisted Living Facility (97 rooms)	81,330 9.38 Acres	Building Permits Issued	PCN-2138 EIR-2345 PD-802 CUP-1143 ARB-2796
INS-110 MT	068-0-191-070 & 080	C-1 Commerce	06/01/05	Keystone Schools 11980 Mt Vernon Av Grand Terrace, CA 92313	1718 E Main St Catalina	New Classroom Building	593 (net increase) .19 Acres	All Planning Approvals	PCN-305 CUP-1195 ARB-2970
INS-111 WS	068-0-082-115	C-P-D Commerce	07/20/05	Ventura Unified School District 359 S. Victoria Ave Ventura, CA 93003 Paul Sheehan (805) 653-8100	255 W. Stanley Ave Avenue	Construction of new education operation support center	41,470 2.83 Acres	In Planning Process	PCN-1847 PD-858 CUP-1196 ALD-966 ARB-2975

VEN00623

Appendix B:

Technical Memorandum No. 1, Wastewater Planning Data

(prepared by K/J Consultants, July 27, 2006)

27 July 2006

Technical Memorandum No. 1

To: Ms. Susan Rungren, City of San Buenaventura

From: Jeff Savard, Pat Huston and Tricia Berger

Subject: Technical Memorandum No. 1
Service Area, Land Use, Design Criteria, Return-to-Sewer Ratios, Peaking Factors, Basic Assumptions and Wastewater Flows
City of San Buenaventura Wastewater Master Plan
Kennedy/Jenks Consultants Project No. 0689017

Introduction

In support of our overall master planning effort for the City of San Buenaventura (City), Kennedy/Jenks Consultants (K/J) has evaluated the basic master planning assumptions and wastewater flow projections to be used in the development of the Wastewater Master Plan (WWMP). The need for this system-wide wastewater master plan is being driven by recent redevelopment efforts in the Downtown area, updates to the City's General Plan, concerns about aging wastewater infrastructure, and questions about available conveyance capacity of several trunk sewers. Technical Memorandum No. 1 addresses the following components of the WWMP:

- Delineation of the study area
- Land uses within the study area
- Water billing data
- Collection system design criteria
- Wastewater peaking factors
- Return-to-sewer ratios
- Wastewater flow projections for the following time steps:
  - Existing Conditions
  - Near-Term
  - General Plan Horizon

Figures and tables not included in the text can be found in the appendix, attached at the end of this memorandum.

Study Area

The City of San Buenaventura's wastewater collection system is composed of four main tributary areas. These tributary areas are known as the Eastside, Midtown, Downtown and Westside areas. A collection system study for the Eastside area was prepared by the City in 1995. Kennedy/Jenks Consultants prepared a study focusing on the capital improvement needs for the Downtown and Westside areas in 2005. However, a comprehensive City-wide study inclusive of the Midtown area has not been prepared for the City's wastewater collection system since 1977. The focus of this study is to provide a system-wide analysis resulting in a comprehensive Wastewater Master Plan encompassing these four main tributary areas.

City boundary and regional parcel Geographic Information System (GIS) data were received from the City. The parcel data was coded to separate those parcels inside the City from those outside the City. Only parcels coded as being within the City's boundary were used to calculate the duty factors and wastewater flows reported below. The boundary shape file is used purely for display purposes. Figure 1, in the appendix, displays the City boundary and highlights in green the parcels coded as within this boundary. These parcels compose the study area for the WWMP.

Study Area Land Uses

Each parcel within the study area was assessed for existing, near-term, and General Plan development levels. A master land use database was created in GIS to aid in the production of this WWMP, as well as the development of the concurrent Water Master Plan being completed for the City. The development levels were assessed using the following land use planning data obtained from the City of San Buenaventura:

- Parcel polygons
- General Plan land use polygons
- City boundary
- Water meter locations and descriptions
- Historical water meter billing data
- Near-term development tables

Existing Development

Existing land use categories are based upon County Assessor data encoded in the City's parcel database in conjunction with water meter billing data. Water meter billing data was geocoded to

parcels, matching each water meter within the study area to the nearest parcel. Only parcels within the City limits with recorded water use from billing data were included in the calculations for existing development. A list of water meters sewered by alternate agencies was also provided by the City for exclusion from existing development calculations. Parcels containing both sewered and non-sewered meters were not excluded from calculations for existing development.

The County Assessor data contained a break down of 153 descriptive land uses included under eight main categories. Kennedy/Jenks Consultants retained these eight main categories, splitting the Industrial category into 3 separate levels for a total of 10 master plan land use categories. These 10 master plan land use categories are used when categorizing land use and wastewater flow data on the tables and figures that follow. The 153 descriptive land uses were summarized into 23 master plan land uses for the development of wastewater flow factors seen later in this report.

Table 1 illustrates the 10 main land use categories developed for the WWMP and provides a description of general types of land uses included under the main description. Figure 2, in the appendix, displays existing City parcels according to master plan category. Parcels displayed as having no existing water use are parcels with no water meter billing data. These parcels are fully developed by applying the appropriate duty factor for the comprehensive plan horizon. Parcels displayed as sewered by others are parcels containing only water meters designated as sewered by others according to City data.

Technical Memorandum No. 1

Table 1
Master Plan Land Use

Master Plan Category	Description
Industrial 1	Industrial/Manufacturing Usage Below 2,500 GPD
Industrial 2	Industrial/Manufacturing Usage Between 2,500 GPD and 7,500 GPD
Industrial 3	Industrial/Manufacturing Usage Above 7,500 GPD
Recreational	Sports Facilities
	Indoor Theaters
Residential	Single Family/Duplex
	Multi Family
	Mobile Homes
	High Density
	Estate
Resource Production	Crops
	Pasture and Range Land
	Orchards
Services	Schools
	Mid-size office Bldg (3000-10,000 sf)
	Major Office Bldg (over 10,000 sf)
	Full Care Hospital
	Colleges/Universities
	Churches/Organizations
	Cemetery
Trade	Retail
	Restaurants
	Auto
Transportation	Utilities
Community	Streets, Roads and Walkways
Utilities	Parking Lots
	Railways
	Flood Control Basins
Undeveloped	Undeveloped and Unused Land

Near-Term Development

A table of near-term development projects was provided by the City. The list contained project numbers, associated parcel numbers, project address, dwelling unit (DU) per addition (residential only), acre per addition and population per addition. Near-term sewer flows for residential developments were calculated using a factor of 194 gpd/DU. This factor is consistent with that used for the Downtown/Westside Sewer System Study. Wastewater flows for commercial, industrial and institutional developments were calculated using the appropriate duty factor for the land use. A total of 1,654,587 gpd was calculated for near-term development. Table 2, in the appendix, lists project numbers and names along with calculated flow for each development. Figure 3, in the appendix, displays the location of each near-term development project.

General Plan Development

General Plan development is based on allowable future redevelopment of all areas to General Plan limits. General Plan development assumes all vacant parcels will redevelop to the land use categories described in the General Plan. General Plan development also assumes 10 percent of existing parcels currently using less than General Plan allowance will redevelop to General Plan allowance. Parcels currently using more than General Plan allowance were assumed to continue existing usage. General Plan allowance is calculated as the parcel area multiplied by the corresponding wastewater flow factor. Figure 4, in the appendix, displays ultimate land use by master plan category.

Water Billing Information

The City's water meter billing records were received for the time period of January 2004 to February 2006. The data from January 2004 to December 2005 was analyzed to compute water usage in gallons per day (gpd) for each meter. Each meter was then spatially assigned to the parcel nearest it. The total existing usage (gpd) was computed for each parcel.

Collection System Design Criteria

Lift Station Criteria

Lift Stations should be sized for peak wet weather flow with manufacturer's recommended cycling times for pumping equipment and should be sized based upon the following criteria:

- Lift stations should be capable of meeting the criteria with the largest capacity pump serving as standby.
- 60 percent pump efficiency should be assumed, except where other information is available.
- 90 percent motor efficiency should be assumed, except where other information is available.
- Wetwell capacity to contain volume at peak flow for 4 hours and/or provide alternative sources of electrical power to operate lift station.

Force Main Criteria

For the purposes of this study, the following design criteria are proposed for force mains:

• Minimum force main size	8" PVC designed for future loads plus 25%
• Minimum velocity:	3 feet per second
• Maximum velocity:	5 feet per second
• Maximum allowable headloss:	10 feet/1000 feet of pipeline
• Maximum desirable headloss:	5 feet per 100 feet of pipeline
• Hazen-Williams C factor:	130

Gravity Main Criteria

For the purposes of this study, the following design criteria are proposed for gravity mains:

- Pipes 15 inches in diameter and smaller[1]: ½ full at peak flow
- Pipes over 18 inches in diameter[1]: ¾ full at peak flow
- Pipes constructed under freeways[1]: ½ full at peak flow
- Minimum velocity[1]: 2 feet per second
- Maximum velocity: 10 feet per second
- Manning's n for pipes: 0.013
- Dry Weather Flow peaking factor: $Q_{pk} = 1.947*Q_{ave}^{-0.0735}$ (mgd)
- Wet Weather Flow peaking factor: $Q_{pk} = 3.62*Q_{ave}^{-0.185}$ (mgd)
- Minimum Slope requirements: See Table 3 below

Table 3
Minimum Slope Requirements

Sewer Size (in)	Grade (%)
8	0.4[1]
10	0.28
12	0.24
15	0.12
18	0.108
21	0.088
24	0.068
27	0.060
30	0.052
33	0.044
36	0.040
42	0.032

[1] Per the *1997 Engineering Design Standards, City of San Buenaventura*

These criteria were developed using the *1997 Engineering Design Standards, City of San Buenaventura* and recent project experience and will be used to evaluate collection system facilities and size proposed facilities as part of the forthcoming hydraulic modeling efforts.

Peaking Factors

Dry weather and wet weather peaking factors were developed for this study using a combination of flow data collected by the City, existing metering data at the City's Seaside Transfer Station, and Wastewater Treatment Plant Influent Pump Station, and data from prior studies.

The City contracted with both MGD Technologies Inc. (MGD) and DownStream Services Inc. (DownStream) to conduct temporary sewer flow monitoring studies in the City during different times over the past three years. MGD conducted two studies in the Downtown/Westside area during August and September 2003 and March 2004, respectively, of fourteen (14) and twenty-one (21) day durations, respectively. DownStream conducted a seven (7) day study in November 2005 for the Eastside area. All three flow monitoring studies took place during dry weather periods. The flow monitoring results from the March 2004 study were used to create a peak dry weather factor curve and equation, because that study was of the longest duration and gave more conservative results than the other two studies. The recommended peak dry weather curve equation is shown below:

$$\textbf{Peak Dry Weather Factor} = 1.99 \times (\textbf{Average Dry Weather Flow Rate})^{-0.0295}$$

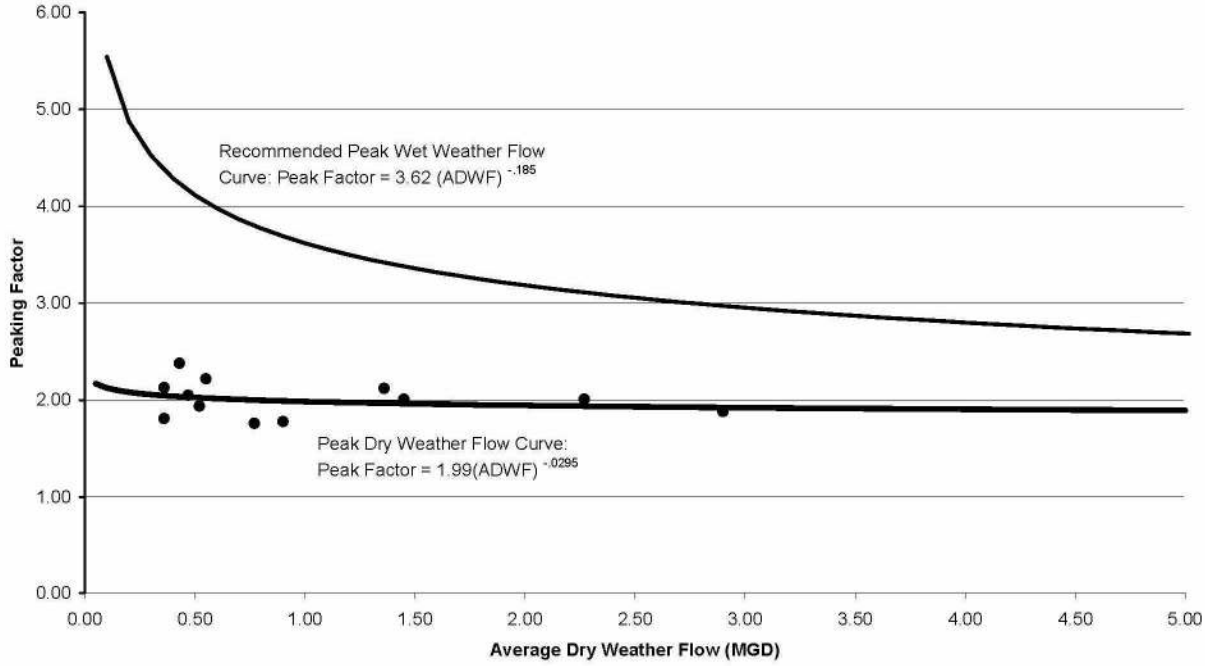
This peak dry weather curve equation corresponds well to the recommended peak dry weather curve equation for the City of Oxnard, which would be expected to have similar wastewater collection system characteristics.

MGD Technologies Inc. (MGD) was also contracted by the City of San Buenaventura (City) to conduct a wet weather flow monitoring study. Over a twenty-one (21) day period in March 2004 measurements were taken at twelve (12) different sites in the Downtown/Westside area. However, no wet weather events occurred during this time frame. Without wet weather flow monitoring data, the peak wet weather curve and equation were determined from metered flows taken at the Seaside Transfer Station and the Influent Pump Station during wet weather events. This flow was adjusted using peaking curves from other recent studies in order to better represent peak flows for lower, average flow conditions. This method was used to determine the peak wet weather curve and equation for the Downtown/Westside Sewer Study. This curve is recommended for use in this study as well. The recommended peak wet weather curve equation follows:

$$\textbf{Peak Wet Weather Factor} = 3.62 \times (\textbf{Average Dry Weather Flow Rate})^{-0.185}$$

It is recommended that the City conduct another wet weather flow monitoring study. Between late 2000 and late 2005, most rain events occurred between late November and mid-March. However, during the 2005-2006 rain season, most rain events occurred in the months of February, March, and April. Therefore, it appears that February and March provide the best opportunity for capturing a wet weather event. Peak wet and peak dry weather curves are shown in Figure 5.

Figure 5
Recommended Peaking Factor Curves



Return-to-Sewer Ratios

The water billing database was used as a means to estimate existing wastewater flows by utilizing return-to-sewer ratios for each master plan category. The return-to-sewer ratio for a given land use category is defined as the percentage of water demand that is returned to the sanitary sewer system for that land use category. Return-to-sewer ratios were used to develop wastewater flow factors, which were used to develop near-term and general plan flows. The return-to-sewer ratios proposed for this study were calculated based on analysis of the parcel database in conjunction with flow monitoring studies conducted by MGD and Downstream and flow monitoring data collected at the Seaside Transfer Station and Influent Pump Station by the City. Parcels were coded by basin and return-to-sewer ratios were developed to correspond with the basin flow monitoring information. Table 4 shows the return-to-sewer ratios used for the purpose of this study.

Table 4
Return-to-Sewer Ratios

No.	Land Use Category	Recommended Return-to-Sewer Ratio
1	Industrial Type 1 - Usage Below 2,500 GPD	80%
2	Industrial Type 2 - Usage Between 2,500 GPD and 7,500 GPD	77%
3	Industrial Type 3 - Usage Above 7,500 GPD	71%
4	Recreation	53%
5	Residential	69%
6	Resource Production	45%
7	Services	80%
8	Trade	79%
9	Trans/Comm/Util	81%
10	Undeveloped	0%

The return-to-sewer ratios shown in Table 4 were then applied, by parcel, to the water meter data provided by the City and a wastewater flow factor in gallons per day per acre was developed. Wastewater flow factors were developed for all 153 sub-categories. The sub-categories were analyzed and grouped into 23 master plan land use categories, shown in Table 5. These flow factors and other analysis methods were utilized to estimate near-term and General Plan flow as needed.

Table 5
Wastewater Flow Factors

No.	Master Plan Category	Master Plan Land Use	Recommended Wastewater Flow Factor (gpd/ac)
1	Industrial	Warehousing	600
2	Industrial	Major Manufacturing	2,800
3	Industrial	Industrial	1,700
4	Recreation	Sports Facilities	450
5	Recreation	Indoor Theaters	1,600
6	Residential	Single Family/Duplex	1,200
7	Residential	Multi Family	2,000
8	Residential	Mobile Homes	1,250
9	Residential	High Density	5,050
10	Residential	Estate	600
11	Resource Production	Resource Production	20
12	Services	Schools	550
13	Services	Mid-size office Bldg (3000-10,000sf)	1,050
14	Services	Major Office Bldg(over 10,000sf)	1,650
15	Services	Full Care Hospital	11,100
16	Services	Colleges/Universities	900
17	Services	Churches/Organizations	700
18	Services	Cemetery	80
19	Trade	Retail	1,500
20	Trade	Restaurants	2,750
21	Trade	Auto	700
22	Trans/Comm/Util	Utilities	500
23	Undeveloped	Undeveloped	0

Wastewater Flow Projections

Wastewater flow projections have been developed utilizing the above-described wastewater duty factors and the existing, near-term and ultimate land use designations within the study area. Table 6 shows the projected Average Dry Weather flows for the study area.

Table 6
Average Dry Weather Flow

Development Condition	Study Area Flow (mgd)
Existing	9.34
Near Term	11.00
General Plan	12.05

Table 7 shows the Peak Dry Weather Flow and Peak Wet Weather Flow calculated from the peak factor developed by the peaking factor curves.

Table 7
Total Projected Flows

Development Condition	Average Dry Weather Flow (mgd)	Peak Dry Weather Flow (mgd)	Peak Wet Weather Flow (mgd)
Existing	9.34	17.40	22.37
Near-Term	11.00	20.39	25.55
General Plan	12.05	22.28	27.52

Existing Wastewater Flow

Existing wastewater flows were calculated on a parcel-by-parcel basis by applying the return-to-sewer ratios to the geocoded water meter billing data. The flow values were checked using the City's recorded wastewater influent flows at various meter locations.

Near-Term Wastewater Flow

Near-term wastewater flows were calculated using a combination of DU information and wastewater flow factors. Residential developments were calculated on a DU basis utilizing a factor of 194 gpd/DU. Industrial, commercial and institutional developments were calculated by applying the wastewater flow factor to the development area.

General Plan Wastewater Flows

General Plan flows were calculated using the wastewater flow factors and land use database developed for this study. Both infill and densification were factors in development of General

Plan flows. Wastewater duty factors were applied to parcels with no current water usage. A comparison between parcels with current water usage and their ultimate calculated water usage based on master plan category was made. Parcels currently using less than their calculated ultimate usage were assumed to have a 10 percent densification rate. Parcels using more than their calculated ultimate usage were left at the higher usage. The combination of infill and densification produced an average dry weather flow increase of approximately 22.5 percent between existing and General Plan flow.

APPENDIX

Table 2
Near-Term Development Projects

Project Number	Project Name	Wastewater Flow GPD
RS-87	Island View	11,640
RS-87		11,640
RS-88		776
RS-90	Aldea Hermosa	6,208
RS-90		6,208
RS-91	The Cottages	7,372
RS-92	Hails	16,684
RS-92		16,684
RS-94	The Renaissance	21,922
RS-95		776
RS-96	Citrus Place	6,208
RS-96		6,208
RS-97		1,940
RS-98	The Grove	14,550
RS-99	Parklands	6,984
RS-99		6,984
RS-99		6,984
RS-99		6,984
RS-99		6,984
RS-99		6,984
RS-99		6,984
RC-60	Bella Vista	10,088
RC-60		10,088
RC-61	Harmony	35,308
RC-64	Melody	14,356
RC-66		1,164
RC-67	Mayfair Lofts	3,492
RC-69		776
RC-70	Hails	5,820
RC-70		5,820
RC-71	Chapel Lane	3,104
RC-72		13,968
RC-73		6,208
RC-74		2,328
RC-78		776
RC-75		2,134
RC-75		2,134
RC-77		4,074

Table 2
Near-Term Development Projects

Project Number	Project Name	Wastewater Flow GPD
RC-79	Chapel Lane	970
RC-79		970
RC-79		970
RC-80	Citrus Place	5,820
RC-80		5,820
RC-81		2,813
RC-81		2,813
RC-82	Renaissance Walk	33,368
RC-83	13-Live Work Units	5,432
RC-83		5,432
RC-84	The Grove	17,072
RC-85	Parklands	6,513
RC-85		6,513
RC-85		6,513
RC-85		6,513
RC-85		6,513
RC-85		6,513
RC-85		6,513
RC-86	Thompson Oak Ct	3,686
RC-86		3,686
RC-87	Main/Central Condos	2,910
RA-91		2,328
RA-96		485
RA-96		485
RA-97		1,358
RA-97		1,358
RA-98		1,358
RA-109		776
RA-101		2,134
RA-103		1,940
RA-105	The Renaissance	9,700
RA-107		29,100
RA-107		29,100
RA-108	Mixed Use Res/Comm	388
RA-108		388
RA-110		776
RA-111		776
RA-112		776

Table 2
Near-Term Development Projects

Project Number	Project Name	Wastewater Flow GPD
RA-113	Artspace	1,746
RA-113		1,746
RA-113		1,746
RA-113		1,746
RA-113		1,746
RA-113		1,746
RA-114	The Grove	8,730
RA-115		388
RA-115		388
RA-116	Citrus Place	5,820
RA-116		5,820
C-350	4 sty hotel, 162 room	725
C-350		725
C-350		725
C-350		725
C-379	Mixed Use Comm Apts	420
C-387	Mixed Use	299
C-387		299
C-388	Carwash Addition	830
C-397	Mixed Use Condos	357
C-402	2 sty ofc/warehouse	389
C-403	3 sty ofc bldg	2,940
C-404	mixed use	515
C-405	mixed use	158
C-406	2 sty comm ofc bldg	179
C-407	Comm Ofc Addition	19,845
C-408	New community bldg	883
C-409	new auto dealership	2,310
C410	Mixed use comm/apts	116
C411	Mixed Use condos	242
C412	Mixed use marina retail	14,123
C412		14,123
C-413	1stry commercial bldg	641
C-414	commercial addition	966
C-415	commercial addition	1,040
C-416	new auto repair bldg	966
C-417	mixed use apts	184
C-417		184
C-419	mixed use condos	452
C-420	4 stry multi use bldg	147
C-421	new acccessory qtrs	147
C-422	construction retail bldg	14,018
C-423	2 1-stry bldgs	14,018

Table 2
Near-Term Development Projects

Project Number	Project Name	Wastewater Flow GPD
C-424	1 stry addition	2,016
C-425	mixed use project	604
C-425		604
C-426	mixed use project	336
C-426		336
C-426		336
C-426		336
C-426		336
C-427	mixed use project	383
C-427		383
C-428	new retail bldg	13,031
C-429	new 2stry comm bldg	599
C-430	new 4 stry hotel	1,948
IND-184		3,154
IND-184	14 Mixed-use acres	1,496
IND-199	Warehouse Building	4,267
IND-186	2/Warehouse/Man	24,820
IND-187	1stry industrial	153
IND-188	2 stry industrial	663
IND-189	1 stry industrial	2,023
IND-189		2,023
IND-190	1 stry industrial	1,326
IND-191	2 stry industrial	884
IND-192	2 1stry industrial	4,522
IND-193	6 industrial	33,252
IND-194	2 stry industrial	1,921
IND-195	5 1stry industrial	34,816
IND-196	temp steel structures	238
IND-197	Add to exist indust bldg	12,597
IND-198	Personal Storage bldg	2,805
INS-101	Com Park, Aquatics Cntr, Rec Fields	161,466
INS-103	County Museum expansion	8,500
INS-104	Mantnce bldg add on, restroom	156,400
INS-105	Clubhouse, mantnce bldg, restroom	430,950
INS-106	Auditorium Addition	7,123
INS-107	Auditorium	3,400
INS-107		3,400
INS-108	Rec Fields	43,520
INS-109	3 bldg at WTP	21,318
INS-100	Assisted Living Facility 97 rooms	15,946
INS-110	Classroom Bldg	162
INS-110		162
INS-111	Education oper suppt cntr	4,811
	TOTAL :	1,654,587

Appendix C:

Memorandum, Seasonal Demands and Diurnal Patterns

(prepared by RBF Consulting, October 30, 2006)

RBF CONSULTING

MEMORANDUM

To: Susan Rungren, City of San Buenaventura JN 10-104392

From: Kevin Gustorf and Karl Meier, RBF Consulting

Date: October 30, 2006

Subject: Seasonal Demands and Diurnal Patterns

Introduction

This technical memorandum is in support of the water master plan and the hydraulic water modeling effort, and addresses the development of the seasonal demands and peaking factors that will be used for the master plan and the hydraulic water model.

Seasonal Peaking Factors

In an effort to make the hydraulic model as accurate as possible, RBF has determined that it would be beneficial to create separate seasonal demand scenarios for the summer and winter months. Creating separate demand scenarios for these seasonal variations in demand allow for more reliable results from the hydraulic model. Creating seasonal scenarios will also aid in modeling the operations of the distribution system facilities, as the City operates the facilities differently in the summer and winter months. Therefore, RBF has created seasonal peaking factors that will be applied to the average day demand data provided by Kennedy/Jenks Consultants.

Typically, seasonal peaking factors are developed using billing information. However, the City does not read all customer meters on a monthly basis, but rather every other month, and all meters are not read at the same time. Using the billing data to generate seasonal peaking factors would be difficult using this data; therefore RBF utilized the City's production data.

The City's production data represents all sources of water production including ground water wells, surface water intake, and purchased water from other agencies. The production data is recorded on a monthly basis.

RBF used production data from 2003 through 2005 to arrive at the summer and winter (seasonal) peaking factors. RBF classified the months of June, July, August, and September as the summer months, while December, January, February, and March were classified as the winter months. The peaking factors for the summer and winter months were determined for each of the three years, and then averaged to arrive at an overall summer and winter peaking factor for the demands in the system. See Figure 1 attached, which displays the 2003 through 2005 production data for each month.

Based on the production data provided, the summer peaking factor calculated was 1.18 times the average yearly production, while the winter peaking factor was 0.82 times the average yearly production. In an effort to be conservative, the summer peaking factor that will be used for the model is 1.20 while the winter peaking factor will be 0.80.

Table 1 below contains a summary of the seasonal peaking factors that RBF will use in the development of the hydraulic water model.

Table 1 – Seasonal Peaking Factors

Season	Peaking Factor	Average System Demand (gpm)
Yearly Average	1.00	10,484
Summer Average	1.20	12,581
Winter Average	0.80	8,387

The values in Table 1 represent the average daily flow for three conditions. The system demands shown are the base demands that will be allocated to the hydraulic model for each of the seasonal scenarios. This base flow will be peaked and lowered over 24-hours using a diurnal curve.

In addition to the seasonal peaking factors, a maximum day demand and peak hour demand peaking factor will be developed and applied to the hydraulic model for analysis of the distribution system. Development of the maximum day demand and peak hour demand peaking factors will be coordinated between RBF and the City using available SCADA and historical data.

Diurnal Curve Development

The hydraulic model will have the ability to simulate a 24-hour variation in demand, allowing for detailed analyses of the distribution system. This will be accomplished in the model using a diurnal pattern, which will peak the seasonal average daily demands in Table 1.

The diurnal peaking factors were developed using actual meter data from one of the thirteen large users metered for the modeling effort. A master meter for the CPM/Peppertree apartments was selected for use in the development of the system wide diurnal pattern. This large user was selected due to the fact that the diurnal pattern was consistent with industry standard diurnal patterns. The data recorded at this location exhibits a 24-hour variation in demand that is expected to occur throughout the distribution system. Please see Figure 2 attached, which contains the CPM/Peppertree usage. The diurnal peaking factors are listed in Table 2.

Table 2 – Diurnal Peaking Factors

Hour	Factor
0	0.29
1	0.15
2	0.53
3	0.41
4	0.38
5	0.39
6	1.26
7	2.61
8	1.51
9	1.21
10	1.13
11	0.95
12	0.86
13	0.66
14	1.09
15	1.02
16	1.11
17	1.16
18	1.63
19	1.81
20	1.63
21	1.22
22	0.76
23	0.22

Multiplying the diurnal peaking factors by the seasonal average demands generates the 24-hour variation in demand for the system. Figure 3 attached shows the peaking factors for each hour of the diurnal curve that will be multiplied by the seasonal average demand.

Figure 4 attached shows average annual, summer average daily demands, and the winter average daily demands over a 24-hour period.

The average seasonal demand peaking factors and the diurnal peaking factors discussed in this technical memorandum will be utilized in the hydraulic water model.

Attachments:

Figure 1 – 2003-2005 Production Data
Figure 2 – 79011 – CPM/Peppertree (8-inch)
Figure 3 – Diurnal Curve Peaking Factors
Figure 4 – Diurnal Curves – System Demand

Figure 1
City of San Buenaventura
2003 - 2005 Production Data

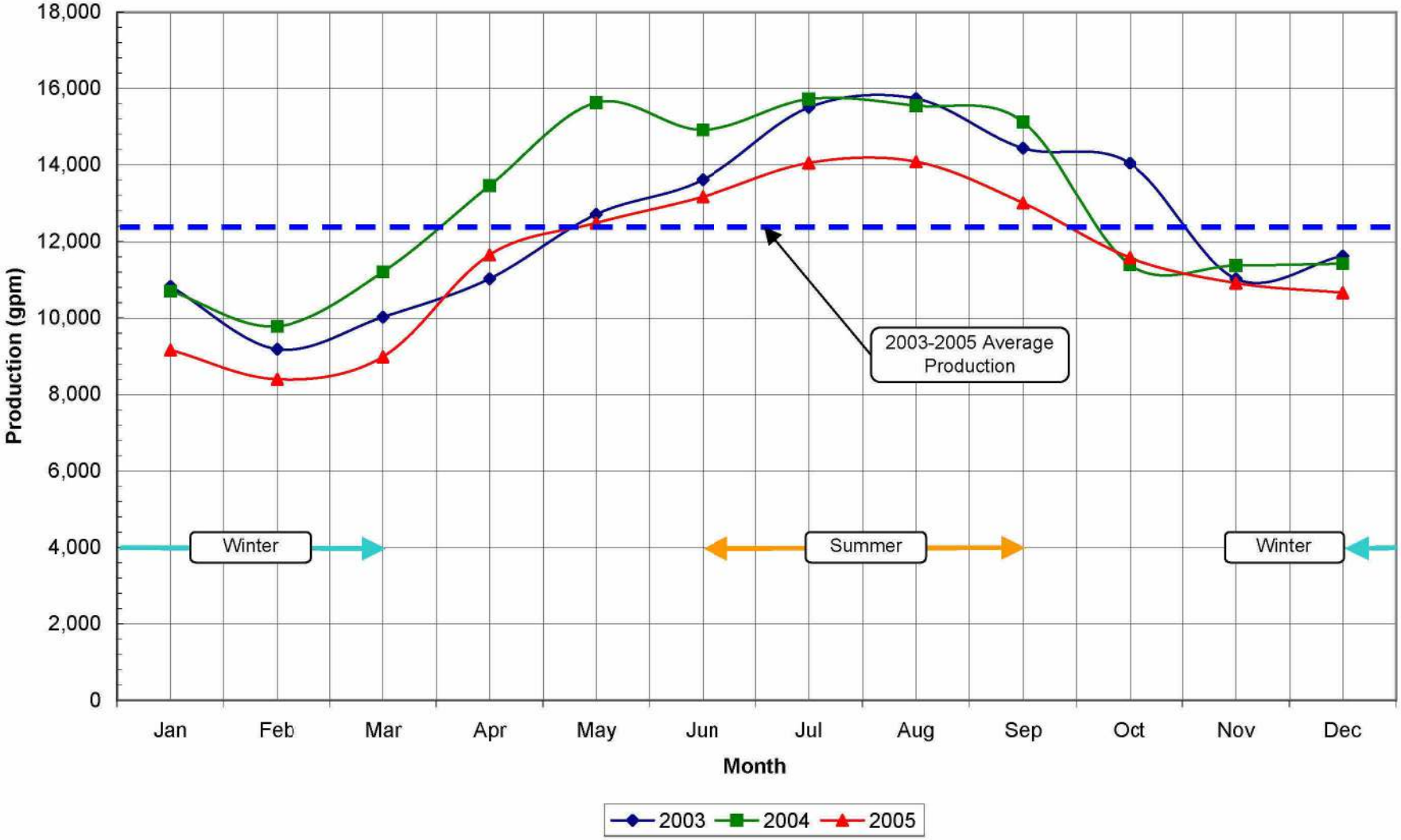


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Figure 2
Meter 79011 -- CPM/Peppertree (8-inch)

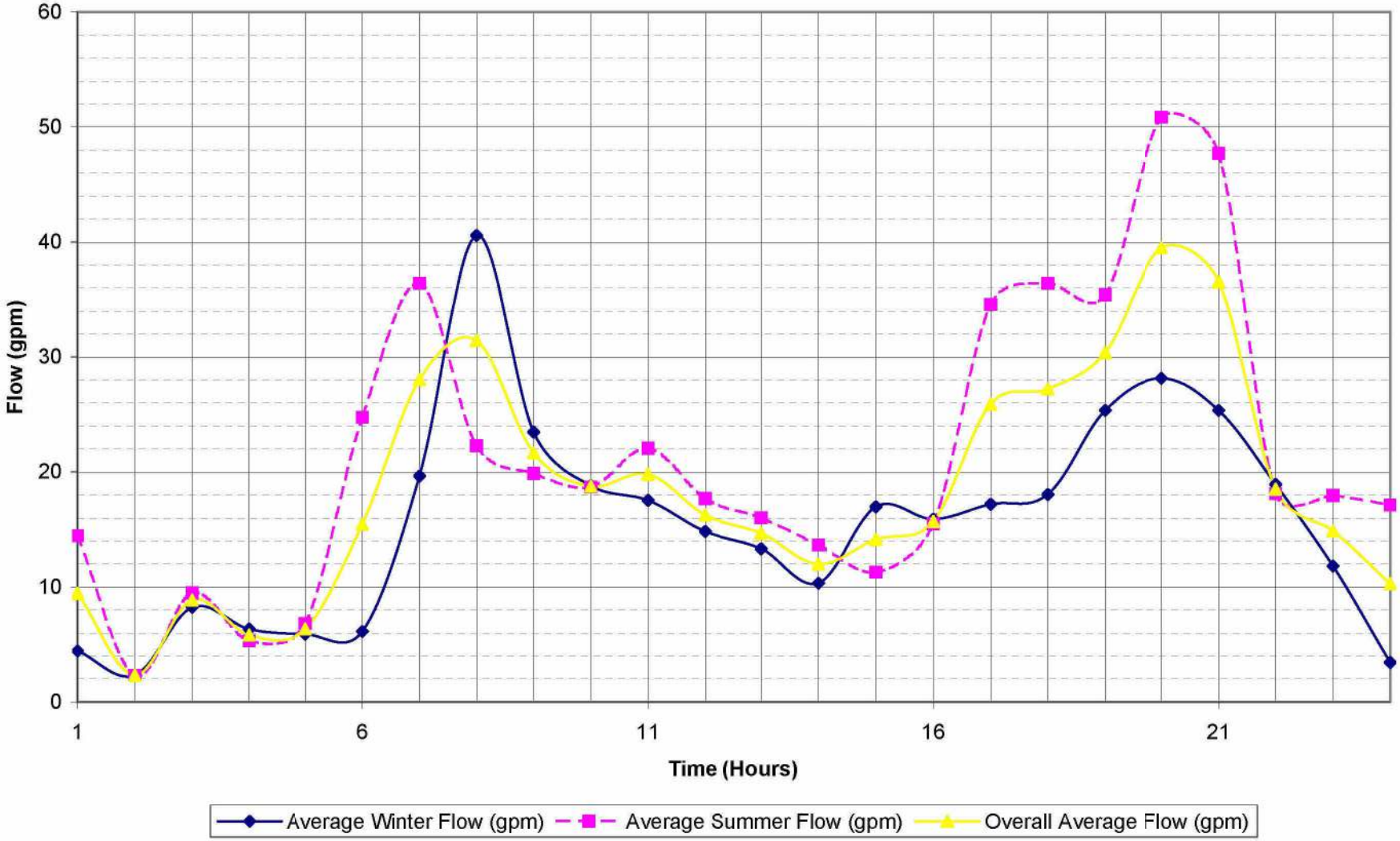

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Figure 3
City of San Buenaventura
Diurnal Curve Peaking Factors

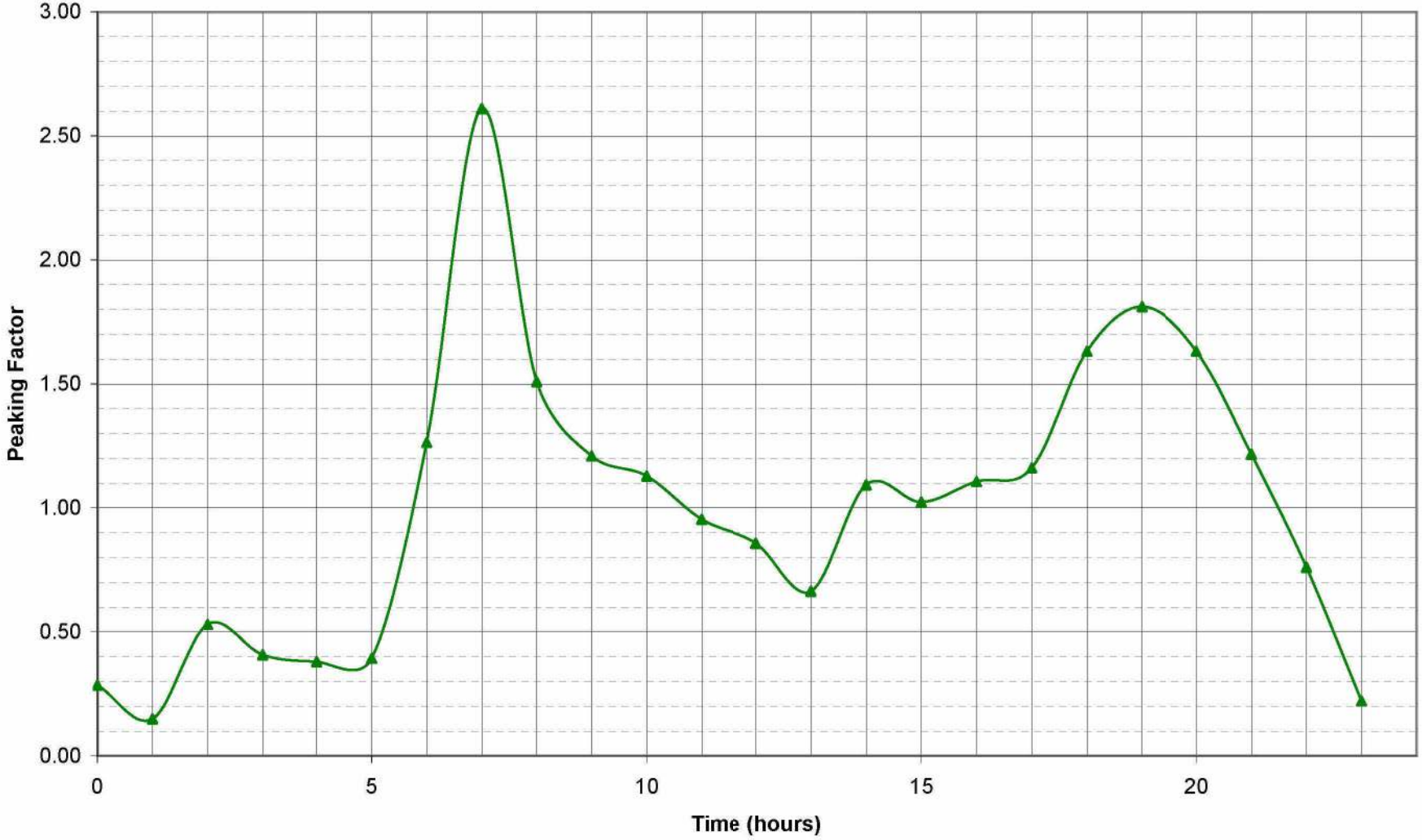

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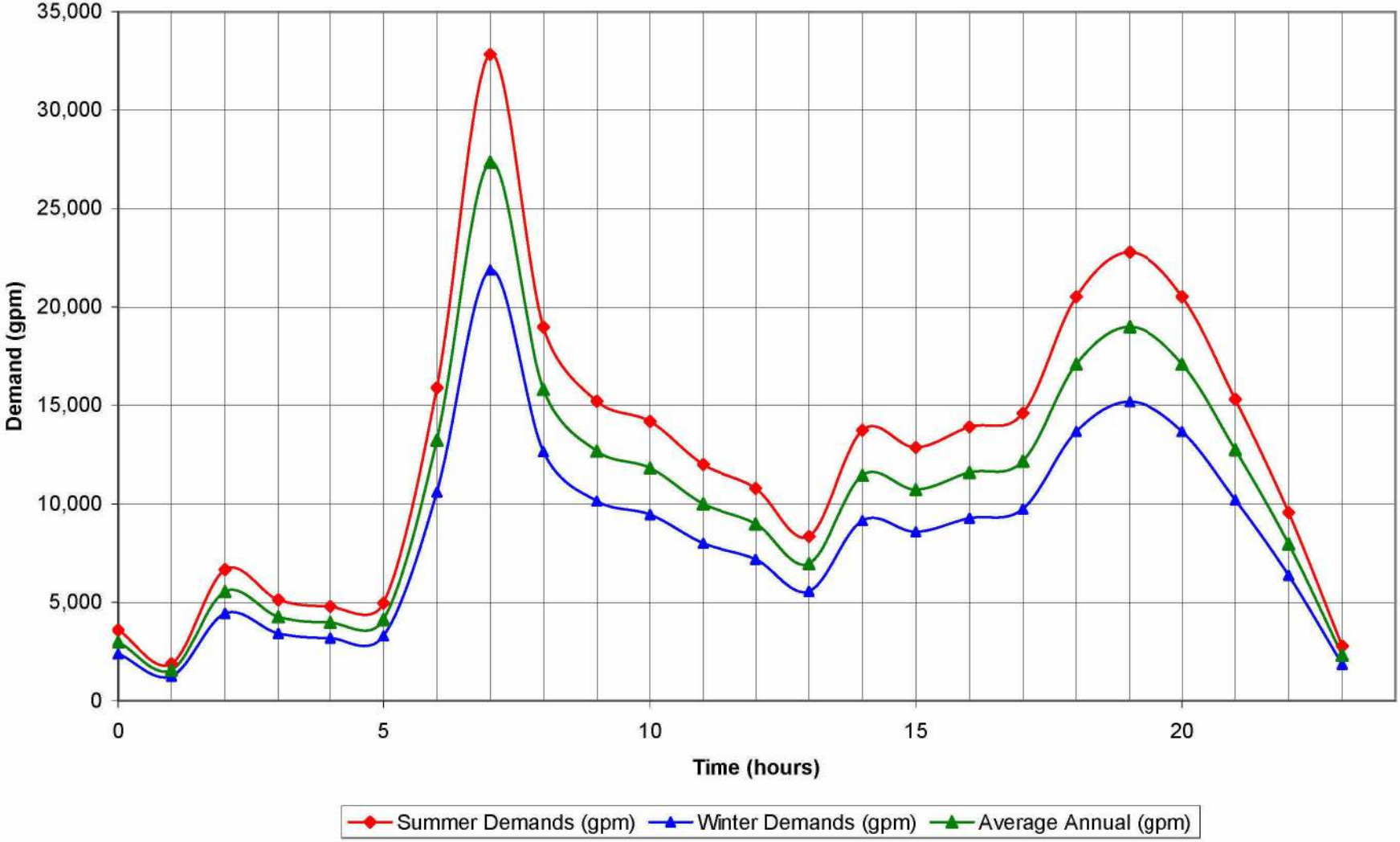
Figure 4
City of San Buenaventura
Diurnal Curves - System Demand



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Appendix D:

Fire Flow Test Locations and Results

Fire Flow Locations - Rev 1
(For Model Calibration)

#	Node	Pressure Zone	Location	Pipe Material
1	J1801	210	Int. of N. Olive and Main Street	PVC/ACP
2	J4757	210	Int. of Seashell Ave. and Seafarer	PVC
3	J4229	210	Int. of Channel Dr. and Valmor	TRANSITE
4	J4807	210	Near Olivas Park Rd. and Palma Dr.	PVC/ACP
5	J2519	260	Int of San Nicholas and San Clemente	PVC/CIP
6	J1697	260	Int. of N. Fir and Buena Vista	CIP
7	J5739	330	Int. of Elizabeth Dr. and Bristol Rd.	ACP
8	J5861	330	Int. of North Bank Dr. and Potomac Ave.	DIP
9	J4909	330	Int. of Portola and McGrath	UNK
10	J5189	330	On Thille near County Square Dr.	PVC/ACP
11	J1439	400	End of East Vince	PVC
12	J1203	400	Int. of Omaha Ave. and Dakota Dr.	UNK
13	J7439	430	Int. of Mammoth St. and Saticoy Ave.	PVC
14	J4011	430	Int. of Mound Ave. and Shamrock Dr.	CIP
15	J7203	430	Int. of Norwalk and Topeka	PVC
16	J3667	430	Int. of Day Rd. and Telegraph	TRANSITE
17	J2349	466	End of Sherwood Dr.	TRANSITE
18	J7107	535	End of Del Norte Ct.	CIP
19	J6969	535	Int. of Contra Costa Ave. and Siskiyou St.	PVC
20	J7113	535	End of Foothill Rd.	ACP
21	J1705	588	End of Aliso St.	DIP
22	J1683	605K	End of Tioga	CIP
23	J3303	860	Int. of Vista Monte Ave. and Monte Vista Ct.	ACP
24	J3107	1035	End of Southview Ct.	ACP
25	J2981	605	End of Taloma Dr (Near Foothill)	TRANSITE

Revised Fire Flow Test Locations Highlighted in Red.

Fire Flow Locations

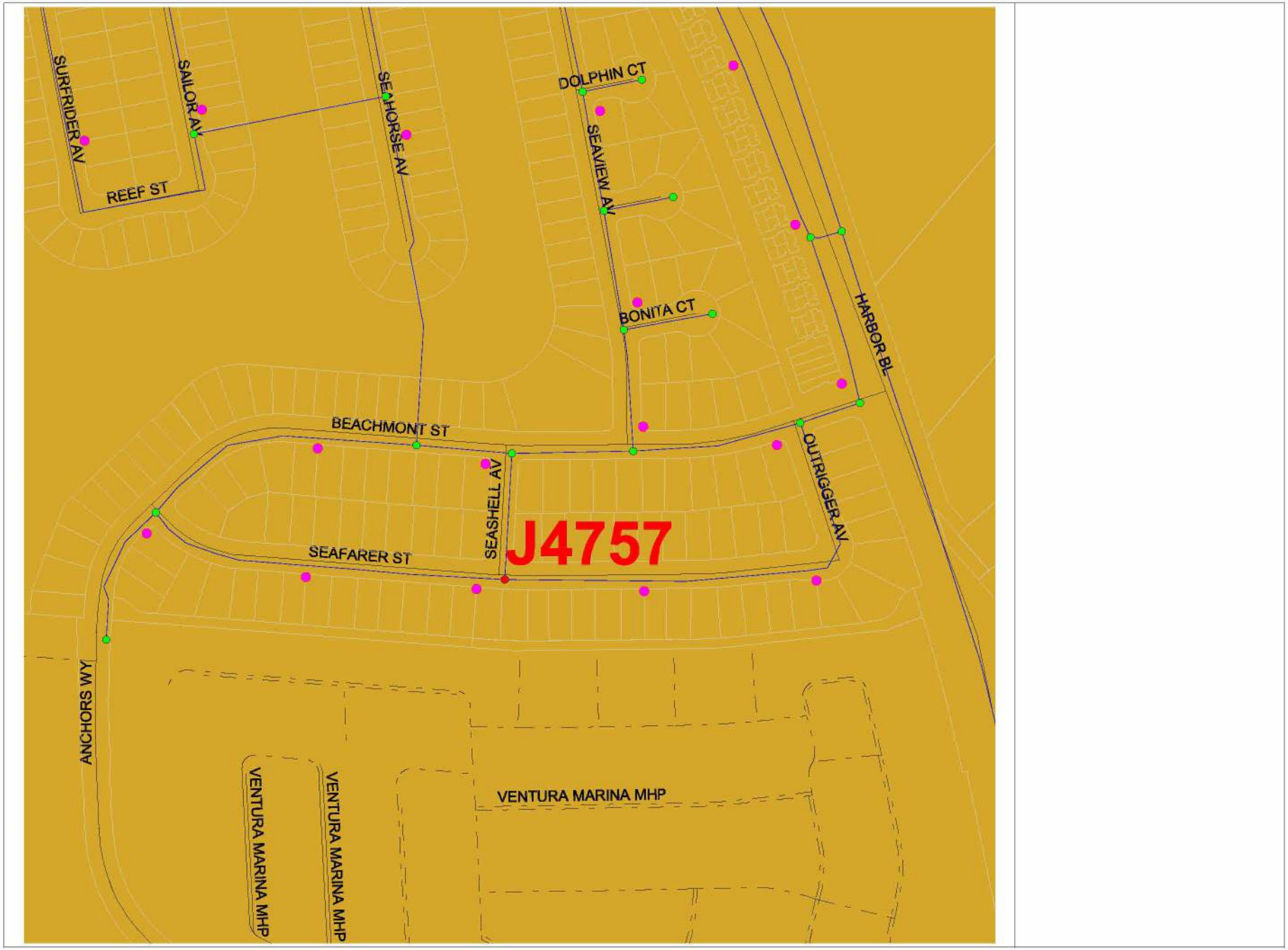
City of Ventura

Prepared By: RBF Consulting

VEN00635

Fire Flow Locations

City of Ventura



Prepared By: RBF Consulting

VEN00003255

Fire Flow Locations

City of Ventura

Prepared By: RBF Consulting

VEN00003259

Fire Flow Locations

City of Ventura

Prepared By: RBF Consulting

VEN00257

Fire Flow Locations

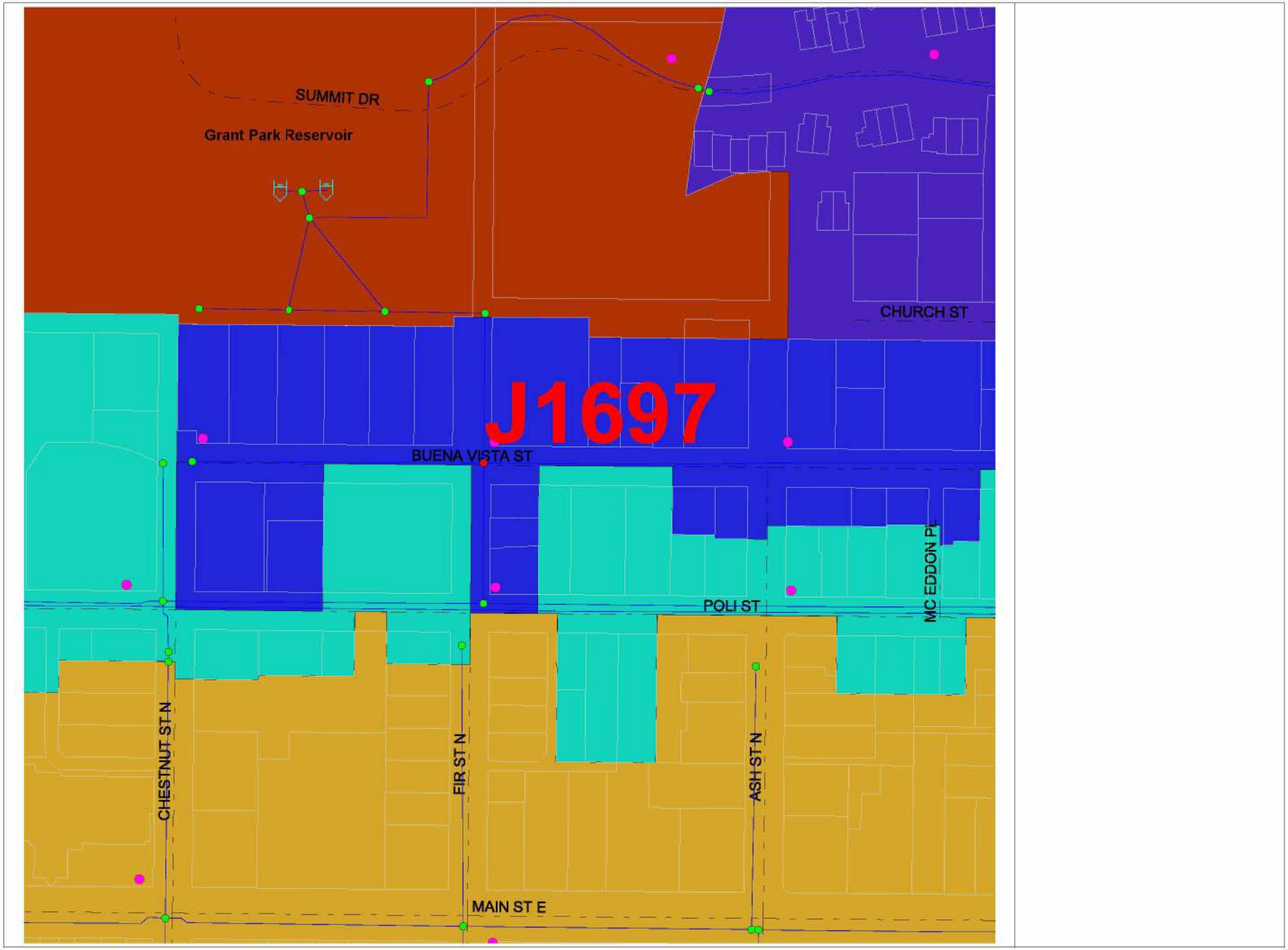
City of Ventura

Prepared By: RBF Consulting

VEN00006258

Fire Flow Locations

City of Ventura



Prepared By: RBF Consulting

VEN00006259

Fire Flow Locations

City of Ventura

Prepared By: RBF Consulting

VEN00092

Fire Flow Locations

City of Ventura

Prepared By: RBF Consulting

VEN00039

Fire Flow Locations

City of Ventura

Prepared By: RBF Consulting

VEN00023

Fire Flow Locations

City of Ventura

Prepared By: RBF Consulting

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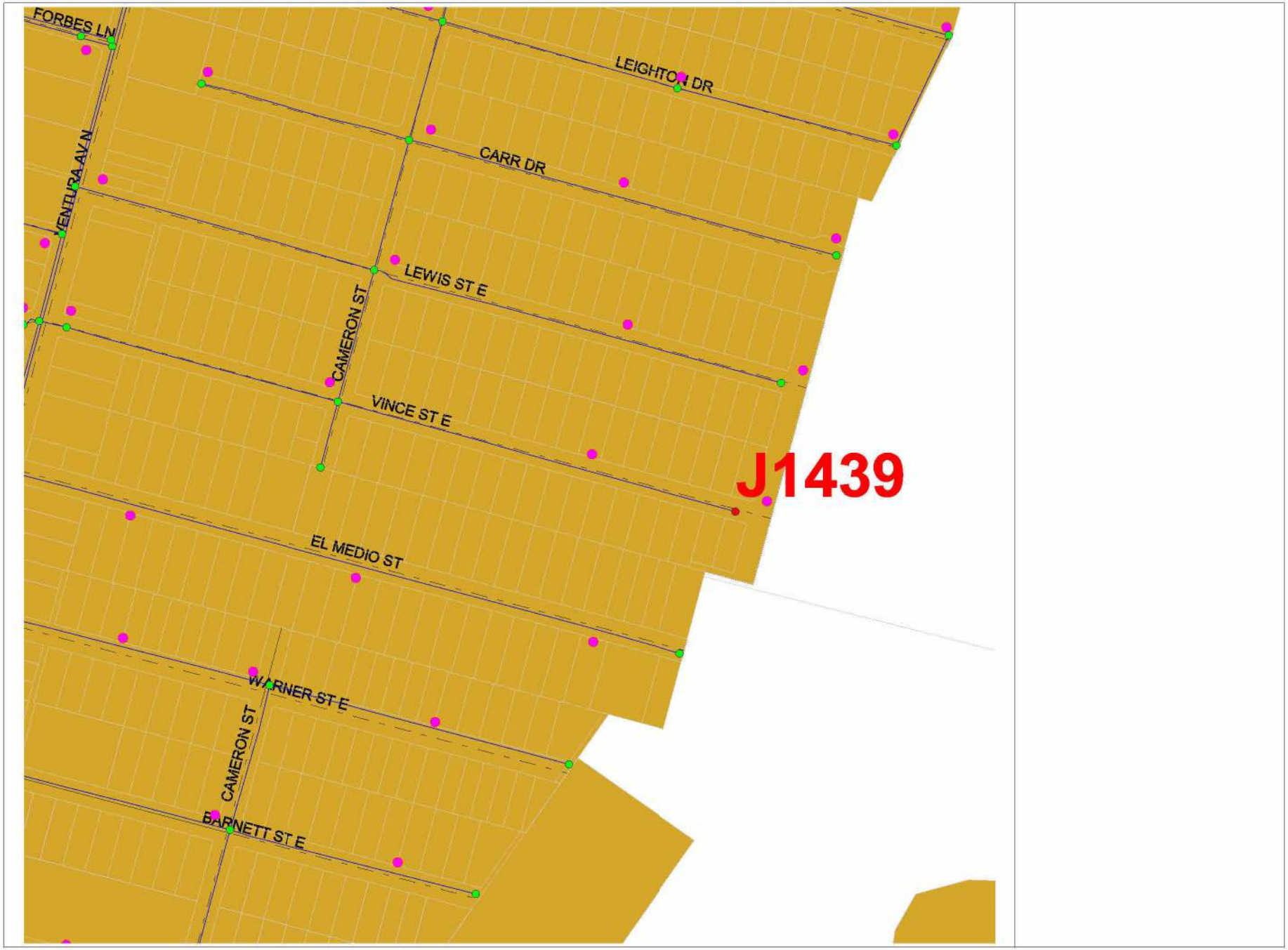
Fire Flow Locations

City of Ventura



Prepared By: RBF Consulting

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Fire Flow Locations

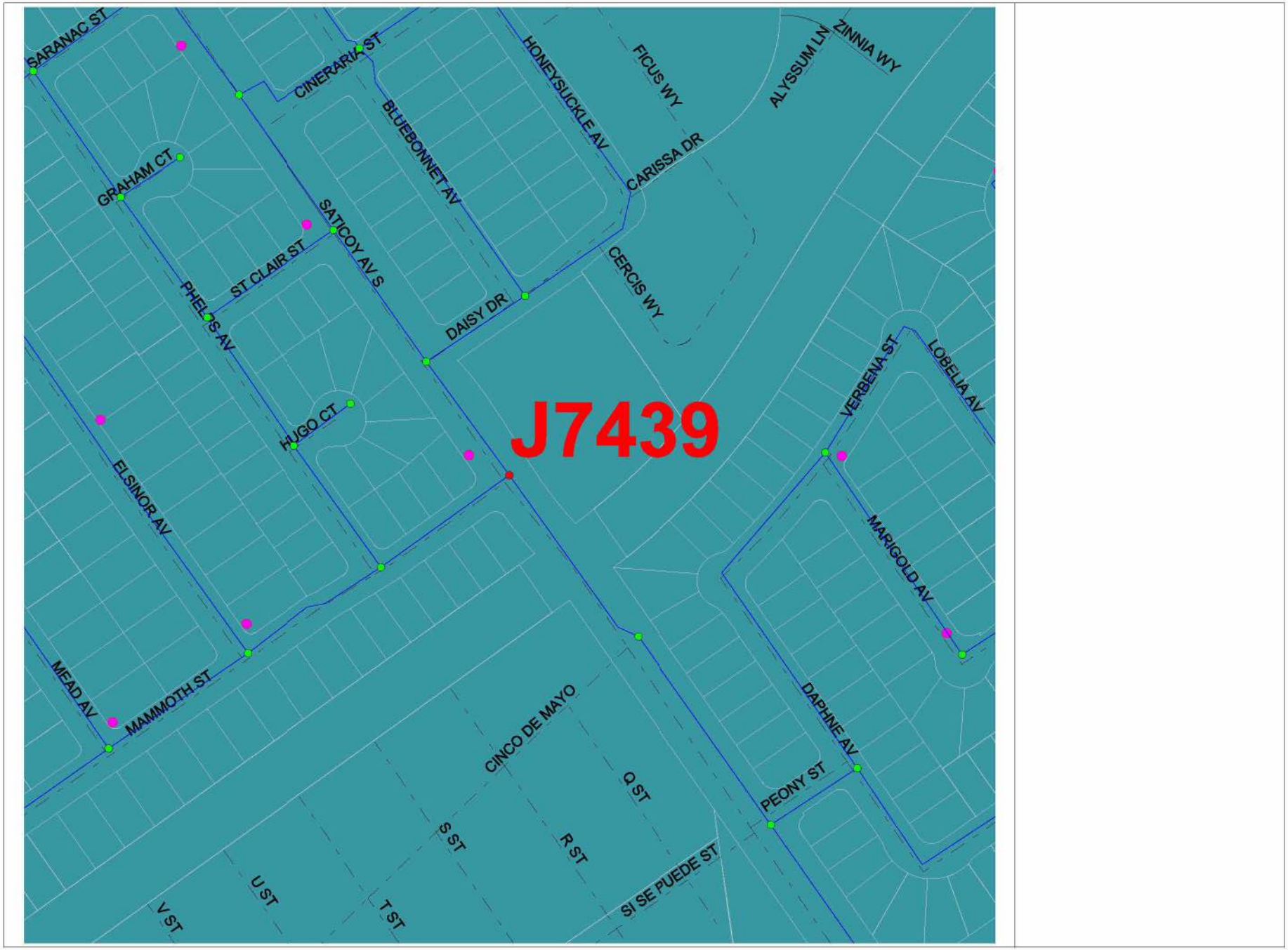
City of Ventura

Prepared By: RBF Consulting

VEN00006295

Fire Flow Locations

City of Ventura



Prepared By: RBF Consulting

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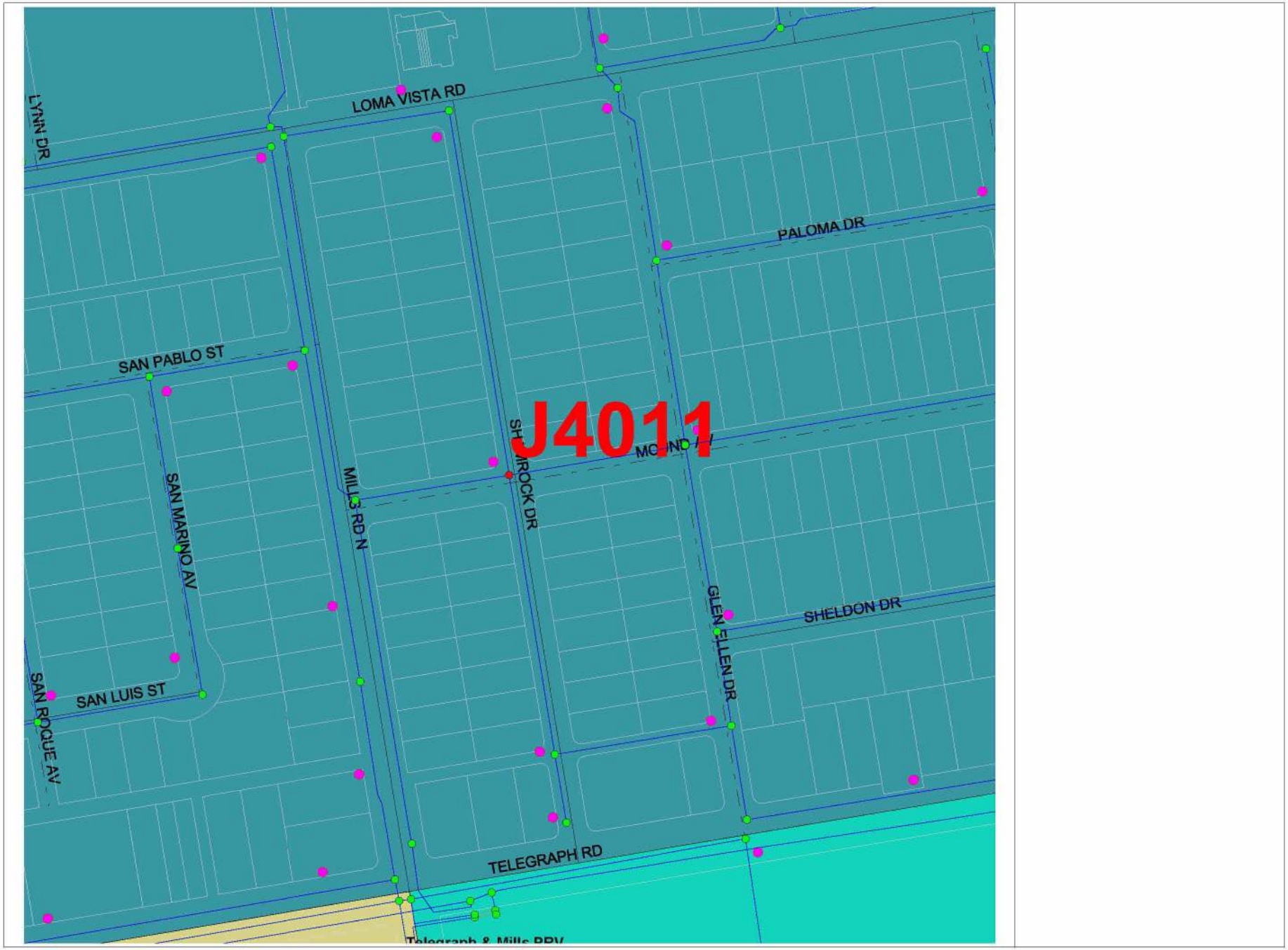
Fire Flow Locations

City of Ventura

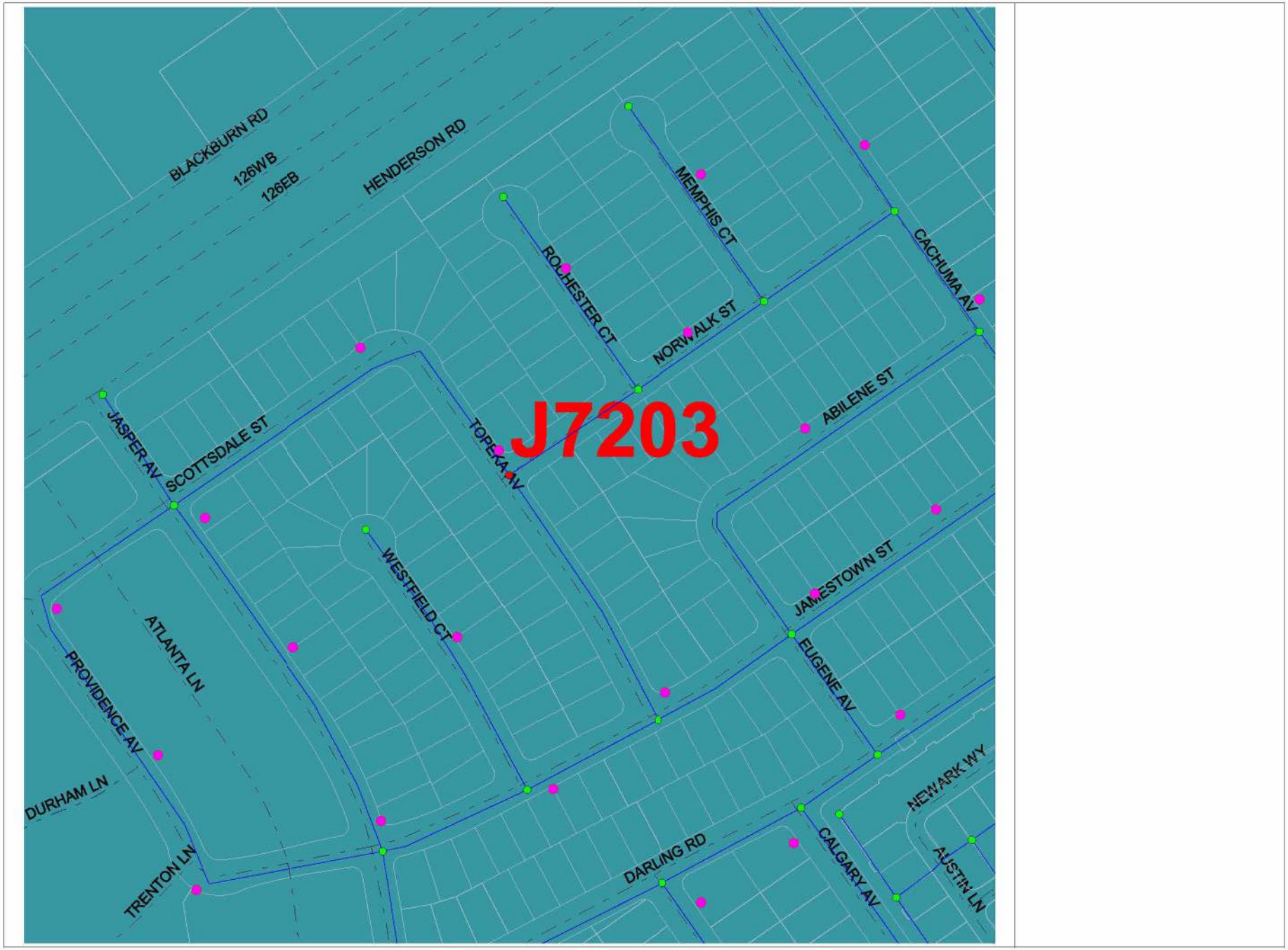


Prepared By: RBF Consulting

VEN00267

Fire Flow Locations

City of Ventura

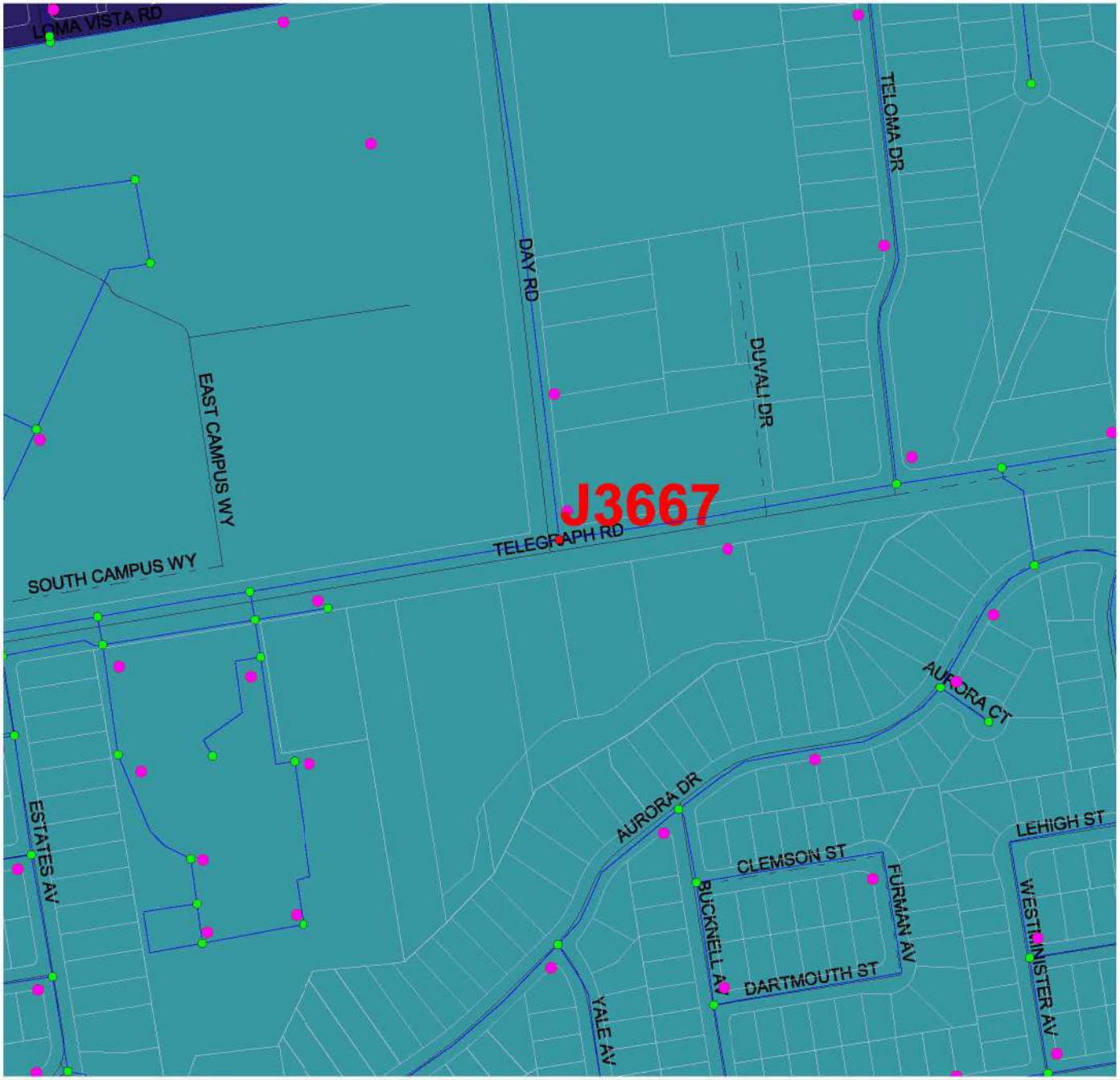


Prepared By: RBF Consulting

VEN0006398

Fire Flow Locations

City of Ventura

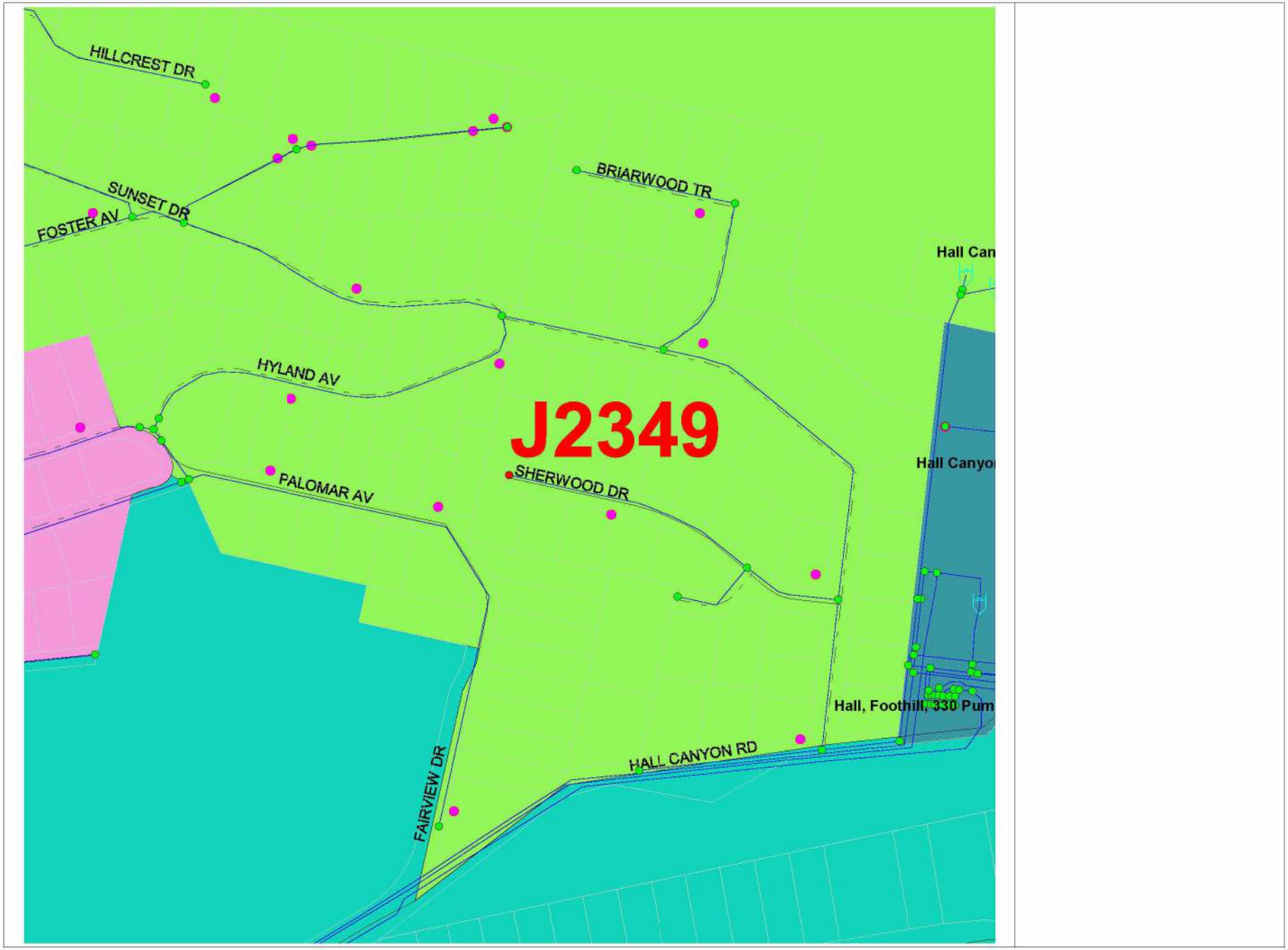


Prepared By: RBF Consulting

VEN00039

Fire Flow Locations

City of Ventura



Prepared By: RBF Consulting

VEN00003270

Fire Flow Locations

City of Ventura

Prepared By: RBF Consulting

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Fire Flow Locations

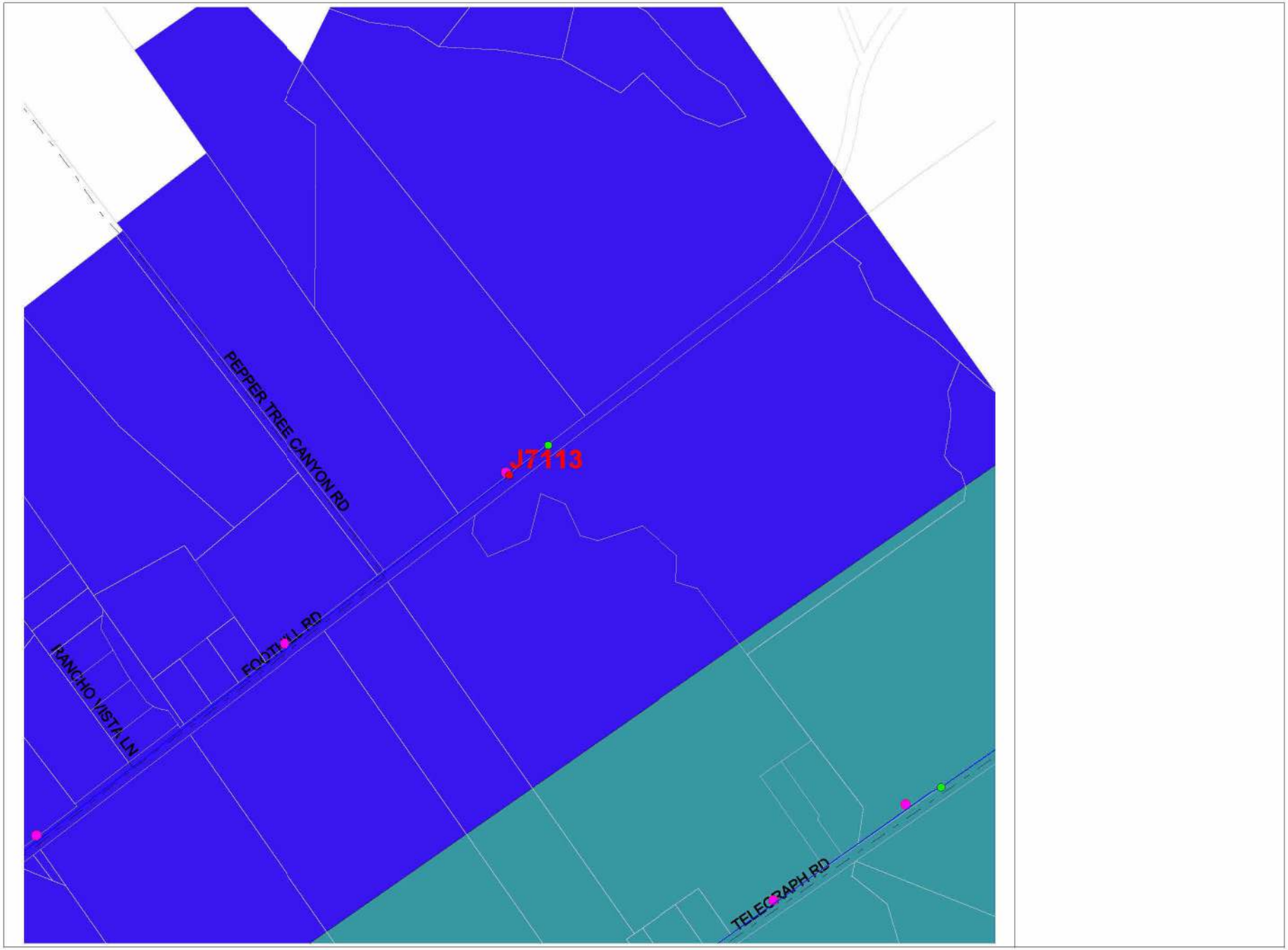
City of Ventura

Prepared By: RBF Consulting

VEN00003272

Fire Flow Locations

City of Ventura



Prepared By: RBF Consulting

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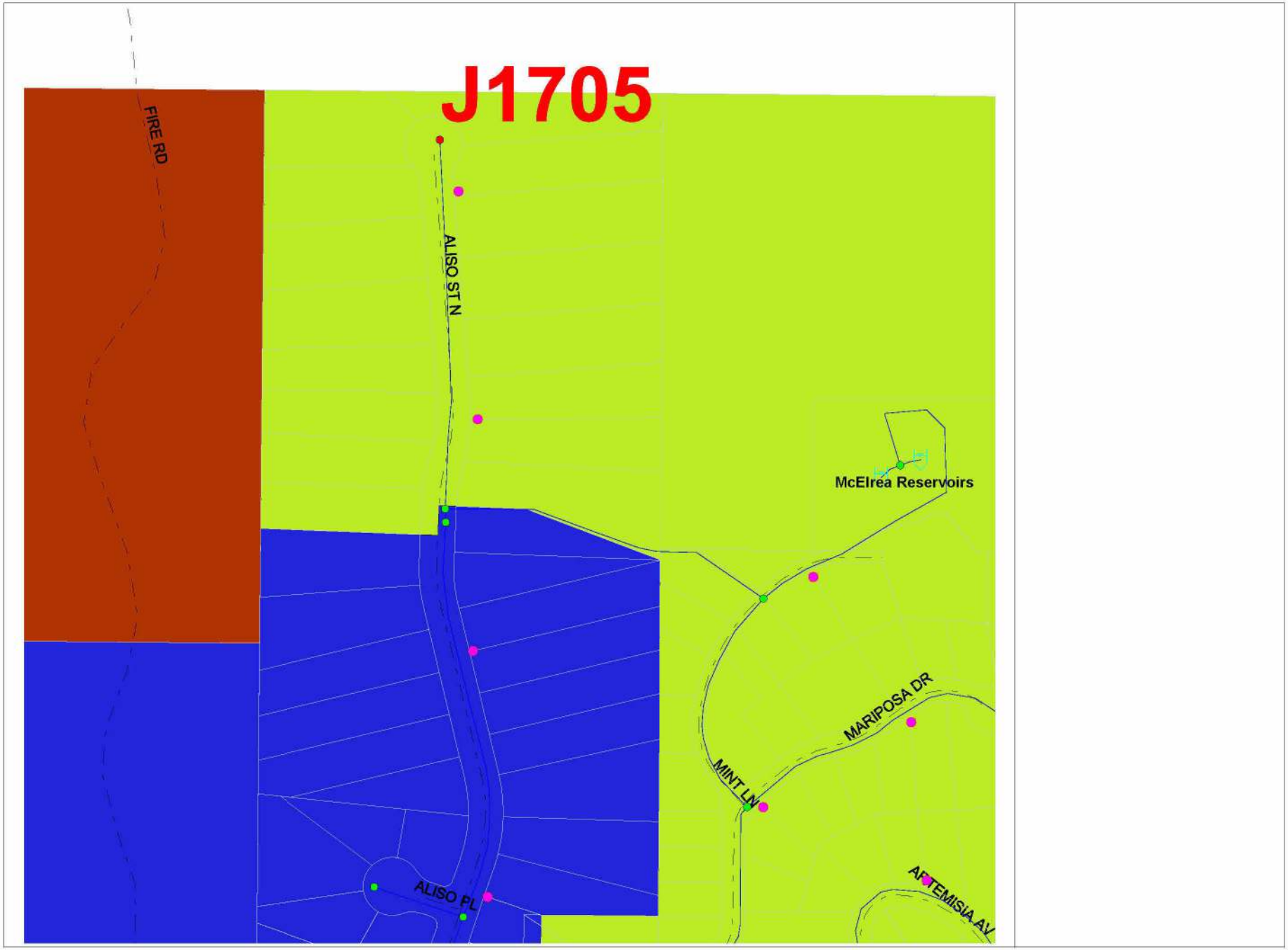
Fire Flow Locations

City of Ventura



Prepared By: RBF Consulting

VEN00022

Fire Flow Locations

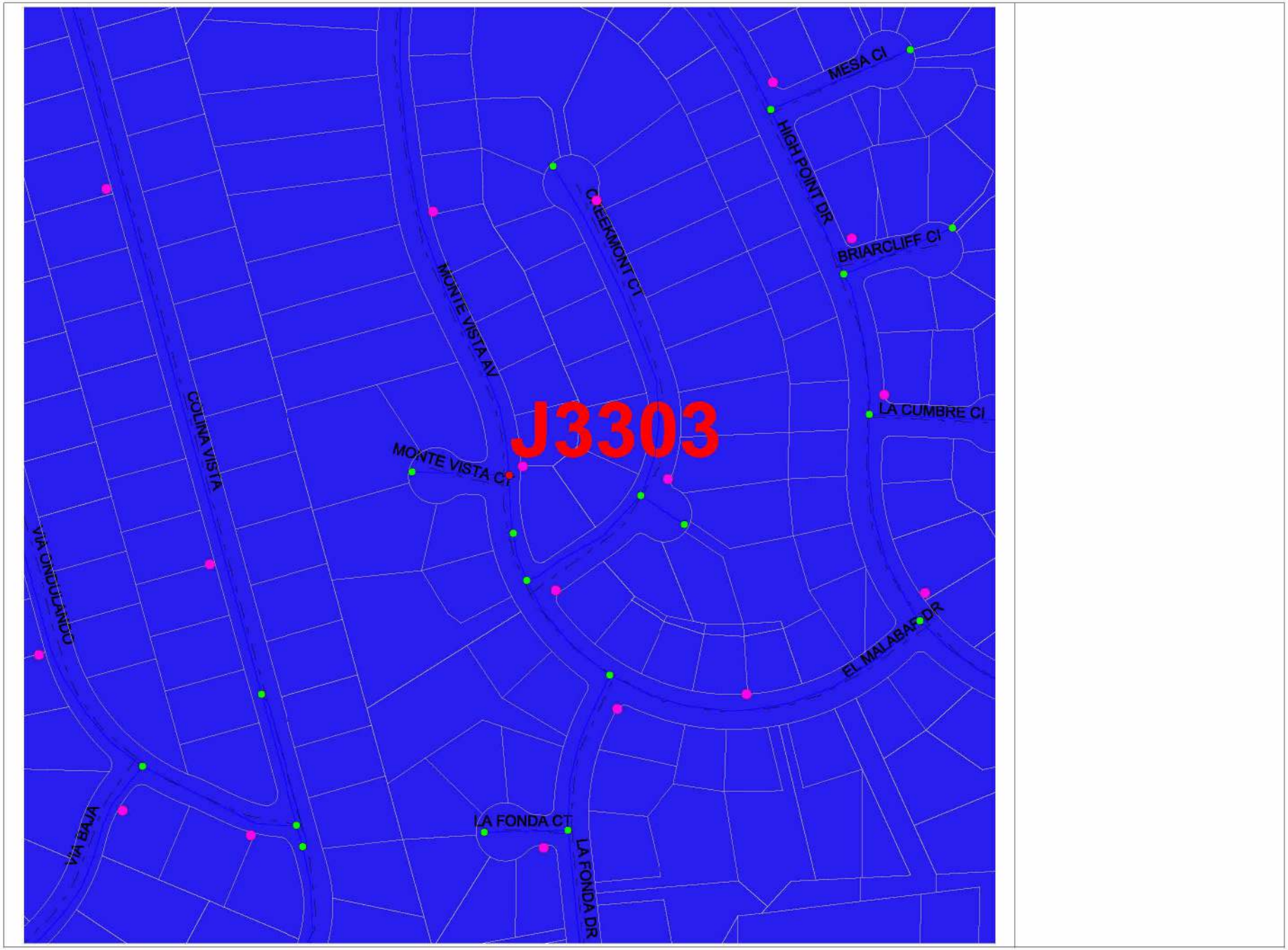
City of Ventura

Prepared By: RBF Consulting

VEN00006275

Fire Flow Locations

City of Ventura

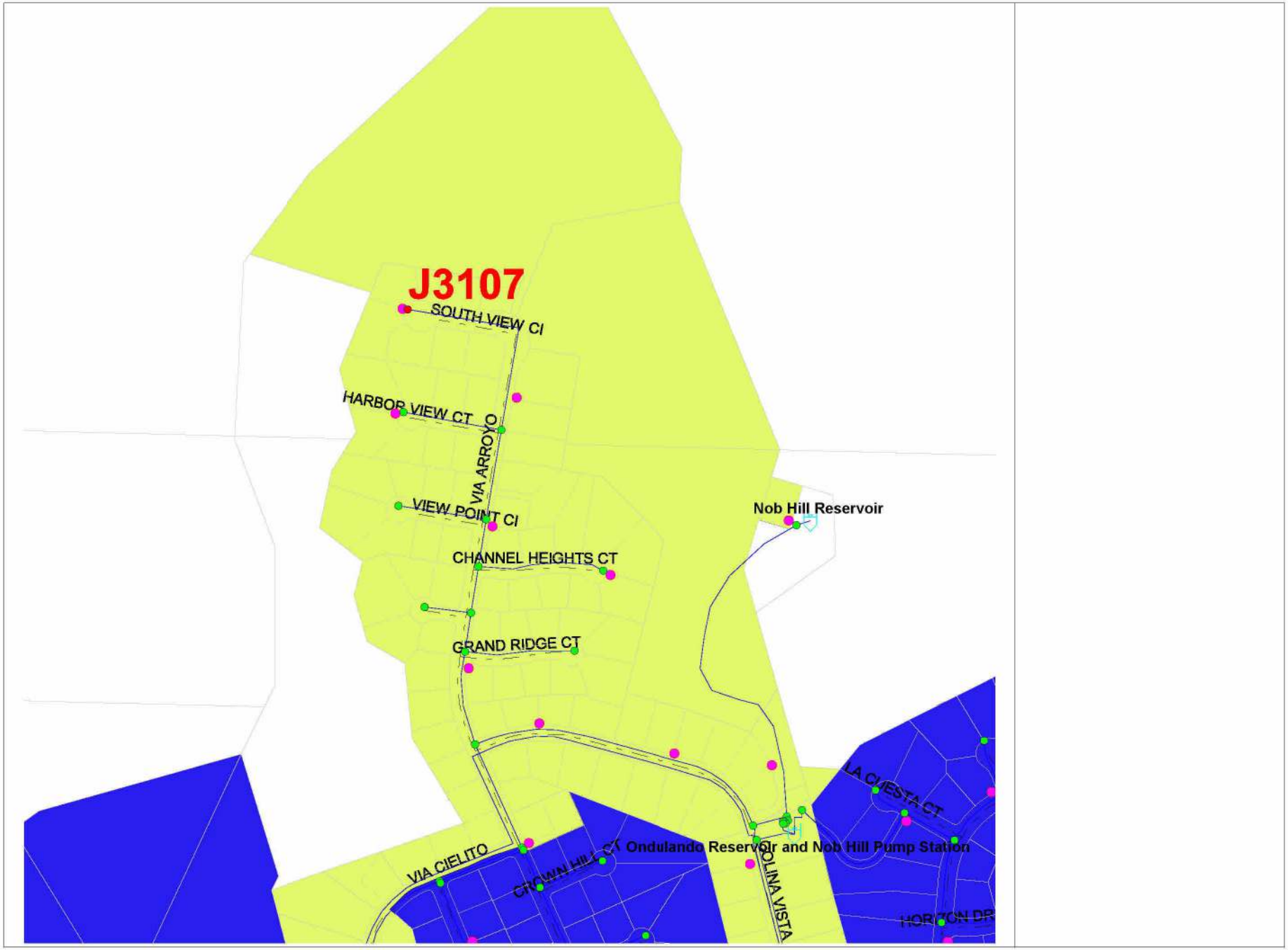


Prepared By: RBF Consulting

VEN00022

Fire Flow Locations

City of Ventura



Prepared By: RBF Consulting

VEN00003277

Fire Flow Locations

City of Ventura

Prepared By: RBF Consulting

VEN00003278

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 9:32 AM/PM

Test Performed By: BY/KM

Pressure Zone: **400**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J1127	74	S8/Floral	1500	54.43	1653	J1135	79	S8/Floral	73

Reservoir	Level (ft)	Remarks
Valley Vista	22.91	
Seneca	20.17	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Gosnell	-	-	-	
Valley Vista	1312	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00003278

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 10:00 AM/PM

Test Performed By: BY/KM

Pressure Zone: **400**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J1203	82	N8/Omaha and Dakota	1500	54.35	1656	J1201	91	N8/Omaha and Dakota	62/78

Reservoir	Level (ft)	Remarks
Valley Vista	23.21	
Seneca	20.25	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Gosnell	-	-	-	
Valley Vista	1287	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00023080

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 10:25 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **210**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J1439	55	K7/ End of Vince	1500	75.31	1195	J8233	62	K7/ End of Vince	52

Reservoir	Level (ft)	Remarks
Power	207.9	
Hall Canyon (Both Reservoirs)	11.9	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Power	3510	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Valley Vista	1277	-	-	
Gosnell	-	-	-	
Modella	0	-	-	
Hall Canyon	781	-	-	
Foothill	659	-	-	
Seaward and Poli	0	-	-	
Five Points	0	-	-	
330 Pumps	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mills Emergency	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00003281

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 10:52 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **210**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J1675	77	I 6/N. Olive and Main	1500	58.57	1537	J1801	80	I 6/N. Olive and Main	77

Reservoir	Level (ft)	Remarks
Power	208	
Hall Canyon (Both Reservoirs)	11.89	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Power	3059	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Valley Vista	1165	-	-	
Gosnell	-	-	-	
Modella	0	-	-	
Hall Canyon	786	-	-	
Foothill	676	-	-	
Seaward and Poli	0	-	-	
Five Points	0	-	-	
330 Pumps	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mills Emergency	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00023

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 11:24 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **210**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J8235	82	D 12/ Seashell and Seafarer	1500	60.81	1480	J4757	82	D 12/ Seashell and Seafarer	63

Reservoir	Level (ft)	Remarks
Power	208	
Hall Canyon (Both Reservoirs)	11.95	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Power	2987 - 3738	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Valley Vista	1177	-	-	
Gosnell	-	-	-	
Modella	0	-	-	
Hall Canyon	0	-	-	
Foothill	683	-	-	
Seaward and Poli	0	-	-	
Five Points	0	-	-	
330 Pumps	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mills Emergency	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00003283

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 11:46 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **210**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J4229	56	F 13/Channel Dr. and Valmor	1500	66.56	1352	J8237	58	F 13/Channel Dr. and Valmor	43-46

Reservoir	Level (ft)	Remarks
Power	208	
Hall Canyon (Both Reservoirs)	11.96	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Power	3685	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Valley Vista	1198	-	-	
Gosnell	-	-	-	
Modella	0	-	-	
Hall Canyon	0	-	-	
Foothill	678	-	-	
Seaward and Poli	0	-	-	
Five Points	0	-	-	
330 Pumps	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mills Emergency	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00028

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 1:08 AM/**PM**

Test Performed By: BY/KM

Pressure Zone: **260**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J2519	65	H 11/San Nicholas San Clemente	1500	51.72	1740	J2517	60	H 11/San Nicholas San Clemente	53

Reservoir	Level (ft)	Remarks
Grant Park (Both Reservoirs)	#1 = 6.45/#2 = 0	
Hall Canyon (Both Reservoirs)	6.64	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Modella	0	-	-	
Hall Canyon	1331	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Kalorama	445	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Telegraph	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00003285

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 1:45 AM/**PM**

Test Performed By: BY/KM

Pressure Zone: **588**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J1705	100	J 10/End of Aliso	1500	57.62	1562	J8239	104	J 10/End of Aliso	70

Reservoir	Level (ft)	Remarks
McElrea	12.4	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
McElrea	0	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Brodea	-	-	-	

VEN00003289

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 2:09 AM/**PM**

Test Performed By: BY/KM

Pressure Zone: **466**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J8241	107	I 12/ End of Sherwood	1000	58.84	1020	J2345	117	I 12/ End of Sherwood	60

Reservoir	Level (ft)	Remarks
Mariano (Both Reservoirs)	11.69	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mariano	706 - 734	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
McElrea	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Barnard Way	-	-	-	

VEN00002287

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 2:31 AM/**PM**

Test Performed By: BY/KM

Pressure Zone: **605K**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J1683	104	J 8/End of Tioga	1000	50.87	1179	J8243	118	J 8/End of Tioga	106

Reservoir	Level (ft)	Remarks
Kalorama (Both Reservoirs)	11.95	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Kalorama	0	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN0006288

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 2:56 AM/**PM**

Test Performed By: BY/KM

Pressure Zone: **605**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J8271	102	I 17/End of Taloma Dr	1500	59.44	1514	J2983	106	I 17/End of Taloma Dr	88

Reservoir	Level (ft)	Remarks
Willis	19.73	
View Park (Both Reservoirs)	13.58	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Day Road	0	-	-	
View Park	790 - 809	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Willis	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00003289

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 3:21 AM/**PM**

Test Performed By: BY/KM

Pressure Zone: **860**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J8245	118	J 21/Vista Monte Ave/Ct	1500	58.91	1528	J3303	140	J 21/Vista Monte Ave/Ct	120

Reservoir	Level (ft)	Remarks
Ondulando	19.55	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Ondulando	0	-	-	
Willis	0	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Nob Hill	455	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Alverstone	-	-	-	
Skyline	-	-	-	

VEN00036080

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 3:37 AM/**PM**

Test Performed By: BY/KM

Pressure Zone: **1035**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J3107	90	M 20/End of Southview Ct	1000	66.21	906	J8247	108	M 20/End of Southview Ct	56

Reservoir	Level (ft)	Remarks
Nob Hill	18.15	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Nob Hill	472	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00003281

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 27-Feb

Time of Day: 3:58 AM/**PM**

Test Performed By: BY/KM

Pressure Zone: **535**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J7107	111	K 27/End of Del Norte Ct	1500	58.06	1550	J8275	110	K 27/End of Del Norte Ct	91

Reservoir	Level (ft)	Remarks
Elizabeth	18.61	
Kimball	0	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Elizabeth	0	-	-	
Kimball	0	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Ondulando	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00022

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 8:27 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **535**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J7113	100	N 29/End of Foothill Rd	1000	125	480	J8249	93	N 29/End of Foothill Rd	43

Reservoir	Level (ft)	Remarks
Elizabeth	12.89	
Kimball	0	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Elizabeth	1487 - 1523	-	-	
Kimball	0	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Ondulando	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00003293

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 8:51 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **535**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J6969	78	J 23/Contra Costa and Siskiyou	1500	51.82	1737	J6967	75	J 23/Contra Costa and Siskiyou	56-62

Reservoir	Level (ft)	Remarks
Elizabeth	13.78	
Kimball	0	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Elizabeth	1442	-	-	
Kimball	0	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Ondulando	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00022

VEN00003295

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 9:14 AM/PM

Test Performed By: BY/KM

Pressure Zone: 430

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J6435	125	H 28/Mammoth and Saticoy	1000	81	741	J8251	120	H 28/Mammoth and Saticoy	118

Reservoir	Level (ft)	Remarks
Foothill (Both Reservoirs)	15.21	
Sexton (Both Reservoirs)	23.47	
Corbett	22.4	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Foothill	663	-	-	
Seaward and Poli	0	-	-	
5 Points	0	-	-	
Bailey	2277	-	-	
Saticoy CF	1094	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
View Park	795	-	-	
Day Road	0	-	-	
Elizabeth	1465	-	-	
Kimball	0			

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Telegraph	-	-	-	
Petit	-	-	-	

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 9:38 AM/PM

Test Performed By: BY/KM

Pressure Zone: 430

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J7203	85	I 26/Norwalk and Topeka	1000	32	1875	J8253	80	I 26/Norwalk and Topeka	62

Reservoir	Level (ft)	Remarks
Foothill (Both Reservoirs)	15.07	
Sexton (Both Reservoirs)	23.25	
Corbett	22.32	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Foothill	666	-	-	
Seaward and Poli	0	-	-	
5 Points	0			
Bailey	2306	-	-	
Saticoy CF	1128	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
View Park	793	-	-	
Day Road	0	-	-	
Elizabeth	1456	-	-	
Kimball	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Telegraph	-	-	-	
Petit	-	-	-	

VEN00003296

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 10:00 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **430**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J8255	66	H 17/Day and Telegraph	1500	52.75	1706	J3667	74	H 17/Day and Telegraph	72

Reservoir	Level (ft)	Remarks
Foothill (Both Reservoirs)	14.95	
Sexton (Both Reservoirs)	23.18	
Corbett	22.28	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Foothill	669	-	-	
Seaward and Poli	0	-	-	
5 Points	0	-	-	
Bailey	2282	-	-	
Saticoy CF	1072	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
View Park	790	-	-	
Day Road	0	-	-	
Elizabeth	1465	-	-	
Kimball	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Telegraph	-	-	-	
Petit	-	-	-	

VEN00003287

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 10:14 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **430**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J4011	107	H 14/Mound and Shamrock	1500	41.56	2166	J4013	104	H 14/Mound and Shamrock	91

Reservoir	Level (ft)	Remarks
Foothill (Both Reservoirs)	14.75	
Sexton (Both Reservoirs)	22.91	
Corbett	22.06	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Foothill	677	-	-	
Seaward and Poli	0	-	-	
5 Points	0	-	-	
Bailey	2256	-	-	
Saticoy CF	1074	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
View Park	798	-	-	
Day Road	0	-	-	
Elizabeth	1434	-	-	
Kimball	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Telegraph	-	-	-	
Petit	-	-	-	

VEN00003298

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 10:46 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **330**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J4809	118	B 17/Olivas Park and Palma	1700	56.1	1818	J8257	113	B 17/Olivas Park and Palma	75

Reservoir	Level (ft)	Remarks
Bailey	9.83	Level Started Rising.

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
330	0	-	-	
Golf Course	5174	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mariano	0	-	-	
Bailey	2267	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Telegraph	-	-	-	
Petit	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mills	-	-	-	

was 4807

VEN00003299

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 11:05 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **330**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J8259	97	D 17/Portola and McGrath	2000	55.25	2172	J4909	93	D 17/Portola and McGrath	84

Reservoir	Level (ft)	Remarks
Bailey	9.83	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
330	0	-	-	
Golf Course	5164	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mariano	0	-	-	
Bailey	2263	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Telegraph	-	-	-	
Petit	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mills	-	-	-	

VEN00003900

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 11:25 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **330**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J5189	55	F 19/Thille near County Square	1500	58.53	1538	J8261	53	F 19/Thille near County Square	51

Reservoir	Level (ft)	Remarks
Bailey	9.86	Level Started Rising.

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
330	0	-	-	
Golf Course	4851	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mariano	0	-	-	
Bailey	2220	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Telegraph	-	-	-	
Petit	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mills	-	-	-	

VEN00003031

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 11:43 **AM**/PM

Test Performed By: BY/KM

Pressure Zone: **330**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J8263	74	D 21/Elizabeth and Bristol	1000	105.97	566	J5739	85	D 21/Elizabeth and Bristol	83

Reservoir	Level (ft)	Remarks
Bailey	10.13	Still Rising

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
330	0	-	-	
Golf Course	5253	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mariano	0	-	-	
Bailey	2309	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Telegraph	-	-	-	
Petit	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mills	-	-	-	

VEN00003023

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 12:05 AM/**PM**

Test Performed By: BY/KM

Pressure Zone: **330**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J8265	80	E 25/North Bank and Potomac	1500	56.84	1583	J8267	78	F 25/North Bank and Potomac	58

Reservoir	Level (ft)	Remarks
Bailey	10.22	Level still rising, 10.34 when test already done.

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
330	0	-	-	
Golf Course	5299	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mariano	0	-	-	
Bailey	2371	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Telegraph	-	-	-	
Petit	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Mills	-	-	-	

VEN0003303

CITY OF SAN BUENAVENTURA
FIELD FLOW TEST

Test Date: 28-Feb

Time of Day: 1:42 AM/**PM**

Test Performed By: BY/KM

Pressure Zone: **260**

Flow Hydrant						Residual Hydrant			
Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Total Flow (gallons)	Time (seconds)	Flow Rate (gpm)	Node Number	Static Pressure (psi)	Atlas Map Page/Street Name	Residual Pressure (psi)
J8269	73	H 10/Santa Cruz	1500	60.28	1493	J2479	66	H 10/Santa Cruz	55

Reservoir	Level (ft)	Remarks
Grant Park (Both Reservoirs)	8.95/0	
Hall Canyon (Both Reservoirs)	7.15	

Pump Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Modella	941	-	-	
Hall Canyon	0	-	-	

Pump Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Kalorama	0	-	-	

Pressure Reducing Station (Into Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
Telegraph	-	-	-	

Pressure Reducing Station (Out of Pressure Zone)	Flow (gpm)	Upstream Pressure (psi)	Discharge Pressure (psi)	Remarks
None	-	-	-	

VEN00030

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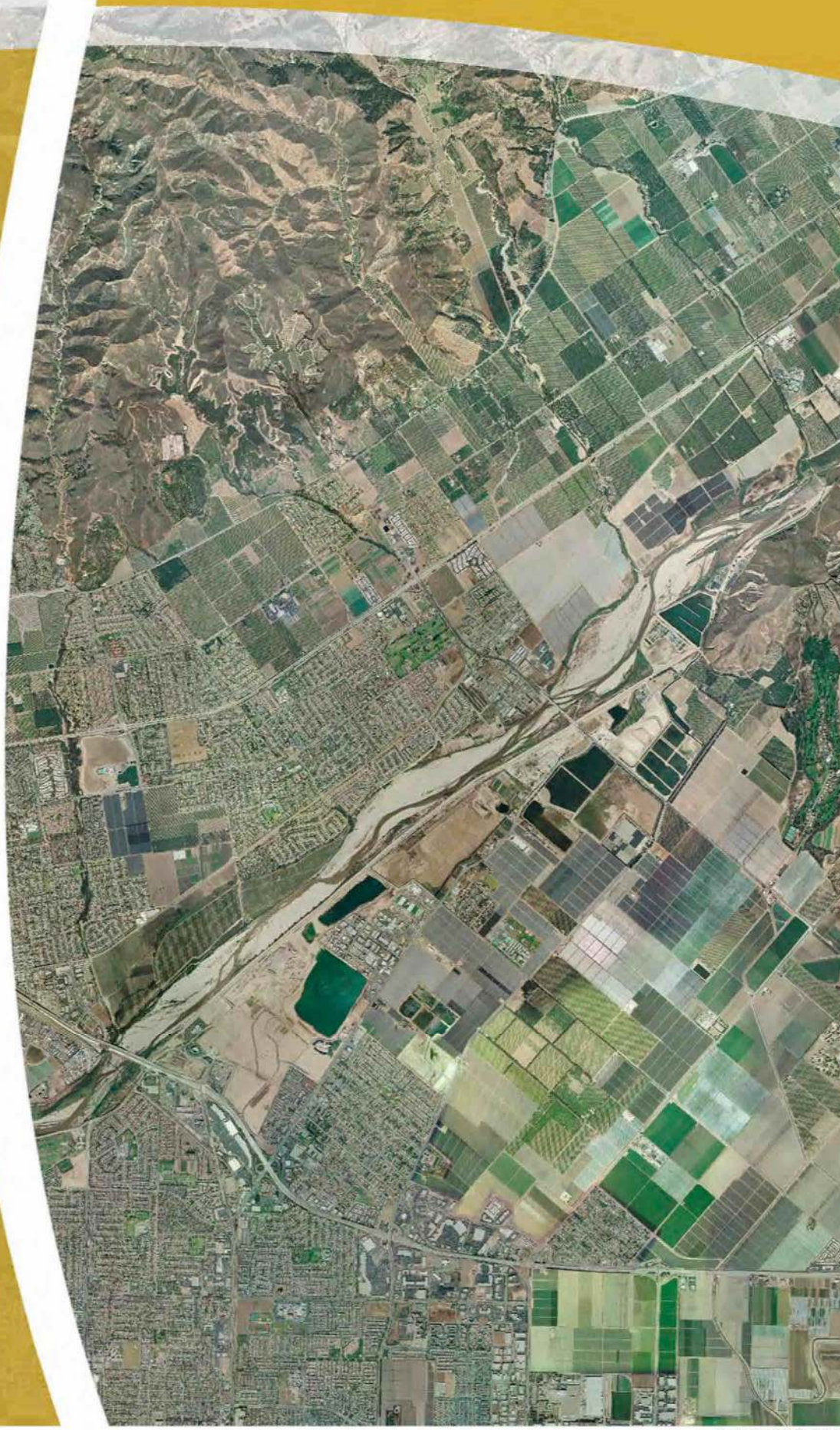
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