CITY OF CORONA
ARANTINE HILLS
WATER MASTER PLAN
FINAL REPORT

Prepared for:

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1-Introduction

The purpose of this study is to provide the Bluestone Communities with a Water Master Plan for a new land development in the City of Corona which considers domestic water supply and storage capabilities with the most recent data; and recommend cost effective facilities to accommodate the City's water needs for short term and ultimate growth in a fiscally responsible manner.

2-Study Area

Arantine Hills is a new land development by Bluestone Communities which is located on the south-east side of the City of Corona in western Riverside County. The development's location and land use is depicted on Figure 2-1. The Arantine Hills development encompasses approximately 275 acres of residential, commercial, and industrial land which will be built in 4 phases consisting of 1621 to 1806 dwelling units, and 745,300 square foot of Commercial / Industrial buildings.

2-1-Land Use

According to Arantine Hills Specific Plan provided by AEI-CASC, the development area divided to 19 Plan Area with different land usage. The land use summary is shown in Table 2.1.

Table 2.1

Arantine Hills Land Use

LAND USE	PHASE 1 AREA (ac)	PHASE 2 AREA (ac)	PHASE 3 AREA (ac)	PHASE 4 AREA (ac)	TOTAL AREA (ac)
General Commercial	--	38.3	--	--	38.3***
Mixed use (Commercial/Residential)	19.9*	--	--	--	19.9
Mixed Use (Commercial/Industrial)	18.6	--	--	--	18.6***
High Density Residential (HDR)	8.1	--	--	26.4***	34.5**
Medium Density Residential (MDR)	44.3	--	21.6	--	65.9
Low Density Residential (LDR)	--	--	29.2	--	29.2
Parks	14.0	--	1.0	--	15.0
Open Space	36.9	--	--	--	36.9
Master Plan Roadways	--	--	--	16.5	16.5
Total Area	141.8	38.3	51.8	42.9	**274.8**

*consist of 12.9 acres HDR and 7 acres Commercial

**46.1 acres total HDR with considering 12.9 acres HDR in Mixed Use (Commercial/Residential)

***AEI-CASC Specific Plan assumes the following approximate acreages will be required for drainage and water quality purposes: 7.5+/- acres from Mixed Use (Commercial/Industrial), 1.9+/- acres from General Commercial, and 1.3+/- acres from Phase 4-HDR area.

To further define and better understanding of the study area, the land use categories are defined as below:

Low Density Residential (LDR): neighborhoods with densities of 3-6 dwelling units per net acre. The target density of 3 du/ac is proposed for this project.

Medium Density Residential (MDR): neighborhoods with densities of 6-15 dwelling units per net acre. The target density of 7 du/ac is proposed for this project.

High Density Residential (HDR): neighborhoods with densities of 15-32 dwelling units per net acre and up to 75 du/net acre for senior units as defined in Corona Water Master Plan. The target density of 18 du/ac in HDR and 35 du/net acre in Mixed Commercial/Residential area is proposed for this project.

General Commercial: accommodates many commercial uses that serve local neighborhoods, visitors, and the community. Typical uses include department stores, apparel stores, supermarkets, theaters, and non-retail uses such as hotels and motels, car dealerships, auto service and repairs. The maximum density is a floor area ratio (FAR) of 0.50:1 which is proposed 0.25:1 for this project.

Open Spaces: defines lands that are permanently protected or committed for open space purpose due to their value as habitat, topography, scenic quality, public safety (e.g. flood control channels), or like purposes.

Mixed use (Industrial/ Commercial): typical industries include research and development, light manufacturing, and e-commerce. The Maximum intensity of development is a FAR of 2.00 for this project.

2-2-Topographical Description

The characteristic topography of the study area is a steady slope of approximately 3.7 percent from the north side of the site to the south. The ground elevation varies from 900 feet to 1135 feet from north to the south side of the site.

The Bedford Wash divides the site into two sections. The eastern section of Bedford Wash includes PA 18 (Open Space), and PA 16 (High Density Residential - Phase 4). The balance of the proposed development lies to the west of the wash.

2-3-Climate

The climate in the City of Corona is typical of Southern California with generally mild temperatures, virtually no days below freezing, and average rainfall of 12.6 inches annually.

3-Drinking Water System Study

The City of Corona will be the water purveyor to supply drinking water for Arantine Hills development area. The facilities proposed and described herein are based on criteria provided by the City.

3-1-Water System Pressure Zones

The City of Corona water service area is divided into six primary pressure zones with high water elevations ranging from 725 to 1640 feet designated numerically 1 through 6. These zones include five hydro-pneumatic sub-zones and four sub-zones served by pressure reducing stations. Typically, service zones are established to maintain static pressures between 52 and 120 psi, corresponding to service elevations from 120 feet to 275 feet below the high water elevation of the zone reservoir.

The Arantine Hills development area is located in pressure Zone 4, and pressure Zone 5.

Service Zone 4 (1220' HWL) spans the City from east to west and is bounded roughly by Ontario Ave. to the north. It serves elevations between 900' and 1100' AMSL. Water is stored in the Hayden Reservoir, Upper& Main Reservoir, and Avenida Del Vista Reservoir.

Service Zone 5 (1380' HWL) is located in the southern part of the City, south of Zone 4. The zone serves elevations between 1100' and 1260' AMSL. It is supplied by a Mills Connection, Eagle Glen Zone 5 Booster station, and Lester Zone 5 Booster Station. Water is stored in Eagle Glen and Gilbert Reservoirs.

Phases 1, 2, 4, and most of Phase 3 land development located in water system pressure Zone 4, and 12 acres in southern part of Phase 3 (with Ground Elevation above 1100 ft.) is in water system pressure Zone 5. Although a portion of Phase 3 (part of Planning Areas 1 and 2) reside above elevation 1100, all of Planning Areas 1, 2, and 3 will be served by Zone 5.

Figure 3-1 shows the area pressure zones.

3-2-Drinking Water System Demands

According to proposed Unit Flow Factors in the City of Corona Water Master Plan (2005), and Arantine Hills land use, the average water demand for Arantin Hills development area is 702,610 gallons per day equal to 487.9 gallons per minute as shown in Table 3.1.

Table 3.2 shows the Average Daily Demand, and Maximum Daily Demand of each Planning Area and also the junctions related to any Planning Area.

Table 3.1
Arantine Hills Average Daily Water Demand

LAND USE	PHASE 1			PHASE 2			PHASE 3			PHASE 4			TOTAL		
	AREA (ac)	UFF[1] (gpd/ac)	DEMAND (gpd)	AREA (ac)	UFF (gpd/ac)	DEMAND (gpd)	AREA (ac)	UFF (gpd/ ac)	DEMAND (gpd)	AREA (ac)	UFF (gpd/ ac)	DEMAND (gpd)	AREA (ac)	UFF (gpd/ ac)	DEMAND (gpd)
General Commercial	7[2]	1,610	11,270	36.4[6]	1,610	58,604	0	1,610	0	0	1,610	0	43.4	1,610	69,874
Mixed Use (Commercial/ Industrial)	11.1[5]	1,720	19,092	0	1,720	0	0	1,720	0	0	1,720	0	11.1	1,720	19,092
High Density Residential (HDR)	21[3]	4,160	87,360	0	4,160	0	0	4,160	0	25.1[4]	4,160	104,416	46.1	4,160	191,776
Medium Density Residential (MDR)	44.3	4,000	177,200	0	4,000	0	21.6	4,000	86,400	0	4,000	0	65.9	4,000	263,600
Low Density Residential (LDR)	0	3,540	0	0	3,540	0	29.2	3,540	103,368[7]	0	3,540	0	29.2	3,540	103,368
Parks	14	1,200	16,800	0	1,200	0	1	1,200	1,200[7]	0	1,200	0	15	1,200	18,000
Open Space	36.9	1,000	36,900	0	1,000	0	0	1,000	0	0	1,000	0	36.9	1,000	36,900
Master Plan Roadways	0	0	0	0	0	0	0	0	0	16.5	0	0	16.5	0	0
Drainage and Water Quality[4]	7.5	0	0	1.9	0	0	0	0	0	1.3	0	0	10.7	0	0
Total	142	x	348,622	38.3	x	58,604	51.8	x	190,968	42.9	x	104,416	275	x	702,610

(1)UFF Unit Flow Factor (gallons per day/ acre)
(2) Part of Mixed Use I. See Table 2.1.
(3) Consist of 8.1 acres on P.A.6 and 12.9 acres of Mixed Use I (P.A.13).
(4) 1.3 acres area of drainage and water quality purposes subtracted from 26.4 acres total Phase IV HDR area.
(5) 7.5 acres area of drainage and water quality purposes subtracted from 18.6 acres total Mixed Use II area.
(6) 1.9 acres area of drainage and water quality purposes subtracted from 38.3 acres GC area.
(7) Zone 5 water demands. The total average daily water demand of Zone 5 equal 72.6gpm.

3-3-Maximum Daily and Hourly Water Demand

The City of Corona Water Master Plan utilizes a factor of 1.80 for Maximum Daily Water Demand. Assuming a total ADD of 487.9gpm (415.3gpm demand of Zone 4 and 72.6gpm demand of Zone 5), the Maximum Daily Water demand for Arantine Hills land development area will be 1.8 times the ADD or 878.2gpm.

Table 3.2

Water Demand

	ADD	MDD	PHD
Arantine Hills Land Development-Zone 4	415.3GPM	747.5GPM	780.8GPM
Arantine Hills Land Development-Zone 5	72.6GPM	130.7GPM	121.2GPM

ADD -Average Daily Demand

MDD- Maximum Daily Demand by multiplying ADD by 1.80 per the City of Corona Water Master Plan

PHD- Peak Hourly Demand by multiplying ADD by 1.88 for zone 4 and 1.67 for zone 5 per the City of Corona Water Master Plan

3-4-Fire Suppression

All pipes are sized to provide adequate fire flows and minimum of 20 psi residual pressure at the hydrant outlet during the fire flow. Fire flow requirements for the City's system are shown in following Table:

Table 3.3

Fire Suppression

Land use	Flow (gpm)	Duration (hrs)	Residual pressure At Hydrant Outlet (psi)	Maximum Distance Between Hydrants(ft)
Residential Single Family	1,500	2	20	300
Residential Multi-Family	2,500	2	20	250
Commercial Buildings/Occupancies	3,000	3	20	250
Industrial Buildings/Occupancies	3,500	4	20	250

- Flow and Duration per Corona Municipal Code 15.12.460.
- Maximum Distance Between Hydrants per Corona Municipal Code 15.12.480.

3-5-Reservoir Capacity

The storage criteria was established at the fire flow requirements plus operational storage equal to 50 percent of maximum day demand plus 10 percent of reservoir capacity as terminal storage. The City of Corona Water Master Plan (Table 7-2) shows that the existing storage capacity of Zone 5 will be sufficient for the future water demand in this zone, so the reservoir storage requirement for Arantine Hills- Zone 4 is determined herein. The following Table shows the reservoir capacity needed for Arantine Hills land development.

Table 3.4

Arantine Hills –Zone 4 Reservoir Storage Requirement

Requirements	Criteria	Storage Volume
Operational	50% of Zone 4 Maximum Day Demand	0.54 MG
Fire Suppression	3,500 gpm for 4 hours (less 1500 gpm for 2 hours – current fire allocation at Hayden Reservoir)	0.66 MG
Terminal	10% of Storage Volume	0.12 MG
Total		1.32 MG

According to water storage analysis in the City of Corona Water Master Plan (section 7, pages 7-1 and 7-2), 2 additional reservoirs with the capacity of 2.5 MG each (Montana Ranch and Masters) will be needed to provide sufficient water storage for zone 4.

The above table shows that the reservoir storage required for Arantine Hills will be 52.8 percent of total proposed capacity of the City's General Plan Masters Reservoir.

Since the proposed street "B" shown on Arantine Hills Specific Plan is the only major access road toward the Masters Reservoir location, the reservoir feed line shall be installed in this road.

The proposed Masters Reservoir is located at east side of Bedford wash and south-east side of Arantine Hills development area as shown in Figures 3-2 to 3-4.

The future study for possibility of relocating this reservoir to the west side of the wash for ease of access and fewer environmental challenges is recommended.

3-6-Pumping Capacity

The required water for the Arantine Hills will be provided from Zone 3 (1020 HWL) by pumping the water from Chase Booster Pump Station to City's Reservoir (1220 HWL) in Zone 4, and Eagle Glen pump station in Zone 5 (1380 HWL). The Hayden Reservoir can provide the allocated volume of water (1500 gpm) for fire suppression in residential single family areas. Additional system upgrades; storage, pumping, etc. are needed depending upon the alternative/option being evaluated to meet the higher Maximum Daily Demand and the fire suppression demand for commercial /industrial land usage in Arantine Hills, and other land developments in the area covered by Hayden Reservoir and Eagle Glen booster pump station.

According to the service criteria in the City's Water Master Plan (Table 6-3), Booster Pump Stations have to be able to deliver the maximum day demand for each zone. Alternatives/ options excluding additional storage require that booster pumps also meet some portion or all of peak hour demands and maximum day plus fire flow demands.

Table 3.5 shows the future required pumping from Chase BPS to Zones 4 and 5.

Table 3.5

Future Required Pumping

From Chase BPS

	Maximum Day Demand	Fire Suppression	Total Required Pumping
Arantine Hills Zone 4	747.5gpm	2,000gpm (3,500gpm for 4 hours less 1500 gpm for 2 hours – current fire allocation at Hayden Reservoir)	2,747.5gpm
Arantine Hills Zone 5	130.7gpm	0 (1500 gpm current fire allocation at zone 5 reservoirs)	130.7gpm
Rest of Zone 4 future demand*	3,014gpm	0 (1500 gpm current fire allocation at Hayden reservoir)	3,014gpm
Rest of Zone 5 future demand**	2,058gpm	0 (1500 gpm current fire allocation at zone 5 reservoirs)	2,058gpm
Total	5,950gpm	2,000gpm	7,950gpm

*will be served by Chase Booster Pump Station. Demand based on land use and unit flow factors, and 1.8 peaking factor.

**will be served by Eagle Glen Booster Pump Station. Demand based on land use and unit flow factors, and 1.8 peaking factor.

As the water demand increases in future, increasing the capacity of Chase BPS and/or construction of Masters Reservoir to be able to provide the required amount of water for maximum day Demand plus Fire Suppression will be required.

According to the above table, the Chase BPS will supply 2,111gpm of water for Zone 5 in the future which will be transferred by Eagle Glen BPS. Eagle Glen BPS has the existing capacity of 1600 gpm and needs to be upgraded for future demand.

3-7- Pump Stations Upgrades

The Chase Booster Pump Station is equipped with 3 vertical pumps, and one spare pump each with 800gpm capacity and 236 feet TDH. It pumps the water from Lester Reservoir in Zone 3 (1060' HWL) to Hayden Reservoir in Zone 4 (1220' HWL), and feeds the Eagle Glen Booster Pump Station. Considering the Zone 4 (1220' HWL) and Zone 5 (1380' HWL), water demand in future, this pump station should be upgraded to pump 7950gpm. The upgrade would require the replacement of existing 800 gpm- 60 HP pumps with 3 vertical pumps each with a capacity of 2650gpm- 200HP. The existing electric service does not need to be upgraded.

The Eagle Glen Booster Pump Station is located at 4255 Eagle Glen Parkway. It pumps the water from Zone 4 to Zone 5. The pump station has 2 horizontal pumps driven by 60 HP electric motors. The pumps have a capacity of 800gpm each and discharge through 8" diameter pipes into service Zone 5 in Eagle Glen Parkway. The existing pumps would need to be replaced with two vertical pumps with capacity of 1100 gpm-75 HP each. Existing 350 Amp electrical service is adequately sized to service the proposed upgrades.

3-8- Arantine Hills Piping Alternatives

According to the City of Corona Water Master Plan, a 16-inch line shall be extended through Streets A, B, and C for future connection to Weirick Road and Masters Reservoir. To accommodate this requirement of the City of Corona Water Master Plan, the following pipe segments in Arantine Hills hydraulic model will be replaced with 16-inch diameter pipes as shown on table 3.6.

Table 3.6
Pipe Size Adjustment

Pipe ID	Length (ft)	Pipe Size in Hydraulic Model (inch)	Pipe Size to be installed (inch)
04-47925-NEW_3	1,789	12	16
NEW_3-NEW-5	538	12	16
NEW_5-NEW_8	451	12	16
NEW_8-NEW_9	745	12	16
NEW_9-NEW_11	1,183	12	16
NEW_3-NEW_19	708	8 &8	16
NEW_19-NEW_2	519	8 &8	16

Since 30.2 acres of Arantine Hills land development area consist of 29.2 acres Low Density Residential and 1 acre Park is located in Pressure Zone 5 and the rest of this development located in pressure Zone 4, the required potable water to serve this area shall be supplied from Pressure Zones 4 and 5. The following three alternatives are considered to connect Arantine Hills water distribution system to the City of Corona water distribution system.

Alternative I- The pressure Zone 5 portion of the site would be connected to the existing 20-inch pipeline in Eagle Glen Parkway and proposed street "C" with a second point of connection in the vicinity of Castlepeak Drive.

Alternative II- The pressure zone 5 part of the site would be connected to the City's pressure zone 5 piping at Eagle Glen Parkway cul de sac, and the zones 4 and 5 pipelines are separated in this alternative. The calculations show that the junction pressures are in acceptable range in this alternative. The acquisition of an easement would be needed for (2) 8-inch pipelines connecting the existing Eagle Glen Parkway water line to the Arantine Hills pressure zone 5.

Alternative III- Since only about 11 percent of the project lies within pressure Zone 5 (elevation above 1100 ft), all the land development area is considered as pressure zone 4 to find the Static and Dynamic pressure in south side of the site. The calculations show that the Static and Dynamic pressures in junctions New_13, New_16 and New_17 (Figure 3-3) are below minimum thresholds (52 psi for static pressure and 40 psi for dynamic pressure) required by the City of Corona Water Master Plan, so due to inadequate pressure in above junctions, this alternative is not acceptable.

3-9- Water Supply System Options

The following two options are considered as most viable options to provide required water for Arantine Hills land development area, and other land developments in the area covered by Chase, and Eagle Glen Booster Pump Stations.

- **Option 1- Upgrading the Chase and Eagle Glen Booster Pump Stations-** With upgrading the Chase and Eagle Glen pump stations to provide maximum daily water demand plus fire suppression, the Masters Reservoir is not included in this option to serve the Arantine Hills land development area.

- **Option 2- Construction of Masters Reservoir** - This option includes Masters Reservoir and assumes Chase and Eagle Glen BPS will be upgraded. The City's preferred option is the second, Option 2 – Construction of Masters Reservoir, because it helps meet storage demands for the higher fire flows and extended periods of high water demands. Given that the project is not expected to develop for a period of five years or more, the improvement conditions for Arantine Hills will include a provision for the preparation of a Preliminary Design Report (PDR) to be submitted for the City's review and approval to

further refine the water system improvements needed to serve the project; reservoir location, offsite pipelines, alignments, detailed improvement of pump stations, etc.

3-10- Hydraulic Analysis

AKM performed hydraulic analysis of the proposed facilities for options 1 and 2 for each of the three alternatives and also a comparison between options 1 and 2 with the other possible options as explained in section 3-11. AKM used hydraulic network model for Maximum Day at Peak Hour Demands (PHD), Maximum Day Demand plus Fire Flow in existing, and future conditions. In existing operating condition, the Chase and Eagle Glen Booster Pump Stations are upgraded, but the proposed reservoirs are not in service. The future operating condition assumes that all proposed reservoirs are in service and the pump stations are upgraded.

The pipe roughness magnitudes are proposed 120 for 12-inch pipe sizes and smaller, and 130 for 16-inch pipe size, to be consistent with the pipe roughness magnitudes in the Hydraulic Model for the City of Corona Water Master Plan.

The amount of pipe required for each alternative is as following:

Table 3.7
Pipe Lengths

	8-inch Diameter (Feet)	12-inch Diameter (Feet)	16-inh Diameter (Feet)	Total (Feet)
Alternative I	13,530	590	9,940	24,060
Alternative II	4,810	590	9,940	15,340
Alternative III	8,890	590	9,940	19,420

3-11- Other Options

The options explained below are studied for better understanding of the functioning of water distribution system facilities related to Arantine Hills development area. The complete result of following options will be included in Preliminary Design Report.

- **Option 3- New Controls on Upgraded Pump Stations** – This option includes Masters Reservoir, and assumes that the Chase and Eagle Glen BPS will be upgraded with new controls.

- **Option 4- No Upgrades** - This option assumes that the Masters Reservoir will not be built and the Chase and Eagle Glen BPS won't be upgraded.

- **Option 5- Upgrading Eagle Glen BPS** – This option assumes that the Eagle Glen BPS will be upgraded, but upgrading of Chase BPS and construction of Masters Reservoir is not included.

- **Option 6- Upgrading Eagle Glen BPS and Construction of Masters Reservoir**- This option assumes existing condition of Chase BPS with upgraded Eagle Glen BPS and includes Masters Reservoir.

- **Option 7- Using Full Capacity of Existing Chase BPS** – This option assumes existing condition of Chase BPS by using all 3 pumps all the time.

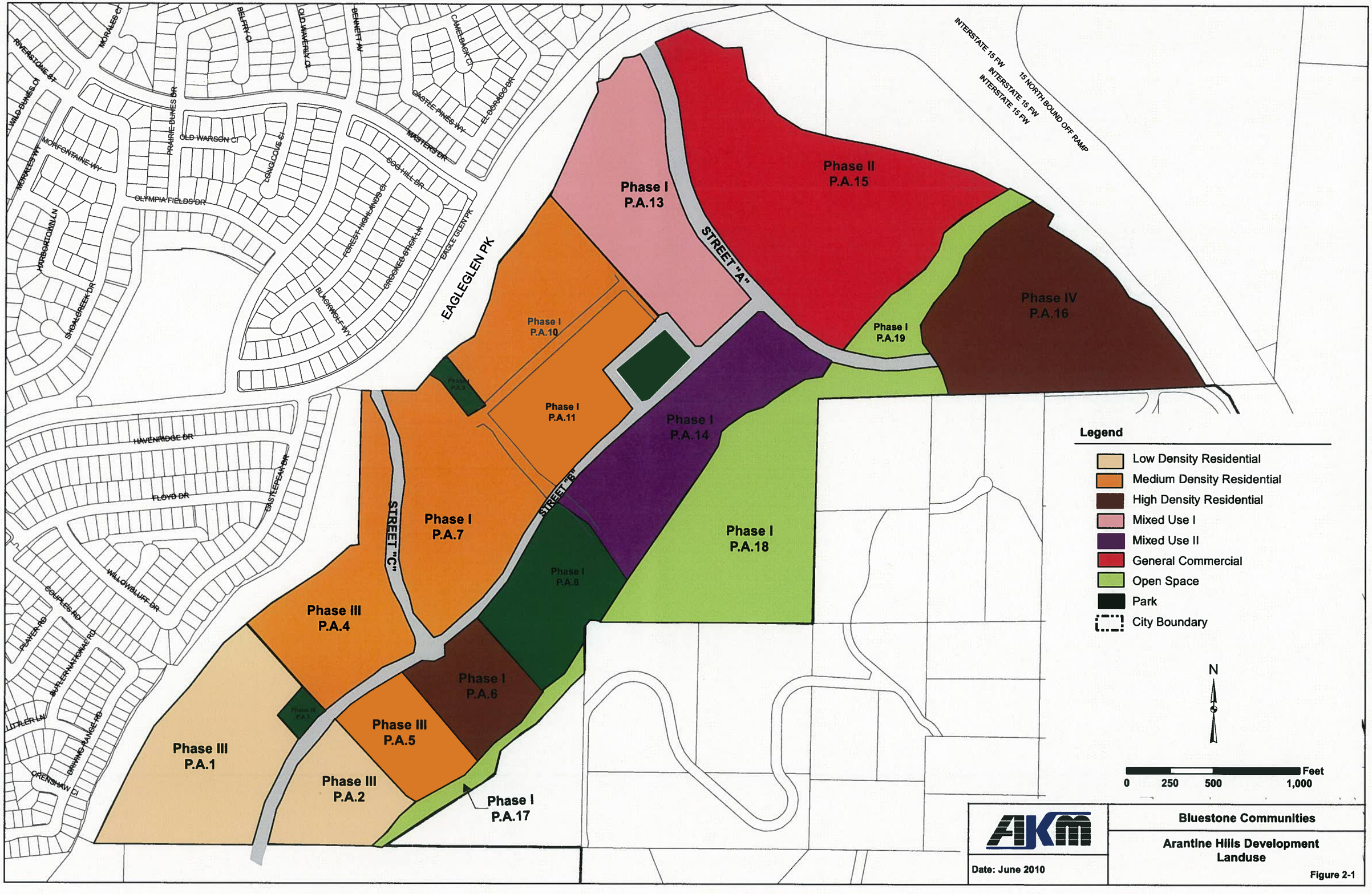
  The hydraulic analysis for all above options is done by AKM Consulting Engineers to find the best option for upgrading the existing facilities and/or construction of Masters Reservoir.

  The following table shows the water level in Hayden, Master, and Eagle Glen Reservoir and amount of water supplied by each Pump Station (Chase, and Eagle Glen) in each option.

Table 3.8 - Arantine Hills Water System Analysis
Option II Maximum Day Demands - Alternative I

Run	Description	Model Name	Chase PS	Edenglen PS	Hayden Res	Edenglen Res	Masters Res	Pressures	Comment
1	Option 4 - existing pumps, no Masters Reservoir	expumps_nomasters	~1200-2100 gpm (used all 3 pumps at times)	~200-700 gpm	Drops from 25' to 7', recovers to 18'	Drops from 27' to 19', doesn't recover	-	Pk Hr pressures < 40 psi in some areas	Proves that EG PS must be upgraded to keep EG Res level up
2	Option 5 (E) Chase pumps, (N) EG pumps, no Masters Reservoir	exchase_nomasters	~600-2100 gpm (used all 3 pumps at times)	~2600-2800 gpm	Drops from 25' to below 6', recovers to 13'	Recovers	-	Pk Hr pressures < 40 psi in some areas	
3	Option 6 (E) Chase pumps, (N) EG pumps, with Masters Reservoir	exchase_masters	~600-2100 gpm (used all 3 pumps at times)	~2600-2800 gpm	Drops from 25' to 14', recovers to 18'	Recovers	Drops from 24' to 6', recovers to 9'	Pk Hr pressures < 40 psi in some areas	
4	Option 7 (E)Chase pumps (force 3 on all the time), (N) EG pumps, with Masters Reservoir	exchase3_masters	~1500-1600 gpm (used all 3 pumps all the time)	~2600-2800 gpm	Drops from 25' to 15', recovers to 18'	Recovers	Drops from 24' to 7', recovers to 9'	Pk Hr pressures < 40 psi in some areas	Chase pumps lower per pump with all three on. Indicates higher head.
5	Option 1 (N) Chase pumps, (N) EG pumps, no Masters Reservoir	newpumps_nomasters	~3000-5000 gpm	~3200 gpm	Drops from 25' to 11', recovers to 24'	Recovers	-	Pk Hr pressures < 40 psi in some areas	
6	Option 2 (N) Chase pumps, (N) EG pumps, with Masters Reservoir	newpumps_masters	~3000-5000 gpm	~3400 gpm	Drops from 25' to 18', recovers to 23'	Recovers	Drops from 24' to 7', recovers to 13'	Pk Hr pressures < 40 psi in some areas	Pressures a few psi higher than in Run 6; Shows that it is better to have Masters Reservoir because Hayden levels stay up and pressures increase slightly.
7	Option 3 (N) Chase pumps with (N) controls, New EG pumps, with Masters Reservoir	newpumps_masters2	~3000-5000 gpm	~3400 gpm	Drops from 25' to 20', recovers to 23'	Recovers	Drops from 24' to 9', recovers to 13'	Pk Hr pressures < 40 psi in some areas	P1 on when Hayden is at 24', P2 on when Hayden is at 23'

EXHIBIT 1: PROPOSED WATER PIPELINE MAPS



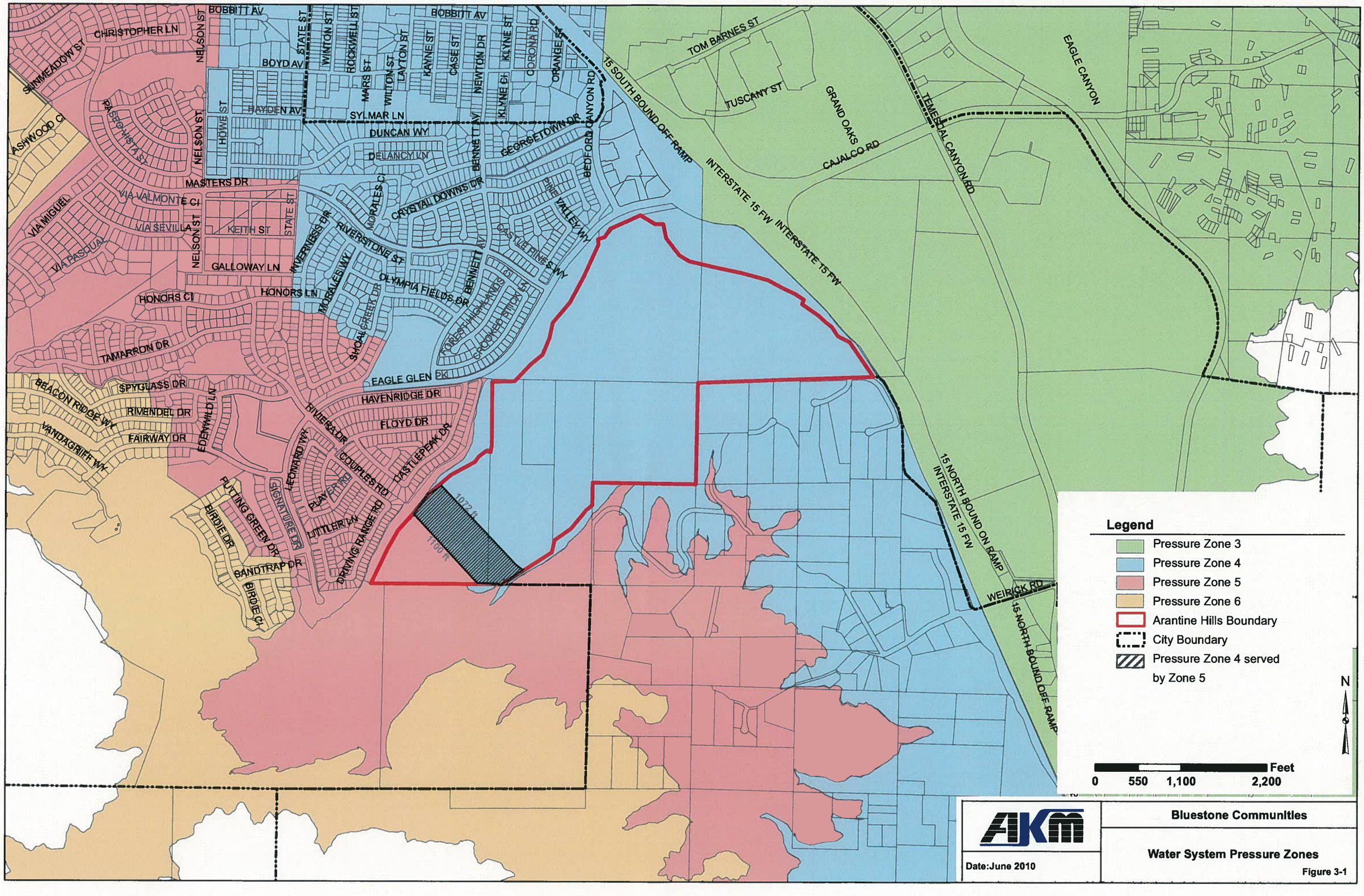
AKM

Date: June 2010

Bluestone Communities

Arantine Hills Development
Landuse

Figure 2-1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SUNMEADOW ST
ASHWOOD CI
BOYD AV
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LAYTON ST
KAYNE ST
CASE ST
NEWTON DR
KLYNE CI
KLYNE ST
CORONA RD
ORANGE ST
HAYDEN AV
HOWE ST
SYLMAR LN
DUNCAN WY
DELANCY LN
BERNETT AV
GEORGETOWN DR
BEDFORD CANYON RD
15 SOUTH BOUND OFF RAMP
INTERSTATE 15 FW
TOM BARNES ST
TUSCANY ST
GRAND OAKS
CAJALCO RD
TEMESCAL CANYON RD
EAGLE CANYON
MASTERS DR
VIA VALMONTE CI
VIA MIGUEL
VIA SEVILLA
VIA PASCUAL
KEITH ST
GALLOWAY LN
HONORS CI
HONORS LN
MORALES CI
CRYSTAL DOWNS DR
RIVERSTONE ST
OLYMPIA FIELDS DR
CASTLEPINE VALLEY WY
FOREST HIGHLANDS
CROOKED STICK
SHOAL CREEK DR
TAMARRON DR
EAGLE GLEN PKI
SPYGLASS DR
BEACON RIDGE WY
RIVENDEL DR
VANDAGRIFF WY
FAIRWAY DR
EDENWILD LN
HAVENRIDGE DR
FLOYD DR
RIVIERA DR
LEONARD WY
COUPLES RD
CASTLEPEAK DR
PUTTING GREEN DR
BIRDIE DR
BIRDIE CI
SIGNATURE DR
PLAY FIRD
LITTLER LN
DRIVING RANGE RD
SANDTRAP DR
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1100 ft
15 NORTH BOUND ON RAMP
INTERSTATE 15 FW
WEIRICK RD
15 NORTH BOUND OFF RAMP
Legend
Pressure Zone 3
Pressure Zone 4
Pressure Zone 5
Pressure Zone 6
Arantine Hills Boundary
City Boundary
Pressure Zone 4 served by Zone 5
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Feet
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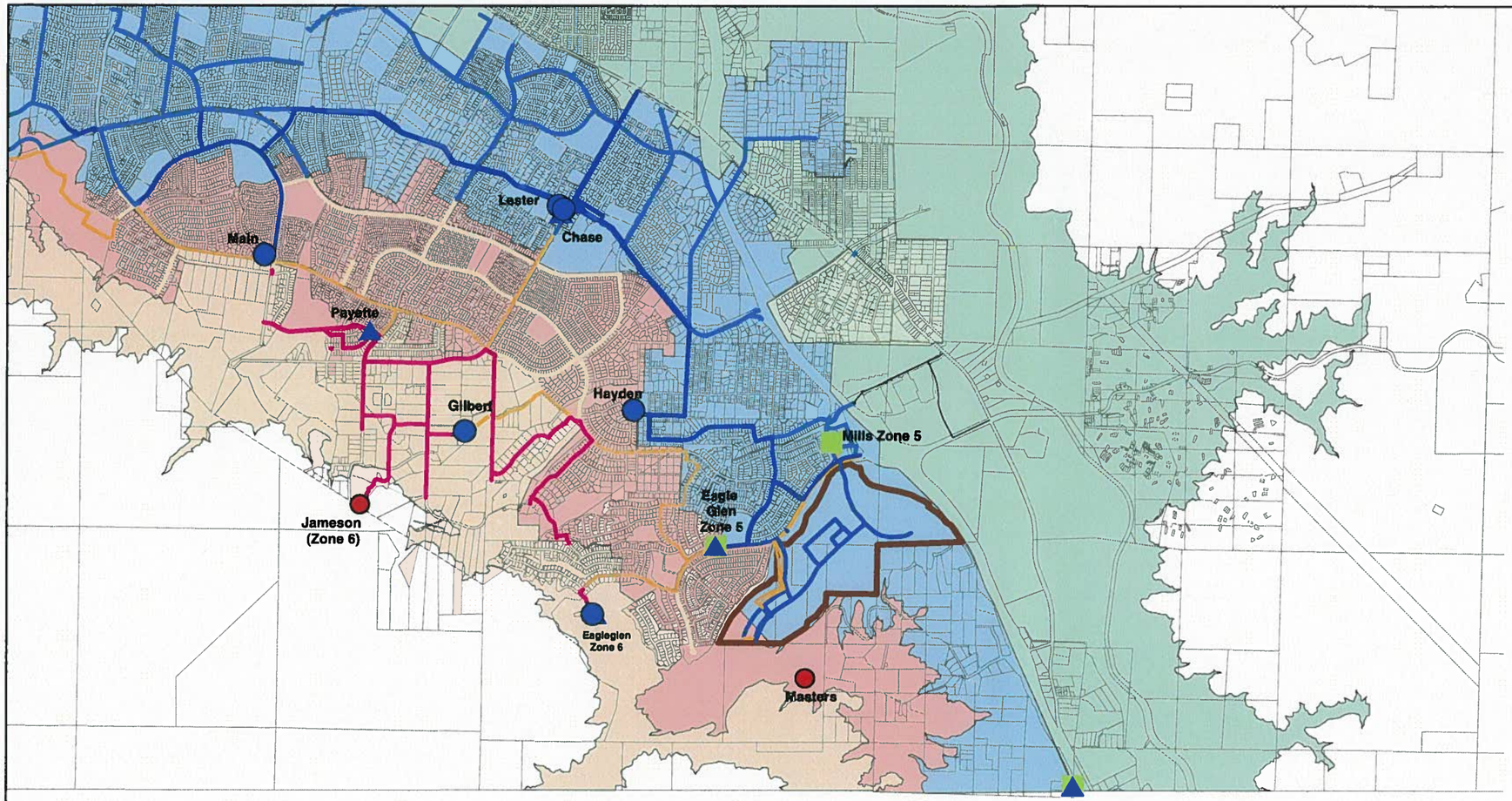
2,200
AKM
Date:June 2010
Bluestone Communities
Water System Pressure Zones
Figure 3-1



Legend

- Future pumpstations
- Future Reservoir
- Water Pumpstation
- ArantineHills Boundry
- Pressure Reducing Valve
- Water Tank

City of Corona Pipeline

- Pipe Diameter >= 16" in Zone 4
- Pipe Diameter=12" in Zone 4
- Pipe Diameter >= 16" in Zone 5
- Pipe Diameter= 12" in Zone 5
- Pipe Diameter >=12" in Zone 6

Pressure Zones

- Pressure Zone 3
- Pressure Zone 3A
- Pressure Zone 4
- Pressure Zone 5
- Pressure Zone 6

Arantine Hills Pipeline

- Zone 4 Pipeline
- Zone 5 Pipeline

Reservoirs High Water Level

Hayden	1220'
Gilbert	1380'
Jameson	1640'
Main	1220'
Lester	1060'

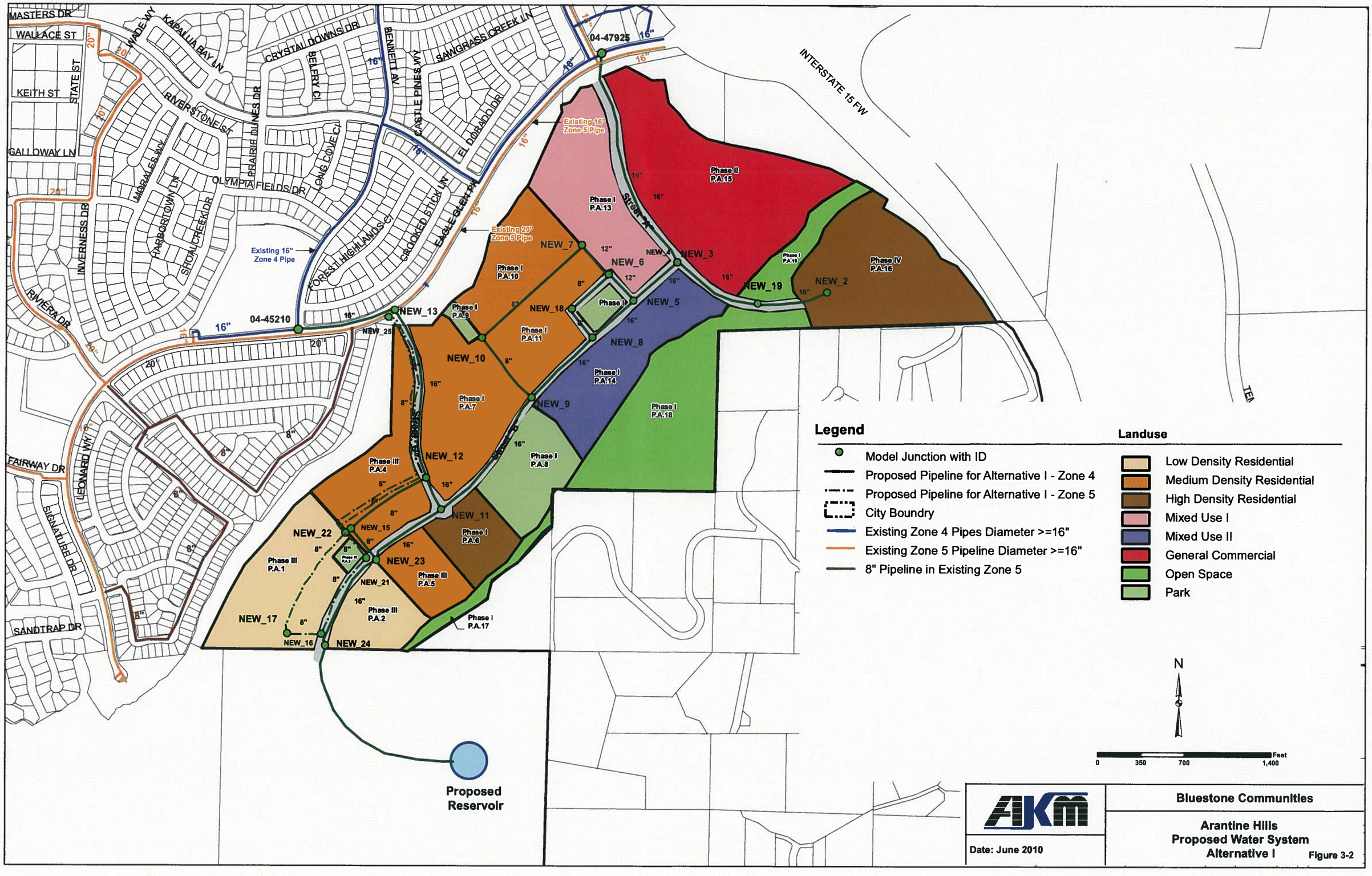
AKM

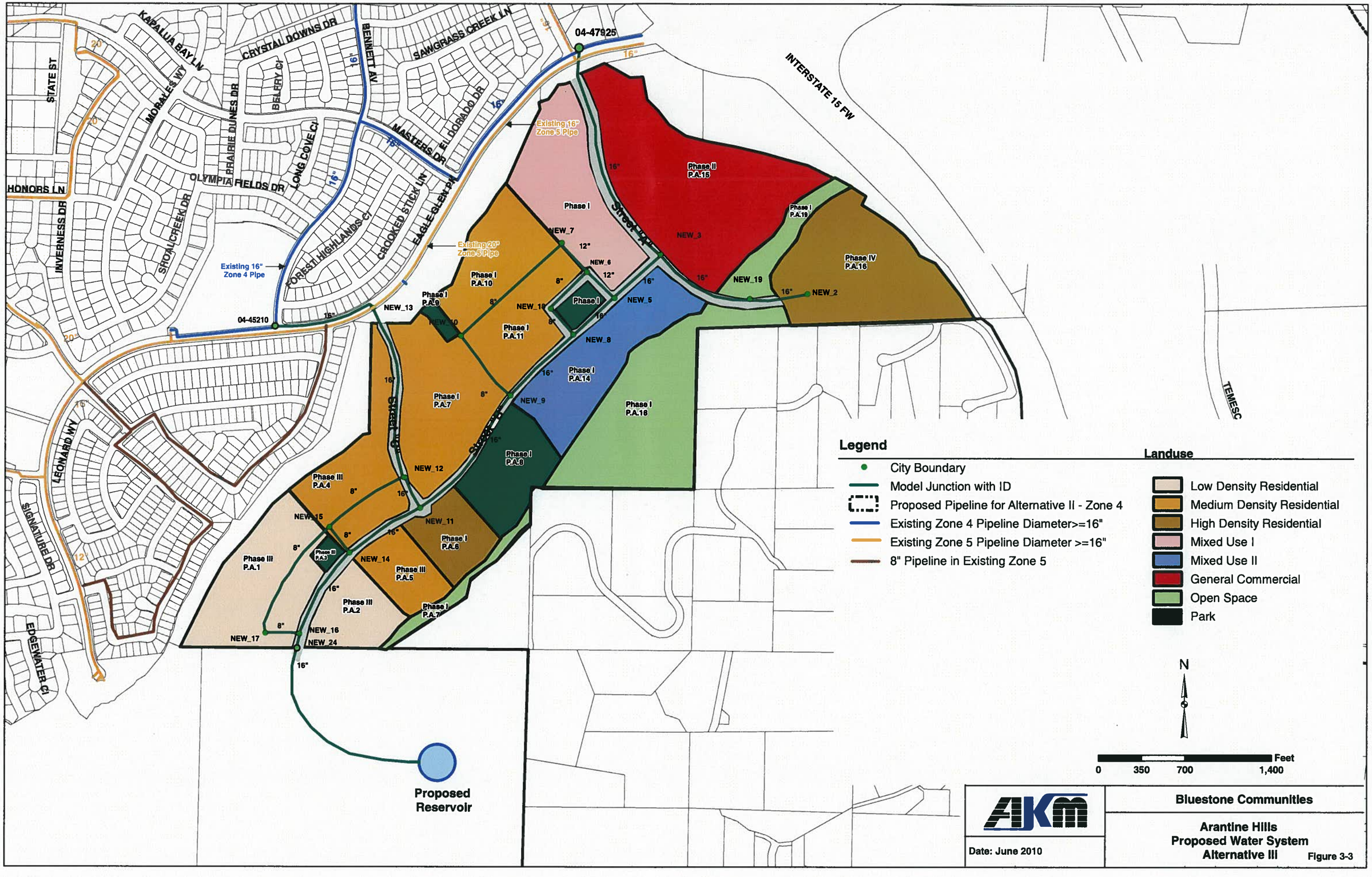
Date: June 2010

CITY OF CORONA

Main Distribution System
Corona South-East Part

Figure 3-1A


MASTERS DR
WALLACE ST
KEITH ST
STATE ST
GALLOWAY LN
WADE WY
KAPALUA BAY LN
CRYSTAL DOWNS DR
BELFRY CT
RIVERSTONE ST
PRAIRIE DUNES DR
MORALES WY
HARBORTOWN LN
SHOAL CREEK DR
OLYMPIA FIELDS DR
LONG COVE CT
INVERNESS DR
RIVIERA DR
FAIRWAY DR
LEONARD WY
SIGNATURE DR
SANDTRAP DR
FOREST HIGHLANDS CT
CROOKED STICK LN
EAGLE GLEN PL
BENNETT AV
CASTLE PINES WY
SAWGRASS CREEK LN
EL DORADO DR
INTERSTATE 15 FW
TEA
04-47925
04-45210
Existing 16" Zone 5 Pipe
Existing 20" Zone 5 Pipe
Existing 16" Zone 4 Pipe
Street "A"
NEW_2
NEW_3
NEW_4
NEW_5
NEW_6
NEW_7
NEW_8
NEW_9
NEW_10
NEW_11
NEW_12
NEW_13
NEW_15
NEW_16
NEW_17
NEW_18
NEW_19
NEW_21
NEW_22
NEW_23
NEW_24
NEW_25
Phase I P.A.7
Phase I P.A.8
Phase I P.A.9
Phase I P.A.10
Phase I P.A.11
Phase I P.A.13
Phase I P.A.14
Phase I P.A.15
Phase I P.A.16
Phase I P.A.17
Phase I P.A.18
Phase I P.A.19
Phase II P.A.15
Phase III P.A.1
Phase III P.A.2
Phase III P.A.3
Phase III P.A.4
Phase III P.A.5
Phase I P.A.6
Proposed Reservoir
Legend
Model Junction with ID
Proposed Pipeline for Alternative I - Zone 4
Proposed Pipeline for Alternative I - Zone 5
City Boundry
Existing Zone 4 Pipes Diameter >=16"
Existing Zone 5 Pipeline Diameter >=16"
8" Pipeline in Existing Zone 5
Landuse
Low Density Residential
Medium Density Residential
High Density Residential
Mixed Use I
Mixed Use II
General Commercial
Open Space
Park
N
0
350
700
1,400
Feet
AKM
Date: June 2010
Bluestone Communities
Arantine Hills
Proposed Water System
Alternative I
Figure 3-2


KAPALUA BAY LN
CRYSTAL DOWNS DR
BENNETT AV
SAWGRASS CREEK LN
04-47925
INTERSTATE 15 FW
STATE ST
MORALES WY
PRAIRIE DUNES DR
BELFRY CT
MASTERS DR
ELDORADO DR
HONORS LN
OLYMPIA FIELDS DR
LONG COVE CT
INVERNESS DR
SHOAL CREEK DR
FOREST HIGHLANDS CT
CROOKED STICK LN
EAGLE GLEN PL
Existing 16" Zone 5 Pipe
Existing 20" Zone 5 Pipe
Existing 16" Zone 4 Pipe
04-45210
Phase I
Phase II P.A.15
Phase I P.A.19
Phase IV P.A.16
Phase I P.A.10
Phase I P.A.9
Phase I P.A.11
Phase I P.A.14
Phase I P.A.18
Phase I P.A.7
Phase I P.A.8
Phase III P.A.4
Phase III P.A.1
Phase II P.A.3
Phase III P.A.5
Phase I P.A.6
Phase III P.A.2
Phase I P.A.17
NEW_1
NEW_2
NEW_3
NEW_5
NEW_6
NEW_7
NEW_8
NEW_9
NEW_10
NEW_11
NEW_12
NEW_13
NEW_14
NEW_15
NEW_16
NEW_17
NEW_19
NEW_24
LEONARD WY
SIGNATURE DR
EDGEWATER CT
Proposed Reservoir
TEMESCAL
Legend
City Boundary
Model Junction with ID
Proposed Pipeline for Alternative II - Zone 4
Existing Zone 4 Pipeline Diameter>=16"
Existing Zone 5 Pipeline Diameter >=16"
8" Pipeline in Existing Zone 5
Landuse
Low Density Residential
Medium Density Residential
High Density Residential
Mixed Use I
Mixed Use II
General Commercial
Open Space
Park
N
Feet
0
350
700
1,400
AKM
Date: June 2010
Bluestone Communities
Arantine Hills
Proposed Water System
Alternative III
Figure 3-3

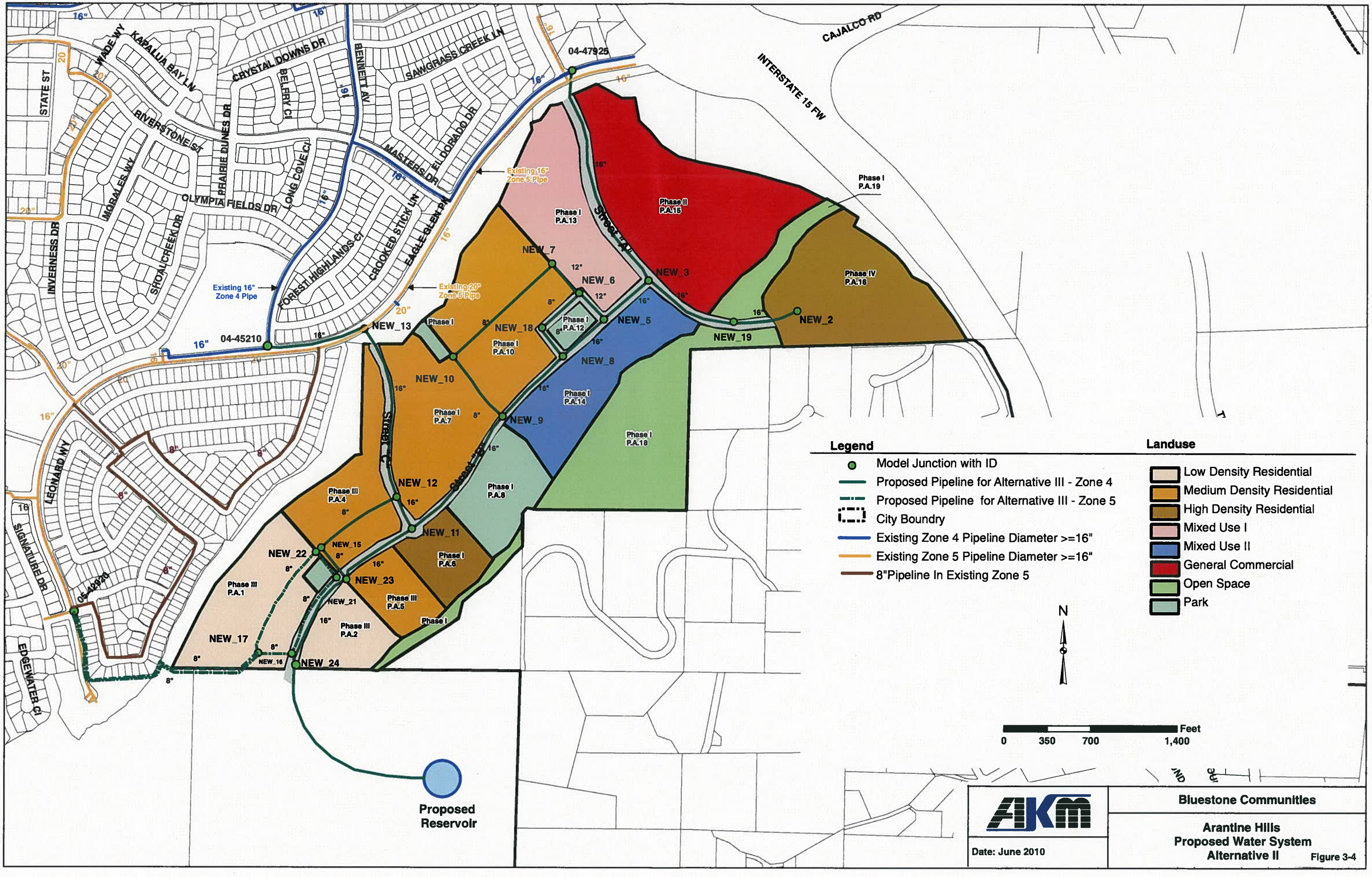

CAJALCO RD
INTERSTATE 15 FW
04-47925
04-45210
04-43920
Existing 16" Zone 5 Pipe
Existing 16" Zone 4 Pipe
Existing 20" Zone 5 Pipe
Proposed Reservoir
NEW_2
NEW_3
NEW_5
NEW_6
NEW_7
NEW_8
NEW_9
NEW_10
NEW_11
NEW_12
NEW_13
NEW_15
NEW_16
NEW_17
NEW_18
NEW_19
NEW_21
NEW_22
NEW_23
NEW_24
Phase I P.A.19
Phase II P.A.15
Phase IV P.A.16
Phase I P.A.13
Phase I P.A.12
Phase I P.A.10
Phase I P.A.14
Phase I P.A.7
Phase I P.A.18
Phase I P.A.8
Phase I P.A.6
Phase III P.A.4
Phase III P.A.1
Phase III P.A.5
Phase III P.A.2
Phase I
Legend
Model Junction with ID
Proposed Pipeline for Alternative III - Zone 4
Proposed Pipeline for Alternative III - Zone 5
City Boundry
Existing Zone 4 Pipeline Diameter >=16"
Existing Zone 5 Pipeline Diameter >=16"
8"Pipeline In Existing Zone 5
Landuse
Low Density Residential
Medium Density Residential
High Density Residential
Mixed Use I
Mixed Use II
General Commercial
Open Space
Park
N
0
350
700
1,400
Feet
AKM
Date: June 2010
Bluestone Communities
Arantine Hills
Proposed Water System
Alternative II
Figure 3-4

EXHIBIT 2: WATER DEMAND IMPLIED TO THE JUNCTIONS

ALTERNATIVE I- ADD, MDD, AND DEMAND IMPLIED TO THE JUNCTIONS

Planning Area	Land Use	Area (Ac)	Unit Flow Factor (gpd/ac)	Average Day Flow (gpd)	Average Day Flow (gpm)	Maximum Day Flow (gpm)	Total Demand implied to the Junction	Model Junction id
P.A.16	High Density Residential	25.10	4,160.00	104,416.00	72.51	130.5		NEW_2
P.A.15	General Commercial	36.40	1,610.00	58,604.00	40.70	73.3		
		12.9 HDR	4,160.00	53,664.00	37.27	67.1		
P.A.13	MU-I (Com, Res)	7 COM	1,610.00	11,270.00	7.83	14.1		
P.A.14	MU-II (Com, Ind)	11.10	1,720.00	19,092.00	13.26	23.9	**178.3**	NEW_3
No Demand								NEW_5
P.A.12	Park	2.00	1,200.00	2,400.00	1.67	3.0		NEW_6
P.A.10	Medium Density Residential	12.90	4,000.00	51,600.00	35.83	64.5		NEW_7
No Demand								NEW_8
P.A.8	Park	11.00	1,200.00	13,200.00	9.17	16.5		NEW_9
P.A.9	Park	1.00	1,200.00	1,200.00	0.83	1.5		NEW_10
P.A.6	High Density Residential	8.10	4,160.00	33,696.00	23.40	42.1		NEW_11
P.A.7	Medium Density Residential	19.10	4,000.00	76,400.00	53.06	95.5		
P.A.4	Medium Density Residential	14.70	4,000.00	58,800.00	40.83	73.5	**169.0**	NEW_12
No Demand								NEW_13
No Demand								NEW_15
P.A.1							**46.95**	NEW_17
	Low Density Residential	19.9	3,540	70,446.00	48.92	88.1	**46.95**	NEW_16
P.A.11	Medium Density Residential	12.30	4,000.00	49,200.00	34.17	61.5		NEW_18
P.A.19	Open Space	6.00	1,000.00	6,000.00	4.17	7.5		
P.A.17	Open Space	3.00	1,000.00	3,000.00	2.08	3.8		
P.A.18	Open Space	27.90	1,000.00	27,900.00	19.38	34.9	**46.1**	NEW_19
No Demand								NEW_21
P.A.3	Park	1	1200	1,200.00	0.83	1.5		
P.A.2	Low Density Residential	9.3	3540	32,922.00	19.61	35.3	**36.8**	NEW_22
P.A.5	Medium Density Residential	6.90	4,000.00	27,600.00	19.17	34.5		NEW_23
No Demand								NEW_24

ALTERNATIVE II- ADD, MDD, AND DEMAND IMPLIED TO THE JUNCTIONS

Planning Area	Land Use	Area (Ac)	Unit Flow Factor (gpd/ac)	Average Day Flow (gpd)	Average Day Flow (gpm)	Maximum Day Flow (gpm)	Total Demand implied to the Junction	Model Junction id
P.A.16	High Density Residential	25.10	4,160.00	104,416.00	72.51	130.5		NEW_2
P.A.15	General Commercial	36.40	1,610.00	58,604.00	40.70	73.3		
		12.9 HDR	4,160.00	53,664.00	37.27	67.1		
P.A.13	MU-I (Com, Res)	7 COM	1,610.00	11,270.00	7.83	14.1		
P.A.14	MU-II (Com, Ind)	11.10	1,720.00	19,092.00	13.26	23.9	**178.3**	NEW_3
No Demand								NEW_5
P.A.12	Park	2.00	1,200.00	2,400.00	1.67	3.0		NEW_6
P.A.10	Medium Density Residential	12.90	4,000.00	51,600.00	35.83	64.5		NEW_7
No Demand								NEW_8
P.A.8	Park	11.00	1,200.00	13,200.00	9.17	16.5		NEW_9
P.A.9	Park	1.00	1,200.00	1,200.00	0.83	1.5		NEW_10
P.A.6	High Density Residential	8.10	4,160.00	33,696.00	23.40	42.1		NEW_11
P.A.7	Medium Density Residential	19.10	4,000.00	76,400.00	53.06	95.5		
P.A.4	Medium Density Residential	14.70	4,000.00	58,800.00	40.83	73.5	**169.0**	NEW_12
No Demand								NEW_13
P.A.5	Medium Density Residential	6.90	4,000.00	27,600.00	19.17	34.5		NEW_14
P.A.3	Park	1	1200	1,200.00	0.83	1.5		
P.A.2	Low Density Residential	9.3	3540	32,922.00	19.61	35.3	**36.8**	NEW_15
P.A.1	Low Density Residential	19.9	3540	70,446.00	48.92	88.1	**46.95**	NEW_17
							46.95	NEW_16
P.A.11	Medium Density Residential	12.30	4,000.00	49,200.00	34.17	61.5		NEW_18
P.A.19	Open Space	6.00	1,000.00	6,000.00	4.17	7.5		
P.A.17	Open Space	3.00	1,000.00	3,000.00	2.08	3.8		
P.A.18	Open Space	27.90	1,000.00	27,900.00	19.38	34.9	**46.1**	NEW_19
No Demand								NEW_24

ALTERNATIVE III- ADD, MDD, AND DEMAND IMPLIED TO THE JUNCTIONS

Planning Area	Land Use	Area (Ac)	Unit Flow Factor (gpd/ac)	Average Day Flow (gpd)	Average Day Flow (gpm)	Maximum Day Flow (gpm)	Demand implied to the Junction	Model Junction id
P.A.16	High Density Residential	25.10	4,160.00	104,416.00	72.51	**130.5**		NEW_2
P.A.15	General Commercial	36.40	1,610.00	58,604.00	40.70	**73.3**		
P.A.13	MU-I (Com, Res)	12.9 HDR	4,160.00	53,664.00	37.27	**67.1**		
P.A.14	MU-II (Com, Ind)	7 COM	1,610.00	11,270.00	7.83	**14.1**		
No Demand		11.10	1,720.00	19,092.00	13.26	**23.9**	**178.3**	NEW_3
P.A.12	Park	2.00	1,200.00	2,400.00	1.67	**3.0**		NEW_5
P.A.10	Medium Density Residential	12.90	4,000.00	51,600.00	35.83	**64.5**		NEW_6
No Demand								NEW_7
P.A.8	Park	11.00	1,200.00	13,200.00	9.17	**16.5**		NEW_8
P.A.9	Park	1.00	1,200.00	1,200.00	0.83	**1.5**		NEW_9
P.A.6	High Density Residential	8.10	4,160.00	33,696.00	23.40	**42.1**		NEW_10
P.A.7	Medium Density Residential	19.10	4,000.00	76,400.00	53.06	**95.5**		NEW_11
P.A.4	Medium Density Residential	14.70	4,000.00	58,800.00	40.83	**73.5**	**169.0**	NEW_12
No Demand								NEW_13
No Demand								NEW_15
P.A.1	Low Density Residential	19.9	3540	70,446.00	48.92	**88.1**	**44.05**	NEW_17
P.A.11	Medium Density Residential	12.30	4,000.00	49,200.00	34.17	**61.5**	**44.05**	NEW_16
P.A.19	Open Space	6.00	1,000.00	6,000.00	4.17	**7.5**		NEW_18
P.A.17	Open Space	3.00	1,000.00	3,000.00	2.08	**3.8**		
P.A.18	Open Space	27.90	1,000.00	27,900.00	19.38	**34.9**	**46.1**	NEW_19
No Demand								NEW_21
P.A.3	Park	1	1200	1,200.00	0.83	**1.5**		
P.A.2	Low Density Residential	9.3	3540	32,922.00	22.86	**41.2**	**42.7**	NEW_22
No Demand								NEW_24
P.A.5	Medium Density Residential	6.90	4,000.00	27,600.00	19.17	**34.5**		NEW_23

EXHIBIT 3: ALTERNATIVE I-OPTION I OPERATION CONDITION HYDRAULIC ANALYSIS, TANK LEVEL, AND PUMP GRAPHS

The Chase and Eagle Glen BPS are upgraded.
2-8" water line are connected to existing 20-inch pressure Zone 5 water line on Eagle Glen Parkway to feed Arantine Hills pressure Zone 5.

Junction Report and Fire Flow Results
Alternative I Option I - Maximum Day plus Fire Flow

Junction ID	Elevation (ft)	Maximum Day, Peak Hour (6:30 AM) Model Results			*Maximum Day plus Fire Flow Model Results						
		Demand (gpm)	Head (ft)	Pressure (psi)	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Available Flow at Hydrant (gpm)	Available Flow Pressure (psi)
NEW_3	939	333.4	1,176.5	102.9	333.4	102.9	1,176.5	3,000	77.5	7,821.6	20.6
NEW_19	935.5	86.5	1,176.5	104.4	86.5	104.4	1,176.5	3,000	77.2	7,216.2	20.5
NEW_2	992	244.0	1,176.5	79.9	244.0	79.9	1,176.5	2,500	57.2	5,731.9	20.3
NEW_5	959.8	-	1,176.4	93.9	-	93.9	1,176.4	3,000	68.2	6,921.3	20.5
NEW_6	959	5.7	1,176.4	94.2	5.7	94.2	1,176.4	2,500	72.2	6,537.6	20.4
NEW_7	958	120.5	1,176.4	94.6	120.5	94.6	1,176.4	3,000	65.1	6,267.7	20.4
NEW_8	976.8	-	1,176.4	86.5	-	86.5	1,176.4	3,000	60.7	6,461.6	20.4
NEW_18	974	115.1	1,176.4	87.7	115.1	87.7	1,176.4	2,500	61.5	5,269.4	20.3
NEW_9	1,003.00	31.0	1,176.4	75.1	31.0	75.1	1,176.4	3,500	44.5	5,754.8	20.3
NEW_10	999	2.7	1,176.4	76.9	2.7	76.9	1,176.4	2,500	44.3	3,698.7	20.1
NEW_11	1,047.00	78.8	1,176.4	56.1	78.8	56.1	1,176.4	2,500	35.2	4,112.5	20.2
NEW_12	1,040.00	315.7	1,176.3	59.1	315.7	59.1	1,176.3	2,500	38.2	4,654.7	20.2
NEW_15	1,071.50	-	1,176.3	45.4	-	45.4	1,176.3	2,500	18.2	2,371.1	20.1
NEW_16	1,106.00	78.9	1,366.3	112.8	78.9	112.8	1,366.3	1,500	76.9	2,712.0	20.1
NEW_17	1,115.00	78.9	1,366.3	108.9	78.9	108.9	1,366.3	1,500	73.0	2,647.9	20.1
NEW_13	1,102.00	-	1,176.4	32.3	-	32.3	1,176.4	2,500	12.0	1,592.7	20.0
NEW_22	1,071.50	68.8	1,366.5	127.8	68.8	127.8	1,366.5	2,500	60.2	3,348.9	20.1
NEW_23	1,074.00	64.6	1,176.3	44.4	64.6	44.4	1,176.3	2,500	22.6	2,806.4	20.1
NEW_24	1,111.00	-	1,176.3	28.3	-	28.31	1,176.34	2,500	5.3	1,051.1	20.0
NEW_25	1,102.00	-	1,367.9	115.2	-	115.2	1,367.9	2,500	110.0	14,315.4	22.1

***Explanation of fire flow model results:**

Each row of the fire flow results is one run in the model. Fire flow demands are only placed at one location at a time.
The residual pressure is the pressure available at the hydrant when the designated fire flow demand is applied at the hydrant or junction being analyzed.
The available flow at the hydrant is the maximum flow available at that location if the residual pressure were brought down to 20 psi (available flow pressure).
Maximum velocity equal 4.3 ft/sec(on 16" line from 04-47925 to New_3) when 3500 gpm Fire Flow applied to junction New_9.
The static demand is the maximum day demand at the time of the fire flow simulation without the fire flow demand.
The static pressure is the associated pressure at the same location. The static head is the associated HGL at the same location.

Pipe Report
Alternative I- Option I Maximum Day at Peak Hour (6:30 AM)

Pipe ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	*Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
04-47925-NEW_3	04-47925	NEW_3	1,789.23	16	130	1,139.2	1.8	1.4	0.8
NEW11-12	NEW_11	NEW_12	273.97	16	130	62.1	0.1	-	-
NEW11-23	NEW_11	NEW_23	674.14	16	130	59.5	0.1	-	-
NEW12-13	NEW_12	NEW_13	1,471.32	16	130	(258.8)	0.4	0.1	0.1
NEW12-15	NEW_12	NEW_15	745.43	8	120	5.1	0.0	-	-
NEW15-23	NEW_15	NEW_23	291.79	8	120	5.1	0.0	-	-
NEW16-17	NEW_16	NEW_17	275.85	8	120	(0.4)	-	-	-
NEW19-3	NEW_19	NEW_3	708.36	16	130	(330.5)	0.5	0.1	0.1
NEW21-16	NEW_21	NEW_16	756.22	8	120	78.5	0.5	0.1	0.2
NEW21-22	NEW_21	NEW_22	253.83	8	120	(78.5)	0.5	0.1	0.2
NEW2-19	NEW_2	NEW_19	519.22	16	130	(244.0)	0.4	0.0	0.1
NEW22-17	NEW_22	NEW_17	991.74	8	120	79.3	0.5	0.2	0.2
NEW22-25	NEW_22	NEW_25	3,867.83	8	120	(113.2)	0.7	1.5	0.4
NEW22A-25	NEW_22	NEW_25	3,862.46	8	120	(113.3)	0.7	1.5	0.4
NEW23-24	NEW_23	NEW_24	861.39	16	130	-	-	-	-
NEW3-5	NEW_3	NEW_5	588.71	16	130	475.3	0.8	0.1	0.2
NEW5-6	NEW_5	NEW_6	299.24	12	120	182.0	0.5	0.0	0.1
NEW5-8	NEW_5	NEW_8	451.07	16	130	293.3	0.5	0.0	0.1
NEW6-18	NEW_6	NEW_18	408.4	8	120	49.2	0.3	0.0	0.1
NEW6-7	NEW_6	NEW_7	293.6	12	120	127.0	0.4	0.0	0.1
NEW7-10	NEW_7	NEW_10	1,144.08	8	120	6.5	0.0	-	-
NEW8-18	NEW_8	NEW_18	299.67	8	120	65.9	0.4	0.0	0.1
NEW8-9	NEW_8	NEW_9	745.43	16	130	227.4	0.4	0.0	0.0
NEW9-10	NEW_9	NEW_10	635.49	8	120	(3.8)	0.0	-	-
NEW9-11	NEW_9	NEW_11	1,182.64	16	130	200.3	0.3	0.0	0.0

Pipe roughnesses per City of Corona Water Master Plan.
***Numbers in parenthesis indicates that the flow is in the reverse direction**
Pipe IDs NEW22-25, NEW16-17, NEW21-16, NEW21-22, NEW22-17 serve Zone 5 and other lines serve Zone 4.

Pipe Report
Alternative I- Option I Maximum Day at Peak Hour (6:30 AM)

Pipe ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	*Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
04-47925-NEW_3	04-47925	NEW_3	1,789.23	16	130	1,139.2	1.8	1.4	0.8
NEW11-12	NEW_11	NEW_12	273.97	16	130	62.1	0.1	-	-
NEW11-23	NEW_11	NEW_23	674.14	16	130	59.5	0.1	-	-
NEW12-13	NEW_12	NEW_13	1,471.32	16	130	(258.8)	0.4	0.1	0.1
NEW12-15	NEW_12	NEW_15	745.43	8	120	5.1	0.0	-	-
NEW15-23	NEW_15	NEW_23	291.79	8	120	5.1	0.0	-	-
NEW16-17	NEW_16	NEW_17	275.85	8	120	(0.4)	-	-	-
NEW19-3	NEW_19	NEW_3	708.36	16	130	(330.5)	0.5	0.1	0.1
NEW21-16	NEW_21	NEW_16	756.22	8	120	78.5	0.5	0.1	0.2
NEW21-22	NEW_21	NEW_22	253.83	8	120	(78.5)	0.5	0.1	0.2
NEW2-19	NEW_2	NEW_19	519.22	16	130	(244.0)	0.4	0.0	0.1
NEW22-17	NEW_22	NEW_17	991.74	8	120	79.3	0.5	0.2	0.2
NEW22-25	NEW_22	NEW_25	3,867.83	8	120	(113.2)	0.7	1.5	0.4
NEW22A-25	NEW_22	NEW_25	3,862.46	8	120	(113.3)	0.7	1.5	0.4
NEW23-24	NEW_23	NEW_24	861.39	16	130	-	-	-	-
NEW3-5	NEW_3	NEW_5	588.71	16	130	475.3	0.8	0.1	0.2
NEW5-6	NEW_5	NEW_6	299.24	12	120	182.0	0.5	0.0	0.1
NEW5-8	NEW_5	NEW_8	451.07	16	130	293.3	0.5	0.0	0.1
NEW6-18	NEW_6	NEW_18	408.4	8	120	49.2	0.3	0.0	0.1
NEW6-7	NEW_6	NEW_7	293.6	12	120	127.0	0.4	0.0	0.1
NEW7-10	NEW_7	NEW_10	1,144.08	8	120	6.5	0.0	-	-
NEW8-18	NEW_8	NEW_18	299.67	8	120	65.9	0.4	0.0	0.1
NEW8-9	NEW_8	NEW_9	745.43	16	130	227.4	0.4	0.0	0.0
NEW9-10	NEW_9	NEW_10	635.49	8	120	(3.8)	0.0	-	-
NEW9-11	NEW_9	NEW_11	1,182.64	16	130	200.3	0.3	0.0	0.0

Pipe roughnesses per City of Corona Water Master Plan.
***Numbers in parenthesis indicates that the flow is in the reverse direction**

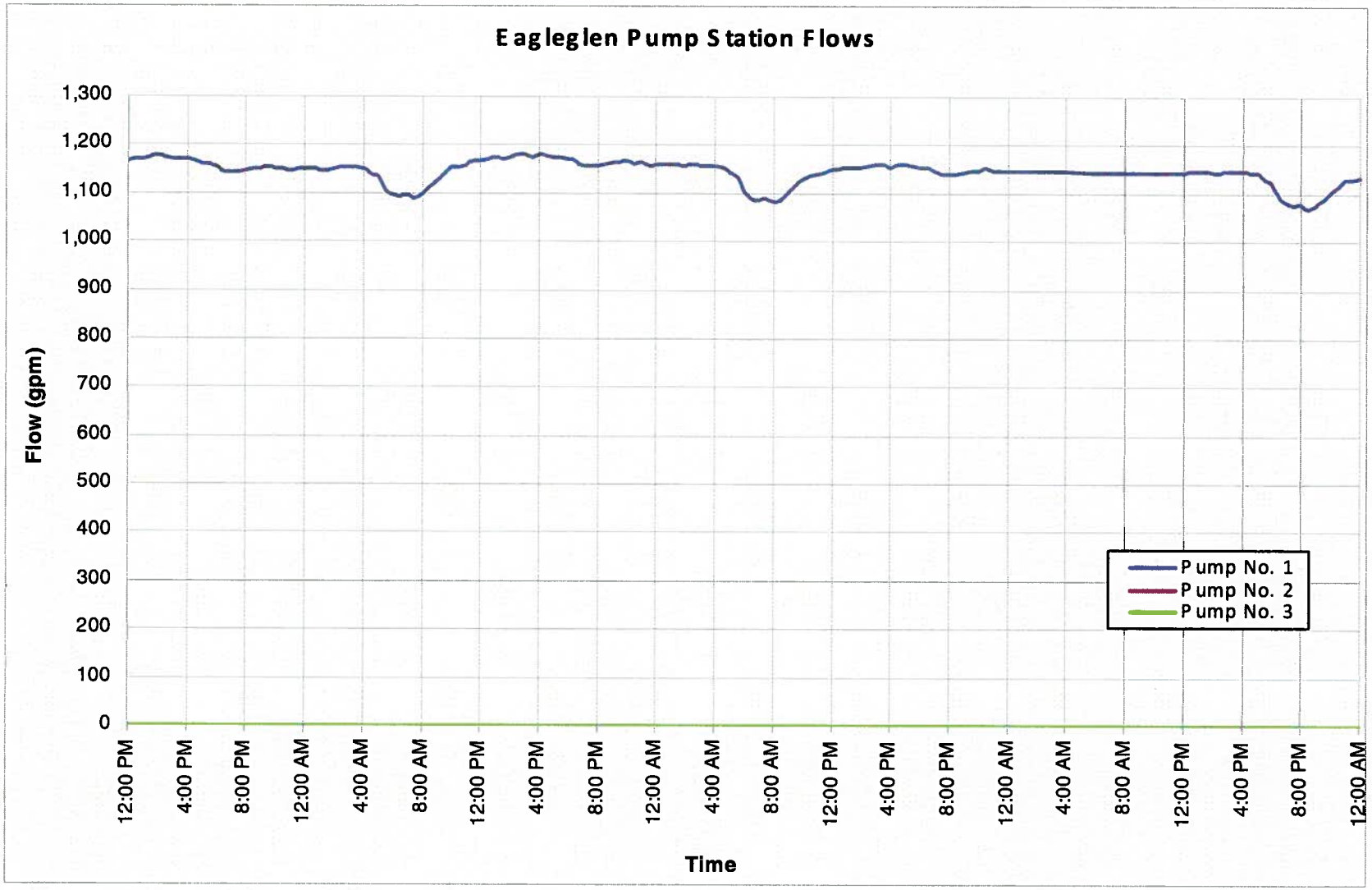
EAGLEGLEN BPS-Pump Group Graphs Option I Maximum Day Alternative I

Time	EAGLEGLENZONE5_P1 (gpm)	EAGLEGLENZONE5_P2 (gpm)	EAGLEGLENZONE5_P3 (gpm)
12:00 PM	1,167.7	-	-
12:30 PM	1,170.0	-	-
1:00 PM	1,170.9	-	-
1:30 PM	1,172.7	-	-
2:00 PM	1,176.3	-	-
2:30 PM	1,174.4	-	-
3:00 PM	1,170.6	-	-
3:30 PM	1,170.6	-	-
4:00 PM	1,169.6	-	-
4:30 PM	1,166.0	-	-
5:00 PM	1,161.7	-	-
5:30 PM	1,160.4	-	-
6:00 PM	1,153.7	-	-
6:30 PM	1,143.2	-	-
7:00 PM	1,143.9	-	-
7:30 PM	1,143.9	-	-
8:00 PM	1,147.7	-	-
8:30 PM	1,149.3	-	-
9:00 PM	1,150.7	-	-
9:30 PM	1,155.2	-	-
10:00 PM	1,150.7	-	-
10:30 PM	1,150.7	-	-
11:00 PM	1,145.9	-	-
11:30 PM	1,149.5	-	-
12:00 AM	1,149.5	-	-
12:30 AM	1,149.7	-	-
1:00 AM	1,147.3	-	-
1:30 AM	1,145.4	-	-
2:00 AM	1,151.1	-	-
2:30 AM	1,152.8	-	-
3:00 AM	1,153.6	-	-
3:30 AM	1,152.9	-	-
4:00 AM	1,150.7	-	-
4:30 AM	1,140.8	-	-
5:00 AM	1,134.6	-	-
5:30 AM	1,105.9	-	-
6:00 AM	1,095.4	-	-
6:30 AM	1,092.5	-	-
7:00 AM	1,096.2	-	-
7:30 AM	1,090.4	-	-
8:00 AM	1,097.9	-	-
8:30 AM	1,112.7	-	-

Time	EAGLEGLENZONE5_P1 (gpm)	EAGLEGLENZONE5_P2 (gpm)	EAGLEGLENZONE5_P3 (gpm)
9:00 AM	1,126.7	-	-
9:30 AM	1,141.5	-	-
10:00 AM	1,152.0	-	-
10:30 AM	1,155.3	-	-
11:00 AM	1,157.4	-	-
11:30 AM	1,168.3	-	-
12:00 PM	1,167.4	-	-
12:30 PM	1,170.3	-	-
1:00 PM	1,172.6	-	-
1:30 PM	1,172.4	-	-
2:00 PM	1,174.9	-	-
2:30 PM	1,180.8	-	-
3:00 PM	1,179.5	-	-
3:30 PM	1,174.6	-	-
4:00 PM	1,179.5	-	-
4:30 PM	1,178.8	-	-
5:00 PM	1,174.2	-	-
5:30 PM	1,173.2	-	-
6:00 PM	1,170.9	-	-
6:30 PM	1,166.7	-	-
7:00 PM	1,157.1	-	-
7:30 PM	1,157.6	-	-
8:00 PM	1,157.7	-	-
8:30 PM	1,159.4	-	-
9:00 PM	1,162.5	-	-
9:30 PM	1,163.9	-	-
10:00 PM	1,168.2	-	-
10:30 PM	1,162.1	-	-
11:00 PM	1,163.0	-	-
11:30 PM	1,158.4	-	-
12:00 AM	1,159.8	-	-
12:30 AM	1,160.4	-	-
1:00 AM	1,161.2	-	-
1:30 AM	1,159.0	-	-
2:00 AM	1,156.4	-	-
2:30 AM	1,159.8	-	-
3:00 AM	1,158.5	-	-
3:30 AM	1,158.5	-	-
4:00 AM	1,157.3	-	-
4:30 AM	1,154.1	-	-
5:00 AM	1,141.9	-	-
5:30 AM	1,133.8	-	-
6:00 AM	1,102.2	-	-
6:30 AM	1,090.1	-	-

Time	EAGLEGLENZONE5_P1 (gpm)	EAGLEGLENZONE5_P2 (gpm)	EAGLEGLENZONE5_P3 (gpm)
7:00 AM	1,085.8	-	-
7:30 AM	1,089.5	-	-
8:00 AM	1,081.2	-	-
8:30 AM	1,087.3	-	-
9:00 AM	1,101.7	-	-
9:30 AM	1,115.7	-	-
10:00 AM	1,129.4	-	-
10:30 AM	1,137.9	-	-
11:00 AM	1,140.5	-	-
11:30 AM	1,141.9	-	-
12:00 PM	1,150.8	-	-
12:30 PM	1,149.6	-	-
1:00 PM	1,152.2	-	-
1:30 PM	1,154.2	-	-
2:00 PM	1,153.7	-	-
2:30 PM	1,155.9	-	-
3:00 PM	1,161.6	-	-
3:30 PM	1,160.1	-	-
4:00 PM	1,155.3	-	-
4:30 PM	1,160.5	-	-
5:00 PM	1,160.1	-	-
5:30 PM	1,155.8	-	-
6:00 PM	1,155.1	-	-
6:30 PM	1,153.0	-	-
7:00 PM	1,147.5	-	-
7:30 PM	1,138.5	-	-
8:00 PM	1,139.4	-	-
8:30 PM	1,140.1	-	-
9:00 PM	1,142.7	-	-
9:30 PM	1,145.9	-	-
10:00 PM	1,147.5	-	-
10:30 PM	1,152.1	-	-
11:00 PM	1,146.5	-	-
11:30 PM	1,147.6	-	-
12:00 PM	1,143.6	-	-
12:30 PM	1,145.5	-	-
1:00 PM	1,146.4	-	-
1:30 PM	1,147.5	-	-
2:00 PM	1,144.1	-	-
2:30 PM	1,142.1	-	-
3:00 PM	1,146.0	-	-
3:30 PM	1,145.4	-	-
4:00 PM	1,145.7	-	-

Time	EAGLEGLENZONE5_P1 (gpm)	EAGLEGLENZONE5_P2 (gpm)	EAGLEGLENZONE5_P3 (gpm)
4:30 PM	1,144.8	-	-
5:00 PM	1,142.0	-	-
5:30 PM	1,130.4	-	-
6:00 PM	1,123.1	-	-
6:30 PM	1,092.7	-	-
7:00 PM	1,080.6	-	-
7:30 PM	1,076.3	-	-
8:00 PM	1,078.8	-	-
8:30 PM	1,069.5	-	-
9:00 PM	1,074.9	-	-
9:30 PM	1,090.3	-	-
10:00 PM	1,103.3	-	-
10:30 PM	1,117.7	-	-
11:00 PM	1,128.4	-	-
11:30 PM	1,130.9	-	-
12:00 AM	1,133.1	-	-


Eagleglen Pump Station Flows
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
Flow (gpm)
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time
Pump No. 1
Pump No. 2
Pump No. 3

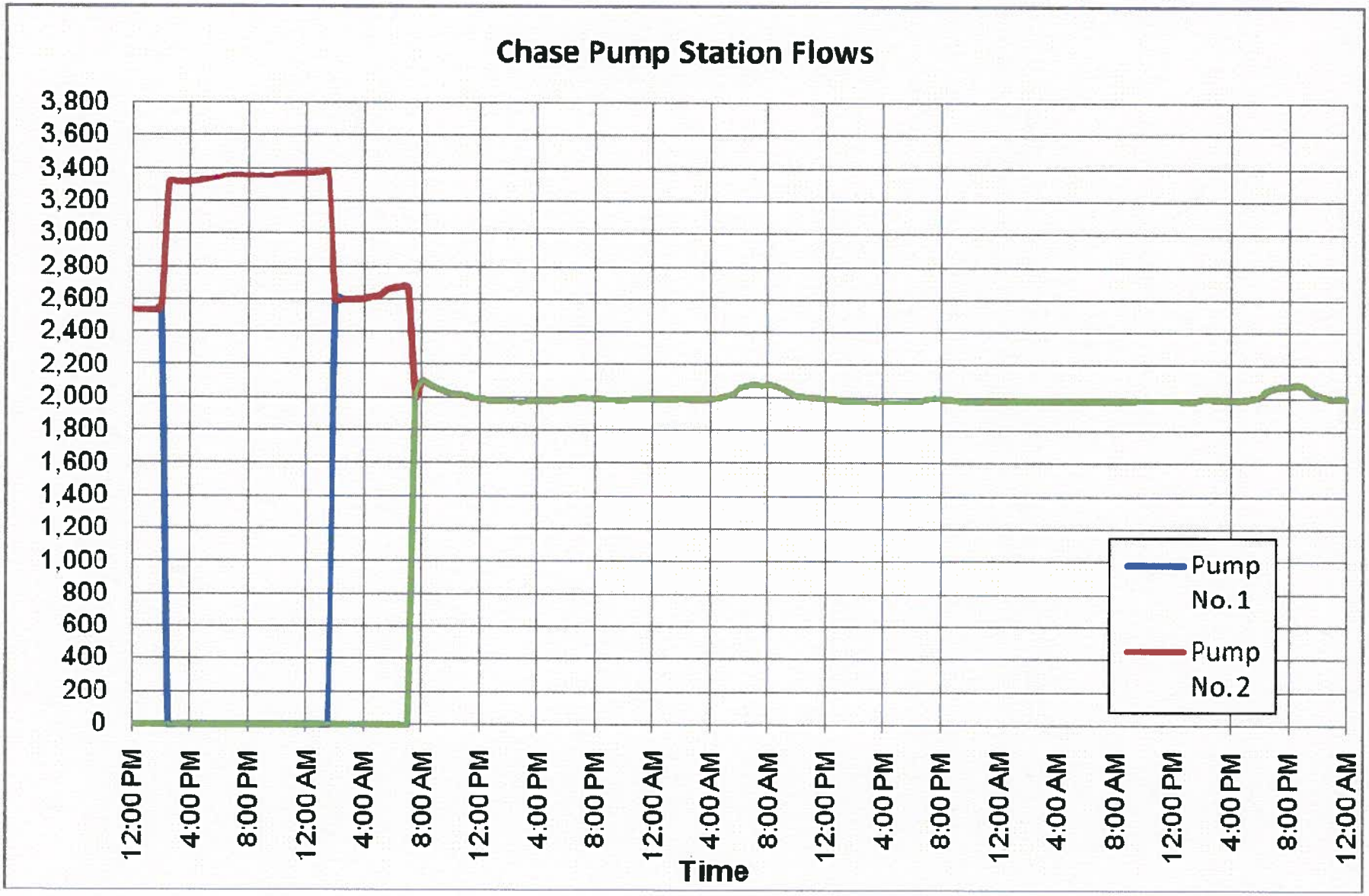
CHASE BPS-Pump Group Graphs Maximum Day Alternative I Option I

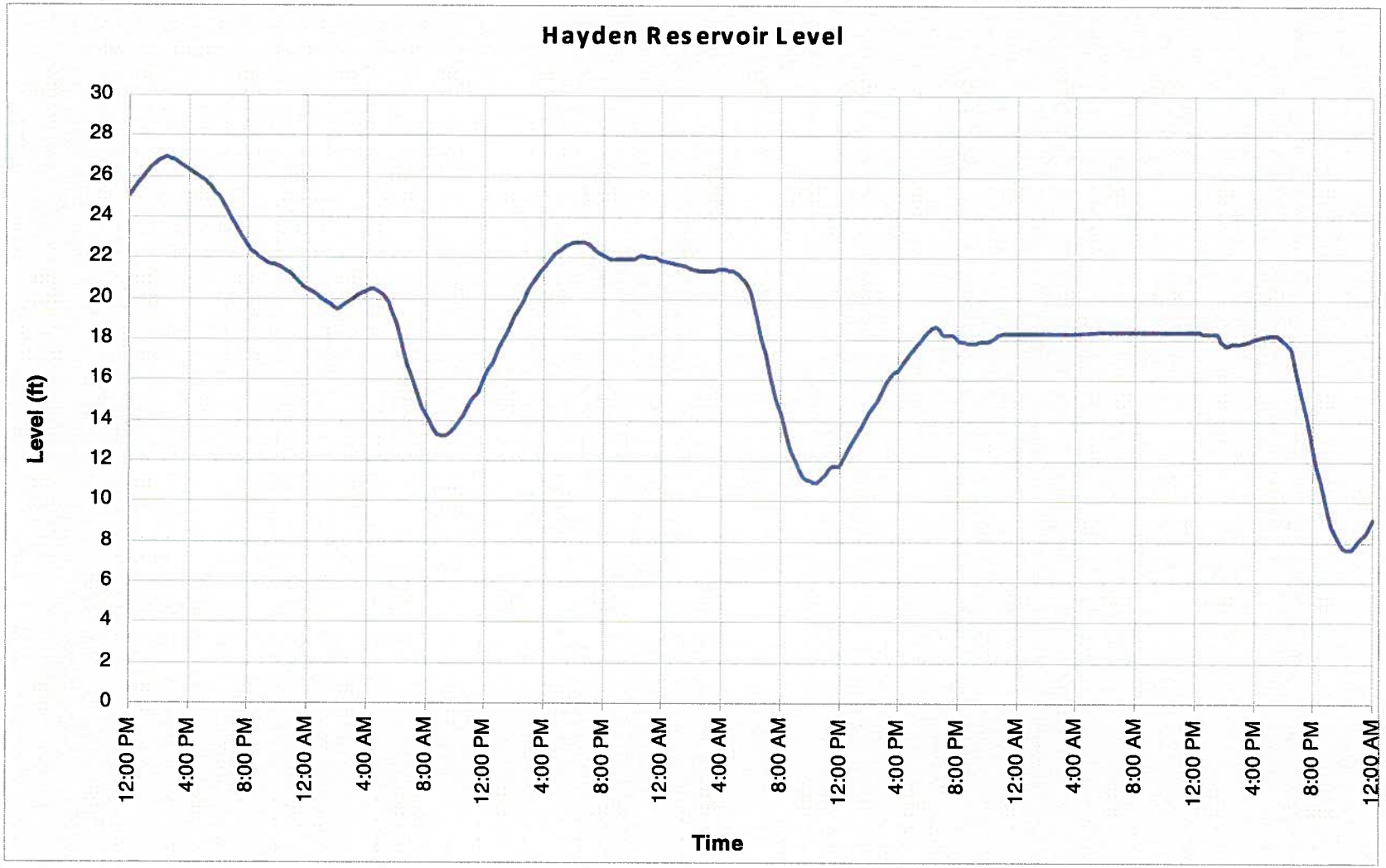
Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
12:00 PM	2,533.2	2,533.2	-
12:30 PM	2,528.3	2,528.3	-
1:00 PM	2,527.6	2,527.6	-
1:30 PM	2,525.0	2,525.0	-
2:00 PM	2,540.1	2,540.1	-
2:30 PM	-	3,311.2	-
3:00 PM	-	3,314.8	-
3:30 PM	-	3,314.7	-
4:00 PM	-	3,316.1	-
4:30 PM	-	3,320.5	-
5:00 PM	-	3,330.5	-
5:30 PM	-	3,339.1	-
6:00 PM	-	3,345.2	-
6:30 PM	-	3,356.6	-
7:00 PM	-	3,357.0	-
7:30 PM	-	3,358.3	-
8:00 PM	-	3,355.8	-
8:30 PM	-	3,355.6	-
9:00 PM	-	3,355.8	-
9:30 PM	-	3,354.4	-
10:00 PM	-	3,363.1	-
10:30 PM	-	3,364.2	-
11:00 PM	-	3,371.8	-
11:30 PM	-	3,373.4	-
12:00 AM	-	3,374.8	-
12:30 AM	-	3,376.0	-
1:00 AM	-	3,379.1	-
1:30 AM	-	3,382.2	-
2:00 AM	2,600.3	2,600.3	-
2:30 AM	2,597.0	2,597.0	-
3:00 AM	2,595.6	2,595.6	-
3:30 AM	2,597.1	2,597.1	-
4:00 AM	2,600.1	2,600.1	-
4:30 AM	2,611.8	2,611.8	-
5:00 AM	2,617.9	2,617.9	-
5:30 AM	2,652.6	2,652.6	-
6:00 AM	2,663.4	2,663.4	-
6:30 AM	2,670.3	2,670.3	-
7:00 AM	2,661.9	2,661.9	-
7:30 AM	1,997.9	1,997.9	1,997.9
8:00 AM	2,089.7	2,089.7	2,089.7
8:30 AM	2,071.1	2,071.1	2,071.1
9:00 AM	2,050.3	2,050.3	2,050.3
9:30 AM	2,033.3	2,033.3	2,033.3

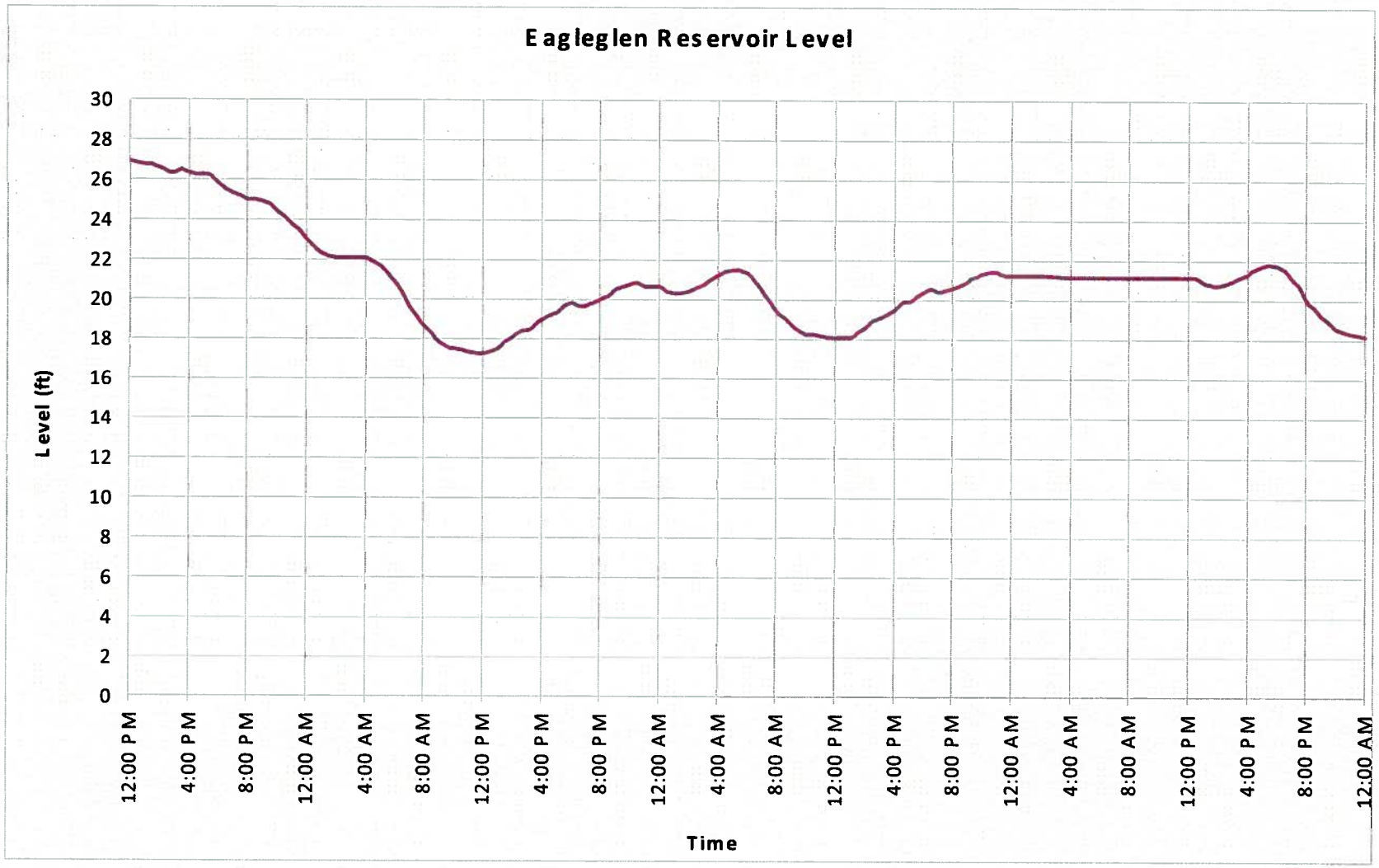
Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
10:00 AM	2,018.4	2,018.4	2,018.4
10:30 AM	2,012.6	2,012.6	2,012.6
11:00 AM	2,008.2	2,008.2	2,008.2
11:30 AM	1,991.7	1,991.7	1,991.7
12:00 PM	1,991.8	1,991.8	1,991.8
12:30 PM	1,982.1	1,982.1	1,982.1
1:00 PM	1,977.6	1,977.6	1,977.6
1:30 PM	1,976.1	1,976.1	1,976.1
2:00 PM	1,972.8	1,972.8	1,972.8
2:30 PM	1,966.5	1,966.5	1,966.5
3:00 PM	1,964.9	1,964.9	1,964.9
3:30 PM	1,980.8	1,980.8	1,980.8
4:00 PM	1,977.5	1,977.5	1,977.5
4:30 PM	1,977.0	1,977.0	1,977.0
5:00 PM	1,978.3	1,978.3	1,978.3
5:30 PM	1,983.5	1,983.5	1,983.5
6:00 PM	1,987.6	1,987.6	1,987.6
6:30 PM	1,989.6	1,989.6	1,989.6
7:00 PM	1,995.0	1,995.0	1,995.0
7:30 PM	1,992.2	1,992.2	1,992.2
8:00 PM	1,990.3	1,990.3	1,990.3
8:30 PM	1,985.8	1,985.8	1,985.8
9:00 PM	1,983.1	1,983.1	1,983.1
9:30 PM	1,981.7	1,981.7	1,981.7
10:00 PM	1,979.3	1,979.3	1,979.3
10:30 PM	1,984.8	1,984.8	1,984.8
11:00 PM	1,984.4	1,984.4	1,984.4
11:30 PM	1,989.1	1,989.1	1,989.1
12:00 AM	1,989.2	1,989.2	1,989.2
12:30 AM	1,989.1	1,989.1	1,989.1
1:00 AM	1,989.0	1,989.0	1,989.0
1:30 AM	1,990.4	1,990.4	1,990.4
2:00 AM	1,991.8	1,991.8	1,991.8
2:30 AM	1,988.1	1,988.1	1,988.1
3:00 AM	1,987.4	1,987.4	1,987.4
3:30 AM	1,987.6	1,987.6	1,987.6
4:00 AM	1,989.5	1,989.5	1,989.5
4:30 AM	1,992.5	1,992.5	1,992.5
5:00 AM	2,006.6	2,006.6	2,006.6
5:30 AM	2,016.0	2,016.0	2,016.0
6:00 AM	2,053.3	2,053.3	2,053.3
6:30 AM	2,066.4	2,066.4	2,066.4
7:00 AM	2,075.9	2,075.9	2,075.9
7:30 AM	2,067.6	2,067.6	2,067.6
8:00 AM	2,073.8	2,073.8	2,073.8
8:30 AM	2,065.3	2,065.3	2,065.3

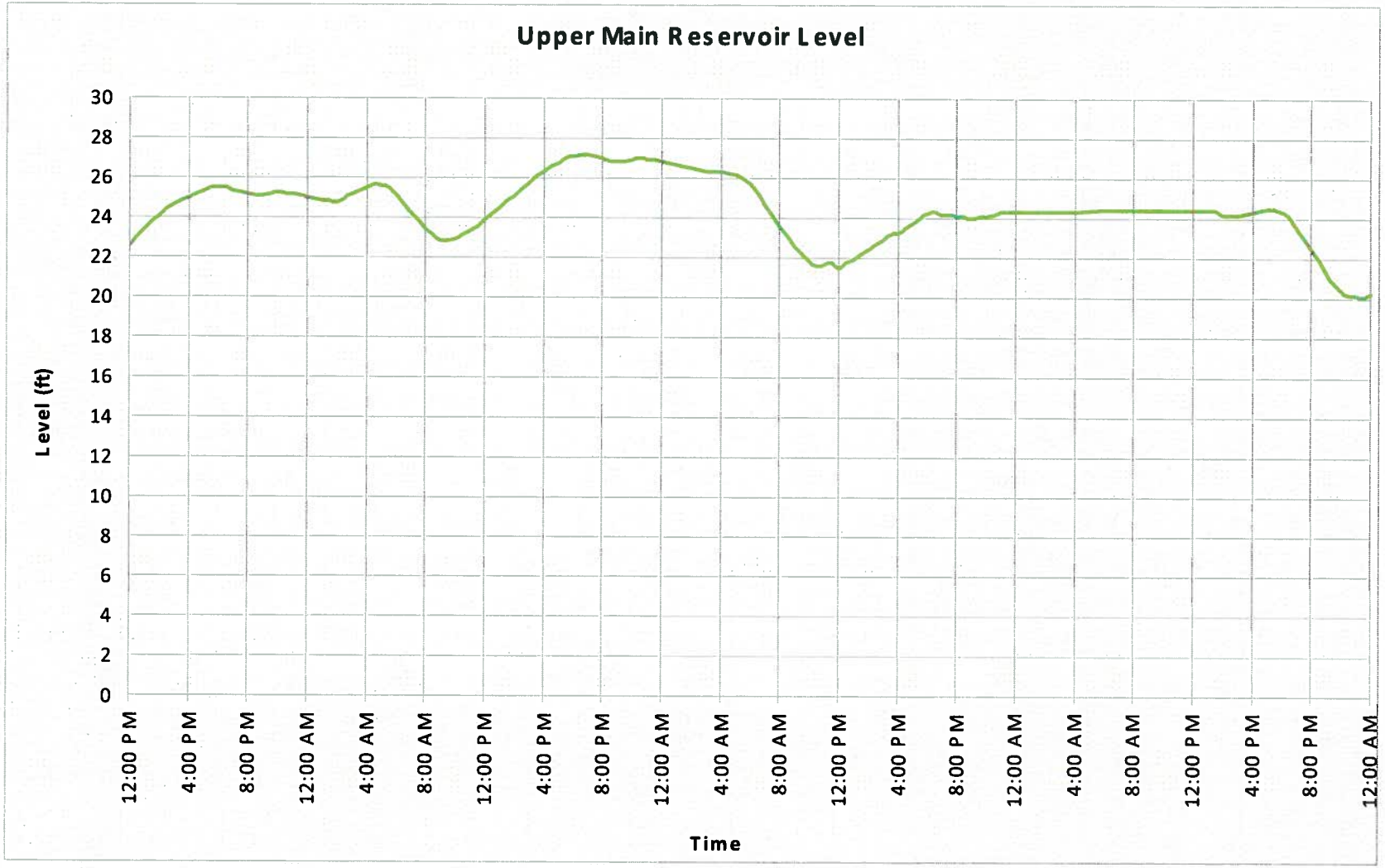
Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
9:00 AM	2,048.1	2,048.1	2,048.1
9:30 AM	2,023.3	2,023.3	2,023.3
10:00 AM	2,005.4	2,005.4	2,005.4
10:30 AM	2,002.3	2,002.3	2,002.3
11:00 AM	1,997.5	1,997.5	1,997.5
11:30 AM	1,993.8	1,993.8	1,993.8
12:00 PM	1,989.3	1,989.3	1,989.3
12:30 PM	1,989.5	1,989.5	1,989.5
1:00 PM	1,980.1	1,980.1	1,980.1
1:30 PM	1,975.8	1,975.8	1,975.8
2:00 PM	1,974.8	1,974.8	1,974.8
2:30 PM	1,971.8	1,971.8	1,971.8
3:00 PM	1,965.7	1,965.7	1,965.7
3:30 PM	1,964.1	1,964.1	1,964.1
4:00 PM	1,970.8	1,970.8	1,970.8
4:30 PM	1,966.1	1,966.1	1,966.1
5:00 PM	1,967.0	1,967.0	1,967.0
5:30 PM	1,968.0	1,968.0	1,968.0
6:00 PM	1,972.9	1,972.9	1,972.9
6:30 PM	1,977.0	1,977.0	1,977.0
7:00 PM	1,990.4	1,990.4	1,990.4
7:30 PM	1,993.9	1,993.9	1,993.9
8:00 PM	1,990.0	1,990.0	1,990.0
8:30 PM	1,987.6	1,987.6	1,987.6
9:00 PM	1,983.5	1,983.5	1,983.5
9:30 PM	1,979.9	1,979.9	1,979.9
10:00 PM	1,978.8	1,978.8	1,978.8
10:30 PM	1,974.6	1,974.6	1,974.6
11:00 PM	1,981.2	1,981.2	1,981.2
11:30 PM	1,979.7	1,979.7	1,979.7
12:00 PM	1,983.0	1,983.0	1,983.0
12:30 PM	1,982.4	1,982.4	1,982.4
1:00 PM	1,981.6	1,981.6	1,981.6
1:30 PM	1,980.7	1,980.7	1,980.7
2:00 PM	1,992.6	1,992.6	1,992.6
2:30 PM	1,992.4	1,992.4	1,992.4
3:00 PM	1,987.7	1,987.7	1,987.7
3:30 PM	1,985.5	1,985.5	1,985.5
4:00 PM	1,984.6	1,984.6	1,984.6
4:30 PM	1,986.0	1,986.0	1,986.0
5:00 PM	1,987.7	1,987.7	1,987.7
5:30 PM	1,998.2	1,998.2	1,998.2
6:00 PM	2,005.8	2,005.8	2,005.8
6:30 PM	2,041.5	2,041.5	2,041.5
7:00 PM	2,056.8	2,056.8	2,056.8
7:30 PM	2,068.2	2,068.2	2,068.2

Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
8:30 PM	2,076.4	2,076.4	2,076.4
9:00 PM	2,069.8	2,069.8	2,069.8
9:30 PM	2,034.0	2,034.0	2,034.0
10:00 PM	2,017.5	2,017.5	2,017.5
10:30 PM	2,006.2	2,006.2	2,006.2
11:00 PM	1,993.2	1,993.2	1,993.2
11:30 PM	1,995.7	1,995.7	1,995.7
12:00 AM	1,991.6	1,991.6	1,991.6


Chase Pump Station Flows
3,800
3,600
3,400
3,200
3,000
2,800
2,600
2,400
2,200
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time
Pump No. 1
Pump No. 2


Hayden Reservoir Level
Level (ft)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time


Eagleglen Reservoir Level
Level (ft)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time


Upper Main Reservoir Level
Level (ft)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
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Time

EXHIBIT 4: ALTERNATIVE II-OPTION I OPERATION CONDITION HYDRAULIC ANALYSIS, TANK LEVEL, AND PUMP GRAPHS

The Chase and Eagle Glen BPS are upgraded.

Arantine Hills pressure Zone 5. The acquisition of an easement would be needed for 2-8" line at south side of Arantine Hills Land development area.

Junction Report and Fire Flow Results
Alternative II Option I Maximum Day plus Fire Flow

Junction ID	Elevation (ft)	Maximum Day, Peak Hour (6:30 AM) Model Results			*Maximum Day plus Fire Flow Model Results						
		Demand (gpm)	Head (ft)	Pressure (psi)	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Available Flow at Hydrant (gpm)	Available Flow Pressure (psi)
NEW_2	992.0	244.0	1,176.5	79.9	244.0	79.9	1,176.5	2,500	57.2	5,732.0	20.3
NEW_3	939.0	333.4	1,176.5	102.9	333.4	102.9	1,176.5	3,000	77.5	7,821.6	20.6
NEW_5	959.8	-	1,176.4	93.9	-	93.9	1,176.4	3,000	68.2	6,921.1	20.5
NEW_6	959.0	5.7	1,176.4	94.2	5.7	94.2	1,176.4	2,500	72.2	6,537.6	20.4
NEW_7	958.0	120.5	1,176.4	94.6	120.5	94.6	1,176.4	3,000	65.1	6,267.7	20.4
NEW_8	976.8	-	1,176.4	86.5	-	86.5	1,176.4	3,000	60.7	6,461.6	20.4
NEW_9	1,003.0	31.0	1,176.4	75.1	31.0	75.1	1,176.4	3,500	44.5	5,755.1	20.3
NEW_10	999.0	2.7	1,176.4	76.9	2.7	76.9	1,176.4	2,500	44.3	3,698.8	20.1
NEW_11	1,047.0	78.8	1,176.4	56.1	78.8	56.1	1,176.4	2,500	35.2	4,112.6	20.2
NEW_12	1,040.0	315.7	1,176.4	59.1	315.7	59.1	1,176.4	2,500	38.2	4,654.7	20.2
NEW_13	1,102.0	-	1,176.4	32.3	-	32.3	1,176.4	2,500	12.0	1,593.0	20.0
NEW_15	1,071.5	-	1,176.4	45.4	-	45.4	1,176.4	2,500	18.2	2,371.2	20.1
NEW_16	1,106.0	78.9	1,361.1	110.5	78.9	110.5	1,361.1	1,500	86.8	3,537.3	20.1
NEW_17	1,115.0	78.9	1,361.2	106.7	78.9	106.7	1,361.2	1,500	86.4	3,852.7	20.1
NEW_18	974.0	115.1	1,176.4	87.7	115.1	87.7	1,176.4	2,500	61.5	5,269.0	20.3
NEW_19	935.5	86.5	1,176.5	104.4	86.5	104.4	1,176.5	3,000	77.2	7,216.2	20.5
NEW_21	1,074.0	-	1,361.1	124.4	-	124.4	1,361.1	2,500	63.4	3,449.3	20.1
NEW_22	1,071.5	68.8	1,361.1	125.5	68.8	125.5	1,361.1	2,500	64.5	3,540.0	20.1
NEW_23	1,074.0	64.6	1,176.4	44.4	64.6	44.4	1,176.4	2,500	22.6	2,806.6	20.1
NEW_24	1,111.0		1,176.4	28.3	0	28.31	1,176.35	2,500	5.3	1,051.3	20.0
NEW_25	1,102.0	-	1,368.0	115.3	-	115.3	1,368.0	2,500	110.2	14,386.6	22.1

***Explanation of fire flow model results:**

Each row of the fire flow results is one run in the model. Fire flow demands are only placed at one location at a time.

The residual pressure is the pressure available at the hydrant when the designated fire flow demand is applied at the hydrant or junction being analyzed.

The available flow at the hydrant is the maximum flow available at that location if the residual pressure were brought down to 20 psi (available flow pressure).

Maximum velocity equal 4.3 ft/sec(on 16" line from 04-47925 to New_3) when 3500 gpm Fire Flow applied to junction New_9.

The static demand is the maximum day demand at the time of the fire flow simulation without the fire flow demand.

The static pressure is the associated pressure at the same location. The static head is the associated HGL at the same location.

Pipe Report

Alternative II- Option I Maximum Day at Peak Hour (6:30 AM)

Pipe Id	From Node	To Node	Length (ft)	Diameter (in)	Roughness	*Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
04-47925-NEW_3	04-47925	NEW_3	1,789.2	16	130	1,139.12	1.8	1.4	0.8
NEW11-12	NEW_11	NEW_12	274.0	16	130	61.99	0.1	-	-
NEW11-23	NEW_11	NEW_23	674.1	16	130	59.48	0.1	-	-
NEW12-13	NEW_12	NEW_13	1,471.3	16	130	(258.89)	0.4	0.1	0.1
NEW12-15	NEW_12	NEW_15	745.4	8	120	5.15	0.0	-	-
NEW13-0445210	NEW_13	04-45210	794.3	16	130	(258.89)	0.4	0.0	0.1
NEW15-23	NEW_15	NEW_23	291.8	8	120	5.15	0.0	-	-
NEW16-17	NEW_16	NEW_17	275.9	8	120	(95.90)	0.6	0.1	0.3
NEW17-0542920	NEW_17	05-42920	1,549.1	8	120	(113.02)	0.7	0.6	0.4
NEW17A-0542920	NEW_17	05-42920	1,536.0	8	120	(113.54)	0.7	0.6	0.4
NEW19-3	NEW_19	NEW_3	708.4	16	130	(330.54)	0.5	0.1	0.1
NEW21-16	NEW_21	NEW_16	756.2	8	120	(17.02)	0.1	0.0	0.0
NEW21-22	NEW_21	NEW_22	253.8	8	120	17.02	0.1	-	0.0
NEW2-19	NEW_2	NEW_19	519.2	16	130	(244.03)	0.4	0.0	0.1
NEW22-17	NEW_22	NEW_17	991.7	8	120	(51.80)	0.3	0.1	0.1
NEW23-24	NEW_23	NEW_24	861.4	16	130	-	-	-	-
NEW3-5	NEW_3	NEW_5	588.7	16	130	475.24	0.8	0.1	0.2
NEW5-6	NEW_5	NEW_6	299.2	12	120	181.98	0.5	0.0	0.1
NEW5-8	NEW_5	NEW_8	451.1	16	130	293.26	0.5	0.0	0.1
NEW6-18	NEW_6	NEW_18	408.4	8	120	49.24	0.3	0.0	0.1
NEW6-7	NEW_6	NEW_7	293.6	12	120	127.01	0.4	0.0	0.1
NEW7-10	NEW_7	NEW_10	1,144.1	8	120	6.51	0.0	-	-
NEW8-18	NEW_8	NEW_18	299.7	8	120	65.88	0.4	0.0	0.1
NEW8-9	NEW_8	NEW_9	745.4	16	130	227.39	0.4	0.0	0.0
NEW9-10	NEW_9	NEW_10	635.5	8	120	(3.82)	0.0	-	-
NEW9-11	NEW_9	NEW_11	1,182.6	16	130	200.23	0.3	0.0	0.0

Pipe roughnesses per City of Corona Water Master Plan.

***Numbers in parenthesis indicates that the flow is in the reverse direction**

Pipe IDs NEW17-0542920, NEW16-17, NEW22-17, NEW21-16, NEW21-22 serve Zone 5, and all other lines serve Zone 4.

EAGLEGLEN BPS-Pump Group Graphs Option I Maximum Day Alternative II

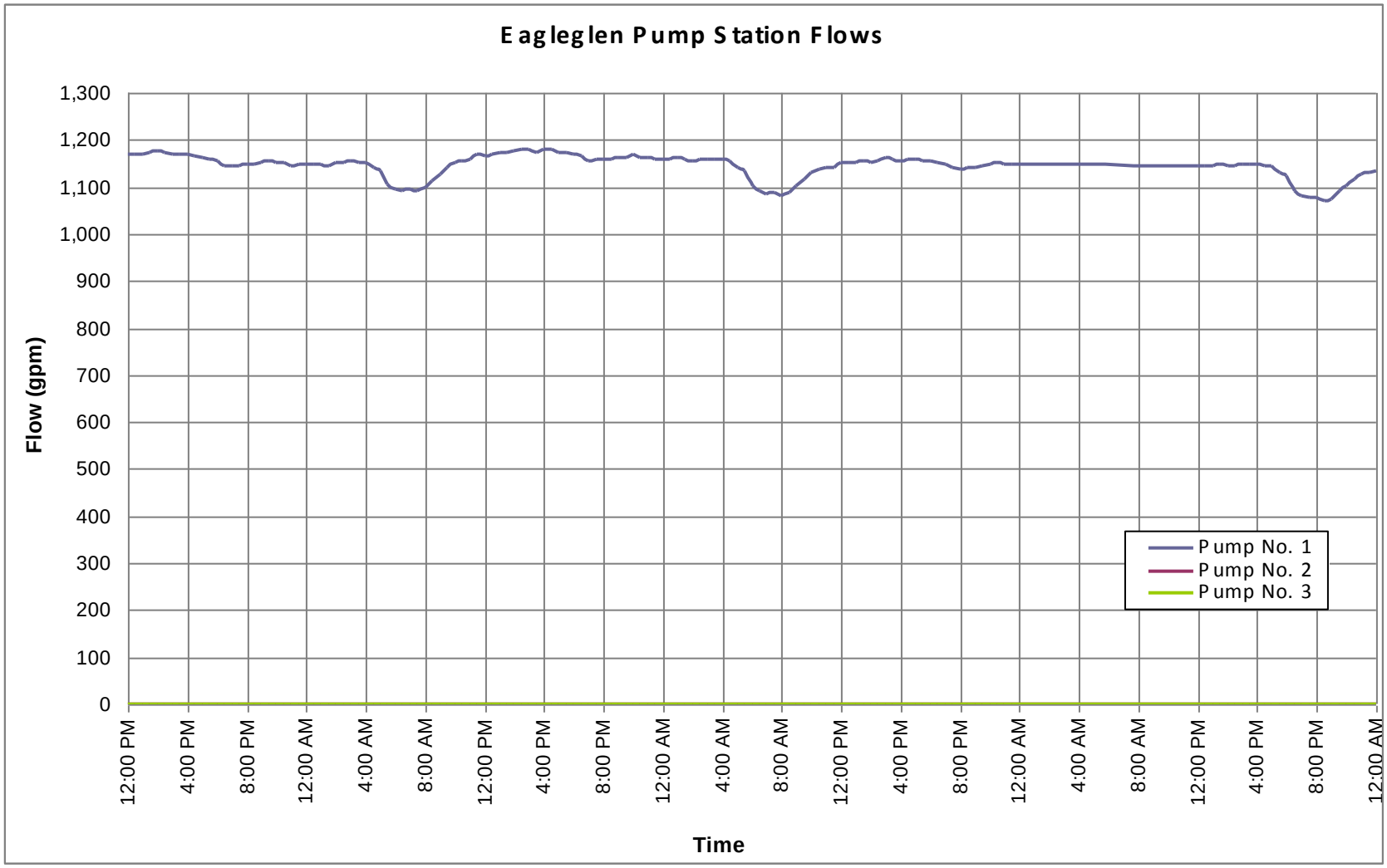
Time	EAGLEGLENZONE5_P1 (gpm)	EAGLEGLENZONE5_P2 (gpm)	EAGLEGLENZONE5_P3 (gpm)
12:00 PM	1,167.6	-	-
12:30 PM	1,169.9	-	-
1:00 PM	1,170.8	-	-
1:30 PM	1,172.5	-	-
2:00 PM	1,176.2	-	-
2:30 PM	1,174.3	-	-
3:00 PM	1,170.5	-	-
3:30 PM	1,170.5	-	-
4:00 PM	1,169.4	-	-
4:30 PM	1,165.9	-	-
5:00 PM	1,161.5	-	-
5:30 PM	1,160.2	-	-
6:00 PM	1,153.6	-	-
6:30 PM	1,143.1	-	-
7:00 PM	1,143.8	-	-
7:30 PM	1,143.8	-	-
8:00 PM	1,147.6	-	-
8:30 PM	1,149.2	-	-
9:00 PM	1,150.6	-	-
9:30 PM	1,155.1	-	-
10:00 PM	1,150.5	-	-
10:30 PM	1,150.6	-	-
11:00 PM	1,145.8	-	-
11:30 PM	1,149.3	-	-
12:00 AM	1,149.3	-	-
12:30 AM	1,149.6	-	-
1:00 AM	1,147.2	-	-
1:30 AM	1,145.3	-	-
2:00 AM	1,151.0	-	-
2:30 AM	1,152.7	-	-
3:00 AM	1,153.5	-	-
3:30 AM	1,152.8	-	-
4:00 AM	1,150.6	-	-
4:30 AM	1,140.7	-	-
5:00 AM	1,134.4	-	-
5:30 AM	1,105.7	-	-
6:00 AM	1,095.2	-	-
6:30 AM	1,092.3	-	-
7:00 AM	1,096.1	-	-
7:30 AM	1,090.3	-	-
8:00 AM	1,097.8	-	-
8:30 AM	1,112.5	-	-
9:00 AM	1,126.6	-	-
9:30 AM	1,141.3	-	-
10:00 AM	1,151.9	-	-
10:30 AM	1,155.2	-	-
11:00 AM	1,157.3	-	-
11:30 AM	1,168.1	-	-

EAGLEGLEN BPS-Pump Group Graphs Existing Maximum Day Alternative

Time	EAGLEGLENZONE5_P1 (gpm)	EAGLEGLENZONE5_P2 (gpm)	EAGLEGLENZONE5_P3 (gpm)
12:00 PM	1,167.3	-	-
12:30 PM	1,170.3	-	-
1:00 PM	1,172.5	-	-
1:30 PM	1,172.3	-	-
2:00 PM	1,174.8	-	-
2:30 PM	1,180.7	-	-
3:00 PM	1,179.4	-	-
3:30 PM	1,174.5	-	-
4:00 PM	1,179.3	-	-
4:30 PM	1,178.7	-	-
5:00 PM	1,174.1	-	-
5:30 PM	1,173.1	-	-
6:00 PM	1,170.7	-	-
6:30 PM	1,166.5	-	-
7:00 PM	1,156.9	-	-
7:30 PM	1,157.4	-	-
8:00 PM	1,157.5	-	-
8:30 PM	1,159.3	-	-
9:00 PM	1,162.3	-	-
9:30 PM	1,163.8	-	-
10:00 PM	1,168.0	-	-
10:30 PM	1,161.9	-	-
11:00 PM	1,162.8	-	-
11:30 PM	1,158.3	-	-
12:00 AM	1,159.6	-	-
12:30 AM	1,160.3	-	-
1:00 AM	1,161.1	-	-
1:30 AM	1,158.9	-	-
2:00 AM	1,156.3	-	-
2:30 AM	1,159.7	-	-
3:00 AM	1,158.5	-	-
3:30 AM	1,158.5	-	-
4:00 AM	1,157.2	-	-
4:30 AM	1,154.0	-	-
5:00 AM	1,141.7	-	-
5:30 AM	1,133.6	-	-
6:00 AM	1,102.0	-	-
6:30 AM	1,090.0	-	-
7:00 AM	1,085.7	-	-
7:30 AM	1,089.4	-	-
8:00 AM	1,081.0	-	-
8:30 AM	1,087.1	-	-
9:00 AM	1,101.5	-	-
9:30 AM	1,115.6	-	-
10:00 AM	1,129.1	-	-
10:30 AM	1,138.2	-	-
11:00 AM	1,140.6	-	-
11:30 AM	1,141.3	-	-

EAGLEGLEN BPS-Pump Group Graphs Existing Maximum Day Alternative

Time	EAGLEGLENZONE5_P1 (gpm)	EAGLEGLENZONE5_P2 (gpm)	EAGLEGLENZONE5_P3 (gpm)
12:00 PM	1,151.5	-	-
12:30 PM	1,150.3	-	-
1:00 PM	1,151.8	-	-
1:30 PM	1,153.8	-	-
2:00 PM	1,153.4	-	-
2:30 PM	1,155.6	-	-
3:00 PM	1,161.2	-	-
3:30 PM	1,159.8	-	-
4:00 PM	1,155.9	-	-
4:30 PM	1,159.6	-	-
5:00 PM	1,159.3	-	-
5:30 PM	1,155.1	-	-
6:00 PM	1,154.3	-	-
6:30 PM	1,152.2	-	-
7:00 PM	1,148.4	-	-
7:30 PM	1,139.4	-	-
8:00 PM	1,139.0	-	-
8:30 PM	1,139.7	-	-
9:00 PM	1,142.4	-	-
9:30 PM	1,145.6	-	-
10:00 PM	1,147.5	-	-
10:30 PM	1,152.0	-	-
11:00 PM	1,146.4	-	-
11:30 PM	1,147.5	-	-
12:00 PM	1,143.5	-	-
12:30 PM	1,145.5	-	-
1:00 PM	1,145.8	-	-
1:30 PM	1,146.9	-	-
2:00 PM	1,145.3	-	-
2:30 PM	1,143.3	-	-
3:00 PM	1,147.1	-	-
3:30 PM	1,146.5	-	-
4:00 PM	1,146.7	-	-
4:30 PM	1,145.7	-	-
5:00 PM	1,142.8	-	-
5:30 PM	1,129.4	-	-
6:00 PM	1,122.2	-	-
6:30 PM	1,092.0	-	-
7:00 PM	1,080.7	-	-
7:30 PM	1,076.4	-	-
8:00 PM	1,078.5	-	-
8:30 PM	1,069.9	-	-
9:00 PM	1,074.1	-	-
9:30 PM	1,090.5	-	-
10:00 PM	1,102.5	-	-
10:30 PM	1,117.7	-	-
11:00 PM	1,128.4	-	-
11:30 PM	1,130.5	-	-
12:00 AM	1,132.8	-	-


Eagleglen Pump Station Flows
Flow (gpm)
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time
Pump No. 1
Pump No. 2
Pump No. 3

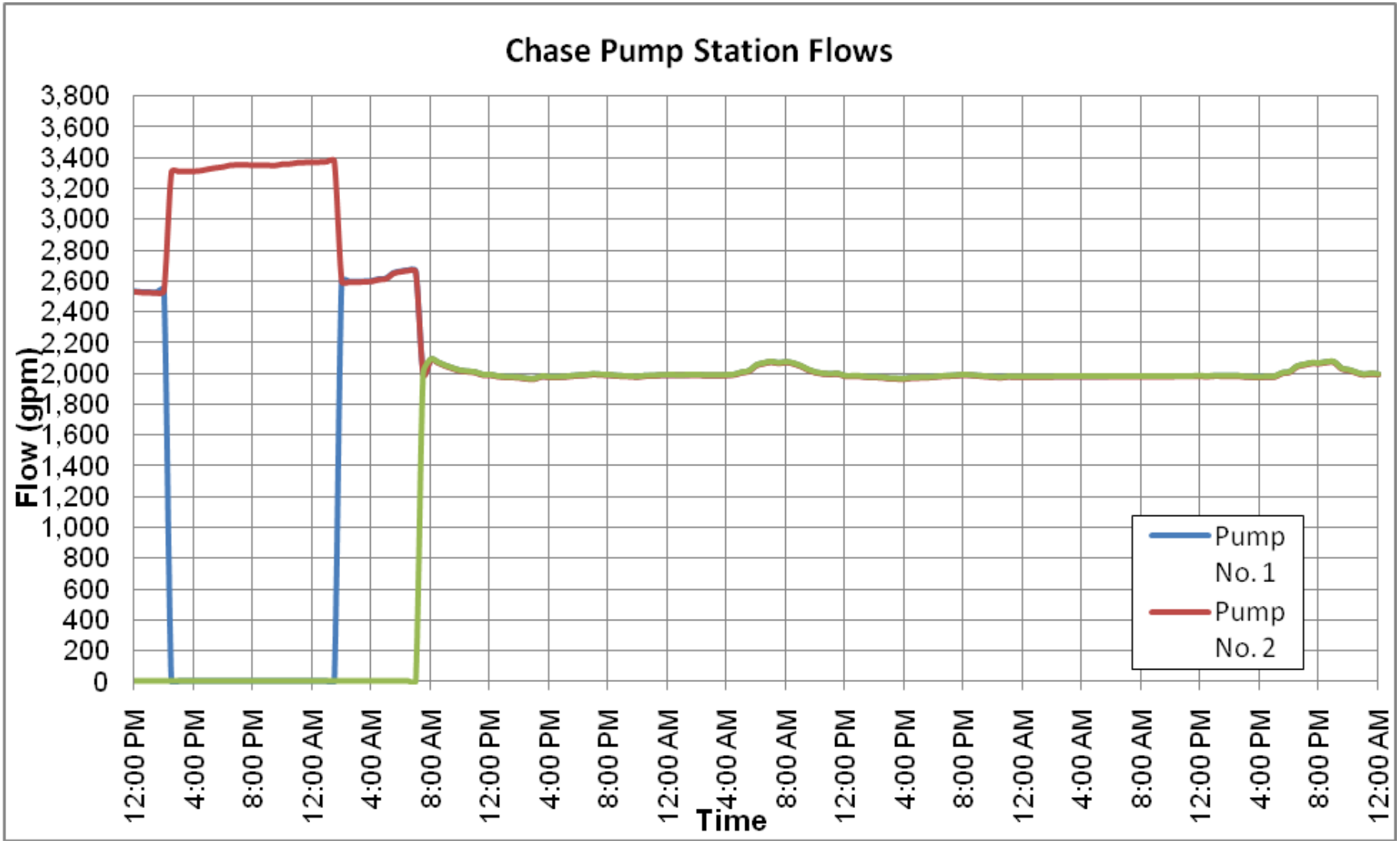
CHASE BPS- Pump Group Graphs Option I Maximum Day Alternative II

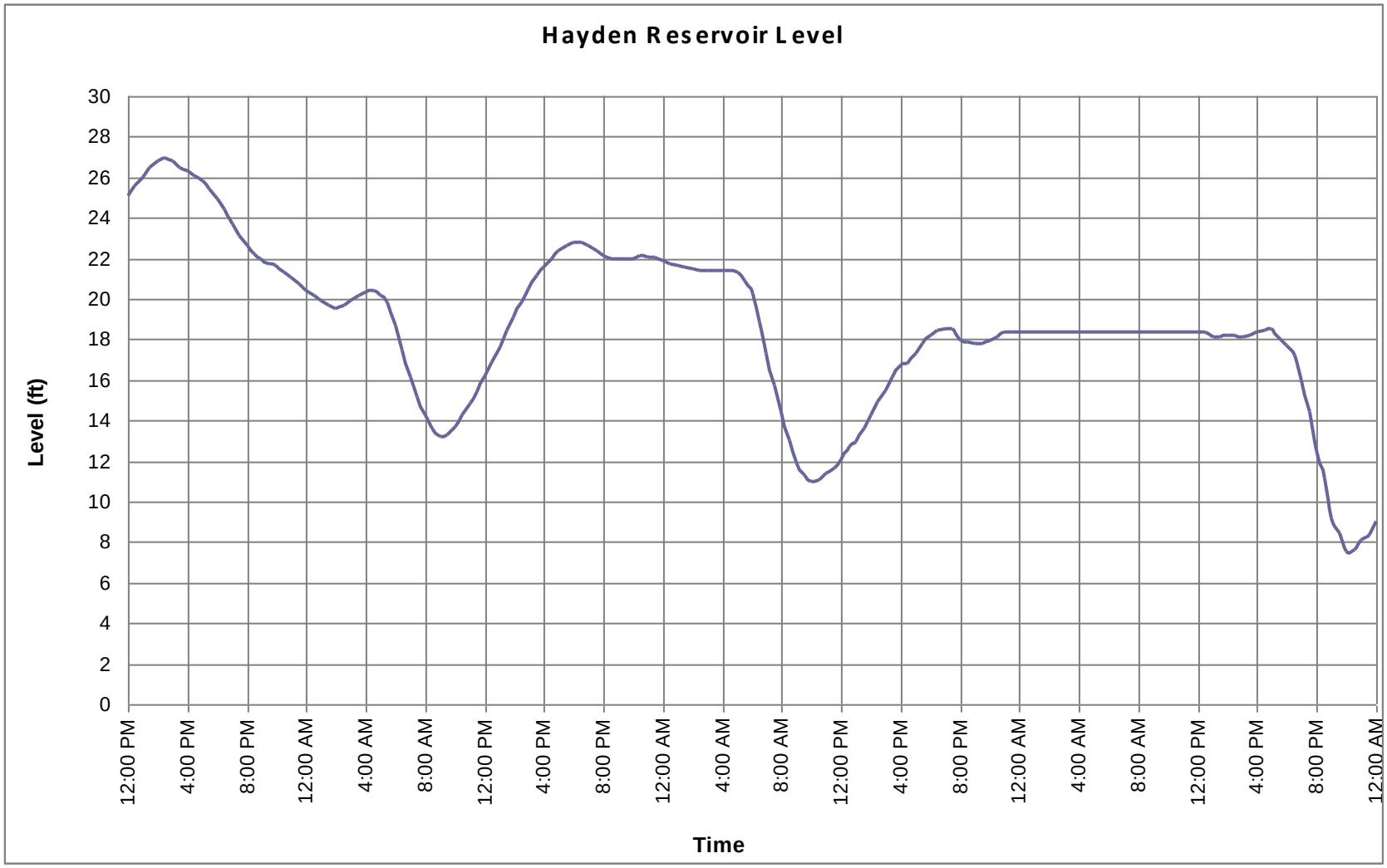
Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
12:00 PM	2,533.2	2,533.2	-
12:30 PM	2,528.3	2,528.3	-
1:00 PM	2,527.6	2,527.6	-
1:30 PM	2,525.0	2,525.0	-
2:00 PM	2,540.1	2,540.1	-
2:30 PM	-	3,311.2	-
3:00 PM	-	3,314.8	-
3:30 PM	-	3,314.7	-
4:00 PM	-	3,316.1	-
4:30 PM	-	3,320.5	-
5:00 PM	-	3,330.5	-
5:30 PM	-	3,339.1	-
6:00 PM	-	3,345.2	-
6:30 PM	-	3,356.6	-
7:00 PM	-	3,357.0	-
7:30 PM	-	3,358.3	-
8:00 PM	-	3,355.9	-
8:30 PM	-	3,355.6	-
9:00 PM	-	3,355.8	-
9:30 PM	-	3,354.4	-
10:00 PM	-	3,363.1	-
10:30 PM	-	3,364.2	-
11:00 PM	-	3,371.8	-
11:30 PM	-	3,373.4	-
12:00 AM	-	3,374.8	-
12:30 AM	-	3,376.1	-
1:00 AM	-	3,379.1	-
1:30 AM	-	3,382.2	-
2:00 AM	2,600.4	2,600.4	-
2:30 AM	2,597.0	2,597.0	-
3:00 AM	2,595.6	2,595.6	-
3:30 AM	2,597.1	2,597.1	-
4:00 AM	2,600.2	2,600.2	-
4:30 AM	2,611.8	2,611.8	-
5:00 AM	2,618.0	2,618.0	-
5:30 AM	2,652.6	2,652.6	-
6:00 AM	2,663.4	2,663.4	-
6:30 AM	2,670.4	2,670.4	-
7:00 AM	2,662.0	2,662.0	-
7:30 AM	1,997.9	1,997.9	1,997.9
8:00 AM	2,089.8	2,089.8	2,089.8
8:30 AM	2,071.1	2,071.1	2,071.1
9:00 AM	2,050.3	2,050.3	2,050.3
9:30 AM	2,033.3	2,033.3	2,033.3
10:00 AM	2,018.4	2,018.4	2,018.4

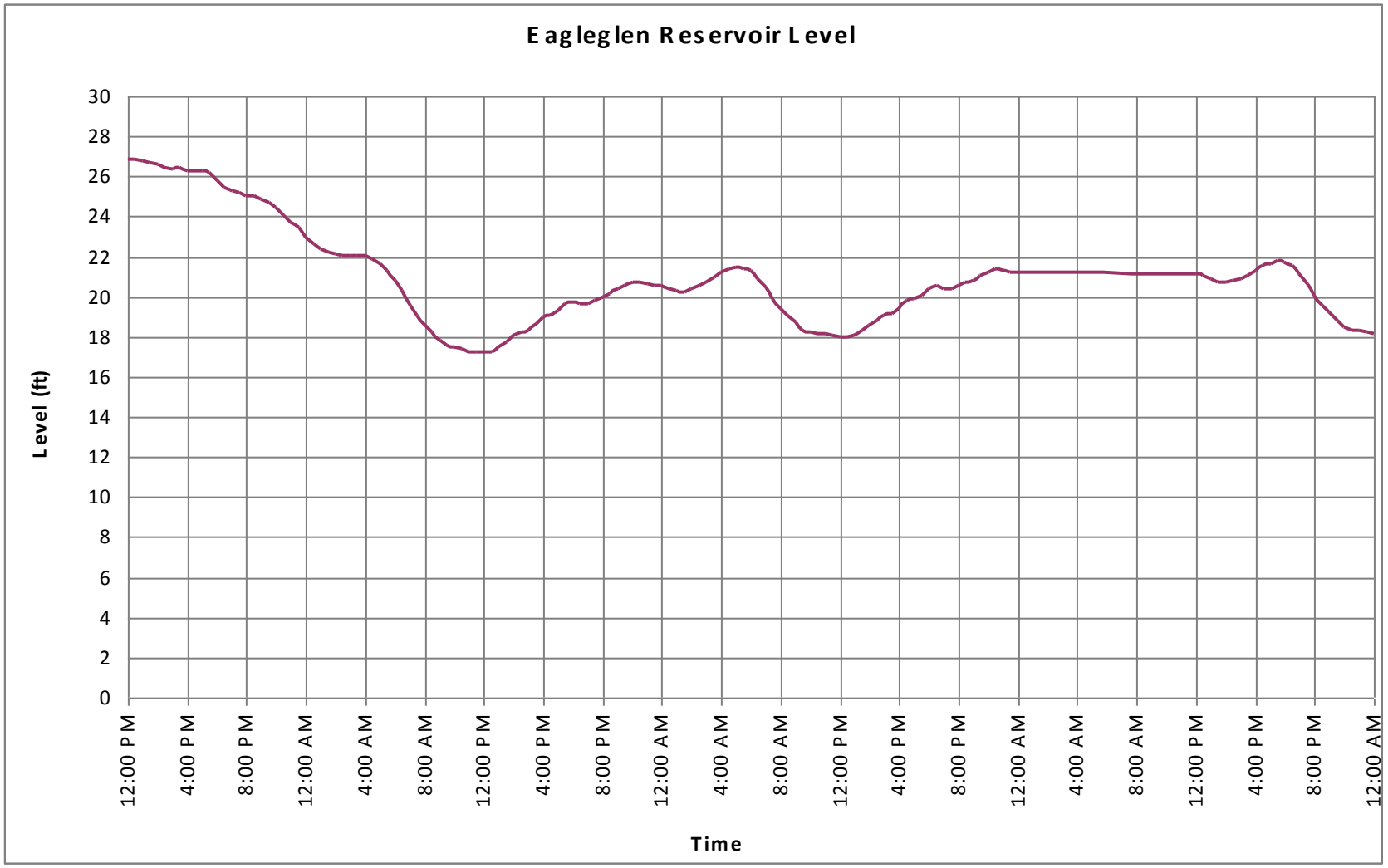
Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
10:30 AM	2,012.6	2,012.6	2,012.6
11:00 AM	2,008.3	2,008.3	2,008.3
11:30 AM	1,991.7	1,991.7	1,991.7
12:00 PM	1,991.8	1,991.8	1,991.8
12:30 PM	1,982.1	1,982.1	1,982.1
1:00 PM	1,977.6	1,977.6	1,977.6
1:30 PM	1,976.1	1,976.1	1,976.1
2:00 PM	1,972.8	1,972.8	1,972.8
2:30 PM	1,966.6	1,966.6	1,966.6
3:00 PM	1,965.0	1,965.0	1,965.0
3:30 PM	1,980.8	1,980.8	1,980.8
4:00 PM	1,977.5	1,977.5	1,977.5
4:30 PM	1,977.0	1,977.0	1,977.0
5:00 PM	1,978.3	1,978.3	1,978.3
5:30 PM	1,983.5	1,983.5	1,983.5
6:00 PM	1,987.6	1,987.6	1,987.6
6:30 PM	1,989.6	1,989.6	1,989.6
7:00 PM	1,995.0	1,995.0	1,995.0
7:30 PM	1,992.2	1,992.2	1,992.2
8:00 PM	1,990.3	1,990.3	1,990.3
8:30 PM	1,985.8	1,985.8	1,985.8
9:00 PM	1,983.1	1,983.1	1,983.1
9:30 PM	1,981.7	1,981.7	1,981.7
10:00 PM	1,979.3	1,979.3	1,979.3
10:30 PM	1,984.9	1,984.9	1,984.9
11:00 PM	1,984.4	1,984.4	1,984.4
11:30 PM	1,989.1	1,989.1	1,989.1
12:00 AM	1,989.2	1,989.2	1,989.2
12:30 AM	1,989.1	1,989.1	1,989.1
1:00 AM	1,989.0	1,989.0	1,989.0
1:30 AM	1,990.4	1,990.4	1,990.4
2:00 AM	1,991.8	1,991.8	1,991.8
2:30 AM	1,988.0	1,988.0	1,988.0
3:00 AM	1,987.4	1,987.4	1,987.4
3:30 AM	1,987.5	1,987.5	1,987.5
4:00 AM	1,989.5	1,989.5	1,989.5
4:30 AM	1,992.5	1,992.5	1,992.5
5:00 AM	2,006.5	2,006.5	2,006.5
5:30 AM	2,016.0	2,016.0	2,016.0
6:00 AM	2,053.2	2,053.2	2,053.2
6:30 AM	2,066.3	2,066.3	2,066.3
7:00 AM	2,075.8	2,075.8	2,075.8
7:30 AM	2,067.6	2,067.6	2,067.6
8:00 AM	2,073.7	2,073.7	2,073.7
8:30 AM	2,065.2	2,065.2	2,065.2
9:00 AM	2,048.0	2,048.0	2,048.0
9:30 AM	2,023.2	2,023.2	2,023.2

Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
10:00 AM	2,006.5	2,006.5	2,006.5
10:30 AM	1,998.7	1,998.7	1,998.7
11:00 AM	1,996.0	1,996.0	1,996.0
11:30 AM	1,998.2	1,998.2	1,998.2
12:00 PM	1,983.3	1,983.3	1,983.3
12:30 PM	1,983.6	1,983.6	1,983.6
1:00 PM	1,982.0	1,982.0	1,982.0
1:30 PM	1,977.7	1,977.7	1,977.7
2:00 PM	1,976.6	1,976.6	1,976.6
2:30 PM	1,973.6	1,973.6	1,973.6
3:00 PM	1,967.4	1,967.4	1,967.4
3:30 PM	1,965.8	1,965.8	1,965.8
4:00 PM	1,965.4	1,965.4	1,965.4
4:30 PM	1,972.4	1,972.4	1,972.4
5:00 PM	1,972.7	1,972.7	1,972.7
5:30 PM	1,973.6	1,973.6	1,973.6
6:00 PM	1,978.4	1,978.4	1,978.4
6:30 PM	1,982.3	1,982.3	1,982.3
7:00 PM	1,984.0	1,984.0	1,984.0
7:30 PM	1,987.5	1,987.5	1,987.5
8:00 PM	1,991.4	1,991.4	1,991.4
8:30 PM	1,989.1	1,989.1	1,989.1
9:00 PM	1,984.9	1,984.9	1,984.9
9:30 PM	1,981.3	1,981.3	1,981.3
10:00 PM	1,978.3	1,978.3	1,978.3
10:30 PM	1,974.0	1,974.0	1,974.0
11:00 PM	1,980.7	1,980.7	1,980.7
11:30 PM	1,979.2	1,979.2	1,979.2
12:00 PM	1,982.5	1,982.5	1,982.5
12:30 PM	1,981.8	1,981.8	1,981.8
1:00 PM	1,985.0	1,985.0	1,985.0
1:30 PM	1,983.9	1,983.9	1,983.9
2:00 PM	1,983.9	1,983.9	1,983.9
2:30 PM	1,983.8	1,983.8	1,983.8
3:00 PM	1,979.5	1,979.5	1,979.5
3:30 PM	1,977.5	1,977.5	1,977.5
4:00 PM	1,976.8	1,976.8	1,976.8
4:30 PM	1,978.3	1,978.3	1,978.3
5:00 PM	1,980.1	1,980.1	1,980.1
5:30 PM	2,002.6	2,002.6	2,002.6
6:00 PM	2,010.1	2,010.1	2,010.1
6:30 PM	2,045.8	2,045.8	2,045.8
7:00 PM	2,056.9	2,056.9	2,056.9
7:30 PM	2,067.6	2,067.6	2,067.6
8:00 PM	2,066.3	2,066.3	2,066.3
8:30 PM	2,074.0	2,074.0	2,074.0

Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
9:00 PM	2,073.9	2,073.9	2,073.9
9:30 PM	2,032.6	2,032.6	2,032.6
10:00 PM	2,022.3	2,022.3	2,022.3
10:30 PM	2,005.7	2,005.7	2,005.7
11:00 PM	1,992.8	1,992.8	1,992.8
11:30 PM	1,998.6	1,998.6	1,998.6
12:00 AM	1,994.3	1,994.3	1,994.3


Chase Pump Station Flows
Flow (gpm)
3,800
3,600
3,400
3,200
3,000
2,800
2,600
2,400
2,200
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time
Pump No. 1
Pump No. 2


Hayden Reservoir Level
Level (ft)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time


Eagleglen Reservoir Level
Level (ft)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time

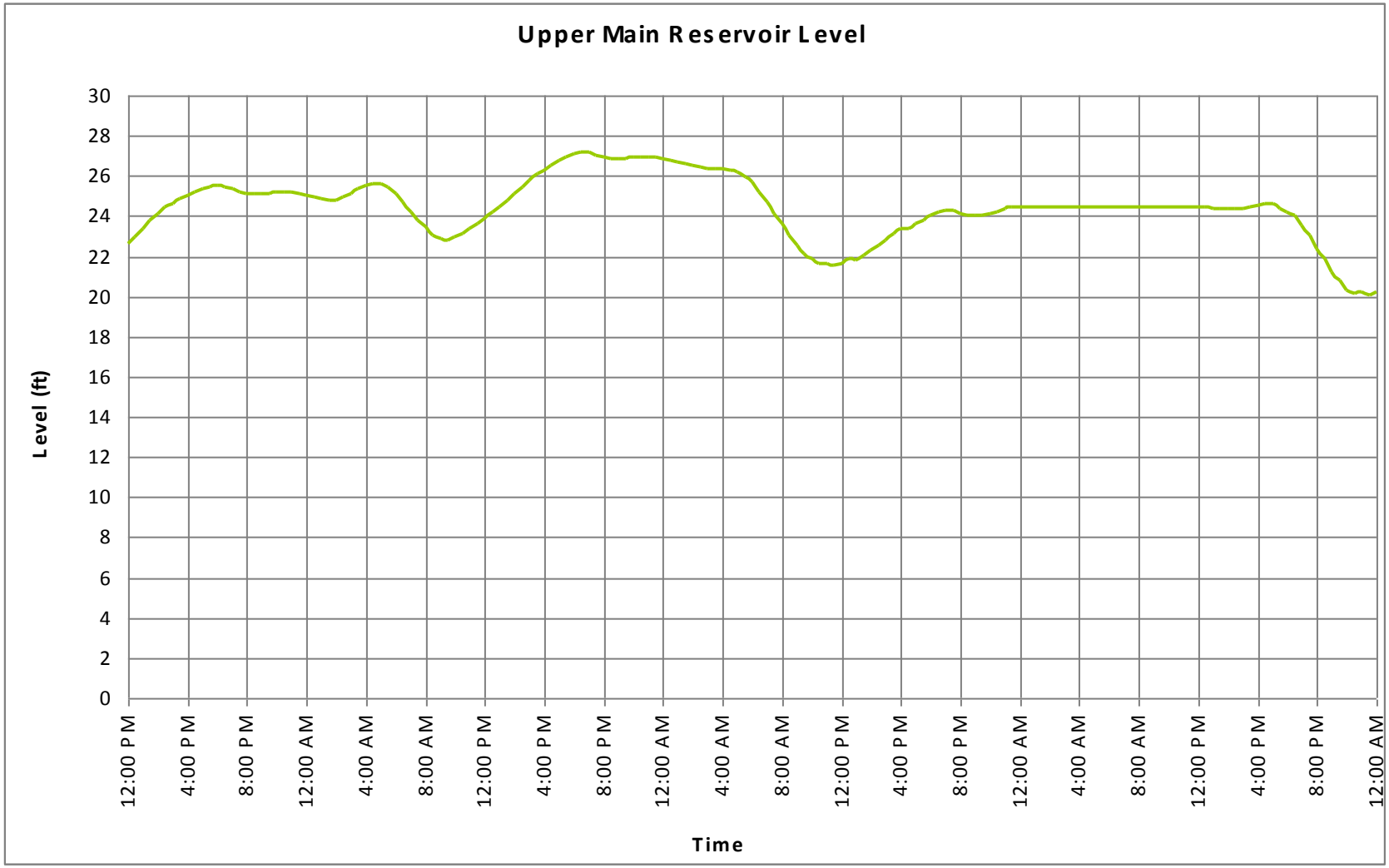

Upper Main Reservoir Level
Level (ft)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time

EXHIBIT 5: ALTERNATIVE III-OPTION I OPERATION CONDITION HYDRAULIC ANALYSIS, TANK LEVEL, AND PUMP GRAPHS

The Chase and Eagle Glen BPS are upgraded.

2-8" water line are connected to existing 16-inch pressure Zone 5 water line on Leonard way to feed

All Arantine Hills land development area is considered as pressure Zone 4.

The pump and reservoirs graphs are not included since this alternative is not acceptable due to low water pressure in Zone 5 area.

Junction Report and Fire Flow Results
Alternative III Option I Maximum Day plus Fire Flow

Junction ID	Elevation (ft)	Maximum Day, Peak Hour (6:30 AM) Model Results			*Maximum Day plus Fire Flow Model Results						
		Demand (gpm)	Head (ft)	Pressure (psi)	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Available Flow at Hydrant (gpm)	Available Flow Pressure (psi)
NEW_2	992.0	244.03	1,170.6	77.4	244.0	77.4	1,170.56	2,500	53.9	5,487.3	20.3
NEW_3	939.0	333.35	1,170.6	100.4	333.4	100.4	1,170.64	3,000	74.4	7,527.2	20.5
NEW_5	959.8	-	1,170.5	91.3	-	91.3	1,170.52	3,000	65.2	6,628.3	20.4
NEW_6	959.0	5.72	1,170.5	91.6	5.7	91.6	1,170.48	2,500	68.9	6,271.2	20.4
NEW_7	958.0	120.50	1,170.5	92.1	120.5	92.1	1,170.46	3,000	62.1	6,027.5	20.4
NEW_8	976.8	-	1,170.5	83.9	-	83.9	1,170.5	3,000	57.6	6,165.4	20.4
NEW_9	1,003.0	30.97	1,170.4	72.6	31.0	72.6	1,170.4	3,500	41.3	5,453.7	20.3
NEW_10	999.0	2.69	1,170.4	74.3	2.7	74.3	1,170.44	2,500	41.0	3,554.1	20.1
NEW_11	1,047.0	78.76	1,170.4	53.5	78.8	53.5	1,170.35	2,500	31.8	3,783.9	20.1
NEW_12	1,040.0	315.73	1,170.4	56.5	315.7	56.5	1,170.35	2,500	34.9	4,328.4	20.2
NEW_13	1,102.0	-	1,170.5	29.7	-	29.7	1,170.51	2,500	8.8	1,240.5	20.0
NEW_14	1,074.0	64.63	1,170.3	41.7	64.6	41.7	1,170.31	2,500	19.1	2,477.4	20.1
NEW_15	1,071.5	68.82	1,170.3	42.8	68.8	42.8	1,170.29	2,500	16.8	2,316.1	20.1
NEW_16	1,106.0	78.88	1,170.3	27.9	78.9	27.9	1,170.30	1,500	14.8	1,029.1	20.0
NEW_17	1,115.0	87.80	1,170.3	24.0	87.8	24.0	1,170.27	1,500	8.3	550.9	20.0
NEW_18	974.0	115.12	1,170.4	85.1	115.1	85.1	1,170.44	2,500	58.3	5,078.3	20.3
NEW_19	935.5	86.51	1,170.6	101.9	86.5	101.9	1,170.59	3,000	74.2	6,949.4	20.5
NEW_25	1,102.0	-	1,368.0	115.2	-	115.2	1,367.95	2,500	110.2	14,406.9	22.1

***Explanation of fire flow model results:**

Each row of the fire flow results is one run in the model. Fire flow demands are only placed at one location at a time.

The residual pressure is the pressure available at the hydrant when the designated fire flow demand is applied at the hydrant or junction being analyzed.

The available flow at the hydrant is the maximum flow available at that location if the residual pressure were brought down to 20 psi (available flow pressure).

Maximum velocity equal 4.5 ft/sec(on 16" line from 04-48925 to New_3) when 3500 gpm Fire Flow applied to junction New_9.

The static demand is the maximum day demand at the time of the fire flow simulation without the fire flow demand.

The static pressure is the associated pressure at the same location. The static head is the associated HGL at the same location.

Pipe Report
Alternative III- Option I Maximum Day at Peak Hour (6:30 AM)

ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
04-47925-NEW_3	04-47925	NEW_3	1,789.2	16	130	1,237.4	2.0	1.7	0.9
NEW11_14	NEW_11	NEW_14	678.8	16	130	253.5	0.4	0.0	0.1
NEW11-12	NEW_11	NEW_12	274.0	16	130	(33.7)	0.1	-	-
NEW12-13	NEW_12	NEW_13	1,471.3	16	130	(396.1)	0.6	0.2	0.1
NEW12-15	NEW_12	NEW_15	745.4	8	120	46.7	0.3	0.1	0.1
NEW13-0445210	NEW_13	04-45210	794.3	16	130	(396.1)	0.6	0.1	0.1
NEW14-15	NEW_14	NEW_15	263.1	8	120	48.4	0.3	0.0	0.1
NEW14-16	NEW_14	NEW_16	795.2	16	130	140.4	0.2	0.0	0.0
NEW15-17	NEW_15	NEW_17	1,037.2	8	120	26.3	0.2	0.0	0.0
NEW16-17	NEW_16	NEW_17	275.9	8	120	61.5	0.4	0.0	0.1
NEW19-3	NEW_19	NEW_3	708.4	16	130	(330.5)	0.5	0.1	0.1
NEW2-19	NEW_2	NEW_19	519.2	16	130	(244.0)	0.4	0.0	0.1
NEW3-5	NEW_3	NEW_5	538.4	16	130	573.5	0.9	0.1	0.2
NEW5-6	NEW_5	NEW_6	299.2	12	120	201.1	0.6	0.1	0.2
NEW5-8	NEW_5	NEW_8	451.1	16	130	372.4	0.6	0.1	0.1
NEW6-18	NEW_6	NEW_18	408.4	8	120	52.8	0.3	0.0	0.1
NEW6-7	NEW_6	NEW_7	293.6	12	120	142.6	0.4	0.0	0.1
NEW7-10	NEW_7	NEW_10	1,144.1	8	120	22.1	0.1	0.0	0.0
NEW8-18	NEW_8	NEW_18	299.7	8	120	62.3	0.4	0.0	0.1
NEW8-9	NEW_8	NEW_9	745.4	16	130	310.1	0.5	0.1	0.1
NEW9-10	NEW_9	NEW_10	635.5	8	120	(19.4)	0.1	0.0	0.0
NEW9-11	NEW_9	NEW_11	1,182.6	16	130	298.5	0.5	0.1	0.1

Pipe roughnesses per City of Corona Water Master Plan.
***Numbers in parenthesis indicates that the flow is in the reverse direction**

Pipe IDs New14 – 16, New16-17, New14-15, New15-17 serve Zone 5, and the other lines serve Zone 4.

EXHIBIT 6: ALTERNATIVE I-OPTION II OPERATION CONDITION HYDRAULIC ANALYSIS, TANK LEVEL, AND PUMP GRAPHS

The Chase and Eagle Glen BPS are upgraded. Masters reservoir is in service.
2-8" water line are connected to existing 20-inch pressure Zone 5 water line on Eagle Glen Parkway to feed Arantine Hills pressure Zone 5.

Junction Report and Fire Flow Results
Alternative I Option II Maximum Day plus Fire Flow

Junction ID	Elevation (ft)	Maximum Day, Peak Hour (6:30 AM) Model Results			*Maximum Day plus Fire Flow Model Results						
		Demand (gpm)	Head (ft)	Pressure (psi)	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Available Flow at Hydrant (gpm)	Available Flow Pressure (psi)
NEW_2	992	244.03	1,201.51	90.8	244.0	90.8	1,201.5	2,500	82.8	10,350.3	21.0
NEW_3	939	333.35	1,201.59	113.8	333.4	113.8	1,201.6	3,000	106.4	16,061.3	22.5
NEW_5	960	-	1,201.67	104.8	-	104.8	1,201.7	3,000	97.6	14,993.3	22.3
NEW_6	959	5.72	1,201.66	105.2	5.7	105.2	1,201.7	2,500	98.3	12,578.7	21.6
NEW_7	958	120.50	1,201.66	105.6	120.5	105.6	1,201.7	3,000	94.7	10,846.7	21.2
NEW_8	977	-	1,201.75	97.5	-	97.5	1,201.8	3,000	90.4	14,319.4	22.1
NEW_9	1,003	30.97	1,201.94	86.2	31.0	86.2	1,201.9	3,500	78.0	13,696.9	21.9
NEW_10	999	2.69	1,201.84	87.9	2.7	87.9	1,201.8	2,500	70.7	5,548.2	20.3
NEW_11	1,047	78.76	1,202.34	67.3	78.8	67.3	1,202.3	2,500	63.1	13,346.3	21.8
NEW_12	1,040	315.73	1,202.28	70.3	315.7	70.3	1,202.3	2,500	65.9	13,591.7	21.8
NEW_13	1,102	-	1,202.05	43.4	-	43.4	1,202.1	2,500	38.5	7,277.4	20.5
NEW_15	1,072	-	1,202.90	56.9	-	56.9	1,202.9	2,500	47.0	5,461.3	20.3
NEW_16	1,106	78.88	1,368.29	113.7	78.9	113.7	1,368.3	1,500	78.0	2,742.4	20.1
NEW_17	1,115	78.88	1,368.29	109.8	78.9	109.8	1,368.3	1,500	74.1	2,678.1	20.1
NEW_18	974	115.12	1,201.66	98.7	115.1	98.7	1,201.7	2,500	87.7	8,411.5	20.7
NEW_19	936	86.51	1,201.54	115.3	86.5	115.3	1,201.5	3,000	106.2	13,396.9	21.8
NEW_21	1,074	-	1,368.44	127.6	-	127.6	1,368.4	2,500	52.7	3,083.4	20.1
NEW_22	1,072	68.82	1,368.49	128.7	68.8	128.7	1,368.5	2,500	61.9	3,383.5	20.1
NEW_23	1,074	64.63	1,203.14	56.0	64.6	56.0	1,203.1	2,500	52.0	11,875.5	21.4
NEW_24	1,111	-	1,204.90	40.7	-	40.7	1,204.9	2,500	37.8	10,213.3	21.0
NEW_25	1,102	-	1,369.94	116.1	-	116.1	1,369.9	2,500	111.7	14,349.7	22.1

***Explanation of fire flow model results:**

Each row of the fire flow results is one run in the model. Fire flow demands are only placed at one location at a time.

The residual pressure is the pressure available at the hydrant when the designated fire flow demand is applied at the hydrant or junction being analyzed.

The available flow at the hydrant is the maximum flow available at that location if the residual pressure were brought down to 20 psi (available flow pressure).

Maximum velocity equal 4.3 ft/sec(on 16" line from 04-47925 to New_3) when 3500 gpm Fire Flow applied to junction New_9.

The static demand is the maximum day demand at the time of the fire flow simulation without the fire flow demand.

The static pressure is the associated pressure at the same location. The static head is the associated HGL at the same location.

Pipe Report
Alternative I- Option II Maximum Day at Peak Hour (6:30 AM)

Pipe Id	From Node	To Node	Length (ft)	Diameter (in)	Roughness	*Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
04-47925-NEW_3	04-47925	NEW_3	1,789.2	16	130	218.26	0.4	0.1	0.0
NEW_24-MASTERS	NEW_24	4_MASTERS	1,425.9	16	130	(1,650.94)	2.6	2.3	1.6
NEW11-12	NEW_11	NEW_12	274.0	16	130	612.46	1.0	0.1	0.3
NEW11-23	NEW_11	NEW_23	674.1	16	130	(1,411.85)	2.3	0.8	1.2
NEW12-13	NEW_12	NEW_13	1,471.3	16	130	471.19	0.8	0.2	0.2
NEW12-15	NEW_12	NEW_15	745.4	8	120	(174.46)	1.1	0.6	0.8
NEW15-23	NEW_15	NEW_23	291.8	8	120	(174.46)	1.1	0.2	0.8
NEW16-17	NEW_16	NEW_17	275.9	8	120	(0.39)	-	-	-
NEW19-3	NEW_19	NEW_3	708.4	16	130	(330.54)	0.5	0.1	0.1
NEW21-16	NEW_21	NEW_16	756.2	8	120	78.49	0.5	0.1	0.2
NEW21-22	NEW_21	NEW_22	253.8	8	120	(78.49)	0.5	0.1	0.2
NEW2-19	NEW_2	NEW_19	519.2	16	130	(244.03)	0.4	0.0	0.1
NEW22-17	NEW_22	NEW_17	991.7	8	120	79.27	0.5	0.2	0.2
NEW22-25	NEW_22	NEW_25	3,867.8	8	120	(113.24)	0.7	1.5	0.4
NEW22A-25	NEW_22	NEW_25	3,862.5	8	120	(113.33)	0.7	1.5	0.4
NEW23-24	NEW_23	NEW_24	1,115.5	16	130	(1,650.94)	2.6	1.8	1.6
NEW3-5	NEW_3	NEW_5	538.4	16	130	(445.63)	0.7	0.1	0.1
NEW5-6	NEW_5	NEW_6	299.2	12	120	69.62	0.2	0.0	0.0
NEW5-8	NEW_5	NEW_8	451.1	16	130	(515.25)	0.8	0.1	0.2
NEW6-18	NEW_6	NEW_18	408.4	8	120	13.59	0.1	-	0.0
NEW6-7	NEW_6	NEW_7	293.6	12	120	50.31	0.1	-	0.0
NEW7-10	NEW_7	NEW_10	1,144.1	8	120	(70.19)	0.5	0.2	0.2
NEW8-18	NEW_8	NEW_18	299.7	8	120	101.53	0.7	0.1	0.3
NEW8-9	NEW_8	NEW_9	745.4	16	130	(616.78)	1.0	0.2	0.3
NEW9-10	NEW_9	NEW_10	635.5	8	120	72.89	0.5	0.1	0.2
NEW9-11	NEW_9	NEW_11	1,182.6	16	130	(720.63)	1.2	0.4	0.3

Pipe roughnesses per City of Corona Water Master Plan.

***Numbers in parenthesis indicates that the flow is in the reverse direction**

Pipe IDs NEW22-25, NEW16-17, NEW21-16, NEW21-22, NEW22-17 serve Zone 5 and other lines serve Zone 4.

EAGLEGLEN BPS-Pump Group Graphs Future Maximum

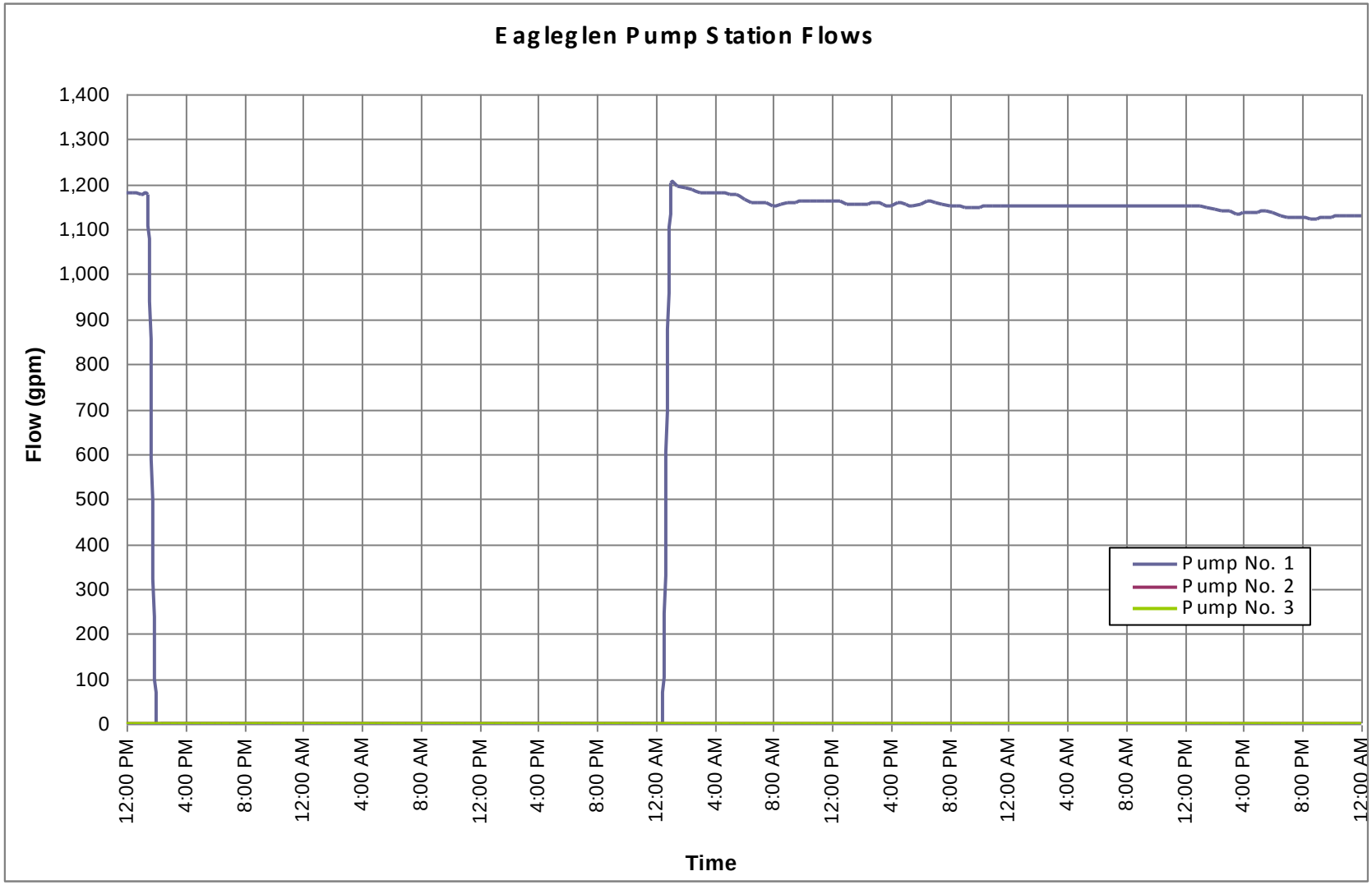
Time	EAGLEGLEN ZONE5_P1 (gpm)	EAGLEGLEN ZONE5_P2 (gpm)	EAGLEGLEN ZONE5_P3 (gpm)
12:00 PM	1,179.2	-	-
12:30 PM	1,179.2	-	-
1:00 PM	1,177.4	-	-
1:30 PM	1,177.9	-	-
2:00 PM	-	-	-
2:30 PM	-	-	-
3:00 PM	-	-	-
3:30 PM	-	-	-
4:00 PM	-	-	-
4:30 PM	-	-	-
5:00 PM	-	-	-
5:30 PM	-	-	-
6:00 PM	-	-	-
6:30 PM	-	-	-
7:00 PM	-	-	-
7:30 PM	-	-	-
8:00 PM	-	-	-
8:30 PM	-	-	-
9:00 PM	-	-	-
9:30 PM	-	-	-
10:00 PM	-	-	-
10:30 PM	-	-	-
11:00 PM	-	-	-
11:30 PM	-	-	-
12:00 AM	-	-	-
12:30 AM	-	-	-
1:00 AM	-	-	-
1:30 AM	-	-	-
2:00 AM	-	-	-
2:30 AM	-	-	-
3:00 AM	-	-	-
3:30 AM	-	-	-
4:00 AM	-	-	-
4:30 AM	-	-	-
5:00 AM	-	-	-
5:30 AM	-	-	-
6:00 AM	-	-	-
6:30 AM	-	-	-
7:00 AM	-	-	-
7:30 AM	-	-	-
8:00 AM	-	-	-
8:30 AM	-	-	-
9:00 AM	-	-	-
9:30 AM	-	-	-
10:00 AM	-	-	-
10:30 AM	-	-	-
11:00 AM	-	-	-

EAGLEGLEN BPS-Pump Group Graphs Future Maximum

Time	EAGLEGLEN ZONE5_P1 (gpm)	EAGLEGLEN ZONE5_P2 (gpm)	EAGLEGLEN ZONE5_P3 (gpm)
11:30 AM	-	-	-
12:00 PM	-	-	-
12:30 PM	-	-	-
1:00 PM	-	-	-
1:30 PM	-	-	-
2:00 PM	-	-	-
2:30 PM	-	-	-
3:00 PM	-	-	-
3:30 PM	-	-	-
4:00 PM	-	-	-
4:30 PM	-	-	-
5:00 PM	-	-	-
5:30 PM	-	-	-
6:00 PM	-	-	-
6:30 PM	-	-	-
7:00 PM	-	-	-
7:30 PM	-	-	-
8:00 PM	-	-	-
8:30 PM	-	-	-
9:00 PM	-	-	-
9:30 PM	-	-	-
10:00 PM	-	-	-
10:30 PM	-	-	-
11:00 PM	-	-	-
11:30 PM	-	-	-
12:00 AM	-	-	-
12:30 AM	-	-	-
1:00 AM	1,201.4	-	-
1:30 AM	1,196.3	-	-
2:00 AM	1,191.7	-	-
2:30 AM	1,188.4	-	-
3:00 AM	1,180.1	-	-
3:30 AM	1,181.2	-	-
4:00 AM	1,181.2	-	-
4:30 AM	1,180.1	-	-
5:00 AM	1,178.7	-	-
5:30 AM	1,175.8	-	-
6:00 AM	1,164.8	-	-
6:30 AM	1,157.4	-	-
7:00 AM	1,158.1	-	-
7:30 AM	1,158.0	-	-
8:00 AM	1,152.3	-	-
8:30 AM	1,153.8	-	-
9:00 AM	1,158.5	-	-
9:30 AM	1,158.0	-	-
10:00 AM	1,161.6	-	-
10:30 AM	1,163.4	-	-
11:00 AM	1,163.2	-	-
11:30 AM	1,161.8	-	-
12:00 PM	1,163.4	-	-

EAGLEGLEN BPS-Pump Group Graphs Future Maximum

Time	EAGLEGLEN ZONE5_P1 (gpm)	EAGLEGLEN ZONE5_P2 (gpm)	EAGLEGLEN ZONE5_P3 (gpm)
12:30 PM	1,162.1	-	-
1:00 PM	1,156.5	-	-
1:30 PM	1,156.2	-	-
2:00 PM	1,154.3	-	-
2:30 PM	1,155.4	-	-
3:00 PM	1,159.6	-	-
3:30 PM	1,155.1	-	-
4:00 PM	1,150.1	-	-
4:30 PM	1,158.3	-	-
5:00 PM	1,155.9	-	-
5:30 PM	1,150.5	-	-
6:00 PM	1,155.5	-	-
6:30 PM	1,160.8	-	-
7:00 PM	1,158.4	-	-
7:30 PM	1,153.8	-	-
8:00 PM	1,152.7	-	-
8:30 PM	1,152.4	-	-
9:00 PM	1,147.8	-	-
9:30 PM	1,149.4	-	-
10:00 PM	1,149.2	-	-
10:30 PM	1,151.4	-	-
11:00 PM	1,153.1	-	-
11:30 PM	1,151.7	-	-
12:00 PM	1,150.1	-	-
12:30 PM	1,152.3	-	-
1:00 PM	1,151.0	-	-
1:30 PM	1,149.4	-	-
2:00 PM	1,145.4	-	-
2:30 PM	1,142.1	-	-
3:00 PM	1,140.1	-	-
3:30 PM	1,133.0	-	-
4:00 PM	1,135.0	-	-
4:30 PM	1,137.7	-	-
5:00 PM	1,138.0	-	-
5:30 PM	1,138.8	-	-
6:00 PM	1,138.2	-	-
6:30 PM	1,131.3	-	-
7:00 PM	1,126.7	-	-
7:30 PM	1,124.5	-	-
8:00 PM	1,125.4	-	-
8:30 PM	1,121.6	-	-
9:00 PM	1,122.9	-	-
9:30 PM	1,126.8	-	-
10:00 PM	1,126.7	-	-
10:30 PM	1,129.7	-	-
11:00 PM	1,130.9	-	-
11:30 PM	1,130.7	-	-
12:00 AM	1,129.5	-	-


Eagleglen Pump Station Flows
Flow (gpm)
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time
Pump No. 1
Pump No. 2
Pump No. 3

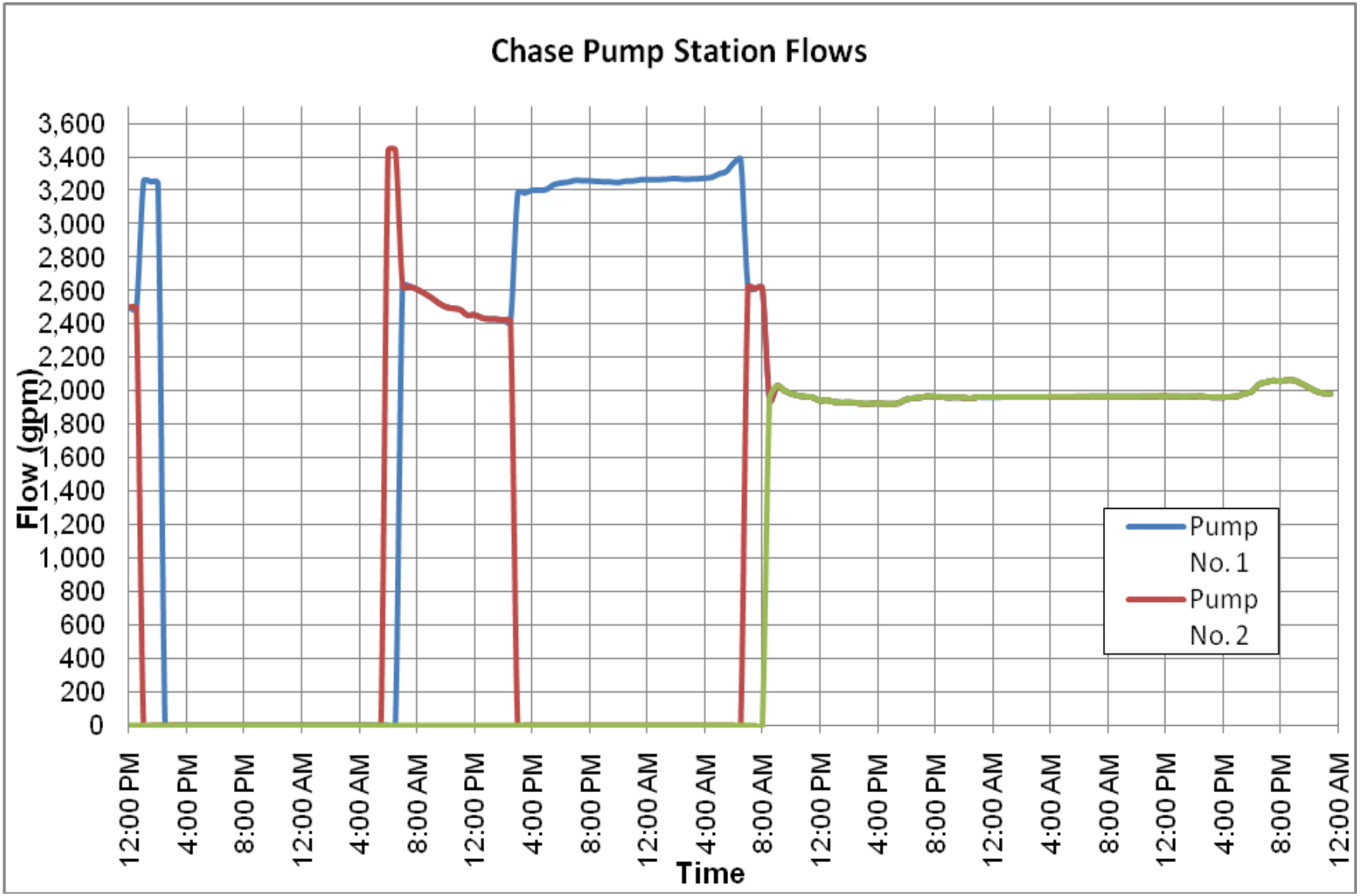
CHASE BPS-Pump Group Graphs Option II Maximum Day Alternative I

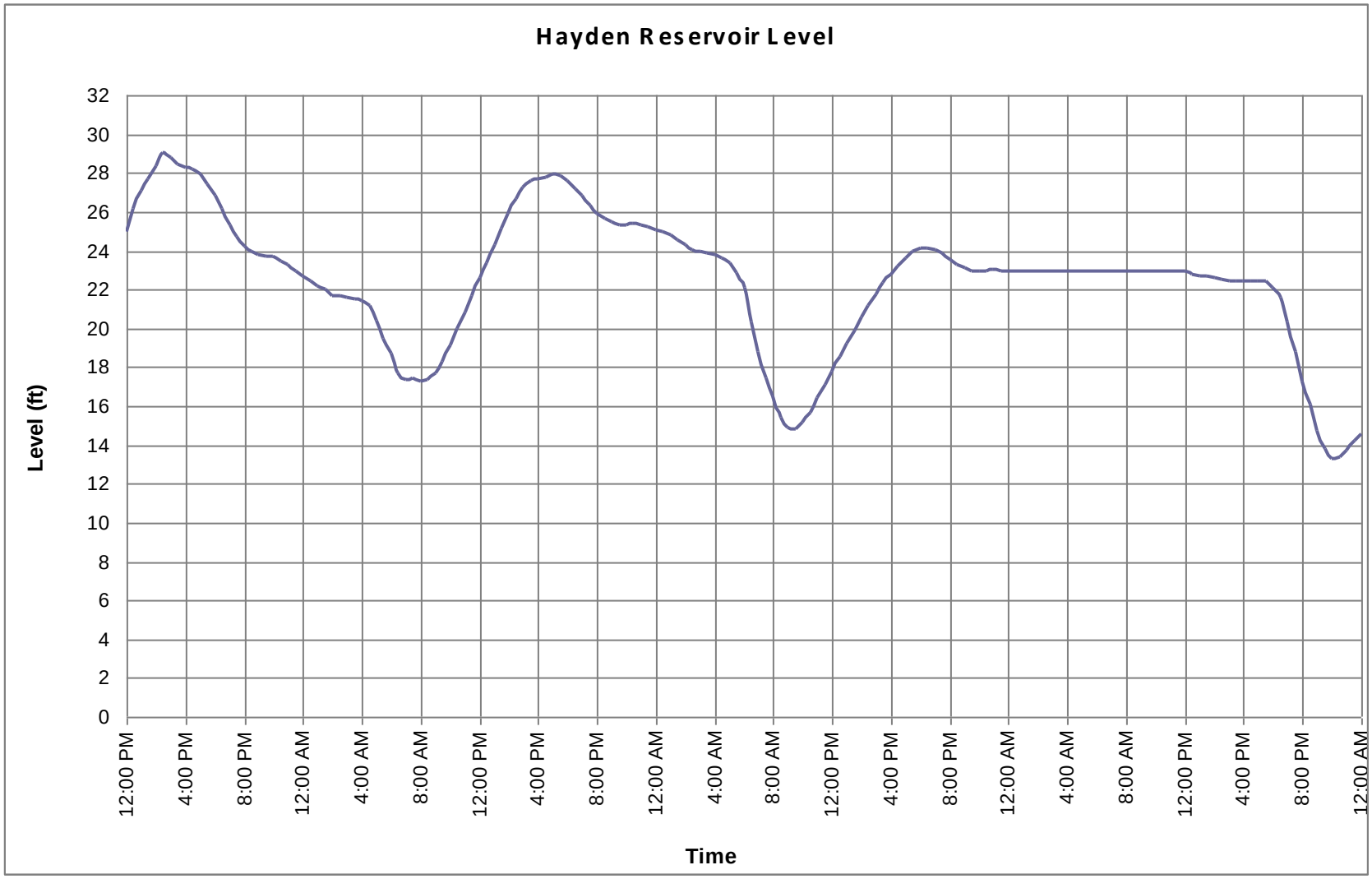
Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
12:00 PM	2,503.6	2,503.6	-
12:30 PM	2,495.1	2,495.1	-
1:00 PM	-	3,258.6	-
1:30 PM	-	3,255.2	-
2:00 PM	-	3,246.0	-
2:30 PM	-	-	-
3:00 PM	-	-	-
3:30 PM	-	-	-
4:00 PM	-	-	-
4:30 PM	-	-	-
5:00 PM	-	-	-
5:30 PM	-	-	-
6:00 PM	-	-	-
6:30 PM	-	-	-
7:00 PM	-	-	-
7:30 PM	-	-	-
8:00 PM	-	-	-
8:30 PM	-	-	-
9:00 PM	-	-	-
9:30 PM	-	-	-
10:00 PM	-	-	-
10:30 PM	-	-	-
11:00 PM	-	-	-
11:30 PM	-	-	-
12:00 AM	-	-	-
12:30 AM	-	-	-
1:00 AM	-	-	-
1:30 AM	-	-	-
2:00 AM	-	-	-
2:30 AM	-	-	-
3:00 AM	-	-	-
3:30 AM	-	-	-
4:00 AM	-	-	-
4:30 AM	-	-	-
5:00 AM	-	-	-
5:30 AM	-	-	-
6:00 AM	3,442.4	-	-
6:30 AM	3,448.1	-	-
7:00 AM	2,631.2	2,631.2	-
7:30 AM	2,629.1	2,629.1	-
8:00 AM	2,611.5	2,611.5	-
8:30 AM	2,588.8	2,588.8	-
9:00 AM	2,561.7	2,561.7	-

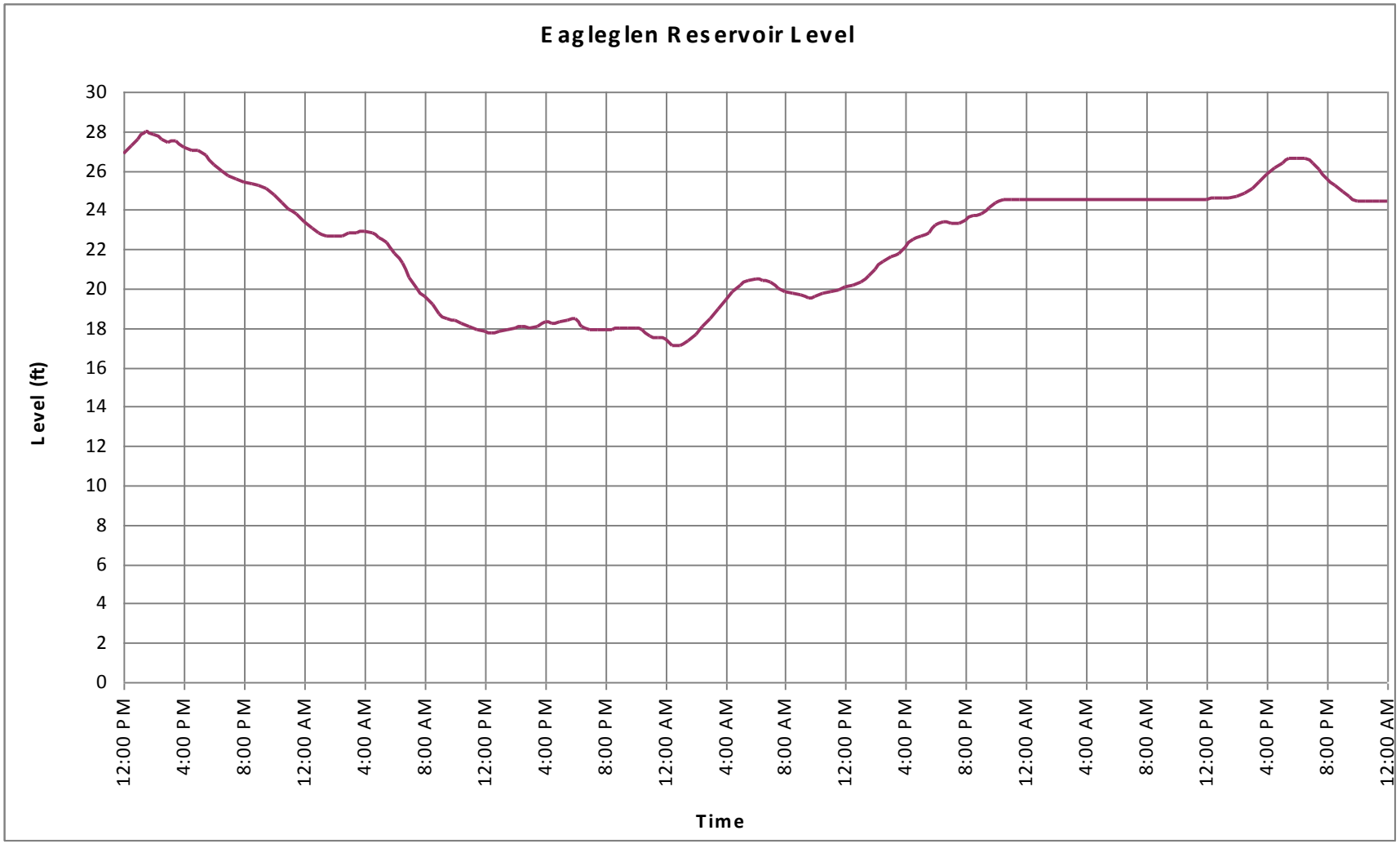
Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
9:30 AM	2,529.7	2,529.7	-
10:00 AM	2,506.4	2,506.4	-
10:30 AM	2,497.5	2,497.5	-
11:00 AM	2,489.9	2,489.9	-
11:30 AM	2,457.1	2,457.1	-
12:00 PM	2,459.4	2,459.4	-
12:30 PM	2,440.8	2,440.8	-
1:00 PM	2,433.6	2,433.6	-
1:30 PM	2,432.8	2,432.8	-
2:00 PM	2,428.1	2,428.1	-
2:30 PM	2,417.2	2,417.2	-
3:00 PM	-	3,186.2	-
3:30 PM	-	3,188.0	-
4:00 PM	-	3,205.3	-
4:30 PM	-	3,205.1	-
5:00 PM	-	3,209.3	-
5:30 PM	-	3,238.0	-
6:00 PM	-	3,248.0	-
6:30 PM	-	3,253.8	-
7:00 PM	-	3,263.5	-
7:30 PM	-	3,261.9	-
8:00 PM	-	3,261.5	-
8:30 PM	-	3,257.5	-
9:00 PM	-	3,255.5	-
9:30 PM	-	3,254.1	-
10:00 PM	-	3,251.0	-
10:30 PM	-	3,259.7	-
11:00 PM	-	3,259.9	-
11:30 PM	-	3,267.1	-
12:00 AM	-	3,267.8	-
12:30 AM	-	3,268.5	-
1:00 AM	-	3,269.6	-
1:30 AM	-	3,272.5	-
2:00 AM	-	3,275.5	-
2:30 AM	-	3,271.0	-
3:00 AM	-	3,271.6	-
3:30 AM	-	3,273.1	-
4:00 AM	-	3,277.0	-
4:30 AM	-	3,282.3	-
5:00 AM	-	3,303.5	-
5:30 AM	-	3,317.3	-
6:00 AM	-	3,366.8	-
6:30 AM	-	3,388.2	-
7:00 AM	2,621.1	2,621.1	-
7:30 AM	2,614.8	2,614.8	-
8:00 AM	2,619.2	2,619.2	-

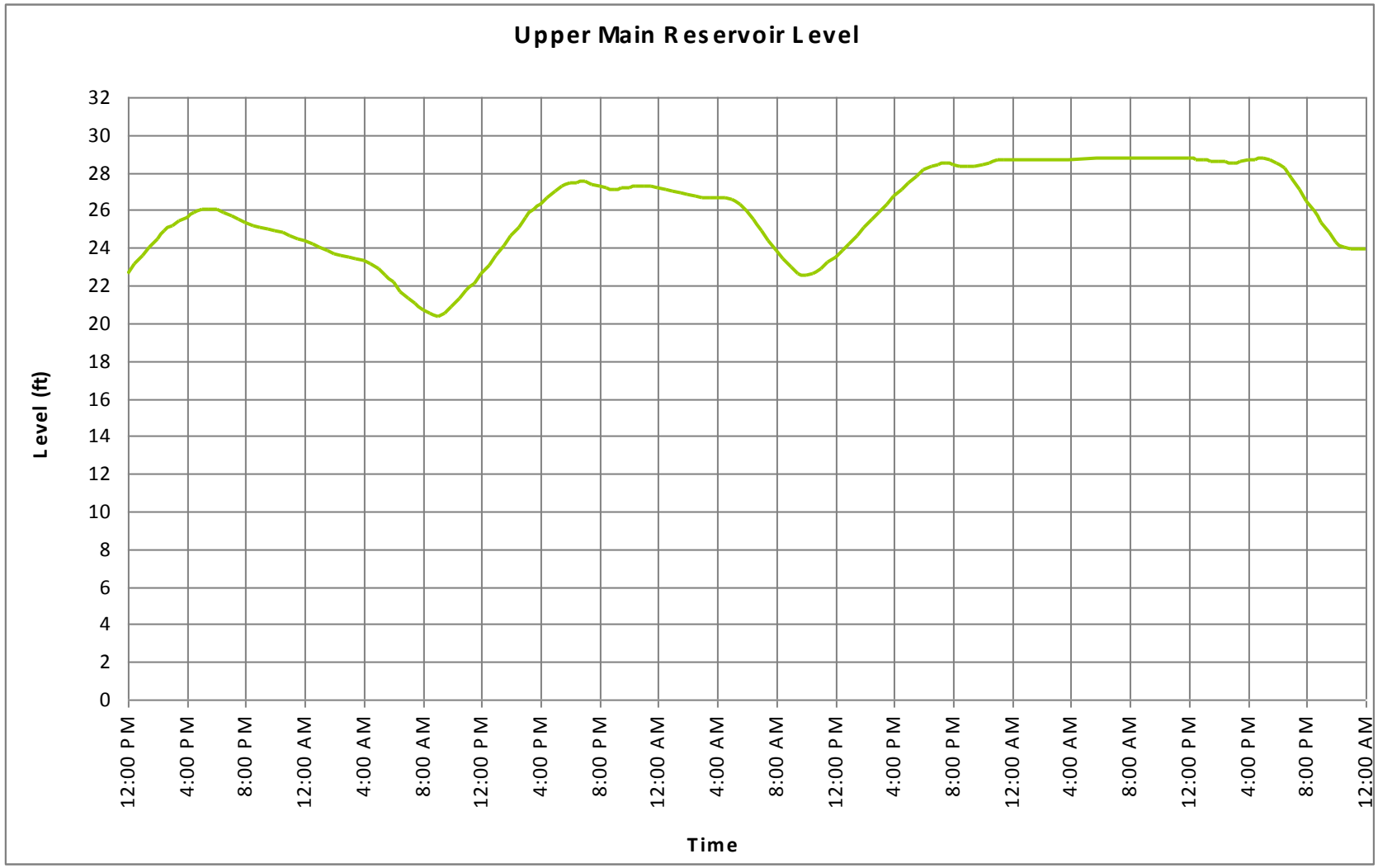
Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
8:30 AM	1,950.0	1,950.0	1,950.0
9:00 AM	2,033.1	2,033.1	2,033.1
9:30 AM	2,006.2	2,006.2	2,006.2
10:00 AM	1,986.5	1,986.5	1,986.5
10:30 AM	1,974.3	1,974.3	1,974.3
11:00 AM	1,968.6	1,968.6	1,968.6
11:30 AM	1,964.9	1,964.9	1,964.9
12:00 PM	1,945.1	1,945.1	1,945.1
12:30 PM	1,948.0	1,948.0	1,948.0
1:00 PM	1,936.8	1,936.8	1,936.8
1:30 PM	1,933.2	1,933.2	1,933.2
2:00 PM	1,934.0	1,934.0	1,934.0
2:30 PM	1,932.0	1,932.0	1,932.0
3:00 PM	1,925.7	1,925.7	1,925.7
3:30 PM	1,926.3	1,926.3	1,926.3
4:00 PM	1,929.6	1,929.6	1,929.6
4:30 PM	1,926.3	1,926.3	1,926.3
5:00 PM	1,924.9	1,924.9	1,924.9
5:30 PM	1,931.2	1,931.2	1,931.2
6:00 PM	1,952.8	1,952.8	1,952.8
6:30 PM	1,959.6	1,959.6	1,959.6
7:00 PM	1,964.2	1,964.2	1,964.2
7:30 PM	1,971.0	1,971.0	1,971.0
8:00 PM	1,968.4	1,968.4	1,968.4
8:30 PM	1,967.0	1,967.0	1,967.0
9:00 PM	1,963.0	1,963.0	1,963.0
9:30 PM	1,965.4	1,965.4	1,965.4
10:00 PM	1,962.6	1,962.6	1,962.6
10:30 PM	1,958.4	1,958.4	1,958.4
11:00 PM	1,966.7	1,966.7	1,966.7
11:30 PM	1,965.4	1,965.4	1,965.4
12:00 PM	1,969.9	1,969.9	1,969.9
12:30 PM	1,969.5	1,969.5	1,969.5
1:00 PM	1,969.2	1,969.2	1,969.2
1:30 PM	1,968.8	1,968.8	1,968.8
2:00 PM	1,969.6	1,969.6	1,969.6
2:30 PM	1,970.5	1,970.5	1,970.5
3:00 PM	1,966.3	1,966.3	1,966.3
3:30 PM	1,964.9	1,964.9	1,964.9
4:00 PM	1,964.8	1,964.8	1,964.8
4:30 PM	1,967.9	1,967.9	1,967.9
5:00 PM	1,971.4	1,971.4	1,971.4
5:30 PM	1,987.6	1,987.6	1,987.6
6:00 PM	1,998.9	1,998.9	1,998.9
6:30 PM	2,041.7	2,041.7	2,041.7
7:00 PM	2,055.0	2,055.0	2,055.0

Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
7:30 PM	2,064.9	2,064.9	2,064.9
8:00 PM	2,061.0	2,061.0	2,061.0
8:30 PM	2,068.5	2,068.5	2,068.5
9:00 PM	2,065.4	2,065.4	2,065.4
9:30 PM	2,045.7	2,045.7	2,045.7
10:00 PM	2,023.7	2,023.7	2,023.7
10:30 PM	2,000.5	2,000.5	2,000.5
11:00 PM	1,989.7	1,989.7	1,989.7
11:30 PM	1,986.4	1,986.4	1,986.4
12:00 AM	1,996.1	1,996.1	1,996.1


Chase Pump Station Flows
Flow (gpm)
3,600
3,400
3,200
3,000
2,800
2,600
2,400
2,200
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time
Pump No. 1
Pump No. 2


Hayden Reservoir Level
Level (ft)
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time


Eagleglen Reservoir Level
Level (ft)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time


Upper Main Reservoir Level
Level (ft)
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 P M
4:00 P M
8:00 P M
12:00 A M
4:00 A M
8:00 A M
12:00 P M
4:00 P M
8:00 P M
12:00 A M
4:00 A M
8:00 A M
12:00 P M
4:00 P M
8:00 P M
12:00 A M
4:00 A M
8:00 A M
12:00 P M
4:00 P M
8:00 P M
12:00 A M
Time

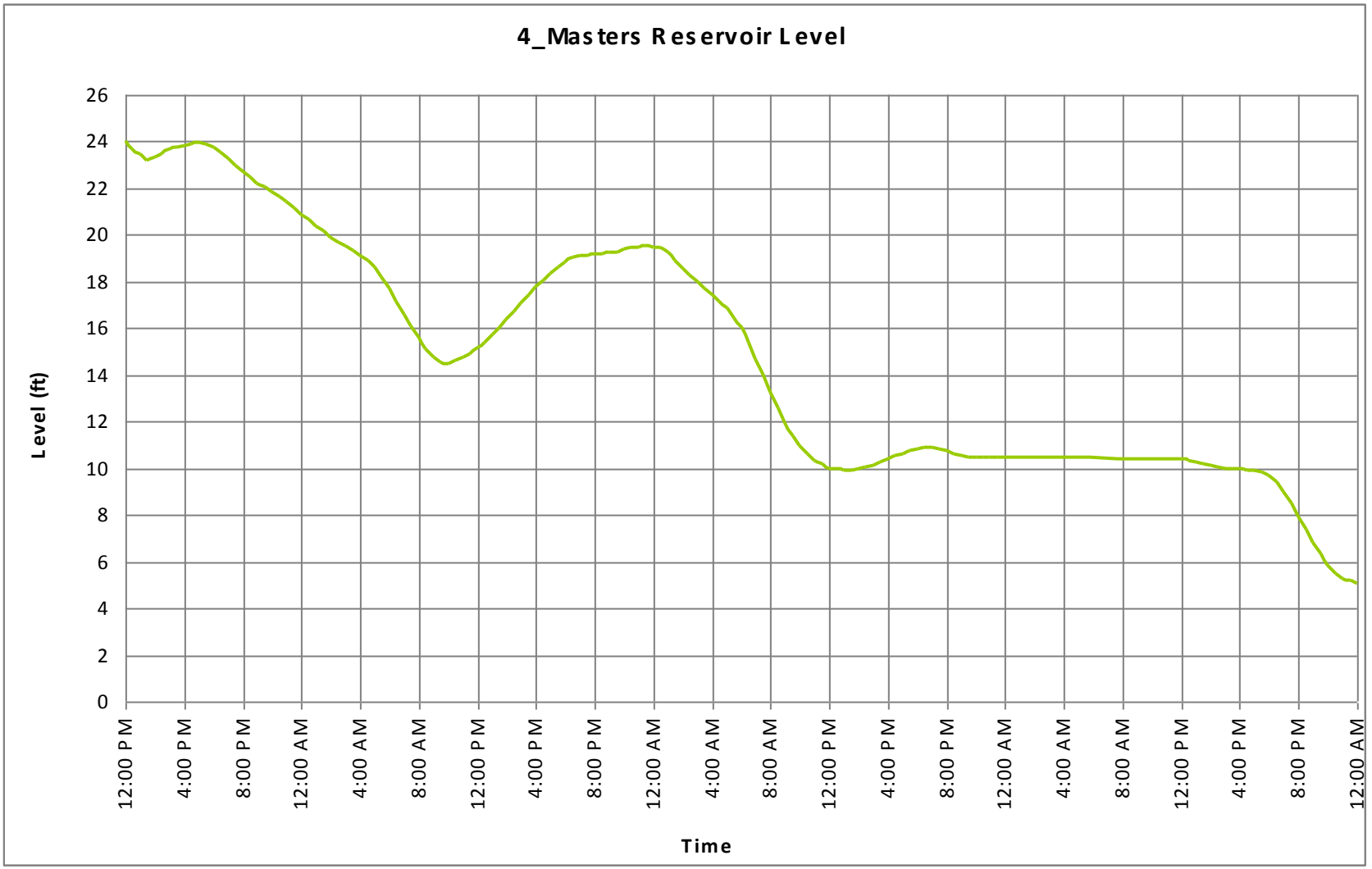

4_Masters Reservoir Level
Level (ft)
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time

EXHIBIT 7: ALTERNATIVE II-OPTION II OPERATION CONDITION HYDRAULIC ANALYSIS, TANK LEVEL, AND PUMP GRAPHS

The Chase and Eagle Glen BPS are upgraded. Masters reservoirs are in service.
Arantine Hills pressure Zone 5. The acquisition of an easement would be needed for 2-8" line at south side of Arantine Hills Land development area.

Junction Report and Fire Flow Results
Alternative II Option II Maximum Day plus Fire Flow

Junction ID	Elevation (ft)	Maximum Day, Peak Hour (6:30 AM) Model Results			*Maximum Day plus Fire Flow Model Results						
		Demand (gpm)	Head (ft)	Pressure (psi)	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Available Flow at Hydrant (gpm)	Available Flow Pressure (psi)
NEW_2	992.0	244.0	1,201.5	90.8	244.03	90.8	1,201.5	2,500	82.8	10,350.2	21
NEW_3	939.0	333.4	1,201.6	113.8	333.35	113.8	1,201.6	3,000	106.4	16,061.2	22
NEW_5	959.8	-	1,201.7	104.8	-	104.8	1,201.7	3,000	97.6	14,993.3	22
NEW_6	959.0	5.7	1,201.7	105.2	5.72	105.2	1,201.7	2,500	98.3	12,578.6	22
NEW_7	958.0	120.5	1,201.7	105.6	120.50	105.6	1,201.7	3,000	94.7	10,846.6	21
NEW_8	976.8	-	1,201.8	97.5	-	97.5	1,201.8	3,000	90.4	14,319.4	22
NEW_9	1,003.0	31.0	1,201.9	86.2	30.97	86.2	1,201.9	3,500	78.0	13,696.9	22
NEW_10	999.0	2.7	1,201.8	87.9	2.69	87.9	1,201.8	2,500	70.7	5,548.2	20
NEW_11	1,047.0	78.8	1,202.3	67.3	78.76	67.3	1,202.3	2,500	63.1	13,346.2	22
NEW_12	1,040.0	315.7	1,202.3	70.3	315.73	70.3	1,202.3	2,500	65.9	13,591.7	22
NEW_13	1,102.0	-	1,202.1	43.4	-	43.4	1,202.1	2,500	38.5	7,277.3	21
NEW_15	1,071.50	0.00	1,202.9	56.9	-	56.9	1,202.9	2,500	47.0	5,461.2	20
NEW_16	1,106.00	78.88	1,364.5	112.0	78.88	112.0	1,364.5	1,500	89.1	3,620.9	20
NEW_17	1,115.00	78.88	1,364.6	108.1	78.88	108.1	1,364.6	1,500	88.7	3,953.4	20
NEW_18	974.0	115.1	1,201.7	98.6	115.12	98.6	1,201.7	2,500	87.7	8,411.5	21
NEW_19	935.5	86.5	1,201.5	115.3	86.51	115.3	1,201.5	3,000	106.2	13,396.9	22
NEW_21	1,074.0	-	1,364.5	125.9	-	125.9	1,364.5	2,500	66.4	3,522.5	20
NEW_22	1,071.5	68.8	1,364.5	127.0	68.82	127.0	1,364.5	2,500	67.5	3,613.2	20
NEW_24	1,111.0	-	1,204.9	40.7	-	40.7	1,204.9	2,500	37.8	10,213.1	21
NEW_23	1,074.0	64.6	1,203.1	56.0	64.63	56.0	1,203.1	2,500	52.0	11,875.4	21
NEW_25	1,102.0	-	1,370.1	116.2	-	116.2	1,370.1	2,500	111.8	14,416.8	22

***Explanation of fire flow model results:**

Each row of the fire flow results is one run in the model. Fire flow demands are only placed at one location at a time.

The residual pressure is the pressure available at the hydrant when the designated fire flow demand is applied at the hydrant or junction being analyzed.

The available flow at the hydrant is the maximum flow available at that location if the residual pressure were brought down to 20 psi (available flow pressure).

Maximum velocity equal 4.3 ftt/sec(on 16" line from 04-47925 to New_3) when 3500 gpm Fire Flow applied to junction New_9.

The static demand is the maximum day demand at the time of the fire flow simulation without the fire flow demand.

The static pressure is the associated pressure at the same location. The static head is the associated HGL at the same location.

Pipe Report
Alternative II Option II Maximum Day at Peak Hour (6:30 AM)

Pipe Id	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
04-47925-NEW_3	04-47925	NEW_3	1,789.2	16	130	218.3	0.4	0.1	0.0
NEW_24-MASTERS	NEW_24	4_MASTERS	1,425.9	16	130	(1,650.8)	2.6	2.3	1.6
NEW11-12	NEW_11	NEW_12	274.0	16	130	612.4	1.0	0.1	0.3
NEW11-23	NEW_11	NEW_23	674.1	16	130	(1,411.8)	2.3	0.8	1.2
NEW12-13	NEW_12	NEW_13	1,471.3	16	130	471.1	0.8	0.2	0.2
NEW12-15	NEW_12	NEW_15	745.4	8	120	(174.5)	1.1	0.6	0.8
NEW13-0445210	NEW_13	04-45210	794.3	16	130	471.1	0.8	0.1	0.2
NEW15-23	NEW_15	NEW_23	291.8	8	120	(174.5)	1.1	0.2	0.8
NEW16-17	NEW_16	NEW_17	275.9	8	120	(95.9)	0.6	0.1	0.3
NEW17-0542920	NEW_17	05-43230	1,549.1	8	120	(113.0)	0.7	0.6	0.4
NEW17A-0542920	NEW_17	05-43230	1,536.0	8	120	(113.5)	0.7	0.6	0.4
NEW19-3	NEW_19	NEW_3	708.4	16	130	(330.5)	0.5	0.1	0.1
NEW21-16	NEW_21	NEW_16	756.2	8	120	(17.0)	0.1	0.0	0.0
NEW21-22	NEW_21	NEW_22	253.8	8	120	17.0	0.1	-	0.0
NEW2-19	NEW_2	NEW_19	519.2	16	130	(244.0)	0.4	0.0	0.1
NEW22-17	NEW_22	NEW_17	991.7	8	120	(51.8)	0.3	0.1	0.1
NEW23-24	NEW_23	NEW_24	1,115.5	16	130	(1,650.8)	2.6	1.8	1.6
NEW3-5	NEW_3	NEW_5	538.4	16	130	(445.6)	0.7	0.1	0.1
NEW5-6	NEW_5	NEW_6	299.2	12	120	69.6	0.2	0.0	0.0
NEW5-8	NEW_5	NEW_8	451.1	16	130	(515.2)	0.8	0.1	0.2
NEW6-18	NEW_6	NEW_18	408.4	8	120	13.6	0.1	-	0.0
NEW6-7	NEW_6	NEW_7	293.6	12	120	50.3	0.1	-	0.0
NEW7-10	NEW_7	NEW_10	1,144.1	8	120	(70.2)	0.5	0.2	0.2
NEW8-18	NEW_8	NEW_18	299.7	8	120	101.5	0.7	0.1	0.3
NEW8-9	NEW_8	NEW_9	745.4	16	130	(616.7)	1.0	0.2	0.3
NEW9-10	NEW_9	NEW_10	635.5	8	120	72.9	0.5	0.1	0.2
NEW9-11	NEW_9	NEW_11	1,182.6	16	130	(720.6)	1.2	0.4	0.3

Pipe roughnesses per City of Corona Water Master Plan.
***Numbers in parenthesis indicates that the flow is in the reverse direction**
Pipe IDsNEW17-0542920, NEW16-17, NEW22-17, NEW21-16, NEW21-22 serve Zone 5, and all other lines serve Zone 4.

EAGLEGLEN BPS-Pump Group Graphs Option II Maxday Alternative II

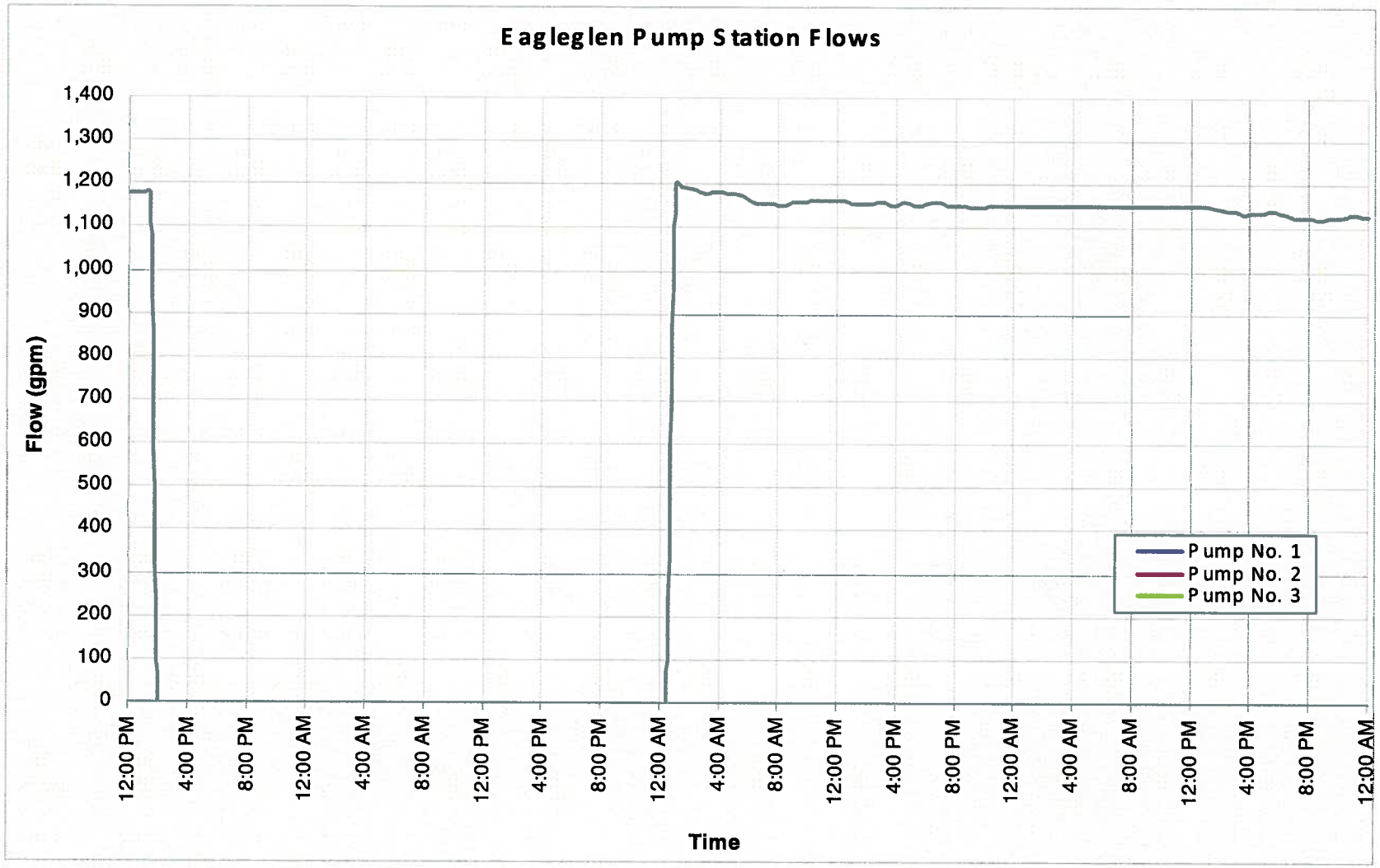
Time	EAGLEGLENZONE5_P1 (gpm)	EAGLEGLENZONE5_P2 (gpm)	EAGLEGLENZONE5_P3 (gpm)
12:00 PM	1,178.9	-	-
12:30 PM	1,178.9	-	-
1:00 PM	1,177.1	-	-
1:30 PM	1,177.6	-	-
2:00 PM	-	-	-
2:30 PM	-	-	-
3:00 PM	-	-	-
3:30 PM	-	-	-
4:00 PM	-	-	-
4:30 PM	-	-	-
5:00 PM	-	-	-
5:30 PM	-	-	-
6:00 PM	-	-	-
6:30 PM	-	-	-
7:00 PM	-	-	-
7:30 PM	-	-	-
8:00 PM	-	-	-
8:30 PM	-	-	-
9:00 PM	-	-	-
9:30 PM	-	-	-
10:00 PM	-	-	-
10:30 PM	-	-	-
11:00 PM	-	-	-
11:30 PM	-	-	-
12:00 AM	-	-	-
12:30 AM	-	-	-
1:00 AM	-	-	-
1:30 AM	-	-	-
2:00 AM	-	-	-
2:30 AM	-	-	-
3:00 AM	-	-	-
3:30 AM	-	-	-
4:00 AM	-	-	-
4:30 AM	-	-	-
5:00 AM	-	-	-
5:30 AM	-	-	-
6:00 AM	-	-	-
6:30 AM	-	-	-
7:00 AM	-	-	-
7:30 AM	-	-	-
8:00 AM	-	-	-
8:30 AM	-	-	-
9:00 AM	-	-	-
9:30 AM	-	-	-
10:00 AM	-	-	-
10:30 AM	-	-	-
11:00 AM	-	-	-
11:30 AM	-	-	-

EAGLEGLEN BPS-Pump Group Graphs Option II Maxday Alternative II

Time	EAGLEGLENZONE5_P1 (gpm)	EAGLEGLENZONE5_P2 (gpm)	EAGLEGLENZONE5_P3 (gpm)
12:00 PM	-	-	-
12:30 PM	-	-	-
1:00 PM	-	-	-
1:30 PM	-	-	-
2:00 PM	-	-	-
2:30 PM	-	-	-
3:00 PM	-	-	-
3:30 PM	-	-	-
4:00 PM	-	-	-
4:30 PM	-	-	-
5:00 PM	-	-	-
5:30 PM	-	-	-
6:00 PM	-	-	-
6:30 PM	-	-	-
7:00 PM	-	-	-
7:30 PM	-	-	-
8:00 PM	-	-	-
8:30 PM	-	-	-
9:00 PM	-	-	-
9:30 PM	-	-	-
10:00 PM	-	-	-
10:30 PM	-	-	-
11:00 PM	-	-	-
11:30 PM	-	-	-
12:00 AM	-	-	-
12:30 AM	-	-	-
1:00 AM	1,200.4	-	-
1:30 AM	1,195.3	-	-
2:00 AM	1,190.8	-	-
2:30 AM	1,187.6	-	-
3:00 AM	1,179.4	-	-
3:30 AM	1,180.4	-	-
4:00 AM	1,180.4	-	-
4:30 AM	1,179.3	-	-
5:00 AM	1,177.8	-	-
5:30 AM	1,174.9	-	-
6:00 AM	1,163.8	-	-
6:30 AM	1,156.4	-	-
7:00 AM	1,157.0	-	-
7:30 AM	1,157.0	-	-
8:00 AM	1,151.4	-	-
8:30 AM	1,152.9	-	-
9:00 AM	1,157.6	-	-
9:30 AM	1,157.3	-	-
10:00 AM	1,160.9	-	-
10:30 AM	1,162.7	-	-
11:00 AM	1,162.5	-	-
11:30 AM	1,161.2	-	-

EAGLEGLEN BPS-Pump Group Graphs Option II Maxday Alternative II

Time	EAGLEGLENZONE5_P1 (gpm)	EAGLEGLENZONE5_P2 (gpm)	EAGLEGLENZONE5_P3 (gpm)
12:00 PM	1,162.7	-	-
12:30 PM	1,161.4	-	-
1:00 PM	1,156.0	-	-
1:30 PM	1,155.6	-	-
2:00 PM	1,153.8	-	-
2:30 PM	1,154.9	-	-
3:00 PM	1,159.0	-	-
3:30 PM	1,154.5	-	-
4:00 PM	1,149.6	-	-
4:30 PM	1,157.7	-	-
5:00 PM	1,155.3	-	-
5:30 PM	1,150.0	-	-
6:00 PM	1,154.8	-	-
6:30 PM	1,160.0	-	-
7:00 PM	1,157.7	-	-
7:30 PM	1,153.2	-	-
8:00 PM	1,152.1	-	-
8:30 PM	1,151.8	-	-
9:00 PM	1,147.3	-	-
9:30 PM	1,148.8	-	-
10:00 PM	1,148.6	-	-
10:30 PM	1,150.8	-	-
11:00 PM	1,152.4	-	-
11:30 PM	1,151.0	-	-
12:00 PM	1,149.5	-	-
12:30 PM	1,151.6	-	-
1:00 PM	1,150.4	-	-
1:30 PM	1,148.8	-	-
2:00 PM	1,144.9	-	-
2:30 PM	1,141.7	-	-
3:00 PM	1,139.6	-	-
3:30 PM	1,132.6	-	-
4:00 PM	1,134.6	-	-
4:30 PM	1,137.3	-	-
5:00 PM	1,137.6	-	-
5:30 PM	1,138.2	-	-
6:00 PM	1,137.6	-	-
6:30 PM	1,130.6	-	-
7:00 PM	1,126.0	-	-
7:30 PM	1,123.8	-	-
8:00 PM	1,124.7	-	-
8:30 PM	1,121.0	-	-
9:00 PM	1,122.3	-	-
9:30 PM	1,126.2	-	-
10:00 PM	1,126.4	-	-
10:30 PM	1,129.2	-	-
11:00 PM	1,130.5	-	-
11:30 PM	1,130.2	-	-
12:00 AM	1,129.2	-	-


Eagleglen Pump Station Flows
Flow (gpm)
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time
Pump No. 1
Pump No. 2
Pump No. 3

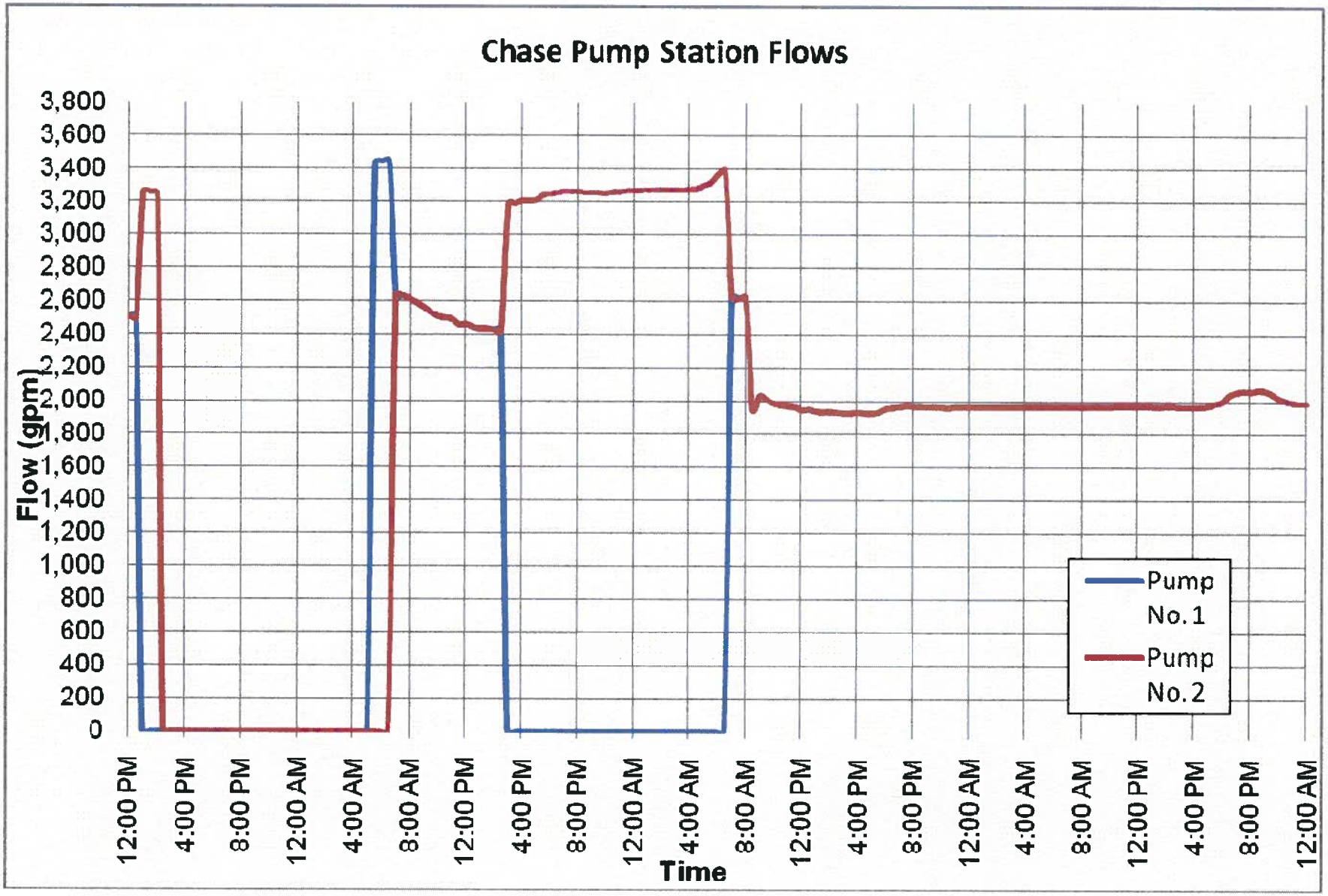
CHASE BPS- Pump Group Graphs Option II Max day Alternative II

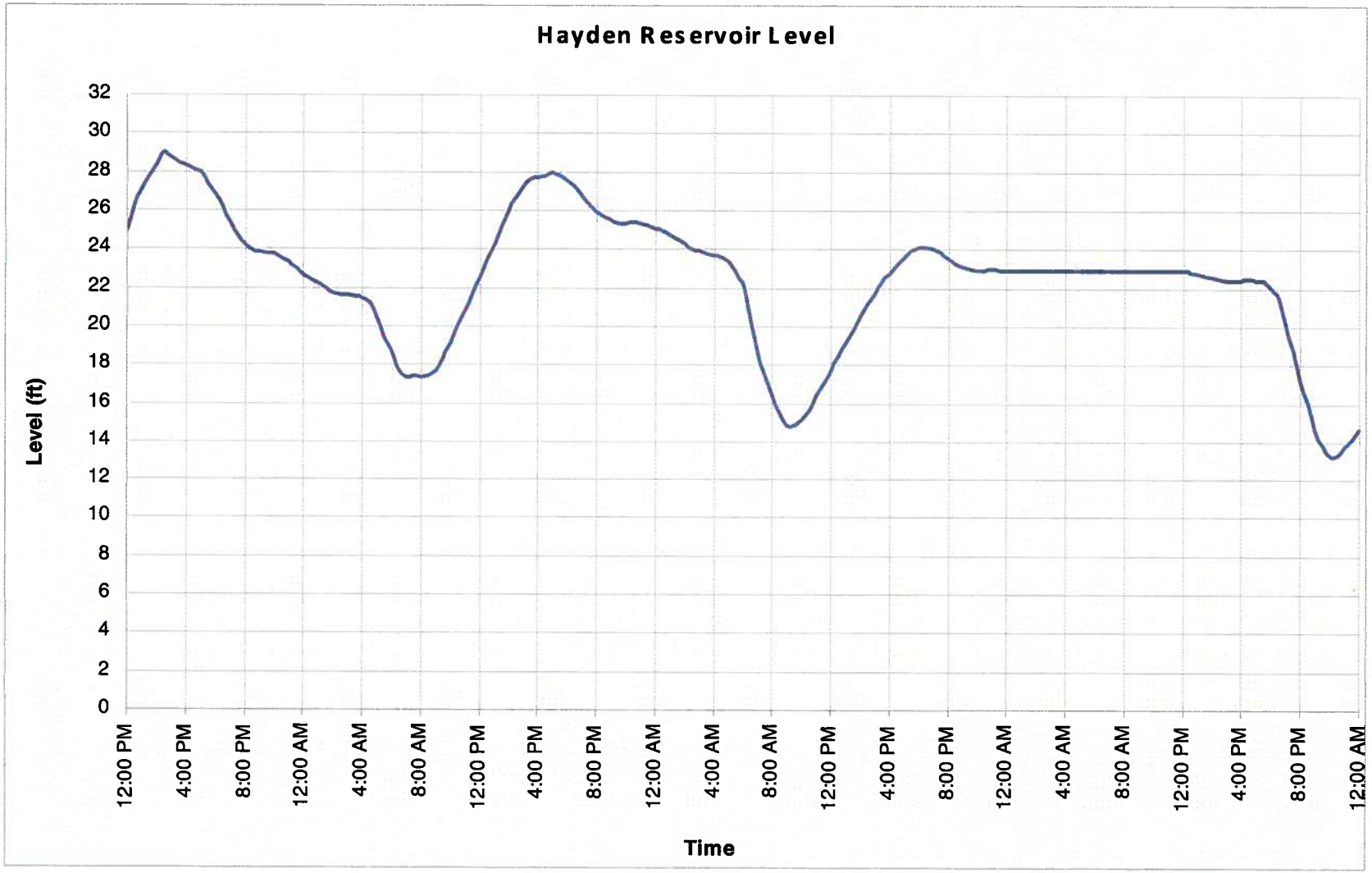
Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
12:00 PM	2,503.6	2,503.6	-
12:30 PM	2,495.1	2,495.1	-
1:00 PM	-	3,258.6	-
1:30 PM	-	3,255.2	-
2:00 PM	-	3,246.0	-
2:30 PM	-	-	-
3:00 PM	-	-	-
3:30 PM	-	-	-
4:00 PM	-	-	-
4:30 PM	-	-	-
5:00 PM	-	-	-
5:30 PM	-	-	-
6:00 PM	-	-	-
6:30 PM	-	-	-
7:00 PM	-	-	-
7:30 PM	-	-	-
8:00 PM	-	-	-
8:30 PM	-	-	-
9:00 PM	-	-	-
9:30 PM	-	-	-
10:00 PM	-	-	-
10:30 PM	-	-	-
11:00 PM	-	-	-
11:30 PM	-	-	-
12:00 AM	-	-	-
12:30 AM	-	-	-
1:00 AM	-	-	-
1:30 AM	-	-	-
2:00 AM	-	-	-
2:30 AM	-	-	-
3:00 AM	-	-	-
3:30 AM	-	-	-
4:00 AM	-	-	-
4:30 AM	-	-	-
5:00 AM	-	-	-
5:30 AM	3,434.2	-	-
6:00 AM	3,442.4	-	-
6:30 AM	3,448.1	-	-
7:00 AM	2,631.2	2,631.2	-
7:30 AM	2,629.1	2,629.1	-
8:00 AM	2,611.5	2,611.5	-

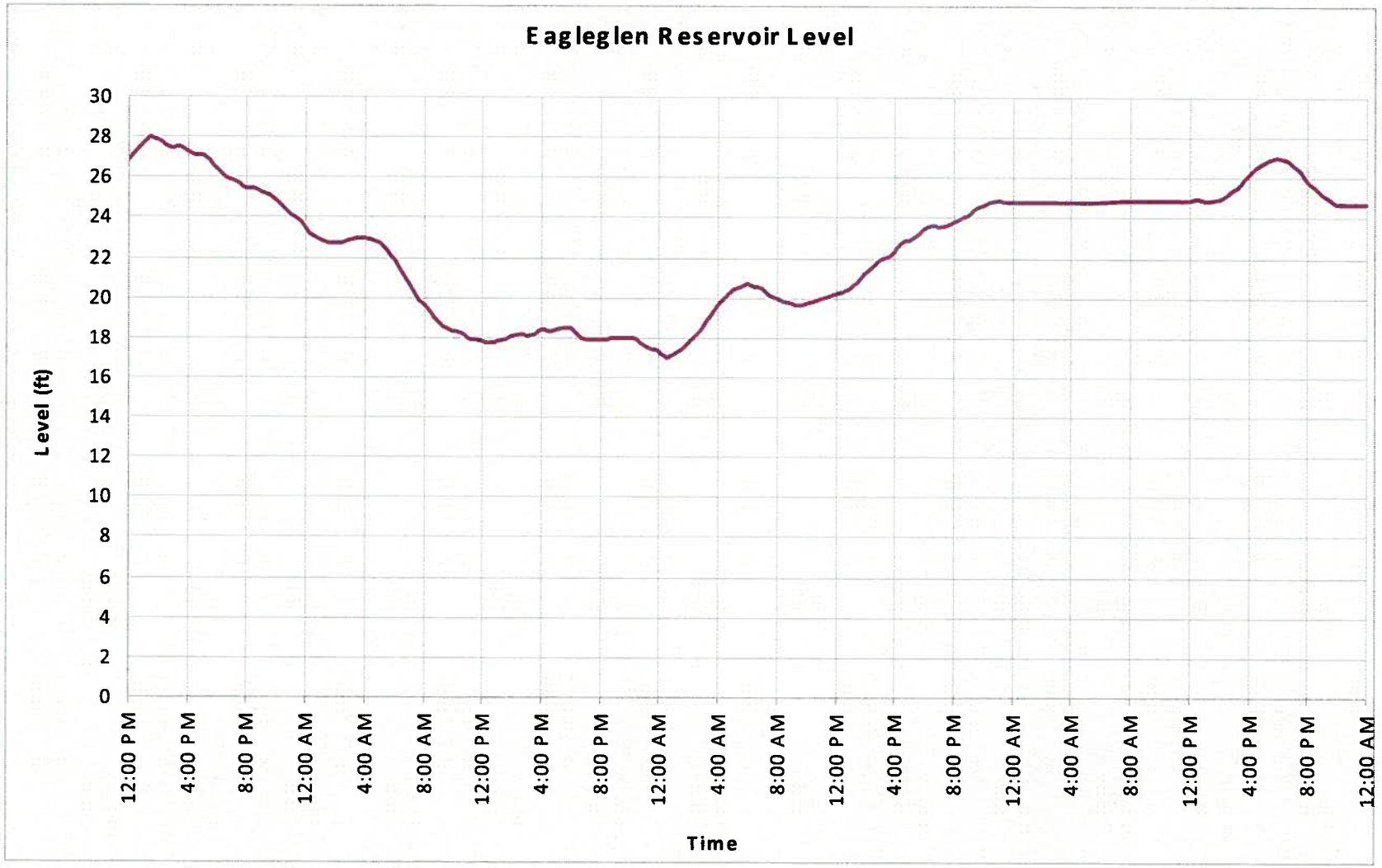
Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
8:30 AM	2,588.8	2,588.8	-
9:00 AM	2,561.7	2,561.7	-
9:30 AM	2,529.8	2,529.8	-
10:00 AM	2,506.4	2,506.4	-
10:30 AM	2,497.6	2,497.6	-
11:00 AM	2,490.0	2,490.0	-
11:30 AM	2,457.1	2,457.1	-
12:00 PM	2,459.4	2,459.4	-
12:30 PM	2,440.9	2,440.9	-
1:00 PM	2,433.6	2,433.6	-
1:30 PM	2,432.9	2,432.9	-
2:00 PM	2,428.1	2,428.1	-
2:30 PM	2,417.3	2,417.3	-
3:00 PM	-	3,186.2	-
3:30 PM	-	3,188.1	-
4:00 PM	-	3,205.3	-
4:30 PM	-	3,205.1	-
5:00 PM	-	3,209.3	-
5:30 PM	-	3,238.0	-
6:00 PM	-	3,248.0	-
6:30 PM	-	3,253.8	-
7:00 PM	-	3,263.5	-
7:30 PM	-	3,261.9	-
8:00 PM	-	3,261.5	-
8:30 PM	-	3,257.5	-
9:00 PM	-	3,255.6	-
9:30 PM	-	3,254.2	-
10:00 PM	-	3,251.1	-
10:30 PM	-	3,259.7	-
11:00 PM	-	3,259.9	-
11:30 PM	-	3,267.1	-
12:00 AM	-	3,267.9	-
12:30 AM	-	3,268.5	-
1:00 AM	-	3,269.8	-
1:30 AM	-	3,272.7	-
2:00 AM	-	3,275.6	-
2:30 AM	-	3,271.2	-
3:00 AM	-	3,271.8	-
3:30 AM	-	3,273.2	-
4:00 AM	-	3,277.1	-
4:30 AM	-	3,282.5	-
5:00 AM	-	3,303.7	-
5:30 AM	-	3,317.5	-
6:00 AM	-	3,367.1	-
6:30 AM	-	3,388.4	-

Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
7:00 AM	2,621.2	2,621.2	-
7:30 AM	2,614.9	2,614.9	-
8:00 AM	2,619.4	2,619.4	-
8:30 AM	1,950.1	1,950.1	1,950.1
9:00 AM	2,033.1	2,033.1	2,033.1
9:30 AM	2,006.2	2,006.2	2,006.2
10:00 AM	1,986.5	1,986.5	1,986.5
10:30 AM	1,974.6	1,974.6	1,974.6
11:00 AM	1,968.8	1,968.8	1,968.8
11:30 AM	1,965.1	1,965.1	1,965.1
12:00 PM	1,945.4	1,945.4	1,945.4
12:30 PM	1,948.2	1,948.2	1,948.2
1:00 PM	1,937.0	1,937.0	1,937.0
1:30 PM	1,933.4	1,933.4	1,933.4
2:00 PM	1,934.2	1,934.2	1,934.2
2:30 PM	1,932.2	1,932.2	1,932.2
3:00 PM	1,925.9	1,925.9	1,925.9
3:30 PM	1,926.5	1,926.5	1,926.5
4:00 PM	1,929.8	1,929.8	1,929.8
4:30 PM	1,926.4	1,926.4	1,926.4
5:00 PM	1,925.1	1,925.1	1,925.1
5:30 PM	1,931.4	1,931.4	1,931.4
6:00 PM	1,952.9	1,952.9	1,952.9
6:30 PM	1,959.7	1,959.7	1,959.7
7:00 PM	1,964.3	1,964.3	1,964.3
7:30 PM	1,971.1	1,971.1	1,971.1
8:00 PM	1,968.6	1,968.6	1,968.6
8:30 PM	1,967.2	1,967.2	1,967.2
9:00 PM	1,963.2	1,963.2	1,963.2
9:30 PM	1,964.6	1,964.6	1,964.6
10:00 PM	1,961.8	1,961.8	1,961.8
10:30 PM	1,957.7	1,957.7	1,957.7
11:00 PM	1,966.0	1,966.0	1,966.0
11:30 PM	1,964.8	1,964.8	1,964.8
12:00 PM	1,969.4	1,969.4	1,969.4
12:30 PM	1,969.0	1,969.0	1,969.0
1:00 PM	1,968.7	1,968.7	1,968.7
1:30 PM	1,968.3	1,968.3	1,968.3
2:00 PM	1,969.1	1,969.1	1,969.1
2:30 PM	1,970.1	1,970.1	1,970.1
3:00 PM	1,965.9	1,965.9	1,965.9
3:30 PM	1,964.5	1,964.5	1,964.5
4:00 PM	1,964.4	1,964.4	1,964.4
4:30 PM	1,967.6	1,967.6	1,967.6
5:00 PM	1,971.2	1,971.2	1,971.2

Time	CHASE_P1 (gpm)	CHASEP2 (gpm)	CHASE_P3 (gpm)
5:30 PM	1,987.5	1,987.5	1,987.5
6:00 PM	1,998.8	1,998.8	1,998.8
6:30 PM	2,041.6	2,041.6	2,041.6
7:00 PM	2,054.9	2,054.9	2,054.9
7:30 PM	2,064.8	2,064.8	2,064.8
8:00 PM	2,060.9	2,060.9	2,060.9
8:30 PM	2,068.4	2,068.4	2,068.4
9:00 PM	2,066.4	2,066.4	2,066.4
9:30 PM	2,046.6	2,046.6	2,046.6
10:00 PM	2,021.0	2,021.0	2,021.0
10:30 PM	2,003.4	2,003.4	2,003.4
11:00 PM	1,992.4	1,992.4	1,992.4
11:30 PM	1,988.9	1,988.9	1,988.9
12:00 AM	1,986.8	1,986.8	1,986.8


Chase Pump Station Flows
Flow (gpm)
3,800
3,600
3,400
3,200
3,000
2,800
2,600
2,400
2,200
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time
Pump No.1
Pump No.2


Hayden Reservoir Level
Level (ft)
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
12:00 AM
Time


Eagleglen Reservoir Level
Level (ft)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
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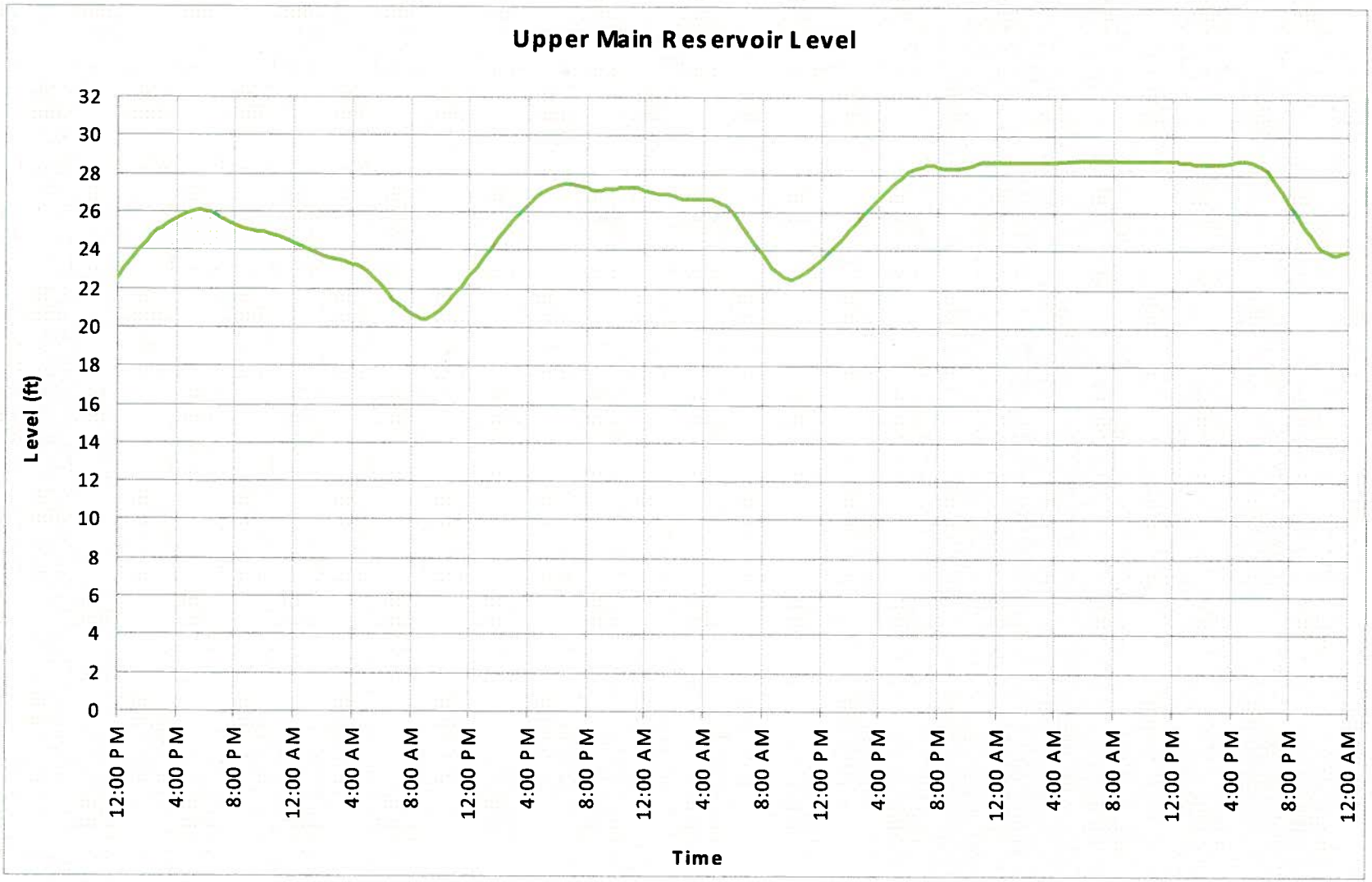
12:00 AM
Time


Upper Main Reservoir Level
Level (ft)
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
8:00 AM
12:00 PM
4:00 PM
8:00 PM
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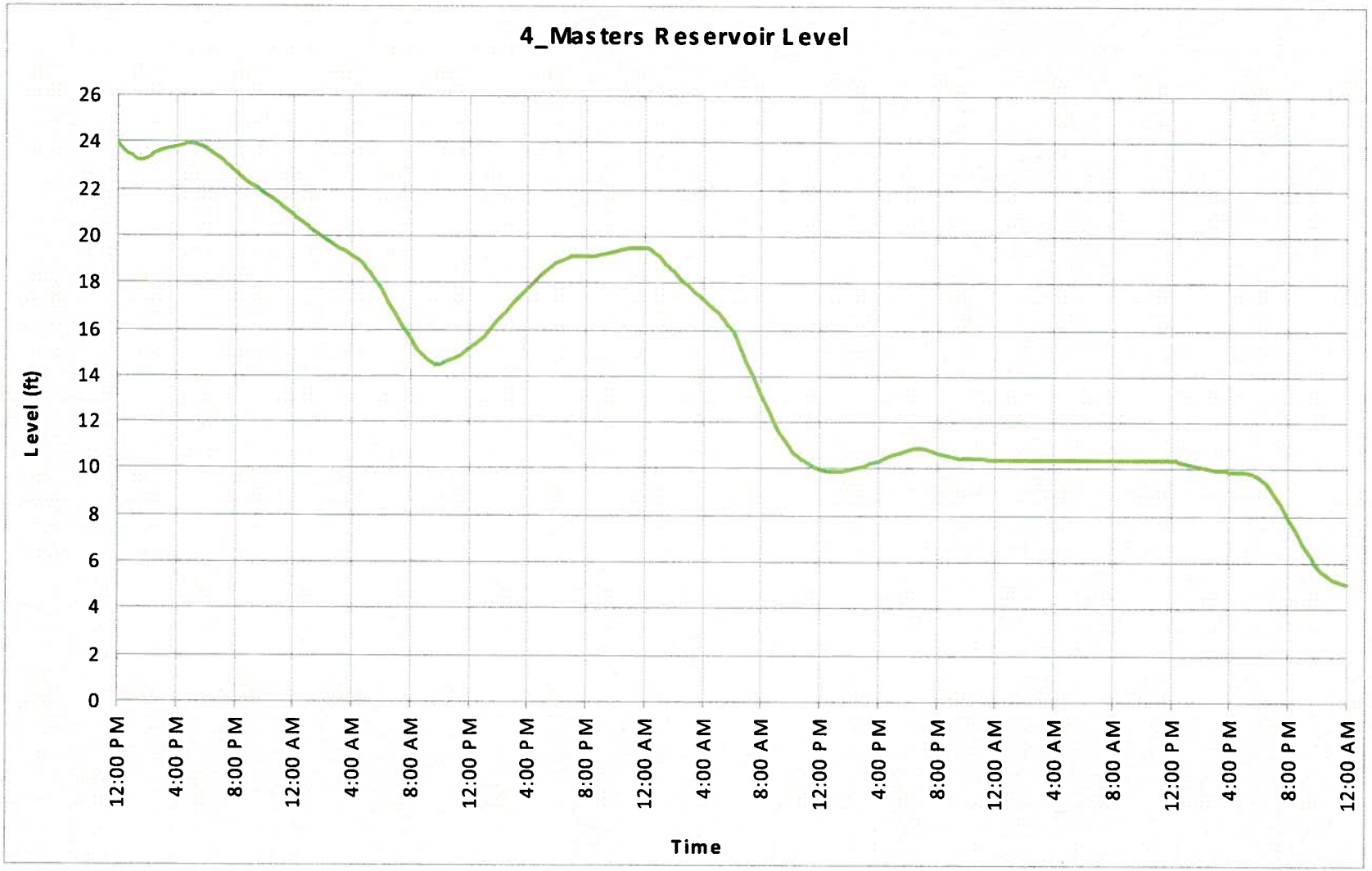
Time


4_Masters Reservoir Level
Level (ft)
26
24
22
20
18
16
14
12
10
8
6
4
2
0
12:00 PM
4:00 PM
8:00 PM
12:00 AM
4:00 AM
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4:00 PM
8:00 PM
12:00 AM
Time

EXHIBIT 8: ALTERNATIVE III-OPTION II OPERATION CONDITION HYDRAULIC ANALYSIS, TANK LEVEL, AND PUMP GRAPHS

The Chase and Eagle Glen BPS are upgraded. Masters reservoir is in service.
2-8" water line are connected to existing 16-inch pressure Zone 5 water line on Leonard way to feed
All Arantine Hills lan development area is considered as pressure Zone 4
The pump and reservoirs graphs are not included since this alternative is not acceptable due to low water pressure in Zone 5 area.

Junction Report and Fire Flow Results
Alternative III Option II Maximum Day plus Fire Flow

		Maximum Day, Peak Hour (6:30			*Maximum Day plus Fire Flow Model Results						
Junction ID	Elevation (ft)	Demand (gpm)	Head (ft)	Pressure (psi)	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Available Flow at Hydrant (gpm)	Available Flow Pressure (psi)
NEW_9	1,003.0	30.97	1,201.1	85.8	31.0	85.8	1,201.1	3,500	77.5	13,599.1	21.8
NEW_8	976.8	-	1,200.9	97.1	-	97.1	1,200.9	3,000	89.9	14,233.2	22.0
NEW_7	958.0	120.50	1,200.8	105.2	120.5	105.2	1,200.8	3,000	94.2	10,795.0	21.1
NEW_6	959.0	5.72	1,200.8	104.8	5.7	104.8	1,200.8	2,500	97.8	12,514.1	21.6
NEW_5	959.8	-	1,200.8	104.4	-	104.4	1,200.8	3,000	97.1	14,911.3	22.2
NEW_3	939.0	333.35	1,200.8	113.4	333.4	113.4	1,200.8	3,000	105.9	15,983.5	22.5
NEW_25	1,102.0	-	1,371.6	116.8	-	116.8	1,371.6	2,500	112.6	14,598.9	22.1
NEW_2	992.0	244.03	1,200.7	90.4	244.0	90.4	1,200.7	2,500	82.3	10,292.0	21.0
NEW_19	935.5	86.51	1,200.7	114.9	86.5	114.9	1,200.7	3,000	105.7	13,335.5	21.8
NEW_18	974.0	115.12	1,200.8	98.3	115.1	98.3	1,200.8	2,500	87.2	8,371.6	20.7
NEW_17	1,115.0	78.88	1,202.7	38.0	78.9	38.0	1,202.7	1,500	33.2	3,513.5	20.1
NEW_16	1,106.0	78.88	1,203.1	42.1	78.9	42.1	1,203.1	1,500	40.1	9,537.0	20.9
NEW_15	1,071.5	68.82	1,202.0	56.6	68.8	56.6	1,202.0	2,500	49.0	6,700.7	20.4
NEW_14	1,074.0	64.63	1,202.1	55.5	64.6	55.5	1,202.1	2,500	51.5	11,628.6	21.3
NEW_13	1,102.0	-	1,201.2	43.0	-	43.0	1,201.2	2,500	38.0	7,156.8	20.5
NEW_12	1,040.0	315.73	1,201.4	69.9	315.7	69.9	1,201.4	2,500	65.5	13,483.1	21.7
NEW_11	1,047.0	78.76	1,201.4	66.9	78.8	66.9	1,201.4	2,500	62.6	13,199.7	21.7
NEW_10	999.0	2.69	1,201.0	87.5	2.7	87.5	1,201.0	2,500	70.3	5,521.4	20.3

***Explanation of fire flow model results:**

Each row of the fire flow results is one run in the model. Fire flow demands are only placed at one location at a time.

The residual pressure is the pressure available at the hydrant when the designated fire flow demand is applied at the hydrant or junction being analyzed.

The available flow at the hydrant is the maximum flow available at that location if the residual pressure were brought down to 20 psi (available flow pressure).

Maximum velocity equal 4.5 ftt/sec(on 16" line from 04-47925 to New_3) when 3500 gpm Fire Flow applied to junction New_9.

The static demand is the maximum day demand at the time of the fire flow simulation without the fire flow demand.

The static pressure is the associated pressure at the same location. The static head is the associated HGL at the same location.

Pipe Report
Alternative III- Option II Maximum Day at Peak Hour (6:30 AM)

Pipe Id	From Node	To Node	Length (ft)	Diameter (in)	Roughness	*Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
04-47925-NEW_3	04-47925	NEW_3	1,789.2	16	130	269.62	0.4	0.1	0.1
NEW11_14	NEW_11	NEW_14	678.8	16	130	(1,285.20)	2.1	0.7	1.0
NEW11-12	NEW_11	NEW_12	274.0	16	130	537.17	0.9	0.1	0.2
NEW12-13	NEW_12	NEW_13	1,471.3	16	130	400.82	0.6	0.2	0.1
NEW12-15	NEW_12	NEW_15	745.4	8	120	(179.38)	1.1	0.7	0.9
NEW13-0445210	NEW_13	04-45210	794.3	16	130	400.82	0.6	0.1	0.1
NEW14-15	NEW_14	NEW_15	263.1	8	120	96.36	0.6	0.1	0.3
NEW14-16	NEW_14	NEW_16	795.2	16	130	(1,446.19)	2.3	1.0	1.2
NEW15-17	NEW_15	NEW_17	1,037.2	8	120	(151.84)	1.0	0.7	0.7
NEW16-17	NEW_16	NEW_17	275.9	8	120	230.72	1.5	0.4	1.4
NEW16-MASTERS	NEW_16	4_MASTERS	1,878.0	16	130	(1,755.78)	2.8	3.3	1.8
NEW19-3	NEW_19	NEW_3	708.4	16	130	(330.54)	0.5	0.1	0.1
NEW2-19	NEW_2	NEW_19	519.2	16	130	(244.03)	0.4	0.0	0.1
NEW3-5	NEW_3	NEW_5	538.4	16	130	(394.27)	0.6	0.1	0.1
NEW5-6	NEW_5	NEW_6	299.2	12	120	79.37	0.2	0.0	0.0
NEW5-8	NEW_5	NEW_8	451.1	16	130	(473.64)	0.8	0.1	0.2
NEW6-18	NEW_6	NEW_18	408.4	8	120	18.40	0.1	0.0	0.0
NEW6-7	NEW_6	NEW_7	293.6	12	120	55.24	0.2	-	0.0
NEW7-10	NEW_7	NEW_10	1,144.1	8	120	(65.26)	0.4	0.2	0.1
NEW8-18	NEW_8	NEW_18	299.7	8	120	96.71	0.6	0.1	0.3
NEW8-9	NEW_8	NEW_9	745.4	16	130	(570.35)	0.9	0.2	0.2
NEW9-10	NEW_9	NEW_10	635.5	8	120	67.95	0.4	0.1	0.2
NEW9-11	NEW_9	NEW_11	1,182.6	16	130	(669.27)	1.1	0.4	0.3

Pipe roughnesses per City of Corona Water Master Plan.
***Numbers in parenthesis indicates that the flow is in the reverse direction**
Pipe IDs NEW14-16, NEW16-17, NEW14-15, NEW15-17 serve Zone 5, and the other lines serve Zone 4.