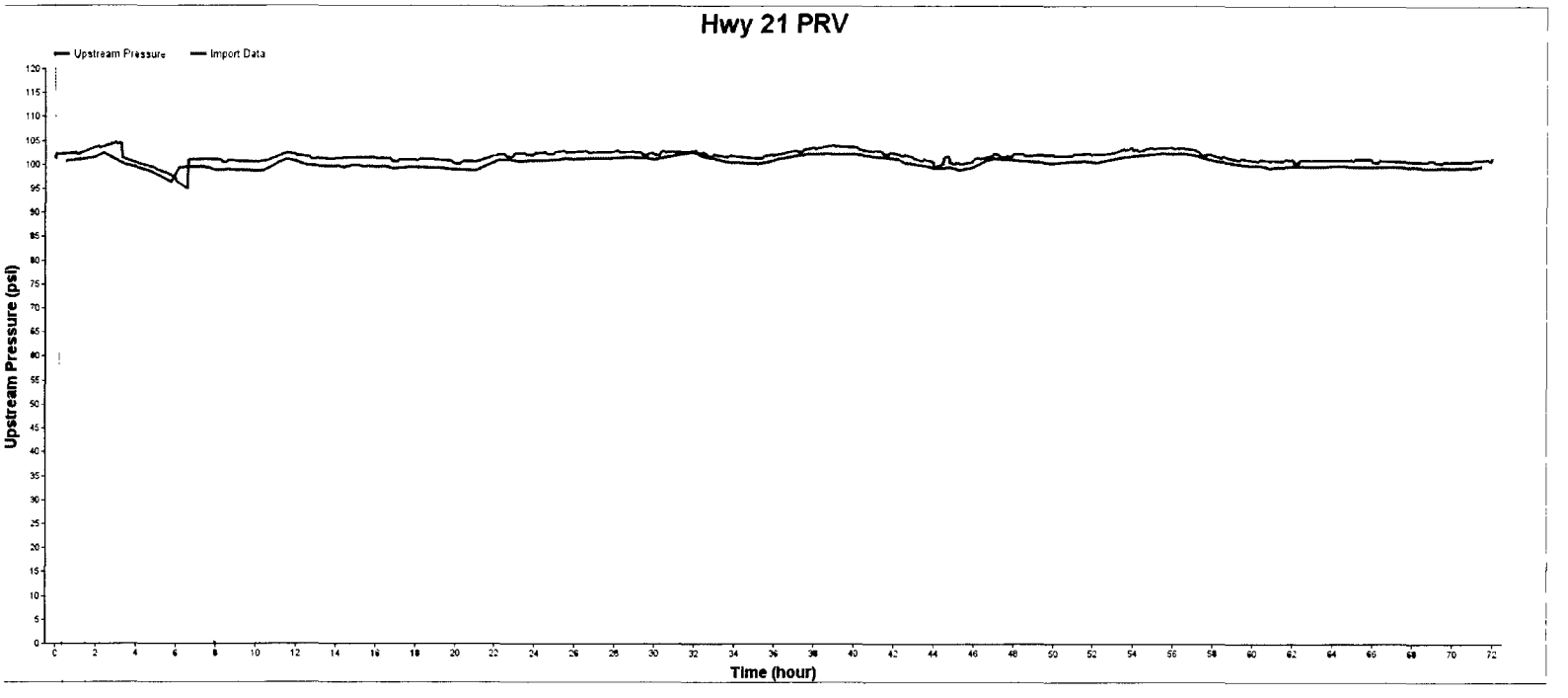
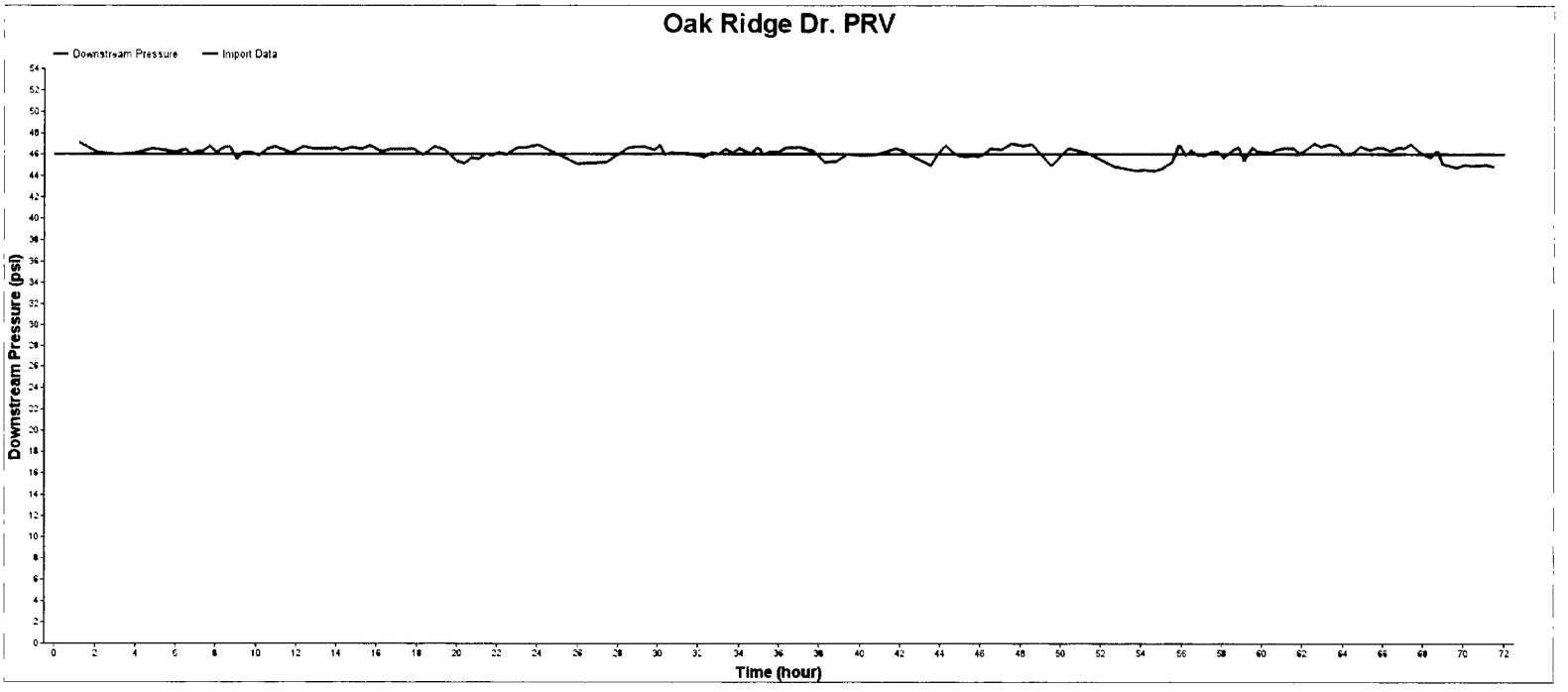
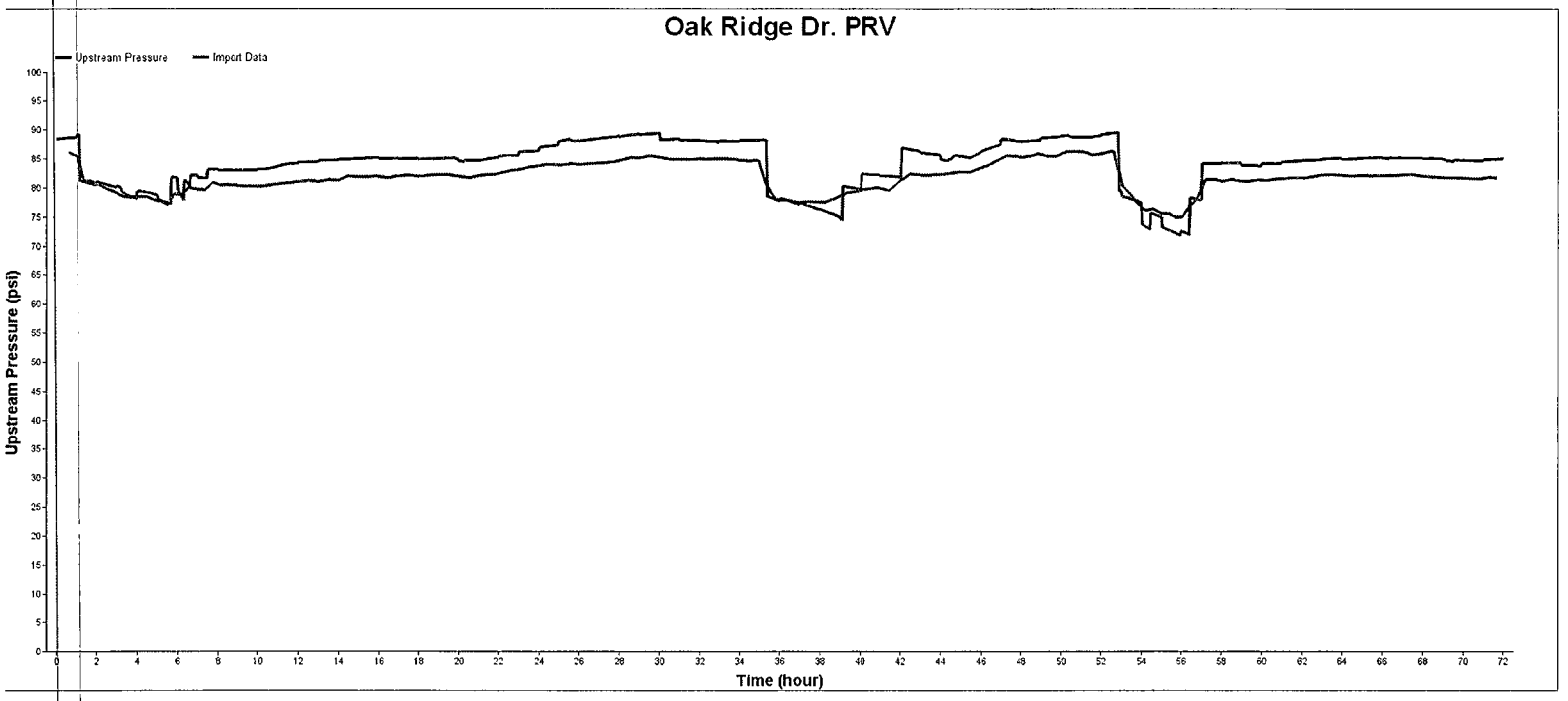
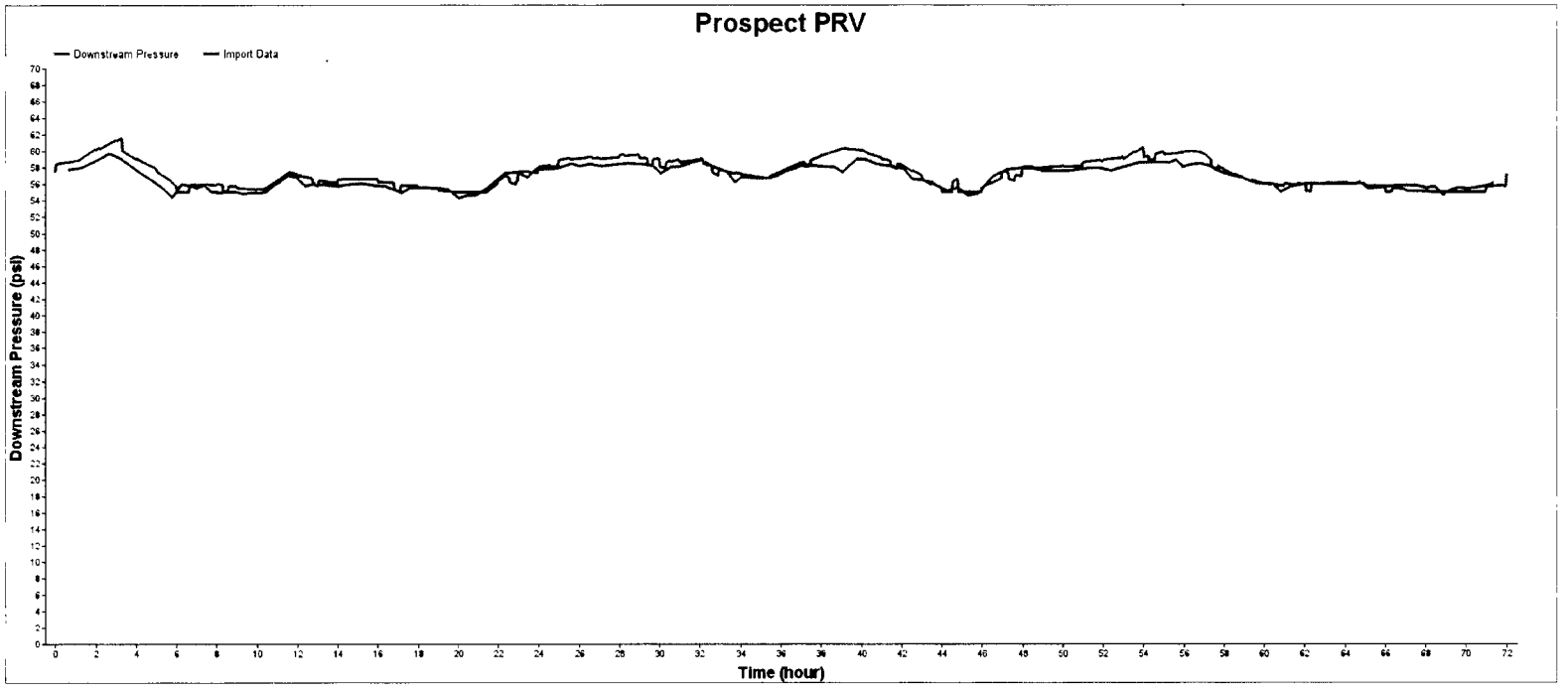
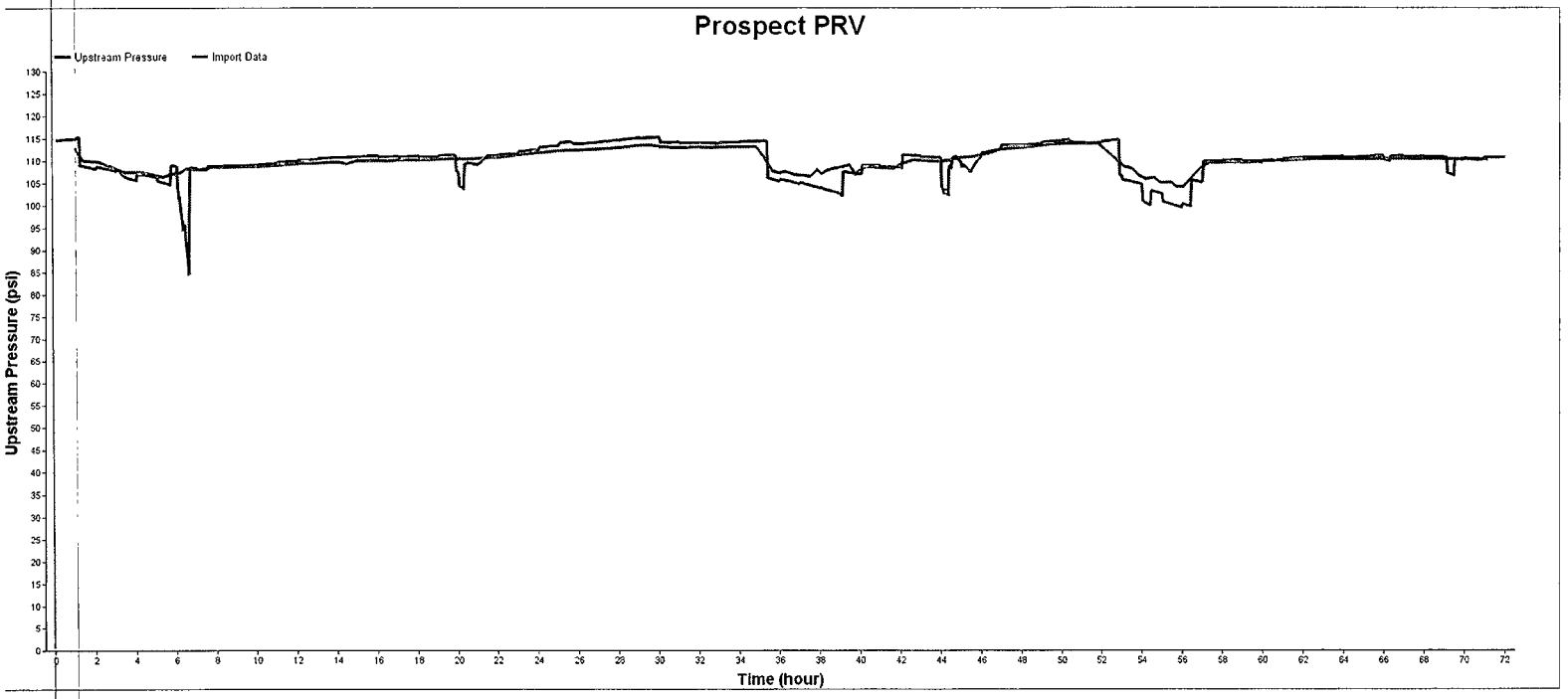
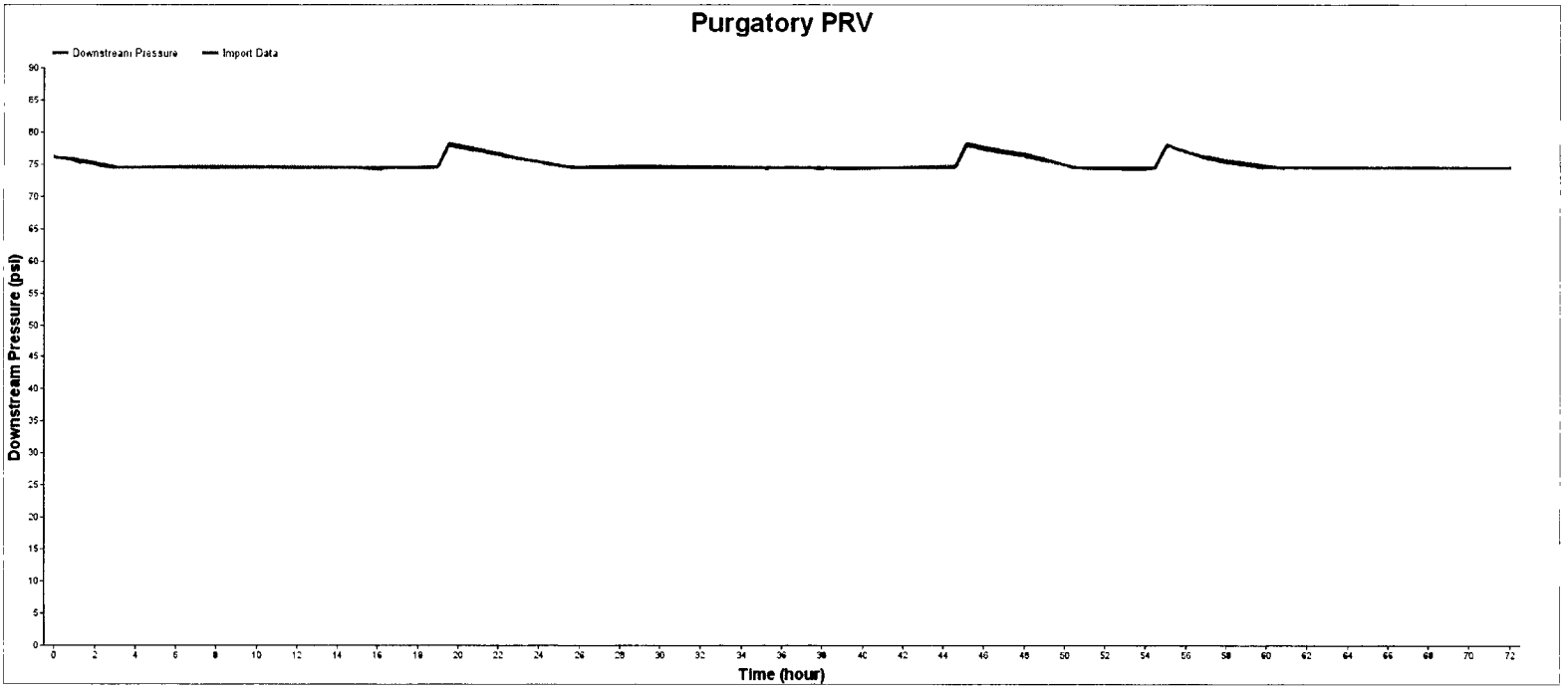

Hwy 21 PRV
Upstream Pressure
Import Data
Upstream Pressure (psi)
Time (hour)

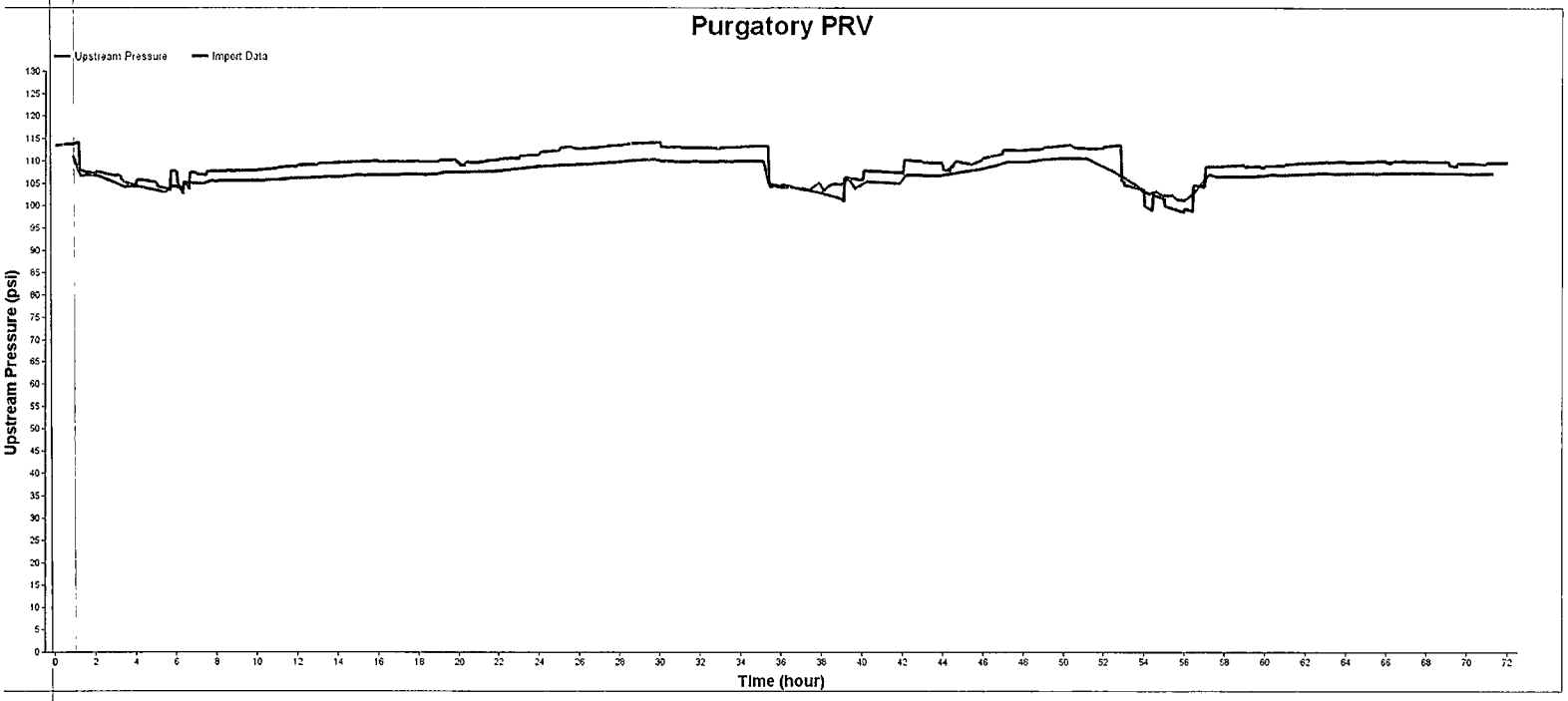

Oak Ridge Dr. PRV
Downstream Pressure
Import Data
Downstream Pressure (psi)
Time (hour)

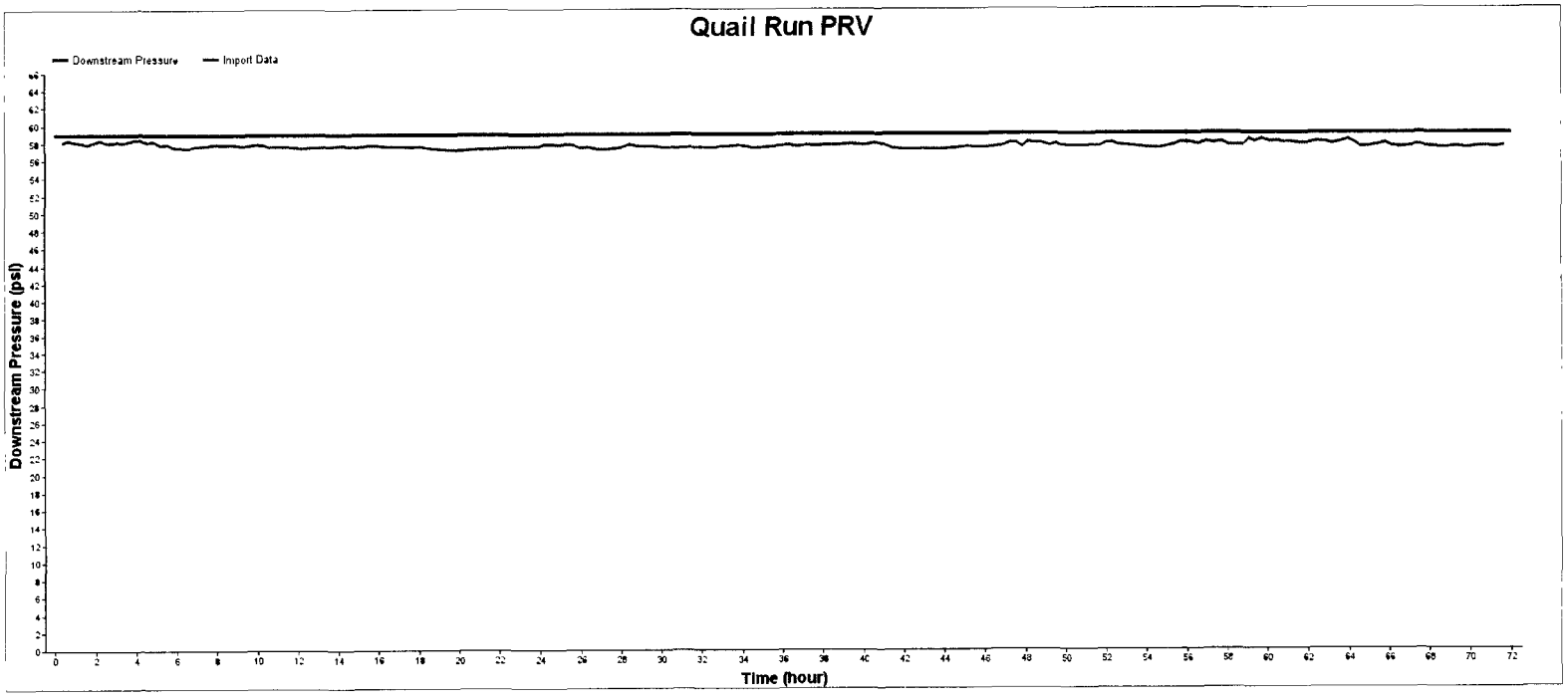

Oak Ridge Dr. PRV
Upstream Pressure
Import Data
Upstream Pressure (psi)
Time (hour)

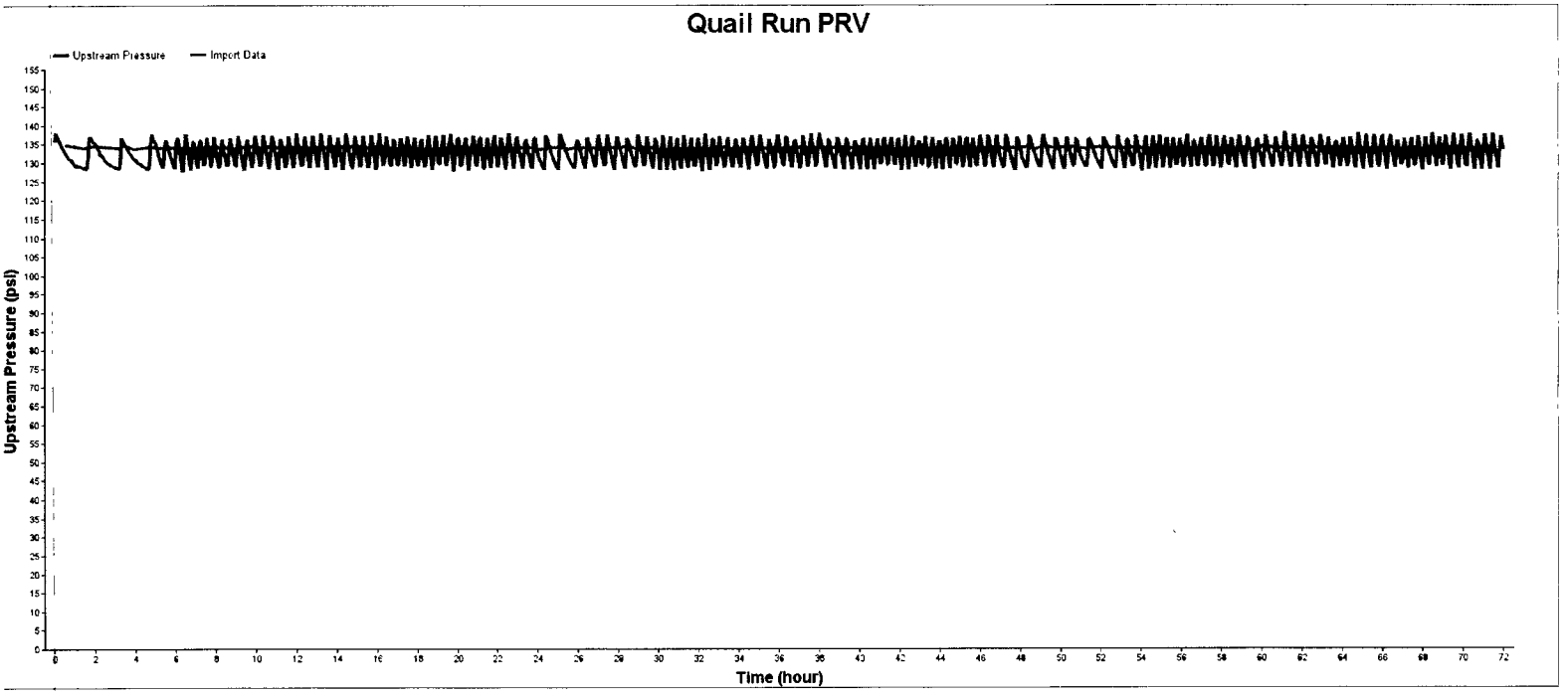

Prospect PRV
Downstream Pressure
Import Data
Downstream Pressure (psi)
Time (hour)

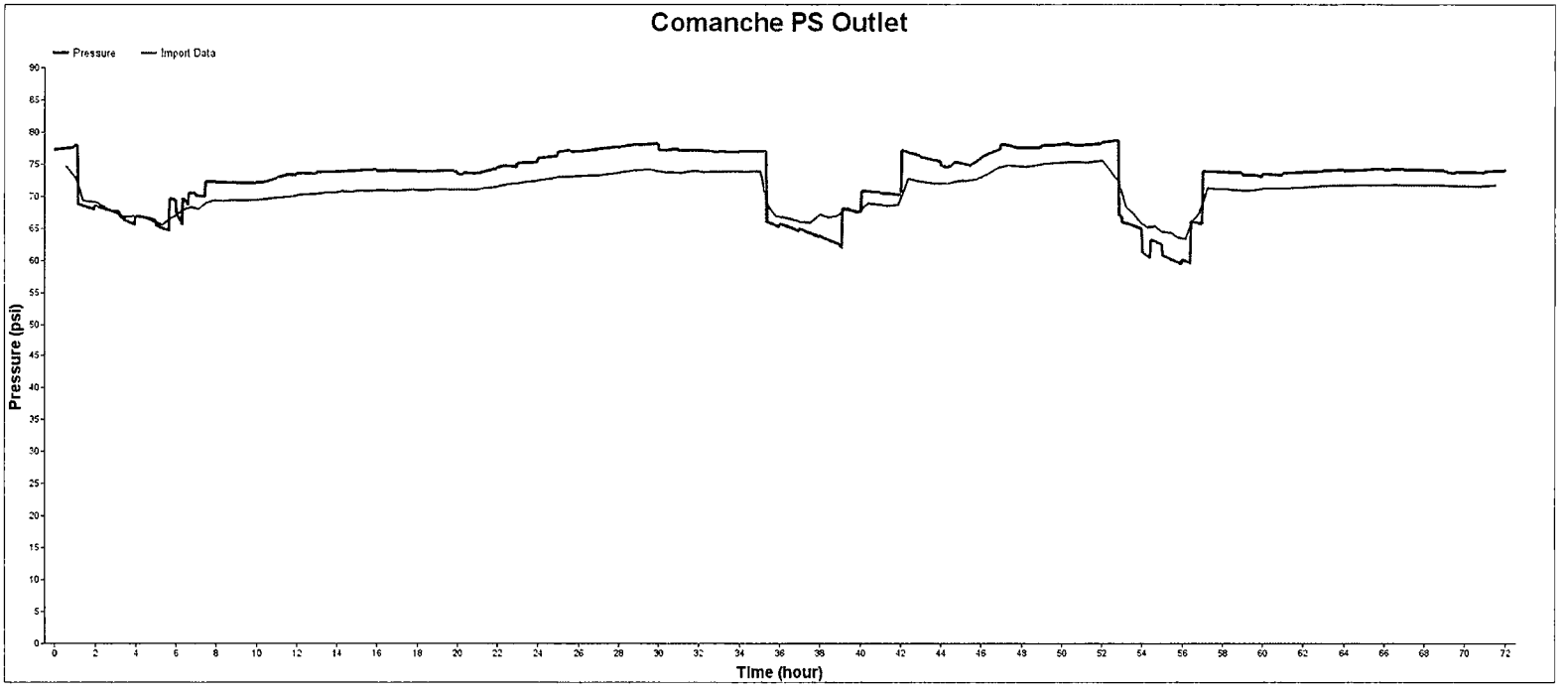

Prospect PRV
Upstream Pressure
Import Data
Upstream Pressure (psi)
Time (hour)

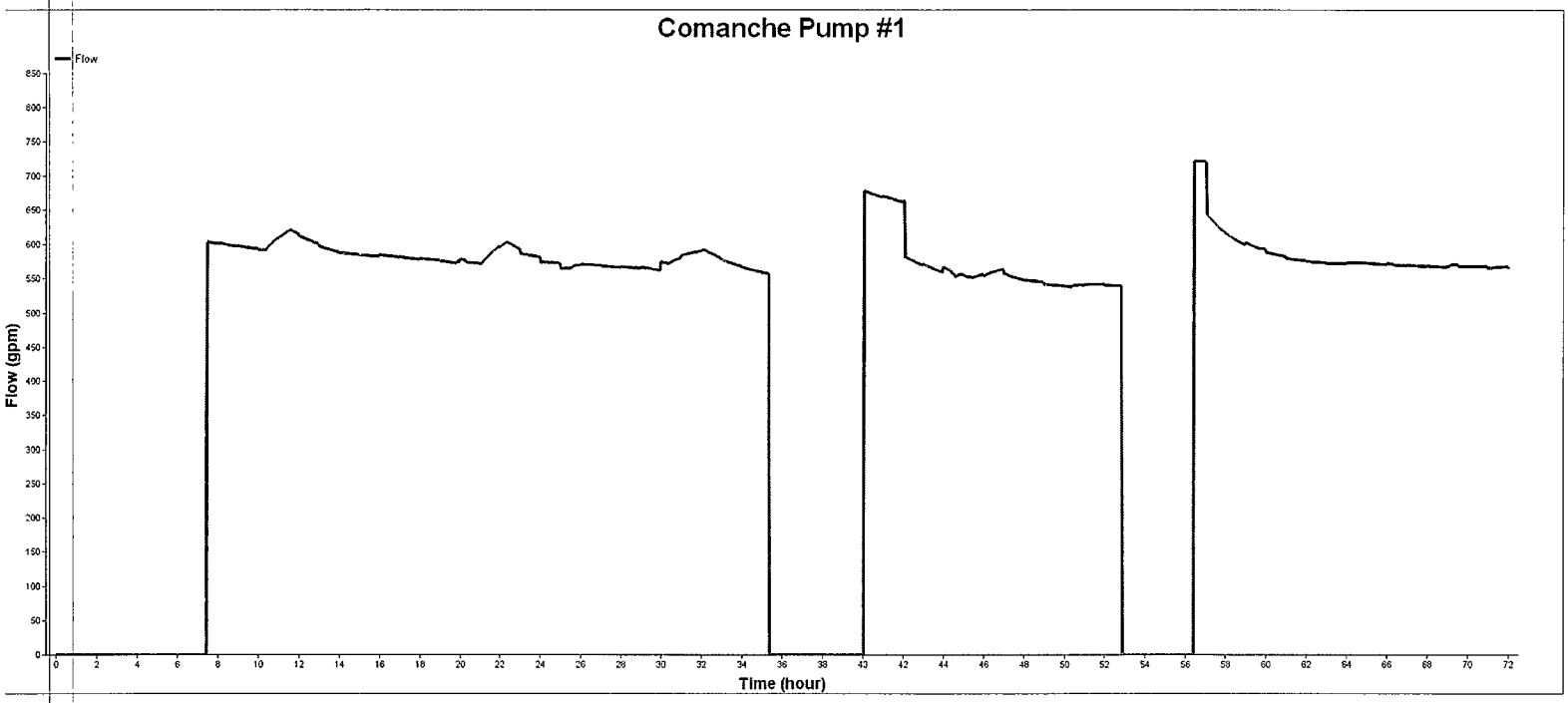

Purgatory PRV
Downstream Pressure
Import Data
Downstream Pressure (psi)
Time (hour)

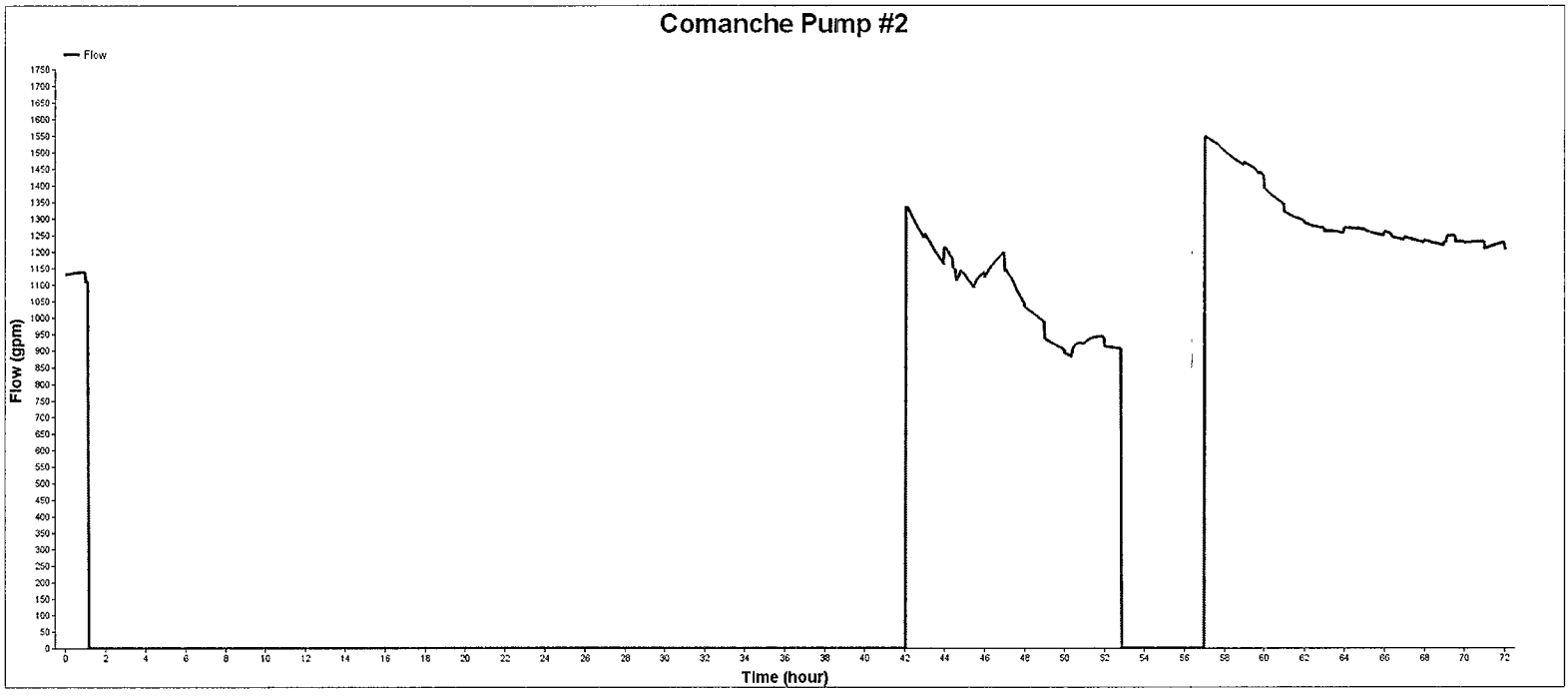

Purgatory PRV
Upstream Pressure
Import Data
Upstream Pressure (psi)
Time (hour)

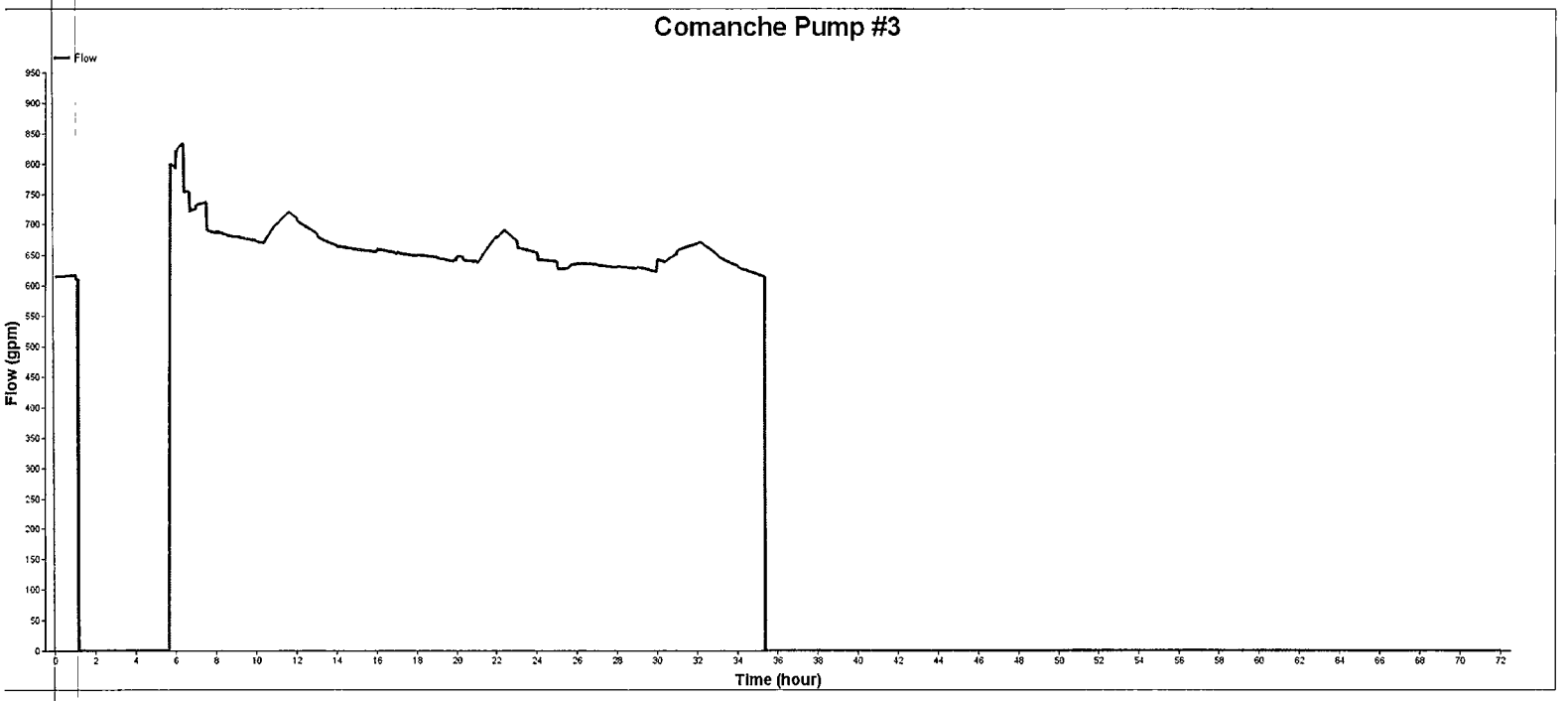

Quail Run PRV
Downstream Pressure
Import Data
Downstream Pressure (psi)
Time (hour)

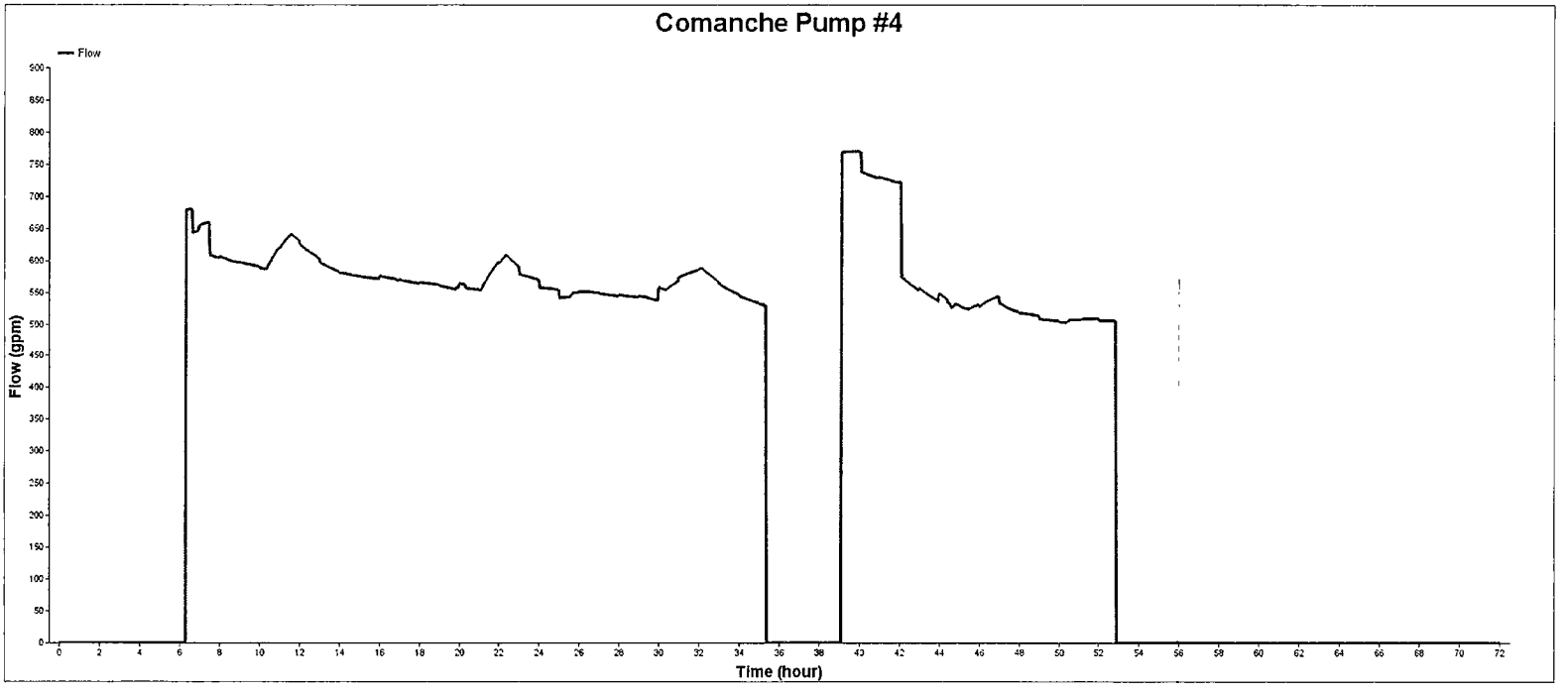

Quail Run PRV
Upstream Pressure
Import Data
Upstream Pressure (psi)
Time (hour)

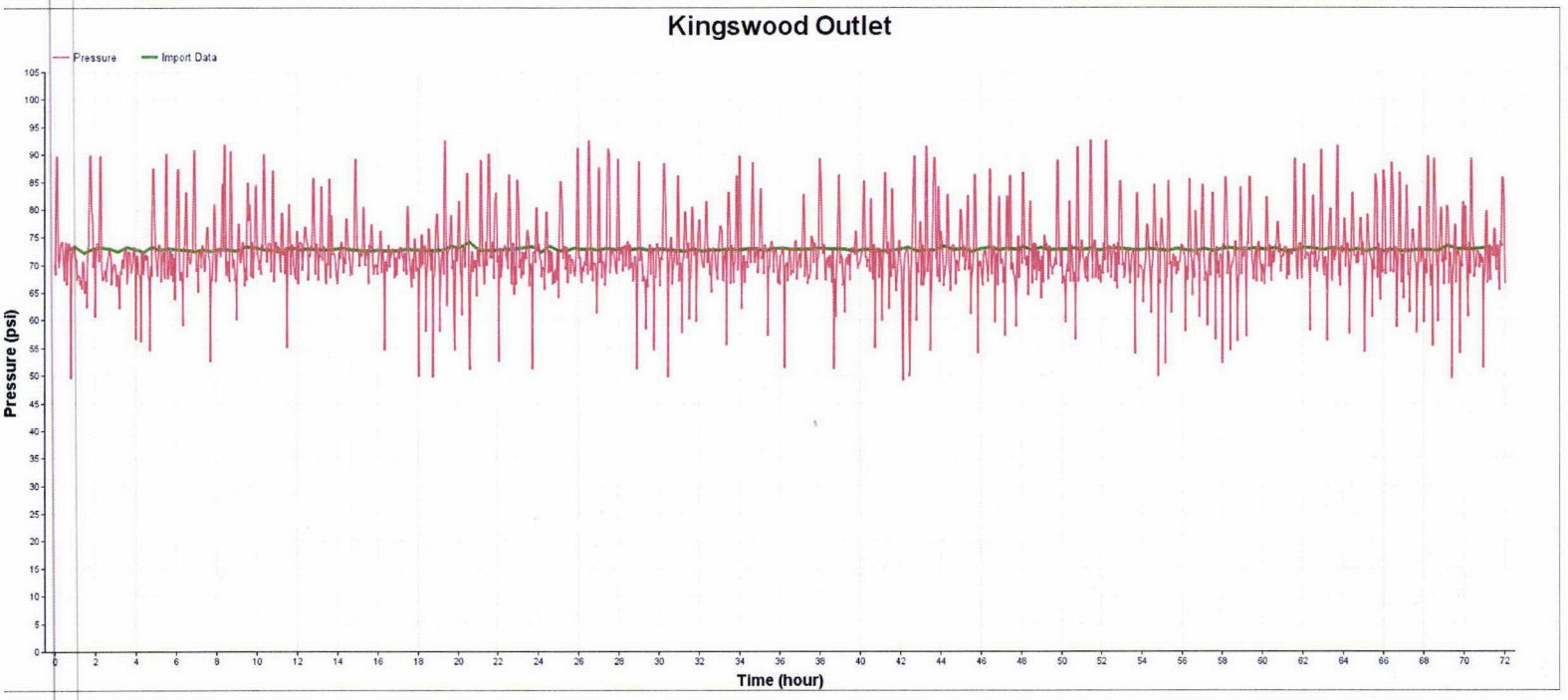

Comanche PS Outlet
Pressure
Import Data
Pressure (psi)
Time (hour)

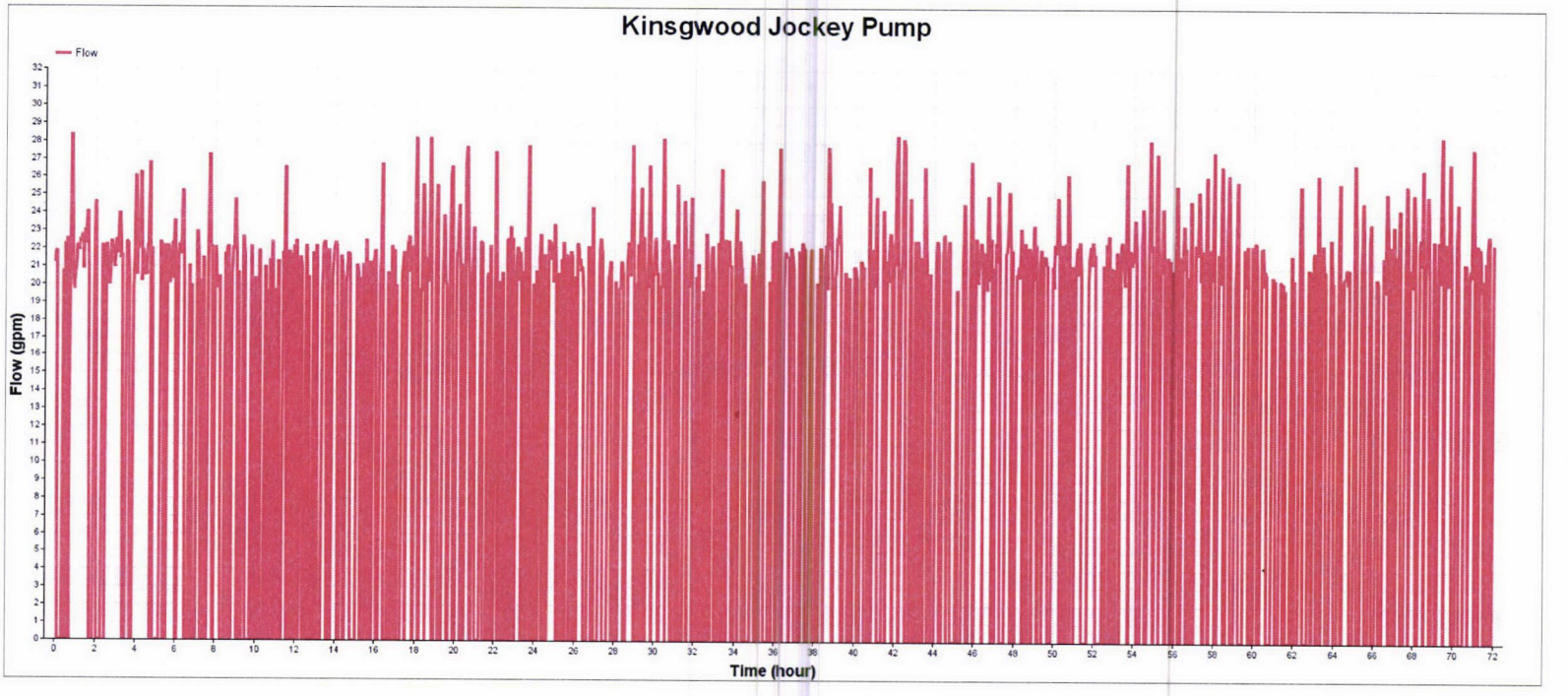

Comanche Pump #1
Flow
Flow (gpm)
Time (hour)

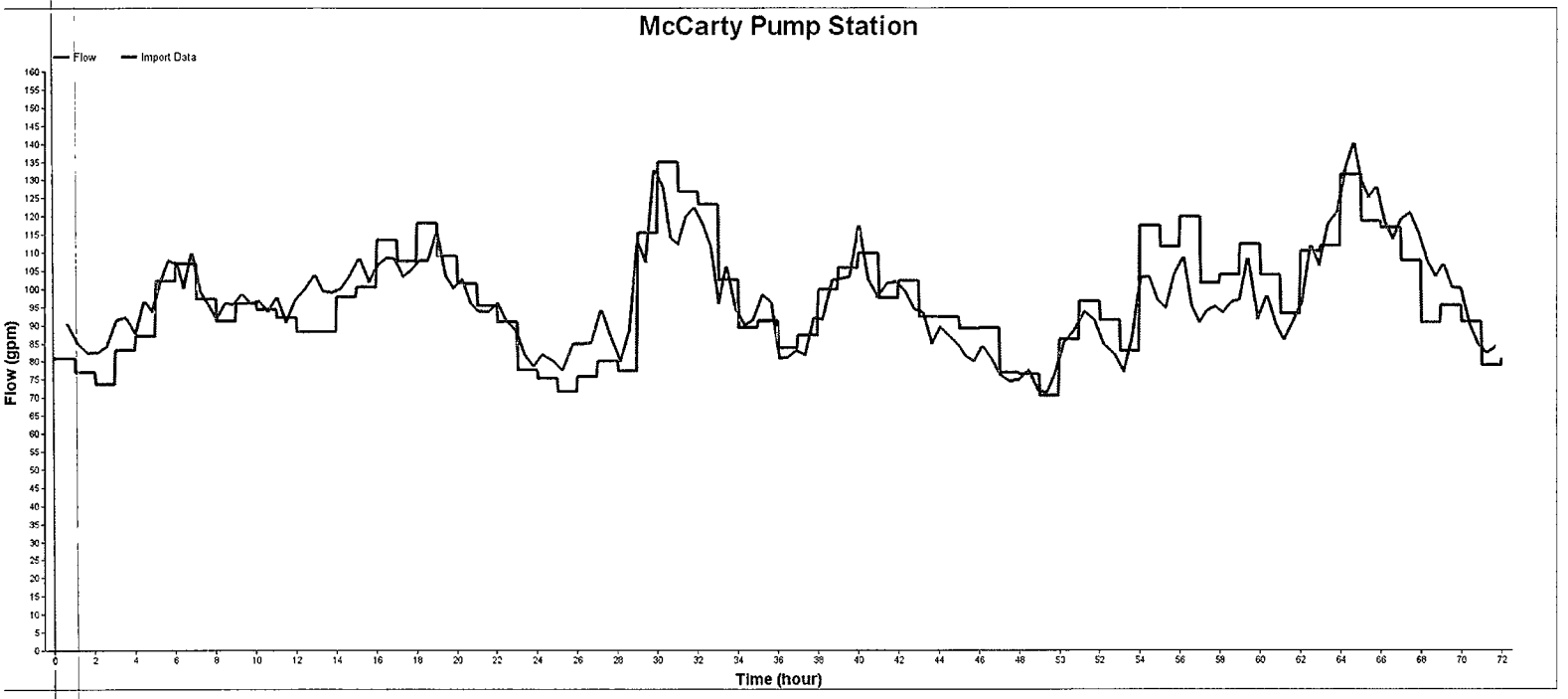

Comanche Pump #2
Flow
Flow (gpm)
Time (hour)

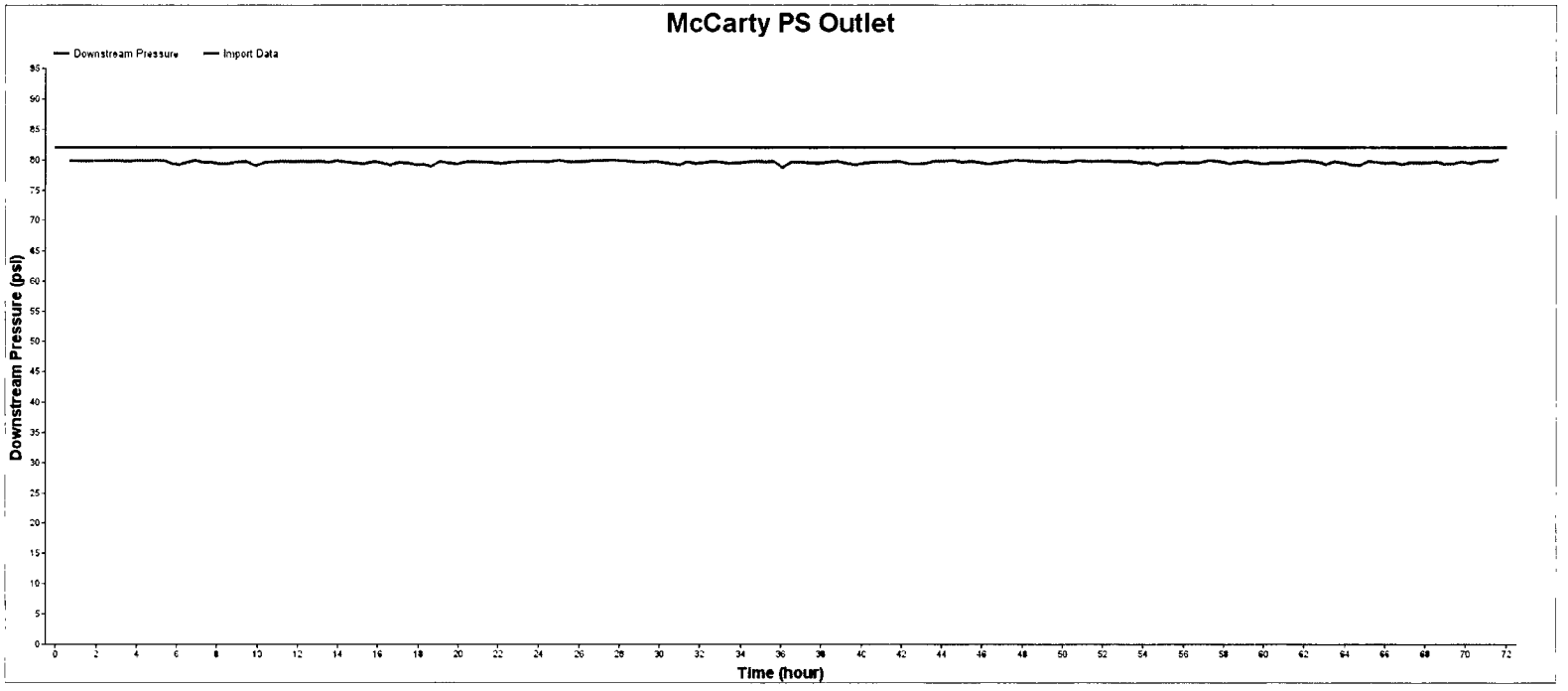

Comanche Pump #3
Flow
Flow (gpm)
Time (hour)

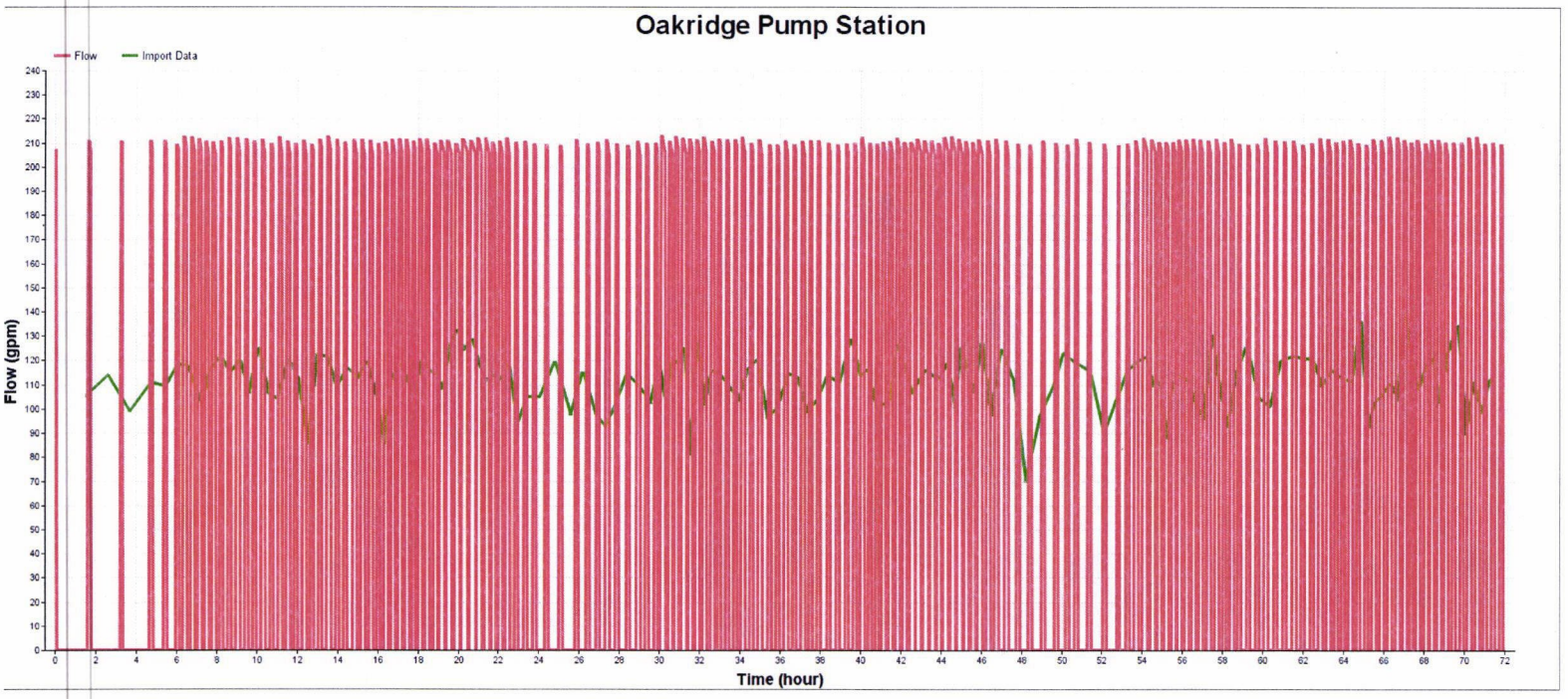

Comanche Pump #4
Flow
Flow (gpm)
Time (hour)

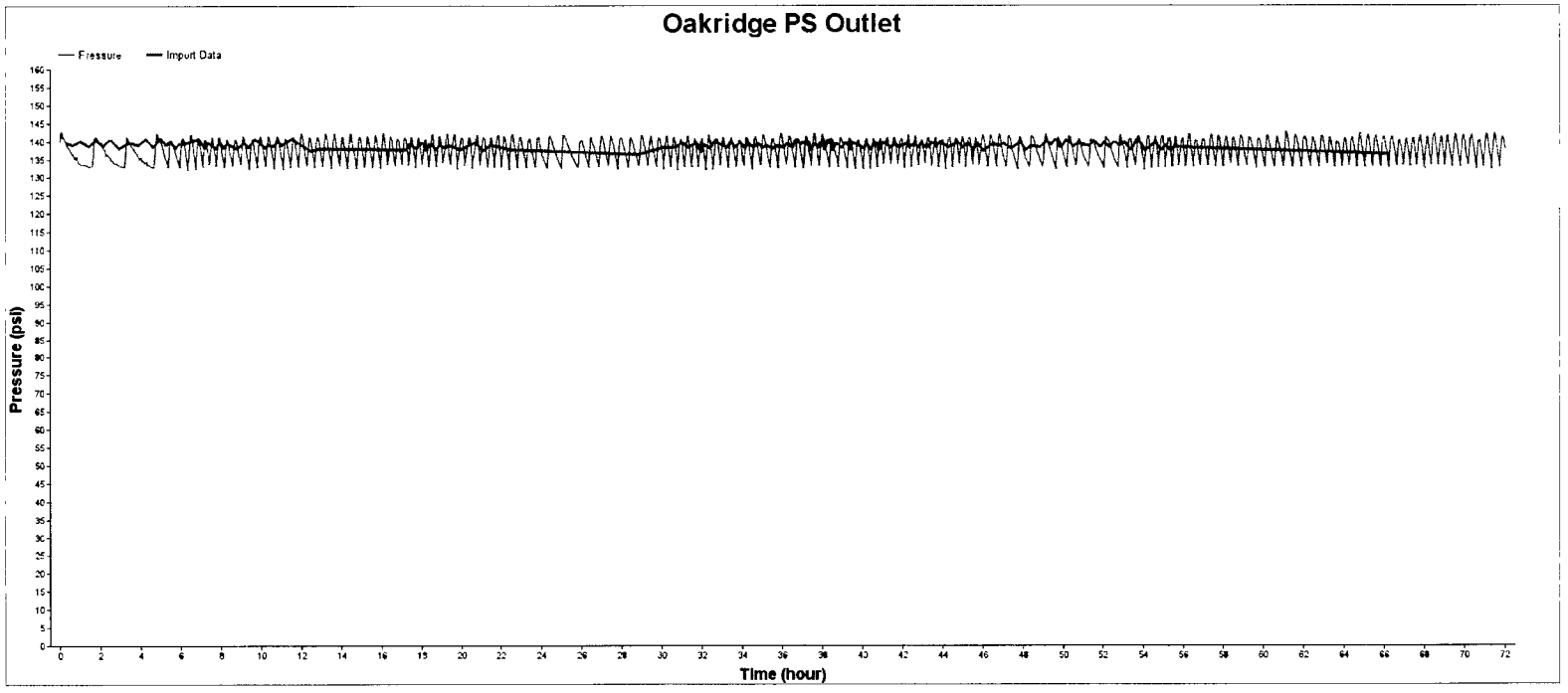

Kingswood Outlet
Pressure
Import Data
Pressure (psi)
Time (hour)

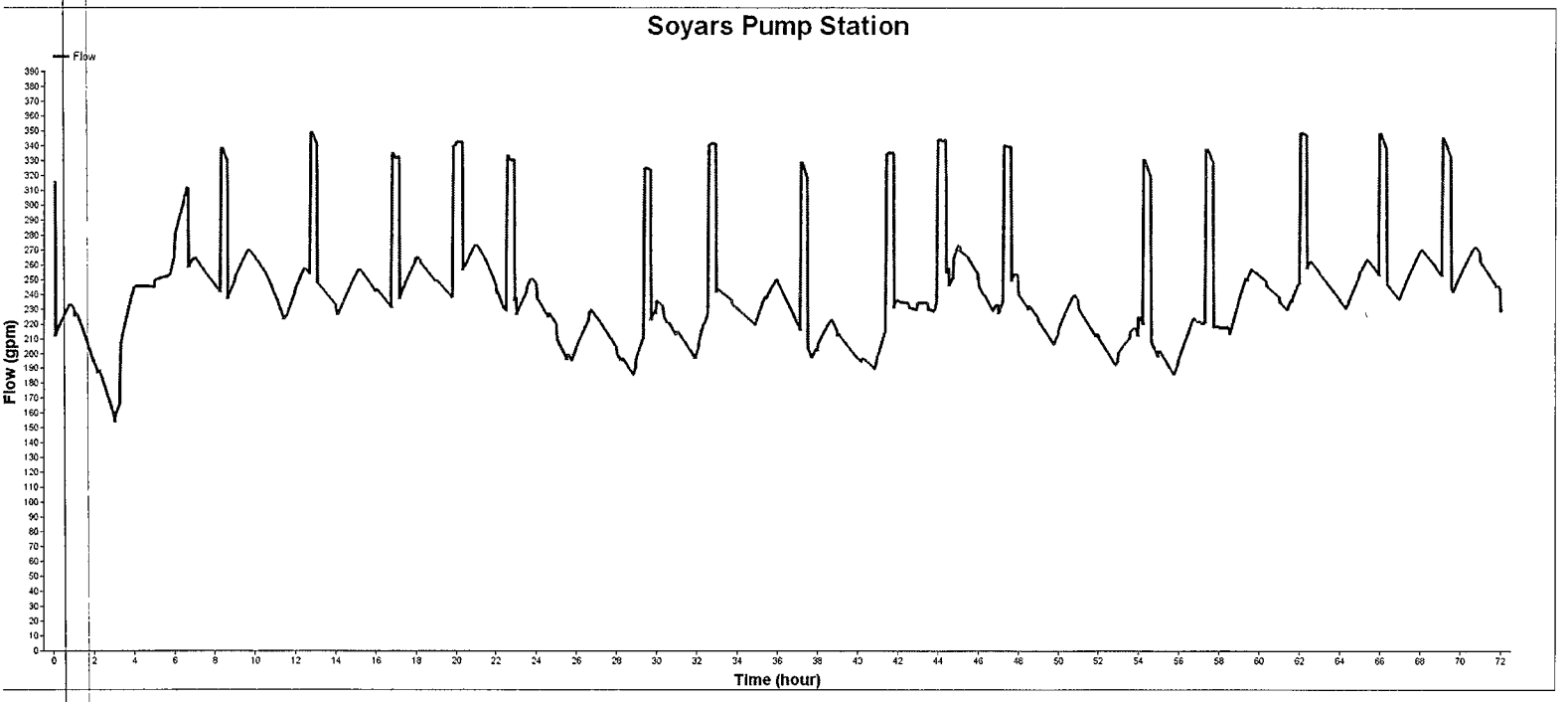

Kinsgwood Jockey Pump
Flow
Flow (gpm)
Time (hour)

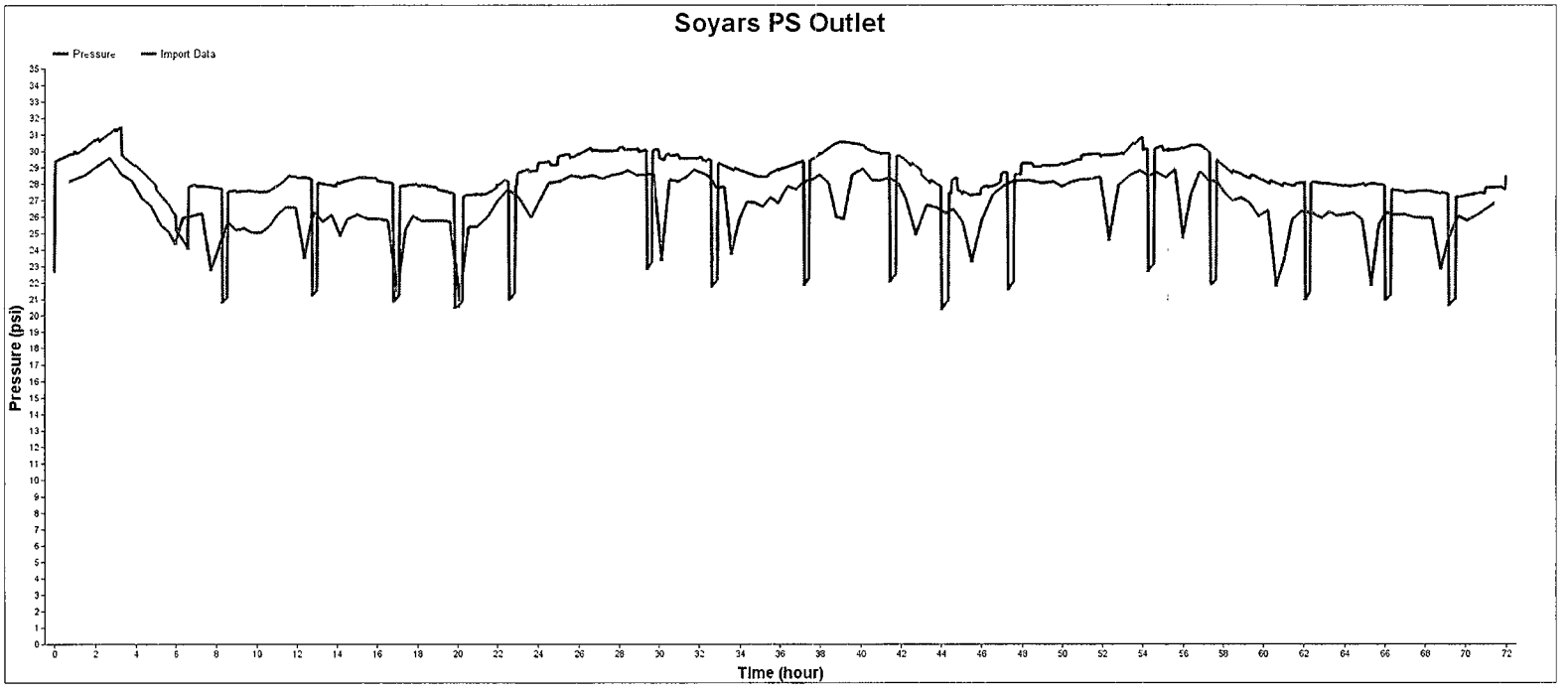

McCarty Pump Station
Flow
Import Data
Flow (gpm)
Time (hour)

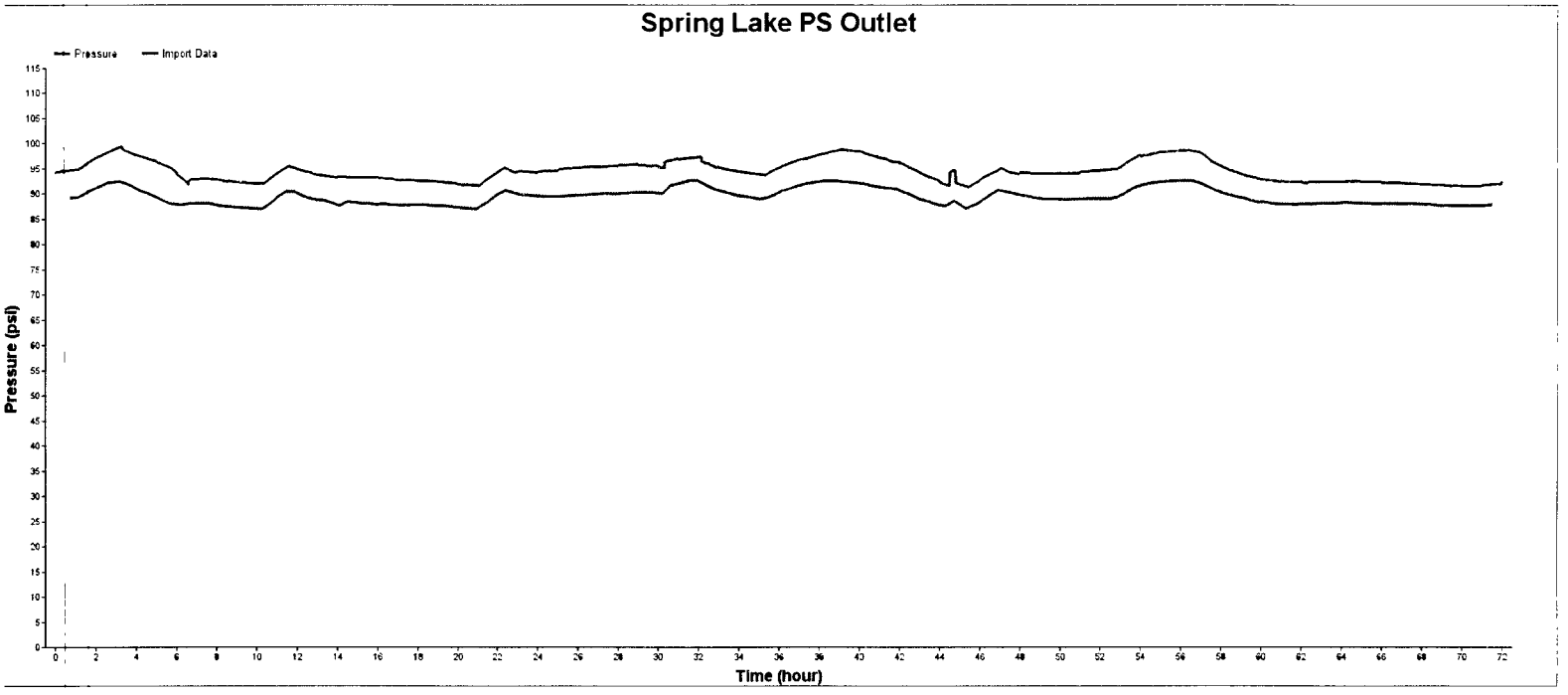

McCarty PS Outlet
Downstream Pressure
Import Data
Downstream Pressure (psi)
Time (hour)

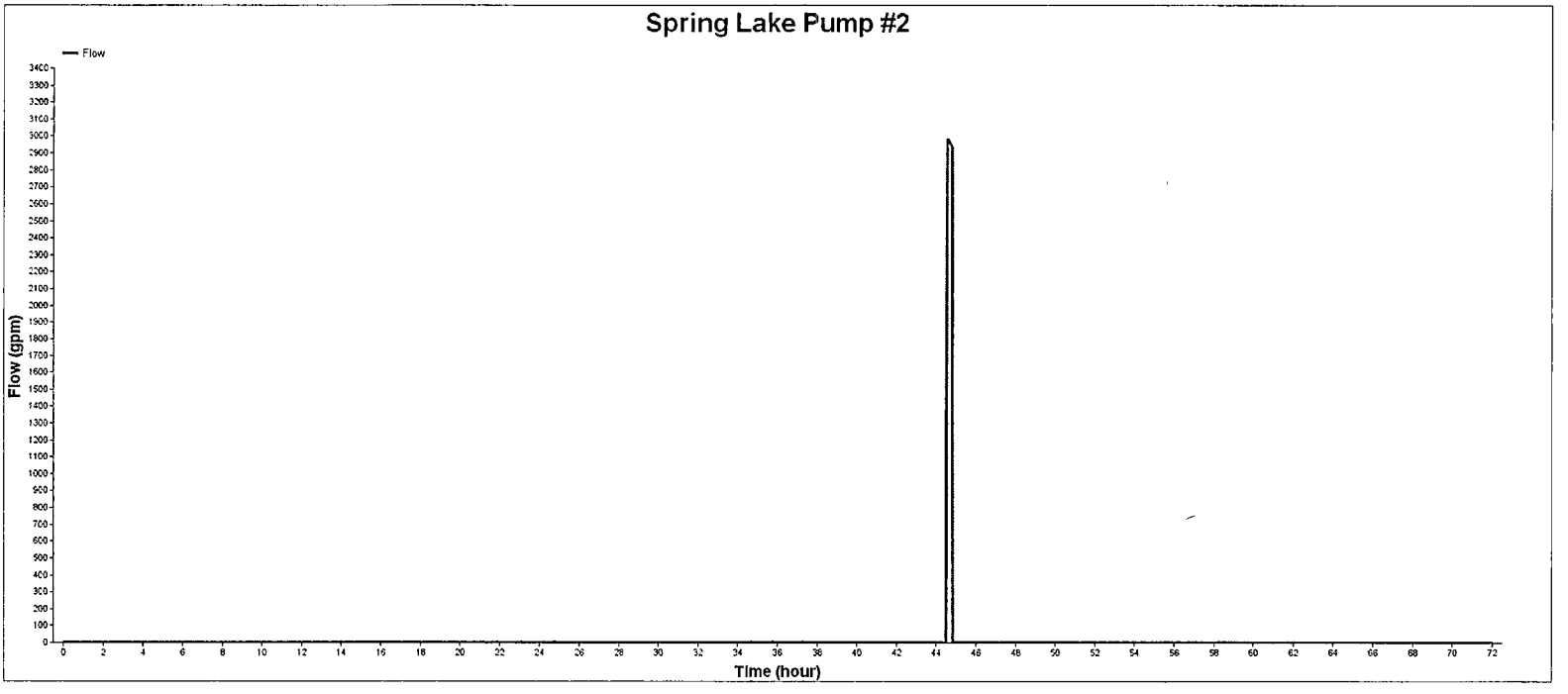

Oakridge Pump Station
Flow
Import Data
Flow (gpm)
Time (hour)

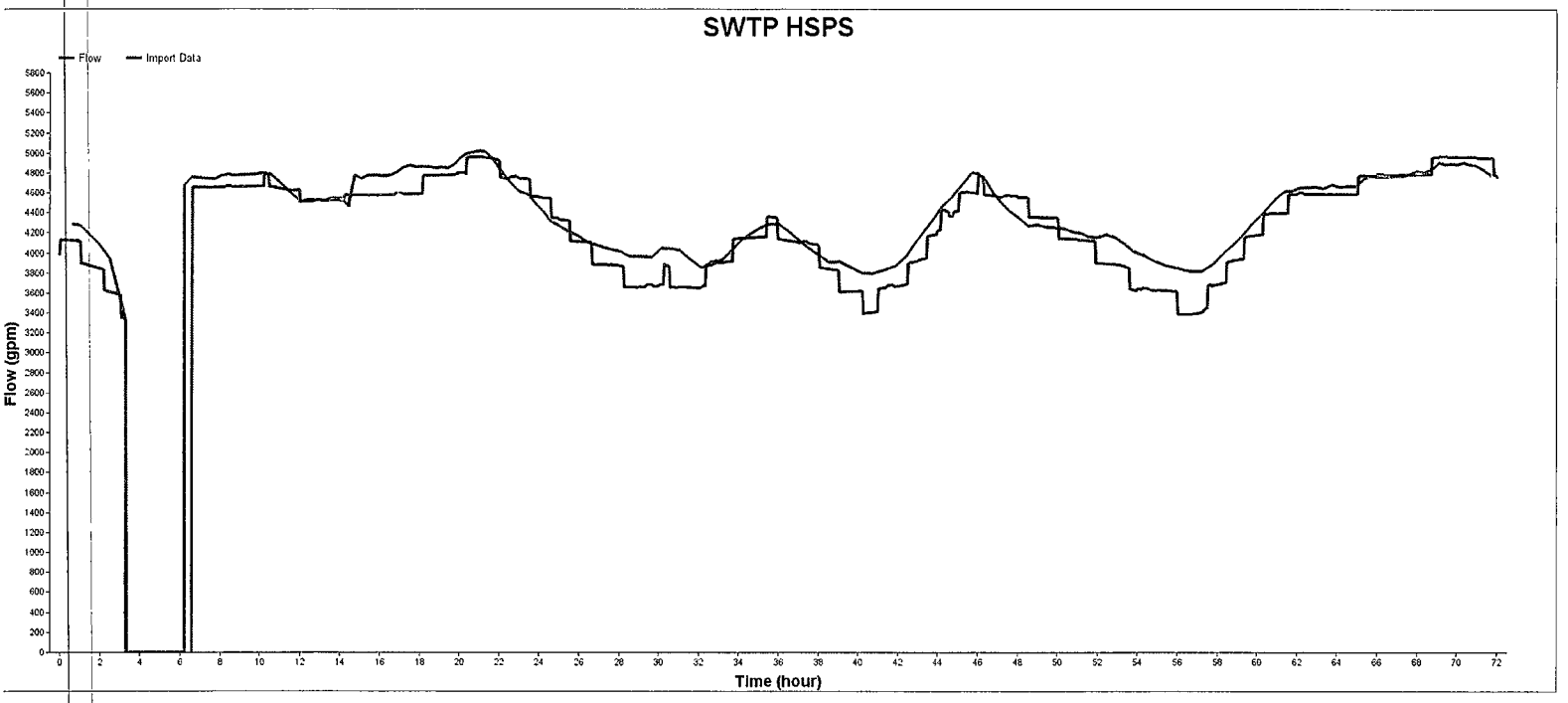

Oakridge PS Outlet
Pressure
Import Data
Pressure (psi)
Time (hour)

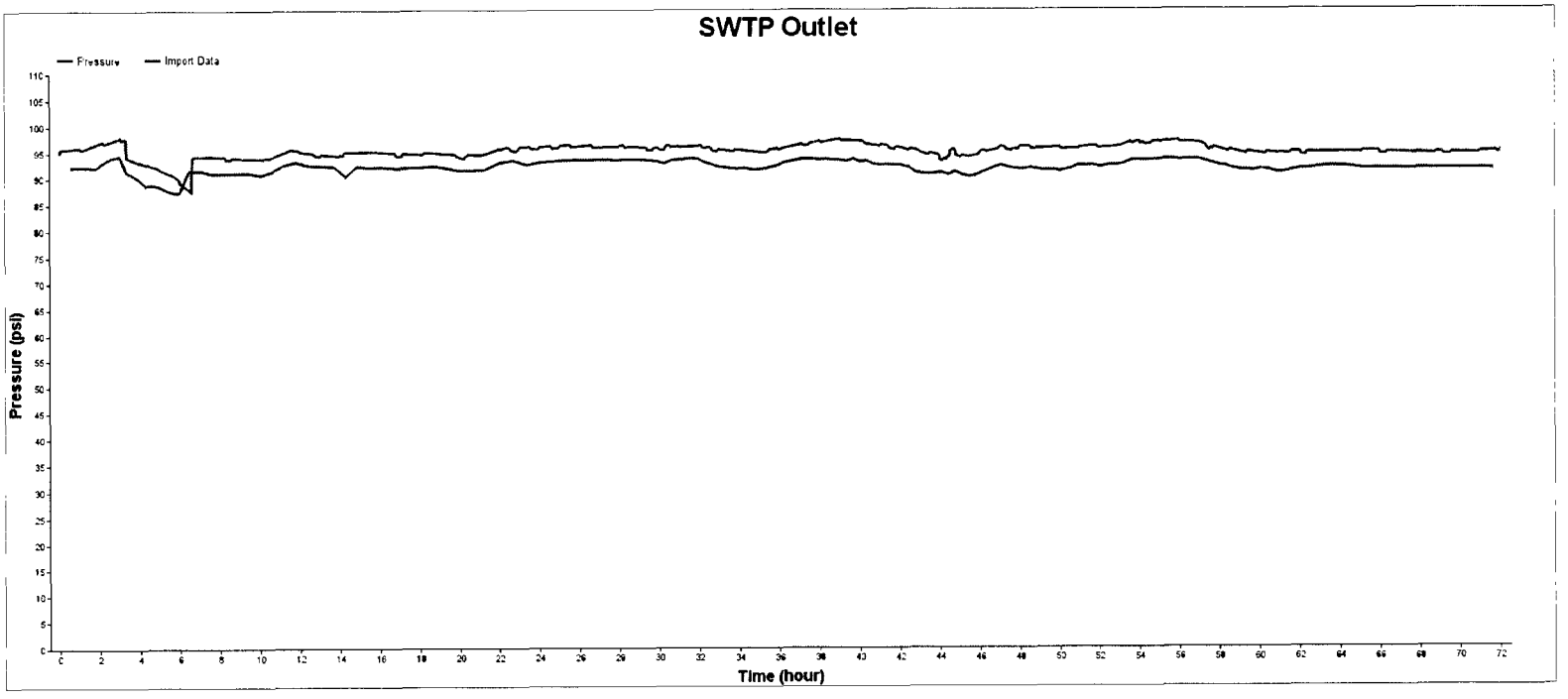

Soyars Pump Station
Flow
Flow (gpm)
Time (hour)

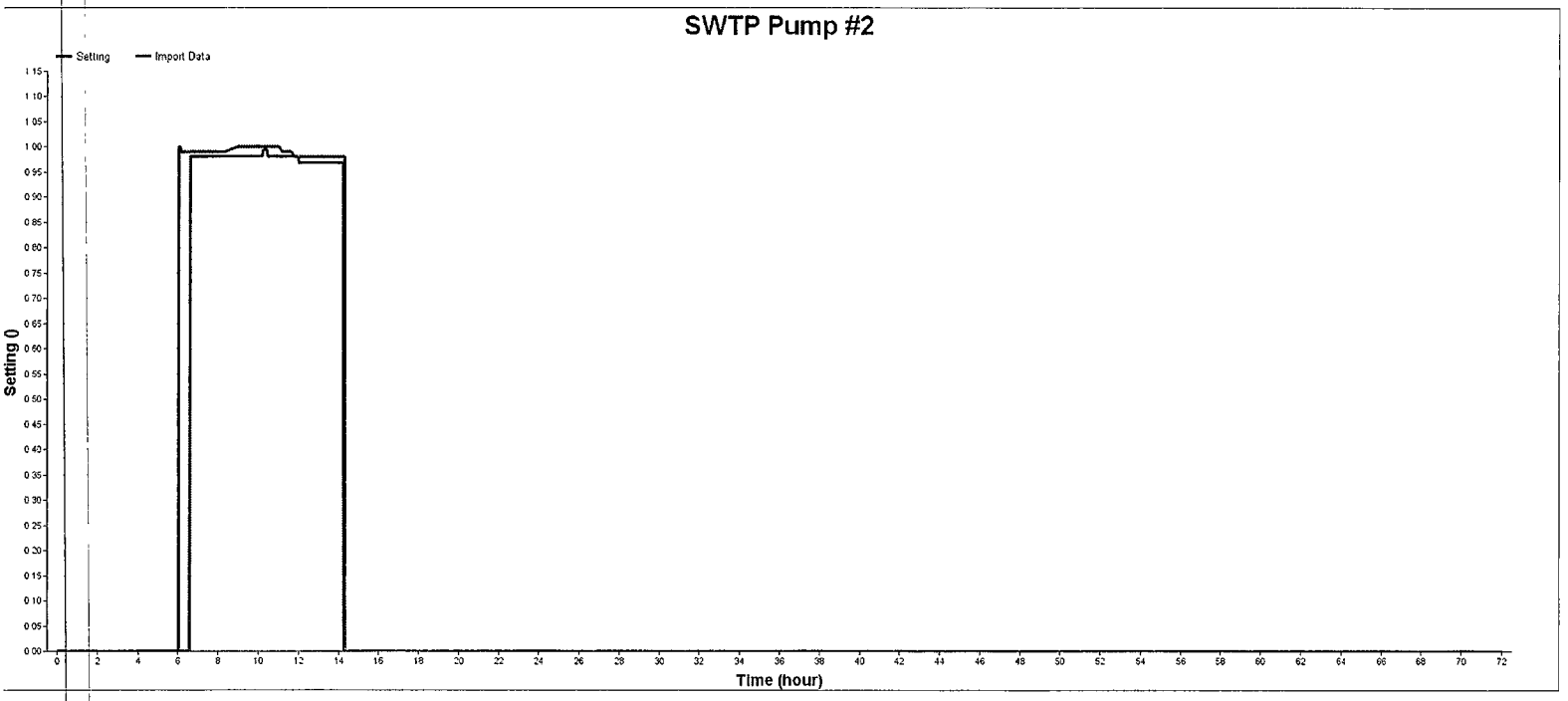

Soyars PS Outlet
Pressure
Import Data
Pressure (psi)
Time (hour)

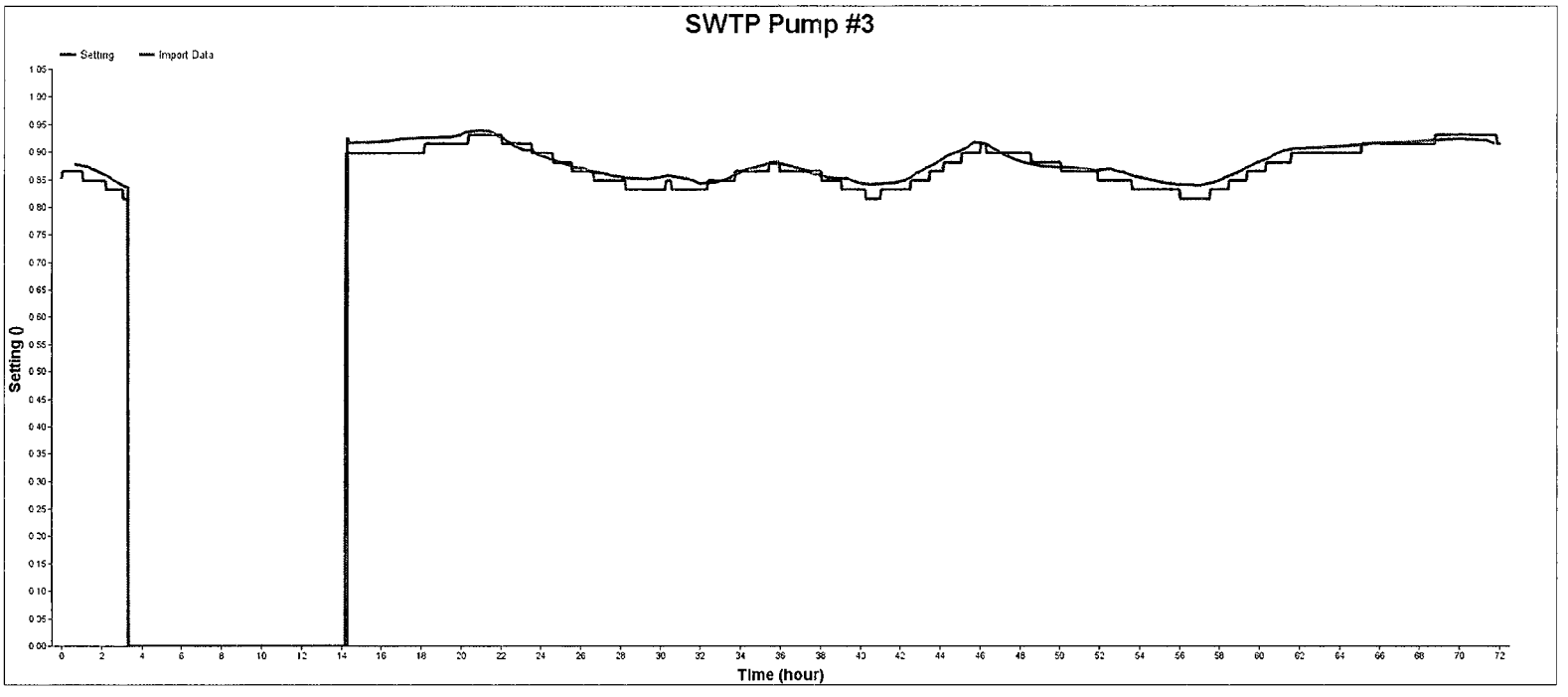

Spring Lake PS Outlet
Pressure
Import Data
Pressure (psi)
Time (hour)


Spring Lake Pump #2
Flow
Flow (gpm)
Time (hour)


SWTP HSPS
Flow
Import Data
Flow (gpm)
Time (hour)


SWTP Outlet
Pressure
Import Data
Pressure (psi)
Time (hour)


SWTP Pump #2
Setting
Import Data
Setting 0
Time (hour)


SWTP Pump #3
Setting
Import Data
Setting ()
Time (hour)

Appendix B

2020 System Hydraulic Model Results

APAI, 2015

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ENVIRONMENTAL ENGINEERS AND SCIENTISTS

FIGURE B-1
City of San Marcos: Water Master Plan Update
2020 Minimum Junction Pressures (Max Day Run)

Document Path: M:\Projects\0800522-01\GIS\REPORT_FIGURES\mxd\FIGB1_2020_Min_Pressre_22x34.mxd

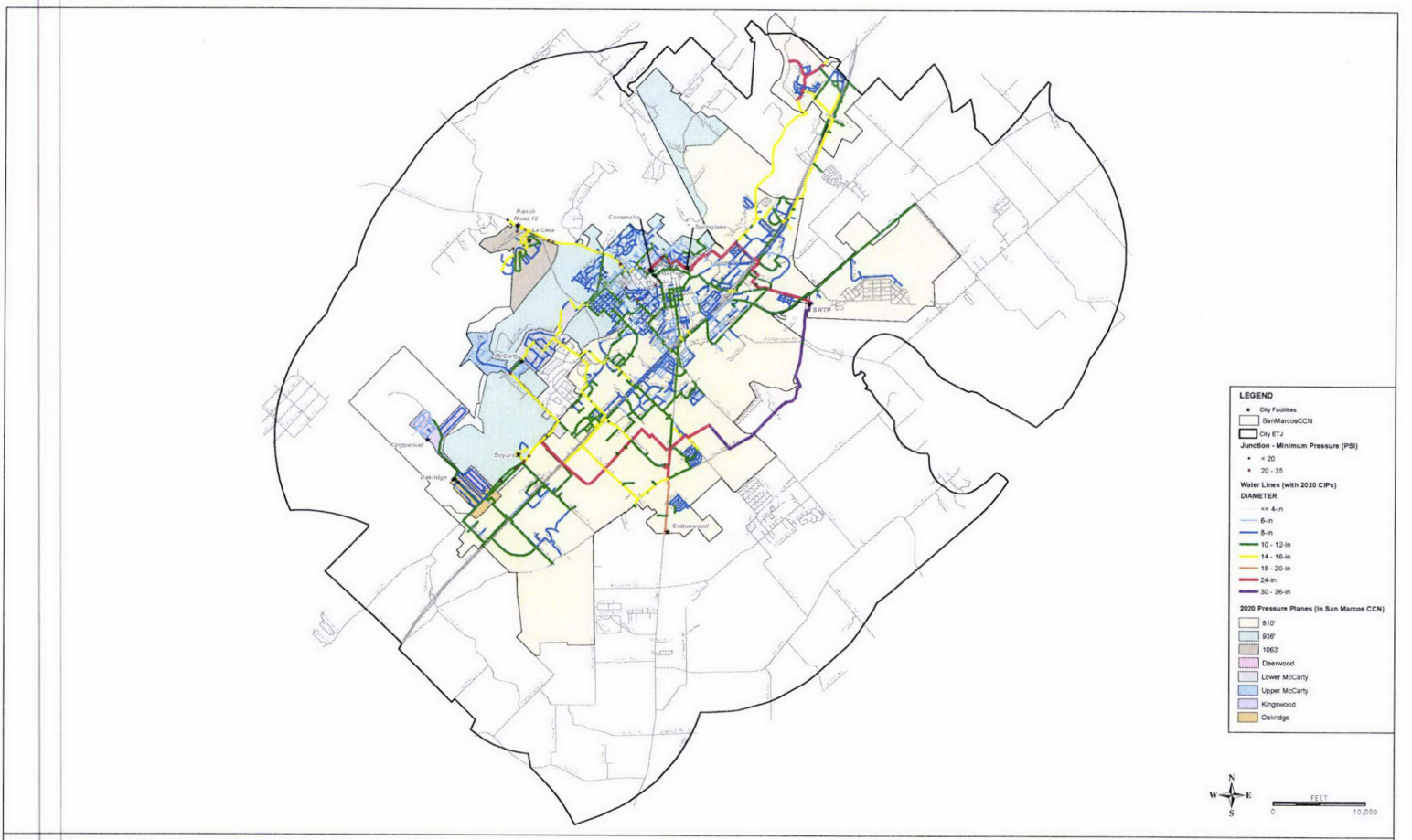

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FIGURE B-2
City of San Marcos: Water Master Plan Update
2020 Minimum Junction Pressures Less Than 35 PSI (Max Day Run)

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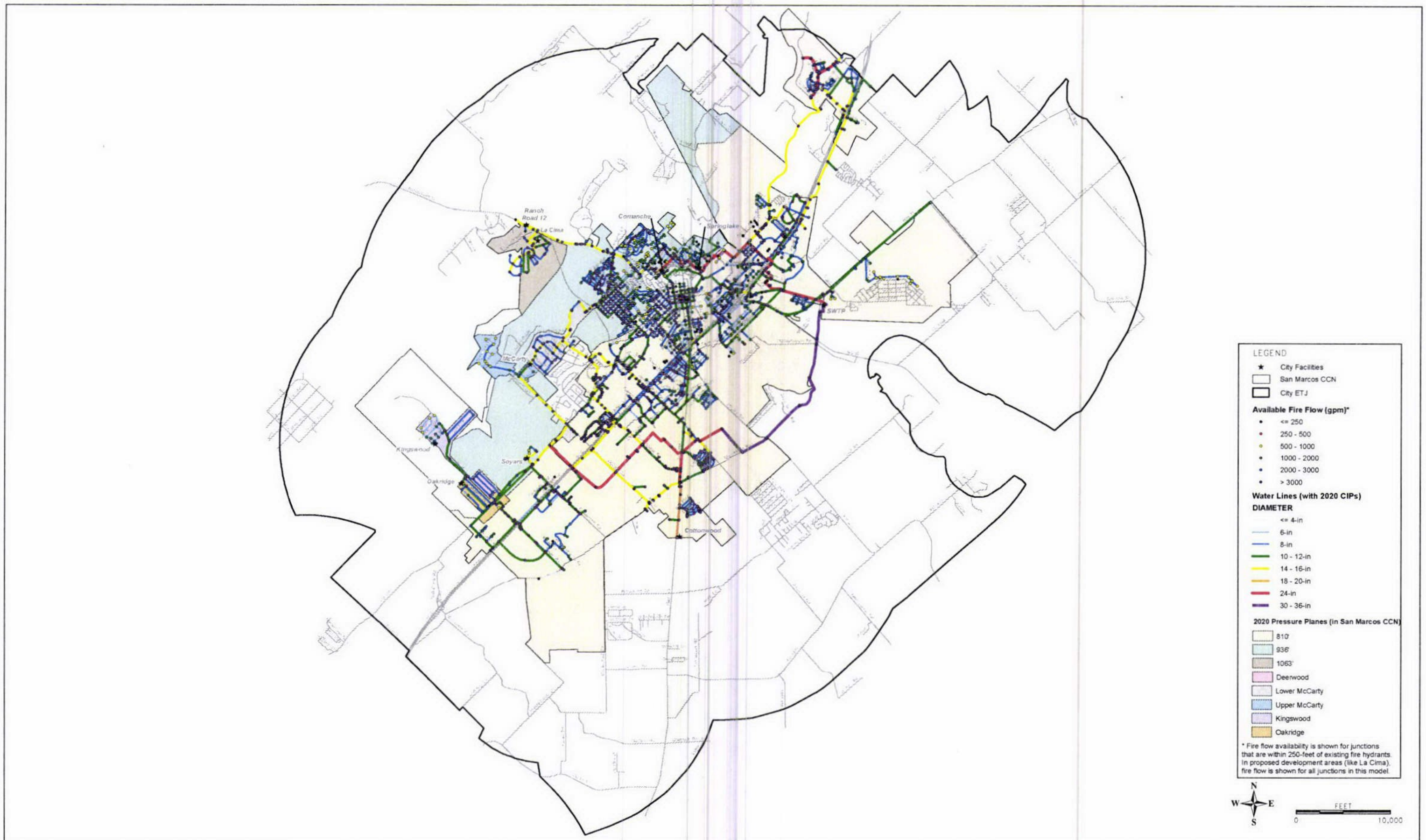

ALAN PLUMMER ASSOCIATES, INC.
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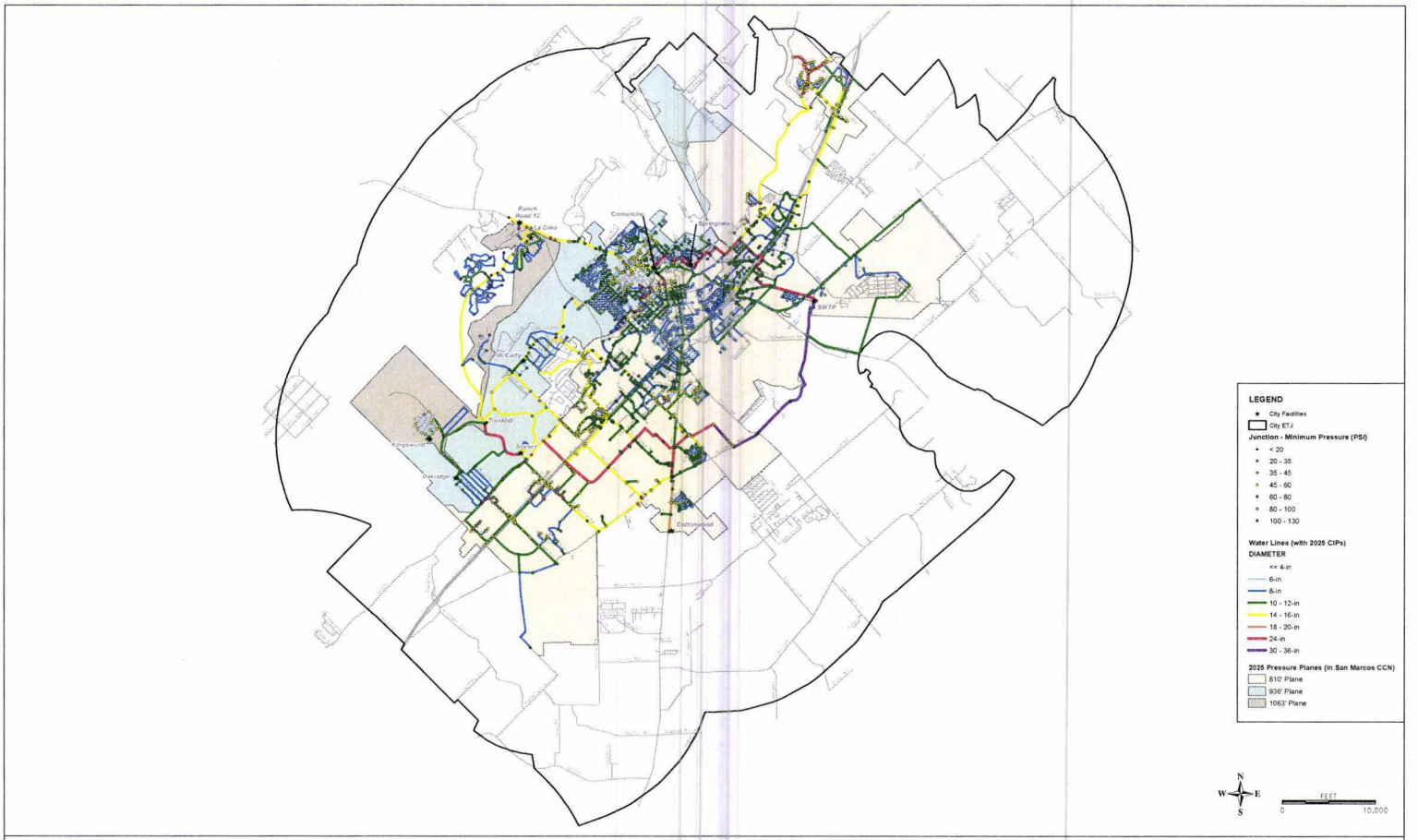
FIGURE B-3
City of San Marcos: Water Master Plan Update
2020 Fire Flow Availability (Max Day Run)

Document Path: M:\Projects\0600\022-01\GIS\REPORT_FIGURES\w4\FIGB3_2020_Fire_Flow_22x34.mxd

Appendix C

2025 System Hydraulic Model Results

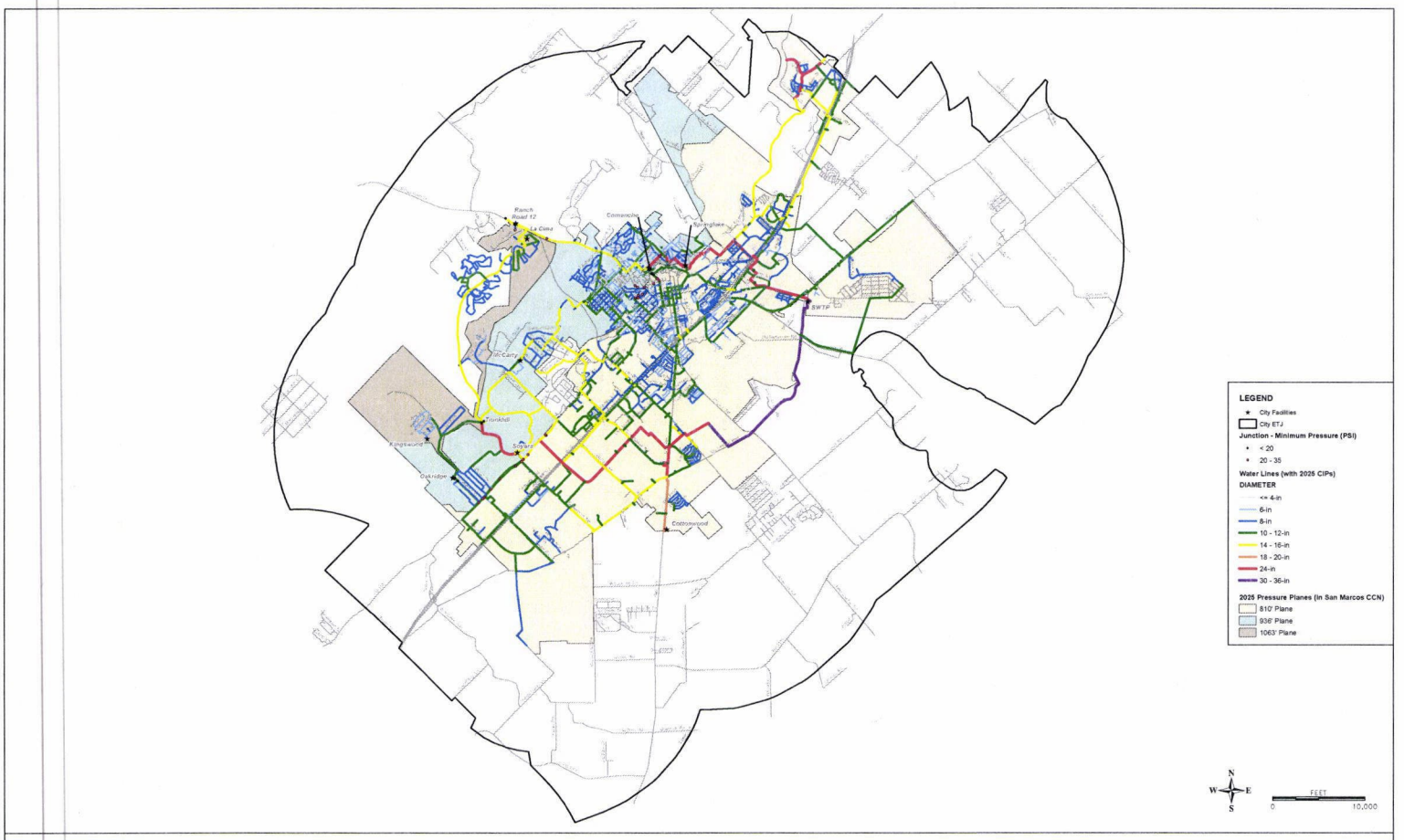
APAI, 2015



ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS

FIGURE C-1
City of San Marcos: Water Master Plan Update
2025 Minimum Junction Pressures (Max Day Run)

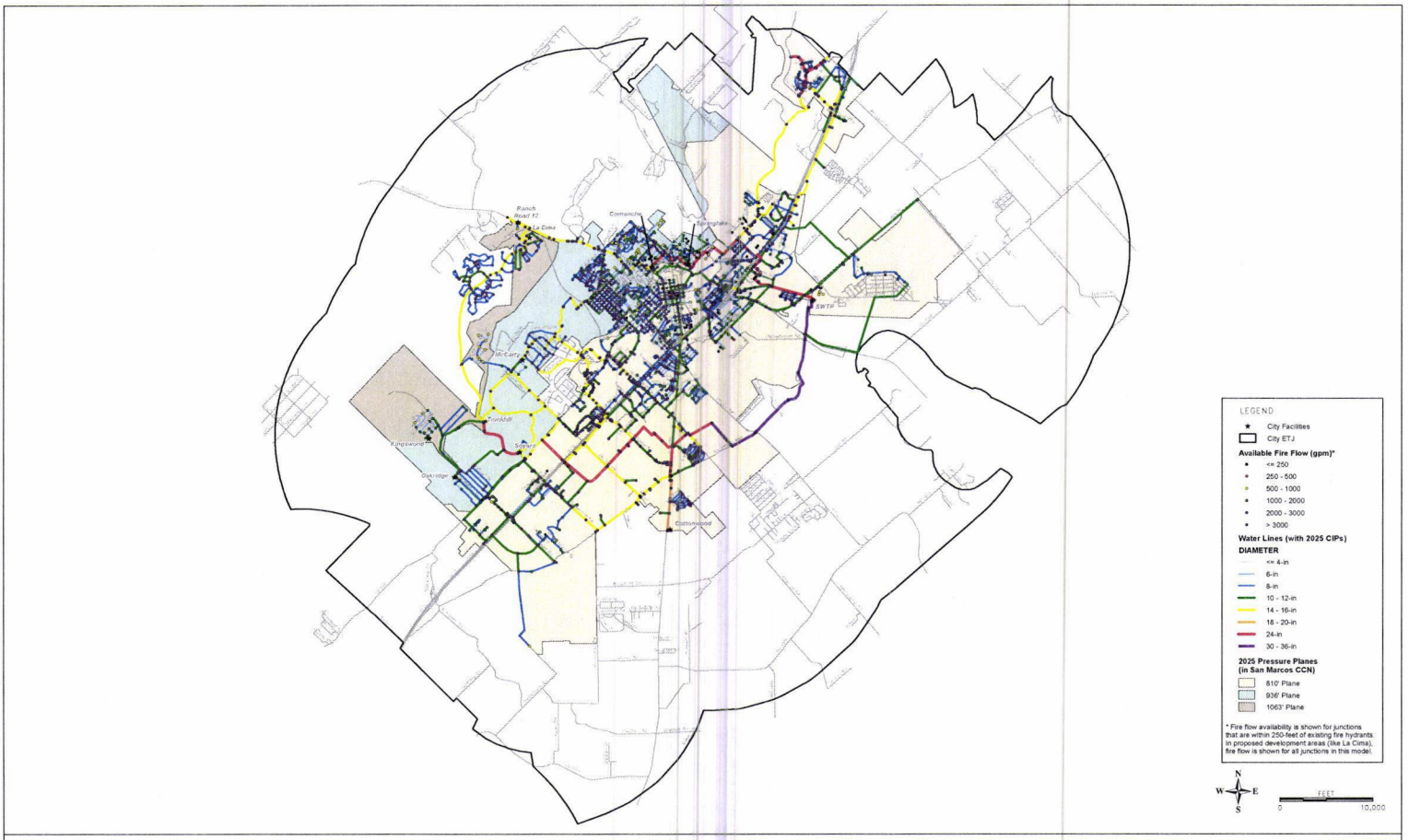
Document Path: M:\Projects\0600\022-01\GIS\REPORT_FIGURES\w4\FIGC1_2025_Min_Pressure_22x34.mxd



ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS

FIGURE C-2
City of San Marcos: Water Master Plan Update
2025 Minimum Junction Pressures Less Than 35 PSI (Max Day Run)

Document Path: M:\Projects\0600\022-01\GIS\WREPORT_FIGURES\w4\FIGC2_2025_Min_Pressure_22x34.mxd



ALAN PLUMMER ASSOCIATES, INC.
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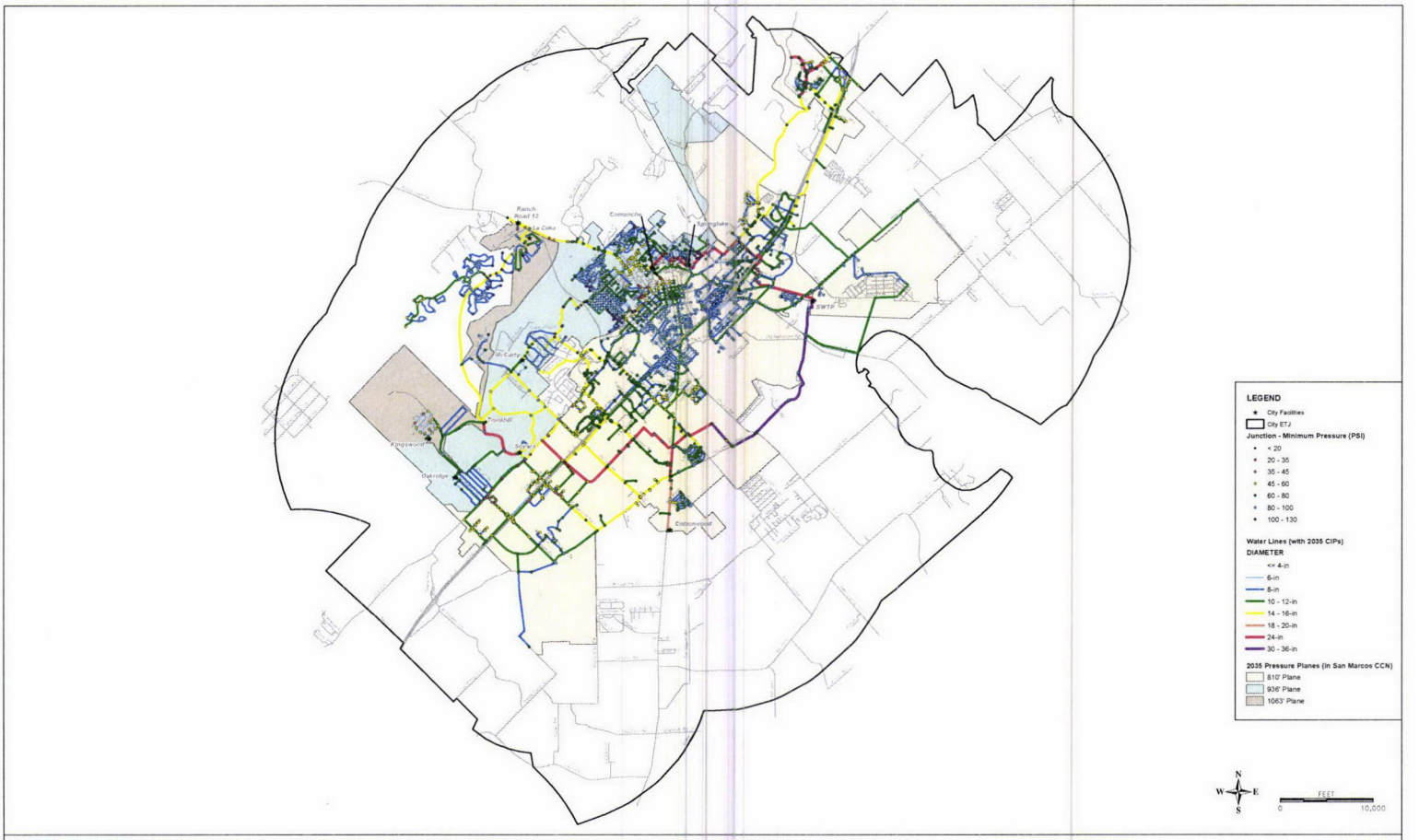
FIGURE C-3
City of San Marcos: Water Master Plan Update
2025 Fire Flow Availability (Max Day Run)

Document Path: M:\Projects\0900\023-01\GIS\REPORT_FIGURES\w4\FIGC3_2025_Fire_Flow_22x34.mxd

Appendix D

2035 System Hydraulic Model Results

APAI, 2015



ALAN PLUMMER ASSOCIATES, INC.

FIGURE D-1
City of San Marcos: Water Master Plan Update
2035 Minimum Junction Pressures (Max Day Run)

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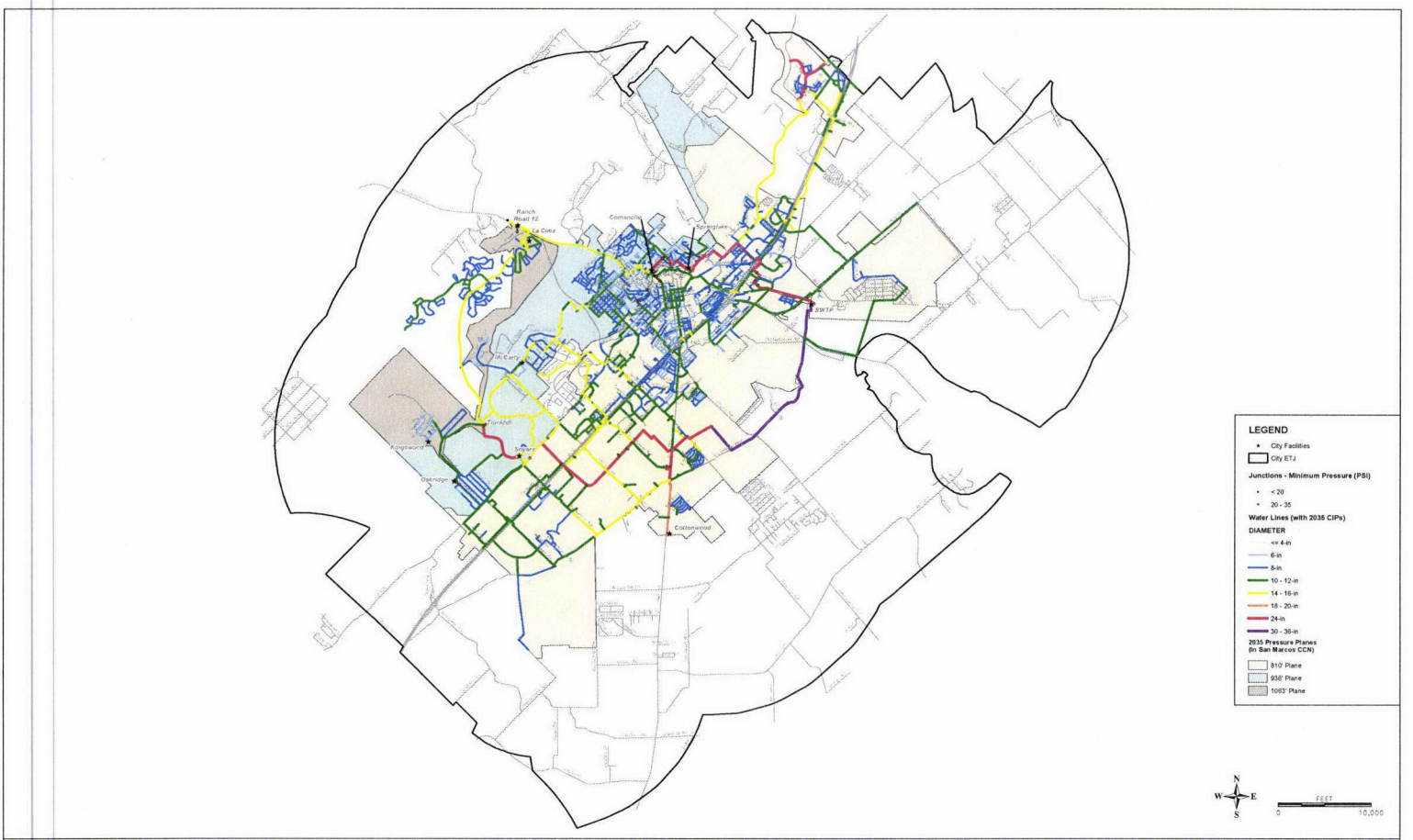

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS

FIGURE D-2
City of San Marcos: Water Master Plan Update
2035 Minimum Junction Pressures Less Than 35 PSI (Max Day Run)

Document Path: \\apa-fs.apa.apaishare\Projects\0500022-01\GIS\REPORT_FIGURES\w4\Fig0D2_2035_Min_Pressre_22x34.mxd

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ENVIRONMENTAL ENGINEERS AND SCIENTISTS

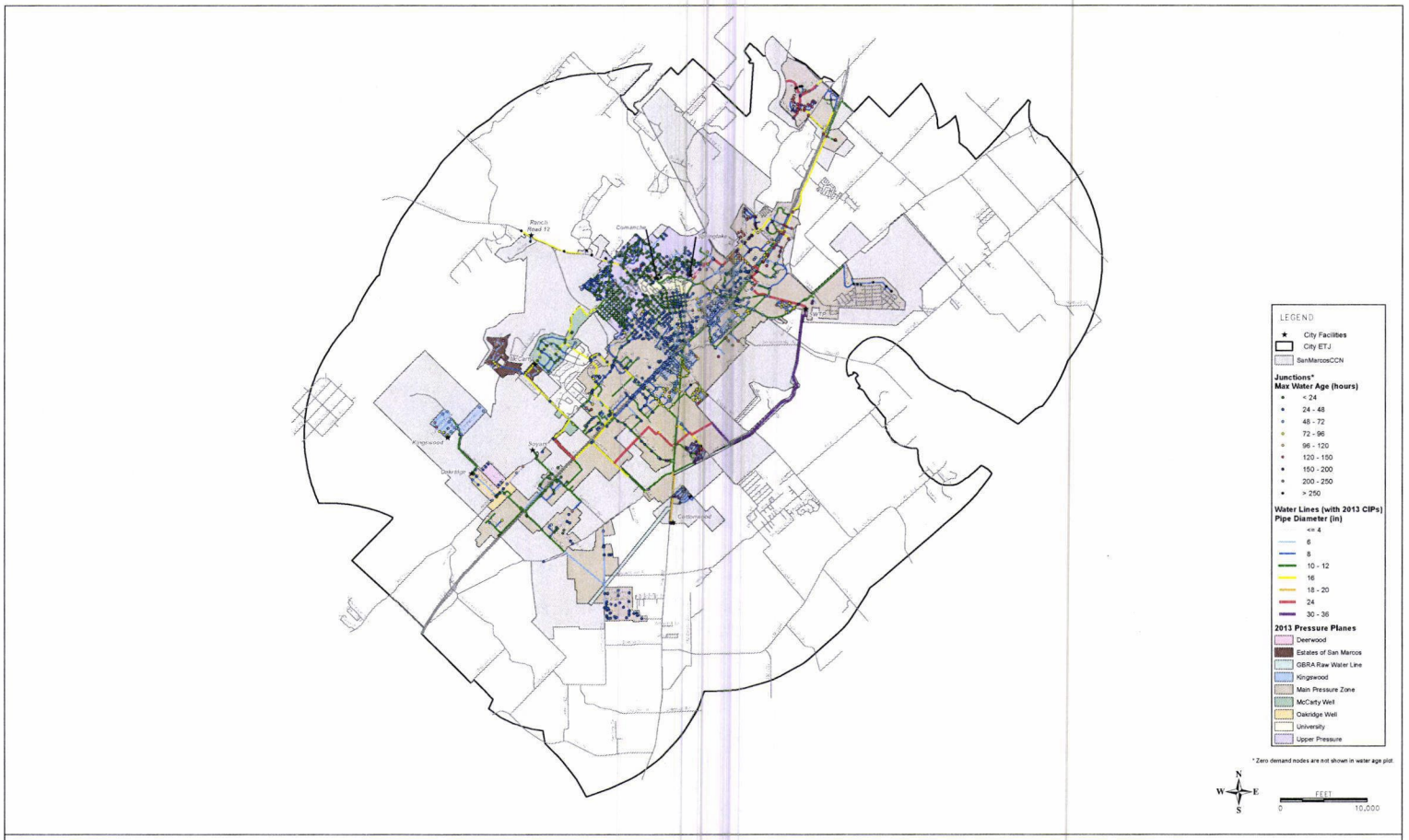
FIGURE D-3
City of San Marcos: Water Master Plan Update
2035 Fire Flow Availability (Max Day Run)

Document Path: \\aus-fs.aus.apahshare\Projects\0600\022-01\GIS\REPORT_FIGURES\wFIG03_2035_Fire_Flow_22x34.mxd

Appendix E

Water Age Model Results

APAI, 2015



ALAN PLUMMER ASSOCIATES, INC.
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FIGURE E-1
City of San Marcos: Water Master Plan Update
2013 Water Age (Average Day Run)

Document Path: M:\Projects\0605022-01\GIS\REPORT_FIGURES\w4\FIGE4_2013_Water_Age_22x34.mxd

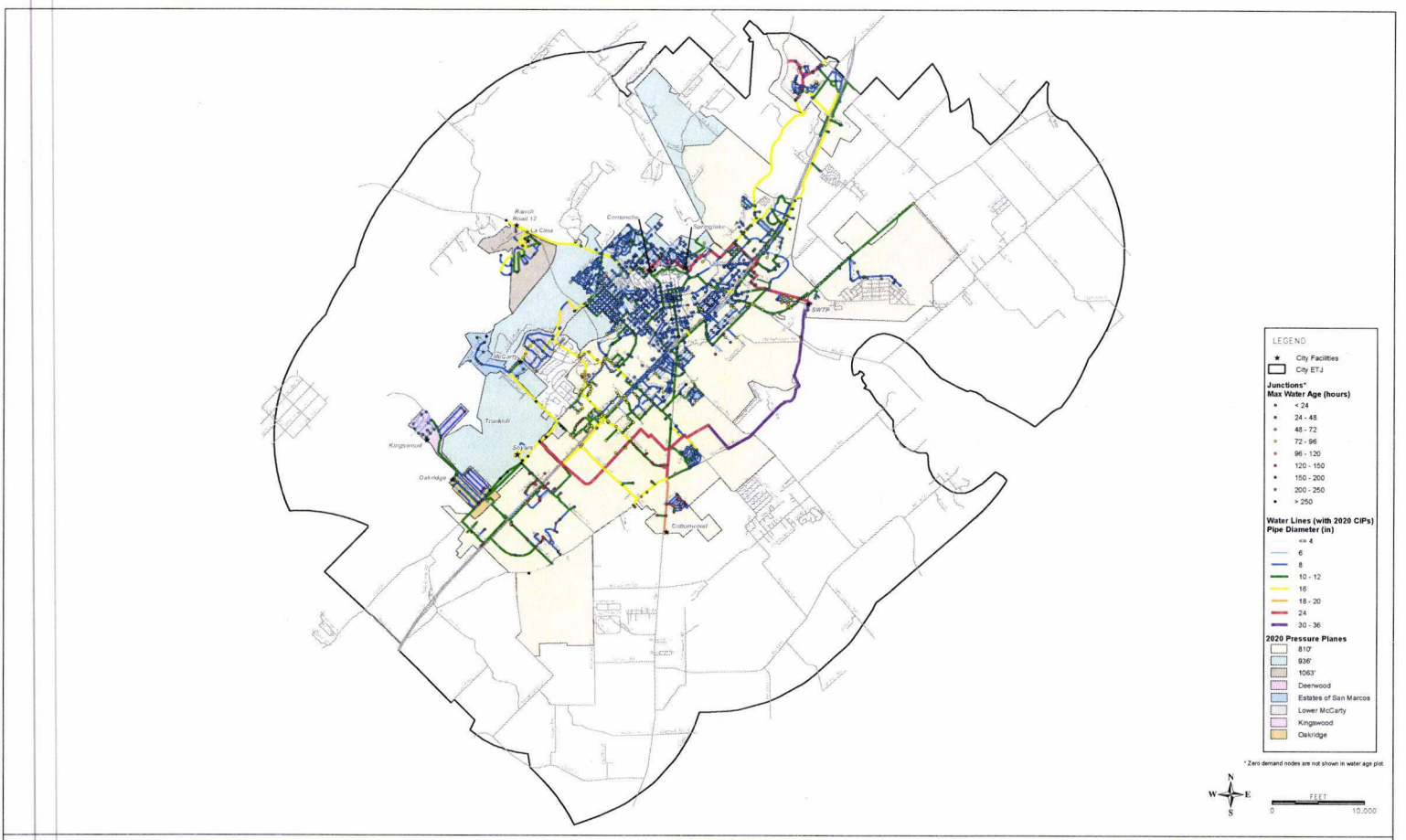

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FIGURE E-2
City of San Marcos: Water Master Plan Update
2020 Water Age (Average Day Run)

Document Path: M:\Projects\0600\22-01\SB\REPORT_FIGURES\mxd\FIGE1_2020_Water_Age_22x34.mxd

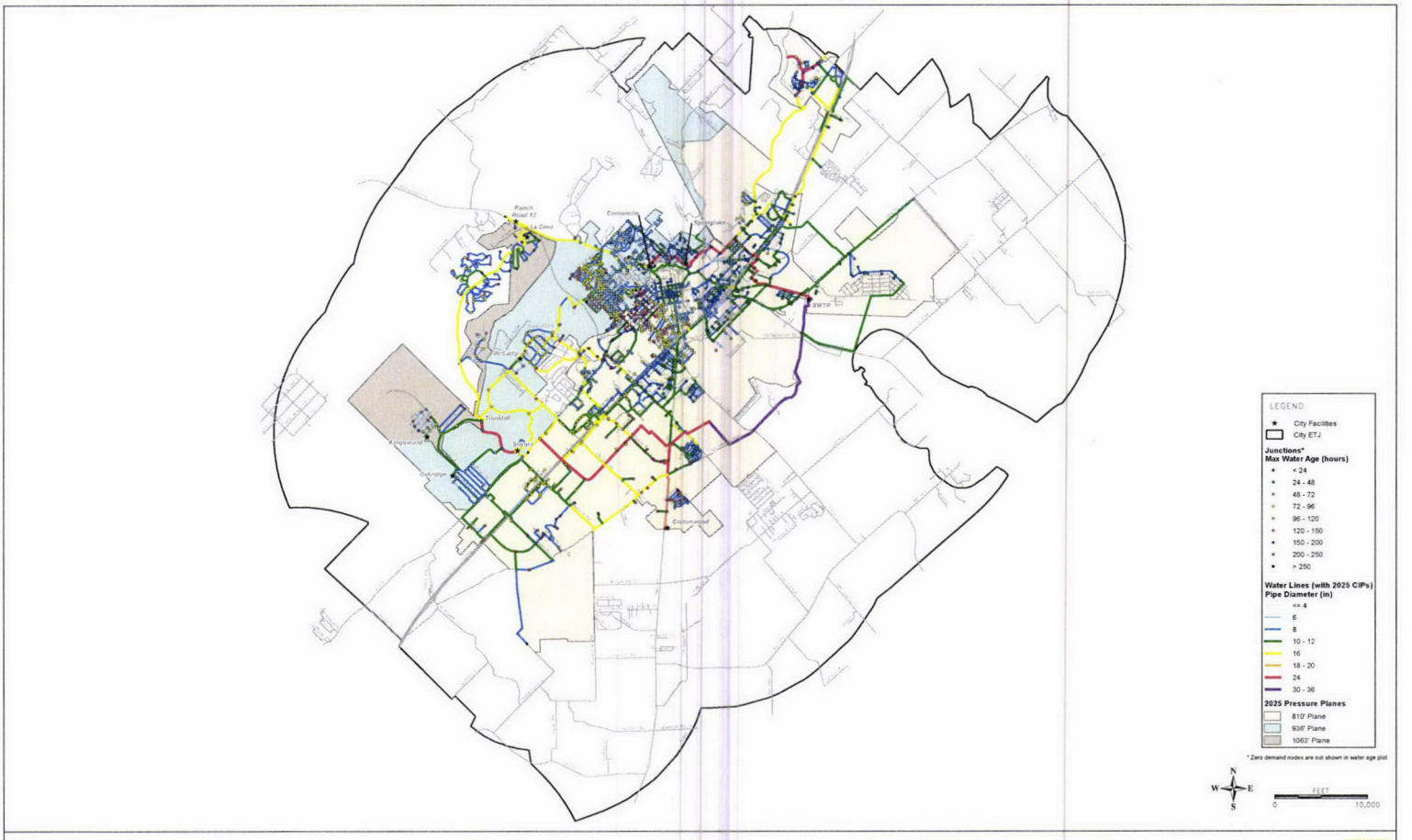

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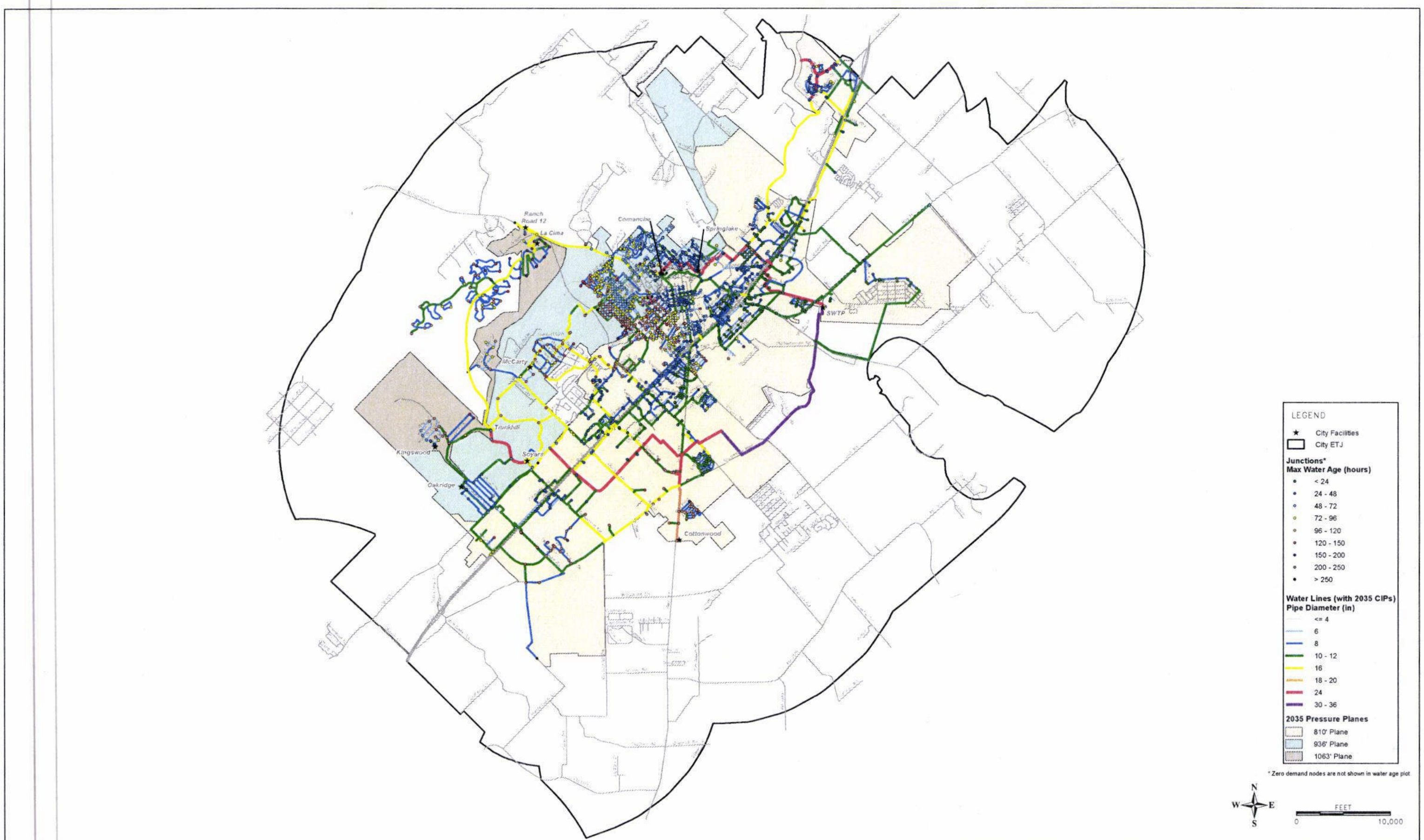
FIGURE E-3
City of San Marcos: Water Master Plan Update
2025 Water Age (Average Day Run)

Document Path: M:\Projects\60600822-01\GIS\REPORT_FIGURES\4-4\FIGE3_2025_Water_Age_22x34.mxd



ALAN PLUMMER ASSOCIATES, INC.
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FIGURE E-4
City of San Marcos: Water Master Plan Update
2035 Water Age (Average Day Run)

Document Path: \\aus-fs.aus.apai\share\Projects\0600\022-01\GIS\REPORT_FIGURES\v4\FIGE1_2035_Water_Age_22x34.mxd

Appendix F

CIP List:
Opinion of Probable Construction Costs

APAI, 2015

Engineer's Opinion of Probable Construction Cost

CIP #	Year	Project Description	Diameter (in)	Length (LF)	Soil Type	$/LF	Line Placement	Easement Width (ft)	Easement Acreage	Land Cost + 10% Surveying	Pipeline Cost	Pavement Repair Cost	Engineering, Legal, Financing, Contingency	Environmental	Total Cost	Rounded Total Cost
4	2020	Seyars Tank Fill / Drain	16	1300	rock	$154	Exist Easement / Development		-	$ -	$ 200 030	$ -	$ 60,009	$ 6,155	$ 266 194	$ 266,000
5	2020	Hunter Rd Loop	16	2800	combo	$141	Easement	30	1 93	$ 40 303	$ 394 930	$ -	$ 118 479	$ 13 258	$ 566 970	$ 567 000
6	2020	Hunter Rd Parallel	12	5300	combo	$85	Easement	30	3 65	$ 76,288	$ 450 227	$ -	$ 135 068	$ 25,095	$ 686 877	$ 687 000
7	2020	McCarty-Tanger Loop	24	6000	soil	$229	Easement	40	5 51	$ 424 242	$ 1 375,203	$ -	$ 412,561	$ 28 409	$ 2 240 416	$ 2,240,000
8	2020	Stagecoach Trail Extension	12	3400	soil	$77	Easement / City Roads	30	1 31	$ 73,409	$ 292 351	$ 24 700	$ 95 115	$ 17 992	$ 503 568	$ 504 000
9	2020	E McCarty Ln Line Replacement	16	2100	soil	$128	Easement	30	1 45	$ 41 364	$ 269 271	$ -	$ 80,781	$ 9 943	$ 401 359	$ 401 000
10	2020	SH 123 Upsize	24	4100	soil	$229	Easement	40	3 76	$ 289,899	$ 939 722	$ -	$ 281 917	$ 19 413	$ 1 530 951	$ 1 531 000
11	2020	Paso Robles - Phase 1	16	1700	rock	$109	Development			$ -	$ 184 453	$ -	$ 55 336	$ 8 049	$ 247,838	$ 248,000
			24	400	rock	$195	Development			$ -	$ 77 856	$ -	$ 23 360	$ 1 894	$ 103 120	$ 103,000
12	2020	Old Bastrop Ext 4 (SH 123 - McCarty)	16	5000	soil	$128	Easement	30	3 44	$ 68 182	$ 641 120	$ -	$ 192 336	$ 23,674	$ 925 313	$ 925,000
13	2020	N LBJ Upgrade	12	4500	rock	$93	City Road	-	-	$ -	$ 418 331	$ 58 500	$ 143 049	$ 21,307	$ 641 187	$ 641 000
14	2020	South Hunter Rd Loop	12	3900	combo	$85	Easement	30	2 69	$ 56 136	$ 331,299	$ -	$ 99 390	$ 18 466	$ 505,291	$ 505,000
15	2020	IH 35 - Civic Center Loop	12	6400	soil	$77	Easement	30	4 68	$ 515,152	$ 523 154	$ -	$ 156 946	$ 32 197	$ 1,227,449	$ 1,227,000
16	2020	Upgrade IH 35 Crossings	16	3200	combo	$450	Bore	-	-	$ -	$ 1 440 000	$ -	$ 432 000	$ 15,152	$ 1 887 152	$ 1 887,000
17	2020	Airport Extension	12	9000	soil	$77	Easement	30	6 20	$ 95 455	$ 692 410	$ -	$ 207 723	$ 42,814	$ 1 038 201	$ 1 038 000
41B	2020	Upsize Lines in Briarmeadow Neighborhood	8	5100	rock	$54	Exist Easement / Development	-	-	$ -	$ 277 926	$ -	$ 83 378	$ 24 148	$ 385,451	$ 385 000
41M	2020	Upsize Lines in Sierra Circle and Tanglewood Neighborhoods	8	1200	rock	$75	City Roads	-		$ -	$ 90,388	$ 15 600	$ 31,798	$ 5 682	$ 143,479	$ 143,000
41P	2020	Upsize Lines in Southwest Hills Neighborhood	8	7800	rock	$75	City Roads			$ -	$ 585 120	$ 102 700	$ 209,346	$ 37 405	$ 944,571	$ 945 000
41Q	2020	Upsize Lines in Willow Creek Neighborhood	8	3100	combo	$69	City Roads	-	-	$ -	$ 213 653	$ 40,300	$ 76 186	$ 14 678	$ 344 817	$ 345 000
41R	2020	Upsize Lines in Heritage Neighborhood	8	7700	combo	$69	City Roads	-	-	$ -	$ 530,687	$ 100,100	$ 189 236	$ 36 458	$ 856 482	$ 856 000
41T	2020	Upsize Lines in Dunbar Neighborhood	8	5400	combo	$69	City Roads		-	$ -	$ 372 170	$ 70 200	$ 132 711	$ 25 568	$ 600,650	$ 601 000
41W	2020	Upsize Lines in Kingswood	8	8500	rock	$75	City Roads			$ -	$ 640,319	$ 110 500	$ 225 246	$ 40 246	$ 1 016,311	$ 1 016,000
41X	2020	Upsize Lines in Oakridge	8	20000	rock	$75	City Roads			$ -	$ 1 506 633	$ 260 000	$ 529 990	$ 94,687	$ 2,391,320	$ 2 391 000
41Y	2020	Upsize Lines in South Posey area	8	8900	soil	$63	City Roads			$ -	$ 556 332	$ 115 700	$ 166 900	$ 42,140	$ 881 072	$ 881 000
															2020 CIP Pipeline Total	**$ 20,333,000**

CIP #	Year	Description	GPM	TDH	Total #	HP Total	Volume	Cost, Subtotal	Engineering, Legal, Financing, Contingency	Environmental	Total Cost	Rounded Total Cost
1	2020	Comanche Pump Replacement	1250	160	4	289		$ 130,200	$ 45,570	$ -	$ 175 770	$ 176 000
2a	2020	La Cima Elevated Storage Tank	-	-			0 5 MG	$ 968 178	$ 338 862	$ 40 000	$ 1 347 041	$ 1,347 000
2b	2020	Ranch Road 12 Pump Station	720	175	2	266		$ 1,865,632	$ 652 971	$ 100 000	$ 2 618 603	$ 2 619 000
			1380	175	2							
3	2020	Seyars Pump Replacement	600	125	2	54		$ 45,800	$ 16 030	$ -	$ 61 830	$ 62 000
										2020 CIP PS/Tank Total		**$ 4,204,000**
										2020 CIP Pipeline + PS/Tank Total		**$ 24,537,000**

Engineer's Opinion of Probable Construction Cost

CIP #	Year	Description	Diameter (in)	Length (LF)	Soil Type	$/LF	Line Placement	Easement Width (ft)	Easement Acreage	Land Cost + 10% surveying	Pipeline Cost	Pavement Repair Cost	Engineering, Legal, Financing, Contingency	Environmental	Total Cost	Rounded Total Cost
20	2025	Parallel Comanche Outlet Main	16	4000	rock	$154	Easement	30	2.75	$ 151,515	$ 615,476	$ -	$ 184,643	$ 18,939	$ 970,573	$ 971,000
21	2025	Paso Robles Loop Phase 2a	16	4300	rock	$109	Development		-	$ -	$ 468,659	$ -	$ 140,598	$ 20,360	$ 629,617	$ 630,000
			24	6000	rock	$196	Development		-	$ -	$ 1,173,250	$ -	$ 351,975	$ 28,409	$ 1,553,635	$ 1,554,000
22	2025	Paso Robles Loop Phase 2b	16	6500	rock	$109	Development		-	$ -	$ 708,438	$ -	$ 212,531	$ 30,777	$ 951,746	$ 952,000
23	2025	Paso Robles Sleepy Hollow Line	12	4900	rock	$66	Development		-	$ -	$ 322,003	$ -	$ 96,601	$ 23,201	$ 441,804	$ 442,000
24	2025	Paso Robles Deerwood Line	12	4700	rock	$66	Development		-	$ -	$ 308,860	$ -	$ 92,658	$ 22,254	$ 423,771	$ 424,000
25	2025	Paso Robles McCarty Line	16	6800	rock	$109	Development		-	$ -	$ 741,135	$ -	$ 222,341	$ 32,187	$ 995,673	$ 996,000
26	2025	Trunk Hill La Cima Loop	8	1300	rock	$54	Development / City Roads		-	$ -	$ 70,844	$ -	$ 21,253	$ 6,155	$ 98,252	$ 98,000
			16	20000	rock	$109			-	$ -	$ 2,309,415	$ -	$ 692,825	$ 94,697	$ 3,096,937	$ 3,097,000
27	2025	McCarty Tank Drain/Fill Line	16	8400	rock	$154	Easement	30	5.79	$ 318,182	$ 1,292,495	$ -	$ 387,750	$ 39,773	$ 2,038,203	$ 2,038,000
28	2025	Airport Loop	12	9800	soil	$77	Easement	30	6.75	$ 51,970	$ 902,023	$ -	$ 270,607	$ 46,402	$ 1,271,001	$ 1,271,000
29	2025	US 40 Loop	12	17000	soil	$77	Easement / Private	30	11.71	$ 450,758	$ 1,307,886	$ -	$ 392,366	$ 80,492	$ 2,231,501	$ 2,232,000
30	2025	Old Bastrop Ext 2 (McCarty to Centerpoint)	16	5400	soil	$128	Easement	30	3.72	$ 73,636	$ 692,410	$ -	$ 207,723	$ 25,568	$ 999,338	$ 999,000
31	2025	Clows Barker Upgrade	16	5100	soil	$128	Easement	30	3.51	$ 166,136	$ 653,943	$ -	$ 196,183	$ 24,148	$ 1,040,410	$ 1,040,000
32	2025	Centerpoint Extension	16	3800	soil	$128	Easement	30	2.62	$ 51,818	$ 487,252	$ -	$ 146,175	$ 17,992	$ 703,238	$ 703,000
33	2025	Upgrade Snyder Hill Dr	16	100	rock	$154	Easement	30	0.07	$ 3,788	$ 15,387	$ -	$ 4,616	$ 473	$ 24,264	$ 24,000
34	2025	Francis Harris Extension	8	13300	soil	$28	City Roads		-	$ -	$ 372,400	$ 172,900	$ 163,590	$ 62,973	$ 771,863	$ 772,000
35	2025	S LBJ Upgrade	12	1700	rock	$93	City Roads		-	$ -	$ 158,036	$ 22,100	$ 54,041	$ 8,049	$ 242,226	$ 242,000
36	2025	McCarty Connection	12	1100	rock	$93	City Roads	1	-	$ -	$ 102,259	$ 14,300	$ 34,968	$ 5,208	$ 156,735	$ 157,000
41D	2025	Upsize Lines in Millview West Neighborhood	8	3000	soil	$63	City Roads			$	$ 187,528	$ 39,000	$ 67,958	$ 14,205	$ 308,691	$ 309,000
41G	2025	Upsize Lines in Rio Vista Neighborhood	8	6800	soil	$63	City Roads		-	$	$ 425,063	$ 88,400	$ 154,038	$ 32,197	$ 699,699	$ 700,000
41U	2025	Upsize Lines in Victory Gardens and Sunset Acres Neighborhoods	8	3100	soil	$63	City Roads			$	$ 193,779	$ 40,300	$ 70,224	$ 14,678	$ 318,980	$ 319,000
															2025 CIP Pipeline Total	**$ 19,976,080**

CIP #	Year	Description	GPM	TDH	Total #	HP Total	Volume	Cost, Subtotal	Engineering, Legal, Financing, Contingency	Environmental	Total Cost	Rounded Total Cost
18a	2025	Trunk Hill Pump Station	1600	175	2	203	-	$ 1,750,085	$ 612,530	$ 100,000	$ 2,462,615	$ 2,463,000
18b	2025	Trunk Hill Ground Storage Tank	-	-		-	0.50 MG	$ 649,784	$ 227,424	$ 40,000	$ 917,208	$ 917,000
19	2025	New Production Well at Soyars or Trunk Hill	1100	TBD	1		-	$ 1,000,000	$ 350,000	$ 100,000	$ 1,450,000	$ 1,450,000
											2025 CIP PS/Tank Total	**$ 4,830,000**
											2025 CIP Pipeline + PS/Tank Total	**$ 24,800,000**

Engineer's Opinion of Probable Construction Cost

CIP #	Year	Description	Diameter (in)	Length (LF)	Soil Type	$/LF	Line Placement	Easement Width (ft)	Easement Acreage	Land Cost + 10% surveying	Pipeline Cost	Pavement Repair Cost	Engineering, Legal, Financing, Contingency	Environmental	Total Cost	Rounded Total Cost
38	2035	Old Bastrop Ext 3 (Centerpoint to Posey)	12	5700	soil	$77	Easement	30	3 93	$ 77 727	$ 438,526	$ -	$ 131 558	$ 26 989	$ 674 800	$ 675 000
39	2035	Tanger Loop	12	2100	soil	$77	Easement	30	1 45	$ 159,091	$ 161 562	$ -	$ 48 469	$ 9 943	$ 379 065	$ 379 000
40	2035	Yarrington Loop	12	1700	soil	$77	Easement	30	1 17	$ 23 182	$ 130 789	$ -	$ 39 237	$ 8,049	$ 201 256	$ 201 000
41A	2035	Upgrade Lines near Post Rd	8	5300	rock	$75	City Roads		-	$ -	$ 399,258	$ 68 900	$ 140 447	$ 25 095	$ 633,700	$ 634 000
41C	2035	Upsize Lines in Millview East Neighborhood	8	1900	soil	$63	City Roads			$ -	$ 118 768	$ 24 700	$ 43 040	$ 8,996	$ 195,504	$ 196 000
41E	2035	Upsize Lines in Two Rivers East Neighborhood	8	4200	soil	$63	City Roads	-		$ -	$ 262 538	$ 54 600	$ 95 142	$ 19 886	$ 432 167	$ 432 000
41F	2035	Upsize Lines in Blanco Gardens Neighborhood	8	4100	soil	$63	City Roads	-		$ -	$ 256,288	$ 53,300	$ 92,876	$ 19 413	$ 421 877	$ 422 000
41H	2035	Upsize Lines in Spring Lake Hills Neighborhood	8	4800	rock	$75	City Roads	-		$ -	$ 361 592	$ 62 400	$ 127 188	$ 22,727	$ 573 917	$ 574,000
41I	2035	Upsize Lines in Fairlawn Neighborhood	8	1300	soil	$63	City Roads	-		$ -	$ 81 262	$ 16 900	$ 29 449	$ 6,155	$ 133 766	$ 134,000
41J	2035	Upsize Lines in Forest Hills Neighborhood	8	800	rock	$75	City Roads	-		$	$ 60 265	$ 10 400	$ 21 200	$ 3 788	$ 95 653	$ 96 000
41K	2035	Upsize Lines in Sessom Creek Neighborhood	8	3100	rock	$75	City Roads		-	$	$ 233 528	$ 40 300	$ 82 148	$ 14,678	$ 370 655	$ 371 000
41L	2035	Upsize Lines in Holland Hills Neighborhood	8	300	rock	$75	City Roads			$	$ 22 595	$ 3 900	$ 7,950	$ 1 420	$ 35,870	$ 36 000
41N	2035	Upsize Lines in Hughson Heights Neighborhood	8	1300	rock	$75	City Roads			$	$ 97,931	$ 16 900	$ 34 449	$ 6 155	$ 155,436	$ 155 000
41O	2035	Upsize Lines in Oak Heights Neighborhood	8	5300	rock	$75	City Roads		-	$	$ 399 258	$ 68 900	$ 140 447	$ 25 095	$ 633 700	$ 634 000
41S	2035	Upsize Lines in Downtown	8	4100	rock	$75	City Roads		-	$	$ 308 800	$ 53 300	$ 108 648	$ 19,413	$ 490 221	$ 490 000
41V	2035	Upsize Lines in East Guadalupe	8	3600	soil	$63	City Roads		-	$	$ 225 033	$ 46 800	$ 81 550	$ 17,045	$ 370 429	$ 370 000
															2035 CIP Pipeline Total	$ 5,799,000

CIP #	Year	Description	GPM	TDH	Total #	HP Total	Volume	Cost, Subtotal	Engineering, Legal, Financing, Contingency	Environmental	Total Cost	Rounded Total Cost
37	2035	SWTP Pump Addition	3250	250	1			$ 350 000	$ 122 500	$	$ 472 500	$ 473 000
											2035 CIP PS/Tank Total	$ 473,000
											2035 CIP Pipeline + PS/Tank Total	$ 6,272,000

Appendix G

Evaluation of Service Unit Equivalency Technical Memorandum

APAI, April 2016

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS • DESIGNERS • SCIENTISTS

TECHNICAL MEMORANDUM

City of San Marcos
Evaluation of Service Unit Equivalency

Project No.: 0600-022-01

Date: April 29, 2016

Prepared For: Laurie Moyer, P.E.

Prepared By: Stephen J. Coonan, P.E. TX PE 65516
Hannah Frels, EIT

INTRODUCTION

The City of San Marcos (City) owns and operates water and wastewater utilities to provide critical service to customers within its service area. The City is experiencing significant growth within its utility service area. The significant growth in the service area poses a challenge to the City in terms of planning and implementing improvements to add capacity to the utility systems and maintain reliable service to all of its customers.

The City has adopted a policy whereby the City looks to the future customers of the system to fund the improvements required to provide service to them. These costs are allocated to future customers through the assessment of an Impact Fee that is collected at the time new customers connect to the system. The City utilizes the concept of Service Unit Equivalents (SUE) to be able to compare the different impacts of widely varying future customers. The City established that one SUE is equal to the anticipated impact from one new single-family residential connection.

The methodology to determine the number of SUEs for a given development was recently called into question following the approval of a large multi-family development that included over 700 bedrooms. Using the current methodology, this development was assessed an impact fee based on 50 SUEs. Since the typical single-family residence has three bedrooms, 50 single-family residences would only have 150 bedrooms. This discrepancy raised the concern that the City is under estimating the impact of multi-family developments, and therefore under collecting impact fees from these developments.

The City retained Alan Plummer Associates, Inc. to conduct an evaluation of the existing methodology to determine the number of SUEs in a development. This Technical Memorandum presents the results of that evaluation.

EXISTING METHODOLOGY

Currently, when a development is submitted to the City for review, the City requires the Developer to determine the peak water demand for the development. This is generally done by conducting a fixture unit count for the development in accordance with the American Water Works Association (AWWA) methodology. This methodology assigns a number of fixture units to each water using fixture, such as toilets, showers, sinks, hose bibs, and washing machines. The anticipated peak demand for the development can then be determined based on the graph presented in Figure 1.

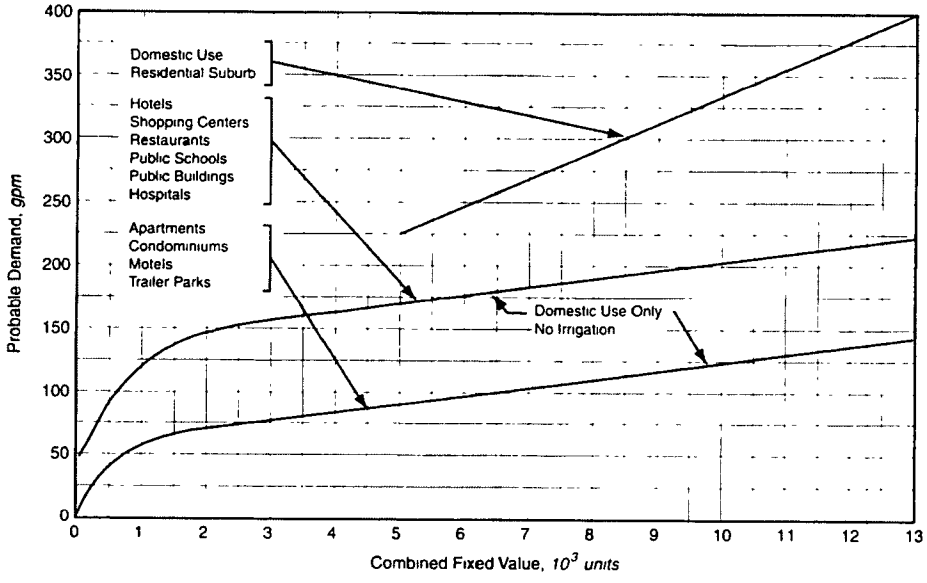


Figure 1: Water Flow Demand per Fixture Value (High Range)

As seen in the graph, the anticipated peak demand per fixture unit decreases as the total number of fixture unit increases. This is in recognition of the fact that the probability of every fixture being in operation at the same time decreases as the number of fixtures increases. Once the peak demand is established, a meter with the appropriate capacity for the development is selected. The number of SUEs for the project is based on the meter selected, as identified in Table 1.

Table 1: Service Unit Equivalents – Old Method

Meter Size	Peak Flow (gpm)	Service Unit Equivalent
5/8"	10	1
3/4"	15	1.5
1"	25	2.5
1-1/2"	50	5
2"	80	8
3"	160	16
4"	250	25
6"	500	50
8"	800	80

METHODOLOGY CONCERNS

As previously indicated, there is a concern that the current methodology is under estimating the impact of multi-family and commercial developments within the City. A quick analysis of the amount of water used on a monthly basis would tend to support this contention. The average single-family residence uses approximately 350 gallons per day per the Water Master Plan. The previously referenced multi-family development with over 700 bedrooms saw monthly demands on the order of 100,000 gallons. This would indicate that the water consumption of the multi-family development is 290 times that of a single-family residence, as opposed to 50 times. This apparent discrepancy is likely due to the difference in the probability that all fixtures in a single-family residence are in use versus the probability that all of the fixtures in the multi-family development are in use at the same time.

SYSTEM OPERATION AND DESIGN

Transmission and distribution lines are not designed based on the impact of a single user. They are designed based on the combined impact of all users within a given area. For a residential development, the water lines are not designed based on adding up the capacity of all the meters within the area. They are designed to meet the peak demand anticipated given the probability that not all of the residents will be using water at the same time. Based on this realization, the design of small residential lines are likely to experience a higher percentage of customers using water at the same time. Major distribution lines serve much larger areas and would see a smaller percentage of customers using water at the same time. Transmission mains serve large portions of the city. As a result, the impact that any one residence or one multi-family development has on the capacity of major distribution and transmission mains is not equivalent to the maximum capacity of the meter.

ALTERNATIVE METHODOLOGY

Several years ago, the City implemented an automated meter reading (AMR) program. The AMR system allows the collection of meter data remotely via electronic signals. Meter data are available across the entire city on an hourly basis. Due to the extensive data available, it is possible to determine what the cumulative impact of customers is on the system.

Hourly meter data were collected for the month of August for the years 2011, 2012, 2013, 2014, and 2015. August was selected as being representative of the highest demand period. The data were separated by customer type, meter type, and meter size. The average hourly demand for all meters within a given category was determined for all 744 hours of the month for each year. Next, the maximum hourly demand for each year for each category was determined and expressed in terms of gallons per minute. Finally, the average peak demand of the five years was determined. The following tables (Table 2 and Table 3) contain the results of that analysis for meter sizes and types where there were at least 10 meters in the system for a given use.

Table 2: August Peak Demands by Customer Class and Meter Size

Customer Class	Meter Size / Type	Aug 2011 (gpm)			Aug 2012 (gpm)			Aug 2013 (gpm)			Aug 2014 (gpm)			Aug 2015 (gpm)		
		No. of Accounts	Peak Demand	Peak Hour σ	No. of Accounts	Peak Demand	Peak Hour σ	No. of Accounts	Peak Demand	Peak Hour σ	No. of Accounts	Peak Demand	Peak Hour σ	No. of Accounts	Peak Demand	Peak Hour σ
Residential	5/8" SR	5,616	0 47	1.44	6,153	0 39	1 26	6,660	0 35	1 14	8,160	0 40	1 37	8,278	0 37	1 22
Residential	3/4" SEAL	92	1 51	4 62	102	1 06	3 88	124	0 68	2 59	134	1 43	7 72	133	1 31	5 16
Residential	1" SEAL	21	3 48	8 48	28	2 20	6 36	35	1 69	6 32	33	2 04	5 69	35	2 57	12 40
Commercial	5/8" SEAL	1,419	0 49	1 48	1,599	0 37	1 22	1,768	0 32	1 01	713	0 35	2 30	728	0 31	1 13
Commercial	3/4" SEAL	22	3 06	5 69	25	1 95	3 94	36	1 11	2 35	31	1 23	2 75	38	0 83	1 98
Commercial	1" SEAL	158	1 45	8 83	185	0 74	1 42	240	0 71	1 61	235	0 76	1 62	242	0 66	1 71
Commercial	1-1/2" SEAL	71	2 44	8.04	73	1.96	4.37	86	1 82	5 27	74	1 60	2 83	68	4 01	26 53
Commercial	2" CMPD	111	4 77	25 42	123	3 18	7 84	154	2 84	6 37	156	3 00	7 01	163	3 00	9 32
Commercial	3" CMPD	34	12 65	15 60	34	10 34	12 68	42	11 41	16 96	48	20 31	99 80	51	10.18	13 91
Commercial	4" CMPD	13	39 60	74 79	20	27 23	47 45	26	19 89	41 72	28	21 18	34 27	29	20.47	31 69
Commercial	6" CMPD	8	25 97	38 74	9	61 67	39 43	11	39 22	59 08	8	43 54	32 28	9	36 33	34 23
Comm - Irrigation	5/8" SEAL	25	1 89	6 40	35	1 57	4 34	44	1 63	4 59	49	1 16	3 19	56	0.93	3 73
Comm - Irrigation	3/4" SEAL	23	2 62	7 01	29	2 47	6 07	34	2 03	5 52	36	1 37	4 45	35	2.41	9 06
Comm - Irrigation	1" SEAL	48	3 86	12 48	56	4 80	11 16	61	3 11	9 16	67	3 14	8 74	75	4 71	10 93
Comm - Irrigation	1-1/2" SEAL	10	13 82	21 36	12	11 78	18 09	13	14 80	19 53	12	8 34	17 32	11	15.24	13 52
Comm - Irrigation	1-1/2" TURBO	18	17 16	22 23	21	15 93	27 56	24	14 12	25.55	27	18 92	36 46	28	16.17	27 61
Comm - Irrigation	2" TURBO	55	19 35	35 56	69	22 68	33 42	79	18 31	29 67	74	14 21	26 57	88	19 19	46 36

Table 3: Average Peak Demands and Calculated Service Unit Equivalents

Customer Class	Meter Size / Type	Average		Service Unit Equivalent
		Peak Demand	σ	
Residential	5/8" SR	0 40	1.29	1.00
Residential	3/4" SEAL	1 20	4 79	3.02
Residential	1" SEAL	2 40	7 85	6 04
Commercial	5/8" SEAL	0 37	1 43	0 93
Commercial	3/4" SEAL	1 63	3 34	4 11
Commercial	1" SEAL	0 86	3 04	2 18
Commercial	1-1/2" SEAL	2 36	9 41	5 96
Commercial	2" CMPD	3 36	11 19	8 46
Commercial	3" CMPD	12 98	31 79	32 69
Commercial	4" CMPD	25 67	45 98	64 66
Commercial	6" CMPD	41 35	40 75	104 13
Comm - Irrigation	5/8" SEAL	1 44	4 45	3 62
Comm - Irrigation	3/4" SEAL	2 18	6 42	5 49
Comm - Irrigation	1" SEAL	3 93	10.49	9 89
Comm - Irrigation	1-1/2" SEAL	12 80	17 96	32 23
Comm - Irrigation	1-1/2" TURBO	16 46	27 88	41 46
Comm - Irrigation	2" TURBO	18 75	34 31	47 21

Annual water consumption data for the years 2011, 2012, 2013, 2014, and 2015 were also analyzed based on customer type and meter size. Similar SUE values were calculated using this method and it was determined that the evaluation would move forward with the previously established metered demand data and the relationship of each meter to the Residential 5/8" SR meter. The following tables (Table 4 and Table 5) contain the results of that analysis for meter sizes and types where there were at least 10 meters in the system for a given use.

Table 4: Annual Water Demand by Customer Class and Meter Size

Customer Class	Meter Size / Type	Aug 2011 (gal)				Aug 2012 (gal)				Aug 2013 (gal)				Aug 2014 (gal)				Aug 2015 (gal)			
		No. of Accounts	Annual Volume	Volume per Meter	Average (gpm)	No. of Accounts	Annual Volume	Volume per Meter	Average (gpm)	No. of Accounts	Annual Volume	Volume per Meter	Average (gpm)	No. of Accounts	Annual Volume	Volume per Meter	Average (gpm)	No. of Accounts	Annual Volume	Volume per Meter	Average (gpm)
Residential	5/8" SR	8,025	625,515,592	77,946	0.15	8,265	555,667,952	67,231	0.13	8,483	524,443,859	61,823	0.12	8,680	521,546,408	60,051	0.11	8,713	519,487,560	59,622	0.11
Residential	3/4" SEAL	137	23,190,207	169,272	0.32	140	18,614,181	132,958	0.25	139	16,571,223	119,217	0.23	141	13,945,990	98,908	0.19	140	13,630,997	97,364	0.19
Residential	1" SEAL	42	7,412,543	176,489	0.34	42	5,783,713	137,707	0.26	42	5,427,150	129,218	0.25	42	4,965,768	118,233	0.23	41	4,637,441	113,108	0.21
Commercial	5/8" SEAL	833	69,867,108	83,874	0.16	828	88,606,531	107,013	0.20	824	66,585,949	80,808	0.15	819	63,390,320	77,155	0.15	810	70,923,381	87,560	0.17
Commercial	3/4" SEAL	35	8,571,355	244,896	0.47	35	9,015,283	257,580	0.49	36	7,029,901	195,275	0.37	38	6,268,949	164,972	0.31	41	6,304,398	153,766	0.29
Commercial	1" SEAL	267	75,417,899	282,464	0.54	267	34,793,203	130,312	0.25	269	54,709,960	203,383	0.39	269	54,437,454	202,370	0.39	270	53,351,238	197,597	0.38
Commercial	1-1/2" SEAL	99	50,039,755	505,452	0.96	94	47,223,680	502,380	0.96	94	42,212,067	449,065	0.85	89	40,702,700	457,334	0.87	86	37,992,939	441,778	0.84
Commercial	2" CMPD	162	143,634,979	886,636	1.69	166	139,294,309	839,122	1.60	183	148,002,896	808,759	1.54	192	160,088,965	833,797	1.59	207	178,255,702	861,139	1.64
Commercial	3" CMPD	50	149,896,054	2,997,921	5.72	52	145,208,315	2,792,468	5.33	56	166,882,466	2,980,044	5.67	59	171,770,075	2,911,357	5.54	63	196,773,174	3,123,384	5.94
Commercial	4" CMPD	26	121,589,990	4,676,538	8.90	30	143,603,080	4,786,769	9.11	36	184,250,660	5,118,074	9.74	37	194,306,487	5,251,527	9.99	36	213,259,920	5,923,887	11.27
Commercial	6" CMPD	11	82,479,870	7,498,170	14.27	11	95,837,100	8,712,464	16.58	12	97,940,300	8,161,692	15.53	11	92,060,670	8,369,152	15.92	10	95,904,670	9,590,467	18.25
Comm - Irrigation	5/8" SEAL	45	3,796,411	84,365	0.16	63	3,734,915	59,284	0.11	65	4,523,747	69,596	0.13	75	3,071,371	40,952	0.08	74	3,379,007	45,662	0.09
Comm - Irrigation	3/4" SEAL	31	4,485,672	144,699	0.28	34	3,253,789	95,700	0.18	38	3,429,932	90,261	0.17	40	3,337,705	83,443	0.16	41	3,390,977	82,707	0.16
Comm - Irrigation	1" SEAL	67	23,433,133	349,748	0.67	71	19,930,409	280,710	0.53	75	19,012,118	253,495	0.48	86	16,576,390	192,749	0.37	95	17,663,797	185,935	0.35
Comm - Irrigation	1-1/2" SEAL	17	7,551,273	444,192	0.85	16	5,303,187	331,449	0.63	16	5,387,623	336,726	0.64	15	4,347,598	289,840	0.55	14	3,493,968	249,569	0.47
Comm - Irrigation	1-1/2" TURBO	24	25,211,318	1,050,472	2.00	24	18,288,571	762,024	1.45	29	21,939,403	756,531	1.44	32	15,938,451	498,077	0.95	35	23,002,792	657,223	1.25
Comm - Irrigation	2" TURBO	91	132,834,581	1,459,721	2.78	94	119,436,639	1,270,603	2.42	98	107,698,064	1,098,960	2.09	100	88,348,448	883,484	1.68	103	107,462,615	1,043,326	1.99

Table 5: Average Annual Demand and Calculated Service Unit Equivalent

Customer Class	Meter Size / Type	Average		Service Unit Equivalent
		Volume per Meter	Average (gpm)	
Residential	5/8" SR	65,335	0.12	1.00
Residential	3/4" SEAL	123,544	0.24	1.89
Residential	1" SEAL	134,951	0.26	2.07
Commercial	5/8" SEAL	87,282	0.17	1.34
Commercial	3/4" SEAL	203,298	0.39	3.11
Commercial	1" SEAL	203,225	0.39	3.11
Commercial	1-1/2" SEAL	471,202	0.90	7.21
Commercial	2" CMPD	845,890	1.61	12.95
Commercial	3" CMPD	2,961,035	5.63	45.32
Commercial	4" CMPD	5,151,359	9.80	78.85
Commercial	6" CMPD	8,466,389	16.11	129.58
Comm - Irrigation	5/8" SEAL	59,972	0.11	0.92
Comm - Irrigation	3/4" SEAL	99,362	0.19	1.52
Comm - Irrigation	1" SEAL	252,527	0.48	3.87
Comm - Irrigation	1-1/2" SEAL	330,355	0.63	5.06
Comm - Irrigation	1-1/2" TURBO	744,865	1.42	11.40
Comm - Irrigation	2" TURBO	1,151,219	2.19	17.62

It is important to note that multi-family is not a discrete use. It is possible that some of the ¾-inch and 1-inch residential meters are actually duplex installations. Some of the larger meters identified as commercial use are certainly multi-family complexes. It is interesting to note that a natural progression from a 5/8-inch meter to a 1-1/2-inch commercial meter is not observed. This is quite likely due to uncertainty concerning the use and the appropriate meter size for these smaller commercial users. It is also interesting to note that irrigation meters experienced higher peak demands than similarly sized meters employed in commercial applications.

Based on the analysis of actual usage data, it is recommended that the City revise its method for determining the number of Service Unit Equivalents. As previously indicated, the cumulative peak demand from numerous users is a better indicator of the capacity required within the transmission and distribution system. Accordingly, it is recommended that the City define an SUE as 0.4 gpm and that the number of SUEs be determined by the calculated peak demand in accordance with Table 6.

Table 6: Commercial Meter Installations

Calculated Peak Flow (gpm)	Service Unit Equivalent
0 - 10	1.0
>10 - 15	2.0
>15 - 25	4.0
>25 - 50	6.0
>50 - 80	8.5
>80 - 160	32.5
>160 - 250	64.5
>250 - 500	104.0
>500	150.0

Similarly, the City may want to have a different SUE determination table for irrigation meters, as the actual data indicate that irrigation meters provide a larger cumulative peak demand on the transmission and distribution system. If the City determines that this is desirable, the recommended rates are shown in Table 7.

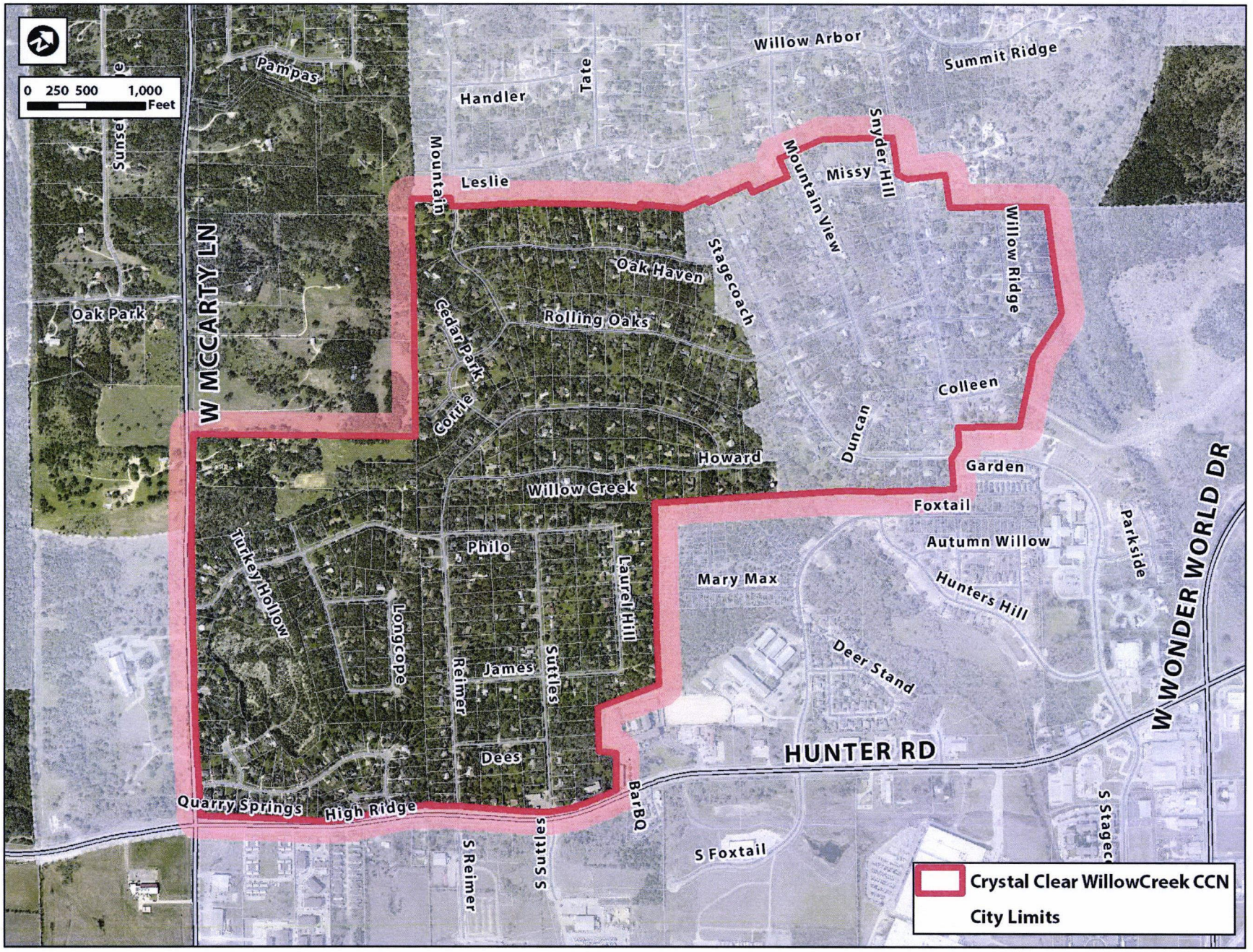
Table 7: Irrigation Meter Installations

Calculated Peak Flow (gpm)	Service Unit Equivalent
0 - 10	3.5
>10 - 15	5.5
>15 - 25	10.0
>25 - 50	32.0
>50 - 80	47.0
>500	60.0

ATTACHMENT D13

Attachment D13

City of San Marcos
630 E. Hopkins
San Marcos, TX 78666



ATTACHMENT D15

City of San Marcos
630 E. Hopkins
San Marcos, TX 78666

Attachment D15 – Rate Comparison

Water Rates per 1,000 gallons for a 5/8" by 3/4" Meter

Usage (in gallons)	Crystal Clear	Usage (in gallons)	COSM Inside City Limits	**Usage (in gallons)**	**COSM Outside City Limits**
0-5,000	$5.09	0-6,000	$4.07	0-6,000	$5.11
5,000-10,000	$5.60	6,001-9,000	$7.13	6,001-9,000	$8.91
10,000-20,000	$6.66	9,001-12,000	$8.16	9,001-12,000	$10.19
20,000-50,000	$9.00	12,001-20,000	$9.18	12,001-20,000	$11.46
50,000+	$11.50	20,001-50,000	$10.19	20,001-50,000	$12.73
		50,000+	$12.22	50,000+	$15.29
Minimum Bill: $41.21		Minimum Bill: $24.32		Minimum Bill: $30.41	

Average Bill Examples

Usage in Gallons	Crystal Clear	COSM (inside limits)	COSM (outside limits)
2,000	$51.39	$32.46	$40.63
5,000	$66.66	$44.67	$55.96
10,000	$94.66	$78.27	$97.97
25,000	206.26	$218.97	$273.66

ATTACHMENT E18

Attachment E18

City of San Marcos
630 E. Hopkins
San Marcos, TX 78666

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 6, 2015

FIRST CLASS MAIL

The Honorable Daniel Guerrero, Mayor
City of San Marcos
630 East Hopkins Street
San Marcos, Texas 78666-6314

RE: City of San Marcos
TCEQ Docket No. 2014-1188-PWS-E; Registration No. 1050001
Agreed Order Assessing Administrative Penalties and Requiring Certain Action

Enclosed is a copy of an order issued by the Commission.

Questions regarding the order should be directed to the Texas Commission on Environmental Quality's Enforcement Division at (512) 239-2545 or the Litigation Division at (512) 239-3400. If there are questions pertaining to the mailing of the order, then please contact Leslie Gann of the Office of the Chief Clerk at (512) 239-3319.

Sincerely,

Bridget C. Bohac

Bridget C. Bohac
Chief Clerk

BCB/lg

Enclosure

cc: Michaelle Garza, Enforcement Coordinator, TCEQ Enforcement Division
Stuart Beckley, SEP Coordinator, TCEQ Enforcement Division

PWS_1050001_CO_20150406_FINAL ORDER

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

IN THE MATTER OF AN ENFORCEMENT ACTION CONCERNING CITY OF SAN MARCOS RN101416337	**§ § § § §**	**BEFORE THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY**

AGREED ORDER
DOCKET NO. 2014-1188-PWS-E

At its APR 0 1 2015 agenda, the Texas Commission on Environmental Quality ("the Commission" or "TCEQ") considered this agreement of the parties, resolving an enforcement action regarding the City of San Marcos (the "Respondent") under the authority of TEX. HEALTH & SAFETY CODE ch. 341. The Executive Director of the TCEQ, through the Enforcement Division, and the Respondent presented this agreement to the Commission.

The Respondent understands that it has certain procedural rights at certain points in the enforcement process, including, but not limited to, the right to formal notice of violations, notice of an evidentiary hearing, the right to an evidentiary hearing, and a right to appeal. By entering into this Agreed Order, the Respondent agrees to waive all notice and procedural rights.

It is further understood and agreed that this Order represents the complete and fully-integrated settlement of the parties. The provisions of this Agreed Order are deemed severable and, if a court of competent jurisdiction or other appropriate authority deems any provision of this Agreed Order unenforceable, the remaining provisions shall be valid and enforceable. The duties and responsibilities imposed by this Agreed Order are binding upon the Respondent.

The Commission makes the following Findings of Fact and Conclusions of Law:

I. FINDINGS OF FACT

1. The Respondent owns and operates a public water supply located at 630 East Hopkins Street in San Marcos, Hays County, Texas (the "Facility") that has approximately 27,187 service connections and serves at least 25 people per day for at least 60 days per year.

2. During a record review conducted from July 28, 2014 through August 8, 2014, TCEQ staff documented that the locational running annual average concentrations for total trihalomethanes ("TTHM") at Stage 2 Disinfection Byproducts Site No. 4 were 0.087 milligrams per liter ("mg/L") for the fourth quarter of 2013, 0.086 mg/L for the first quarter of 2014, and 0.081 mg/L for the second quarter of 2014.

3. The Respondent received notice of the violations on August 19, 2014.

II. CONCLUSIONS OF LAW

1. The Respondent is subject to the jurisdiction of the TCEQ pursuant to TEX. HEALTH & SAFETY CODE ch. 341 and the rules of the Commission.

2. As evidenced by Findings of Fact No. 2, the Respondent failed to comply with the maximum contaminant level of 0.080 mg/L for TTHM based on the locational running annual average, in violation of 30 TEX. ADMIN. CODE § 290.115(f)(1) and TEX. HEALTH & SAFETY CODE § 341.0315(c).

3. Pursuant to TEX. HEALTH & SAFETY CODE § 341.049, the Commission has the authority to assess an administrative penalty against the Respondent for violations of the Texas Water Code and the Texas Health and Safety Code within the Commission's jurisdiction; for violations of rules adopted under such statutes; or for violations of orders or permits issued under such statutes.

4. An administrative penalty in the amount of Three Hundred Forty-Five Dollars ($345) is justified by the facts recited in this Agreed Order, and considered in light of the factors set forth in TEX. HEALTH & SAFETY CODE § 341.049(b). Three Hundred Forty-Five Dollars ($345) shall be conditionally offset by the Respondent's completion of a Supplemental Environmental Project ("SEP").

III. ORDERING PROVISIONS

NOW, THEREFORE, THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY ORDERS that:

1. The Respondent is assessed an administrative penalty in the amount of Three Hundred Forty-Five Dollars ($345) as set forth in Section II, Paragraph 4 above, for violations of TCEQ rules and state statutes. The payment of this administrative penalty and the Respondent's compliance with all the terms and conditions set forth in this Agreed Order completely resolve the violations set forth by this Agreed Order in this action. However, the Commission shall not be constrained in any manner from requiring corrective actions or penalties for other violations that are not raised here. Administrative penalty payments shall be made payable to "TCEQ" and shall be sent with the notation "Re: City of San Marcos, Docket No. 2014-1188-PWS-E" to:

Financial Administration Division, Revenue Operations Section
Attention: Cashier's Office, MC 214
Texas Commission on Environmental Quality
P.O. Box 13088
Austin, Texas 78711-3088

2. The Respondent shall implement and complete a SEP in accordance with TEX. WATER CODE § 7.067. As set forth in Section II, Paragraph 4 above, Three Hundred Forty-Five Dollars ($345) of the assessed administrative penalty shall be offset with the condition that the SEP defined in Attachment A, incorporated herein by reference, is implemented by the Respondent. The Respondent's obligation to pay the conditionally offset portion of the administrative penalty assessed shall be discharged upon final completion of all provisions of the SEP agreement.

3. The Respondent shall undertake the following technical requirements:

   a. Within 365 days after the effective date of this Agreed Order, return to compliance with the maximum contaminant level for TTHM based on the locational running annual average, in accordance with 30 TEX. ADMIN. CODE § 290.115; and

   b. Within 380 days after the effective date of this Agreed Order, submit written certification as described below, and include detailed supporting documentation including photographs, receipts, and/or other records to demonstrate compliance with Ordering Provision No. 3.a. The certification shall be notarized by a State of Texas Notary Public and include the following certification language:

      "I certify under penalty of law that I have personally examined and am familiar with the information submitted and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."

      The certification shall be submitted to:

      Order Compliance Team
      Enforcement Division, MC 149A
      Texas Commission on Environmental Quality
      P.O. Box 13087
      Austin, Texas 78711-3087

with a copy to:

Public Drinking Water Section Manager
Water Supply Division, MC 155
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

4. The provisions of this Agreed Order shall apply to and be binding upon the Respondent. The Respondent is ordered to give notice of the Agreed Order to personnel who maintain day-to-day control over the Facility operations referenced in this Agreed Order.

5. The Executive Director may grant an extension of any deadline in this Agreed Order or in any plan, report, or other document submitted pursuant to this Agreed Order, upon a written and substantiated showing of good cause. All requests for extensions by the Respondent shall be made in writing to the Executive Director. Extensions are not effective until the Respondent receives written approval from the Executive Director. The determination of what constitutes good cause rests solely with the Executive Director.

6. The Executive Director may refer this matter to the Office of the Attorney General of the State of Texas ("OAG") for further enforcement proceedings without notice to the Respondent if the Executive Director determines that the Respondent has not complied with one or more of the terms or conditions in this Agreed Order.

7. This Agreed Order shall terminate five years from its effective date or upon compliance with all the terms and conditions set forth in this Agreed Order, whichever is later.

8. This Agreed Order, issued by the Commission, shall not be admissible against the Respondent in a civil proceeding, unless the proceeding is brought by the OAG to: (1) enforce the terms of this Agreed Order; or (2) pursue violations of a statute within the Commission's jurisdiction, or of a rule adopted or an order or permit issued by the Commission under such a statute.

9. This Agreed Order may be executed in separate and multiple counterparts, which together shall constitute a single instrument. Any page of this Agreed Order may be copied, scanned, digitized, converted to electronic portable document format ("pdf"), or otherwise reproduced and may be transmitted by digital or electronic transmission, including but not limited to facsimile transmission and electronic mail. Any signature affixed to this Agreed Order shall constitute an original signature for all purposes and may be used, filed, substituted, or issued for any purpose for which an original signature could be used. The term "signature" shall include manual signatures and true and accurate reproductions of manual signatures created, executed, endorsed, adopted, or authorized by the person or persons to whom the signatures are attributable. Signatures may be copied or reproduced digitally, electronically, by photocopying, engraving, imprinting, lithographing, electronic mail, facsimile transmission, stamping, or any

other means or process which the Executive Director deems acceptable. In this paragraph exclusively, the terms "electronic transmission", "owner", "person", "writing", and "written" shall have the meanings assigned to them under TEX. BUS. ORG. CODE § 1.002.

10. The Chief Clerk shall provide a copy of this Agreed Order to each of the parties. By law, the effective date of this Agreed Order is the third day after the mailing date, as provided by 30 TEX. ADMIN. CODE § 70.10(b) and TEX. GOV'T CODE § 2001.142.

SIGNATURE PAGE

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

For the Commission

For the Executive Director

2/6/15
Date

I, the undersigned, have read and understand the attached Agreed Order in the matter of the City of San Marcos. I am authorized to agree to the attached Agreed Order on behalf of the City of San Marcos, and do agree to the specified terms and conditions. I further acknowledge that the TCEQ, in accepting payment for the penalty amount, is materially relying on such representation.

I understand that by entering into this Agreed Order, the City of San Marcos waives certain procedural rights, including, but not limited to, the right to formal notice of violations addressed by this Agreed Order, notice of an evidentiary hearing, the right to an evidentiary hearing, and the right to appeal. I agree to the terms of the Agreed Order in lieu of an evidentiary hearing. This Agreed Order constitutes full and final adjudication by the Commission of the violations set forth in this Agreed Order.

I also understand that failure to comply with the Ordering Provisions, if any, in this order and/or failure to timely pay the penalty amount, may result in:

- A negative impact on compliance history;
- Greater scrutiny of any permit applications submitted;
- Referral of this case to the Attorney General's Office for contempt, injunctive relief, additional penalties, and/or attorney fees, or to a collection agency;
- Increased penalties in any future enforcement actions;
- Automatic referral to the Attorney General's Office of any future enforcement actions; and
- TCEQ seeking other relief as authorized by law.

In addition, any falsification of any compliance documents may result in criminal prosecution.

Signature

10/29/14
Date

DANIEL GUERRERO
Name (Printed or typed)
Authorized Representative of
City of San Marcos

MAYOR
Title

Instructions: Send the original, signed Agreed Order with penalty payment to the Financial Administration Division, Revenue Operations Section at the address in Section III, Paragraph 1 of this Agreed Order.

Attachment A

Docket Number: 2014-1188-PWS-E

SUPPLEMENTAL ENVIRONMENTAL PROJECT

Respondent:	**City of San Marcos**
Penalty Amount:	**Three Hundred Forty-Five Dollars ($345)**
SEP Offset Amount:	**Three Hundred Forty-Five Dollars ($345)**
Type of SEP:	**Contribution to a Third-Party Pre-Approved SEP**
Third-Party Administrator:	**Texas State University – San Marcos**
Project Name:	***Water Quality Monitoring of River Basins and Edwards Aquifer Recharge Zone***
Location of SEP:	**Colorado River Basin; Edwards Aquifer**

The Texas Commission on Environmental Quality ("TCEQ") agrees to offset the administrative penalty amount assessed in this Agreed Order for the Respondent to contribute to a Supplemental Environmental Project ("SEP"). The offset is equal to the SEP Offset Amount set forth above and is conditioned upon completion of the project in accordance with the terms of this Attachment A.

1. Project Description

a. Project

The Respondent shall contribute the SEP Offset Amount to the Third-Party Administrator named above. The contribution will be to the **Texas State University – San Marcos** for the *Water Quality Monitoring of River Basins and Edwards Aquifer Recharge Zone* project. The contribution will be used in accordance with the SEP Agreement between the Third-Party Administrator and the TCEQ (the "Project"). Specifically, the SEP Offset Amount will be used pay for sampling equipment, including the portable stormwater sampler, Gore bags, and calibration standards kits. The Third-Party Administrator shall also use the SEP Offset Amount for travel expenses up to $.55 per mile for traveling to the wells and to collect data during storm events. The SEP Offset Amount will also be used for lab analyses of Gore bag samples and field parameters and to pay a portion of the Third-Party's personnel's salary for time spent collecting samples and calibrating instruments. The SEP will be done in accordance with all federal, state, and local environmental laws and regulations.

All dollars contributed will be used solely for the direct cost of implementing the Project, including, but not limited to supplies, materials, and equipment. Any portion of this contribution that is not spent on the specifically identified SEP may, at the discretion of the Executive Director ("ED"), be applied to another pre-approved SEP.

The Respondent's signature affixed to this Agreed Order certifies that the Respondent has no prior commitment to make this contribution and that it is being contributed solely in an effort to settle this enforcement action. The Respondent shall not profit in any manner from this SEP.

b. Environmental Benefit

The continuation of the Trimmier, Witte, and La Coste Stations and the implementation of two new stations will provide valuable data for assessing water quality. Continuous monitoring of these sites will provide the public with knowledge of basic water quality in their watershed. These data will provide useful information in determining baseline conditions, long term trends, and real-time water quality for the area.

The Edwards Aquifer monitoring sites will collect data to measure the water quality of the sensitive area before, during, and after construction of the Paso Robles development and associated golf course. The Project will also monitor the surface runoff following significant rain events to determine the effects of construction activities, the use of effluent, and the application of insecticides and herbicides in the community and golf course. Further, these monitoring sites will identify any contamination of this sensitive recharge area of the Edwards Aquifer Recharge Zone and help prevent possible further introduction of contaminants.

c. Minimum Expenditure

The Respondent shall contribute at least the SEP Offset Amount to the Third-Party Administrator and comply with all other provisions of this SEP.

2. Performance Schedule

Within 30 days after the effective date of this Agreed Order, the Respondent must contribute the SEP Offset Amount to the Third-Party Administrator. The Respondent shall make the check payable to **Texas State University – San Marcos SEP** and shall mail the contribution with a copy of the Agreed Order to:

Dr. Glenn Longley
Texas State University - San Marcos
601 University Drive, JCK 420
San Marcos, Texas 78666

3. Records and Reporting

Concurrent with the payment of the SEP Offset Amount, the Respondent shall provide the Enforcement SEP Coordinator with a copy of the check and transmittal letter indicating full payment of the SEP Offset Amount to the Third-Party Administrator. The Respondent shall mail a copy of the check and transmittal letter to:

Texas Commission on Environmental Quality
Enforcement Division
Attention: SEP Coordinator, MC 219
P.O. Box 13087
Austin, Texas 78711-3087

4. Failure to Fully Perform

If the Respondent does not perform its obligations under this Attachment A, including full expenditure of the SEP Offset Amount and submittal of the required reporting described in Sections 2 and 3 above, the ED may require immediate payment of all or part of the SEP Offset Amount.

In the event the ED determines that the Respondent failed to fully implement and complete the Project, the Respondent shall remit payment for all or a portion of the SEP Offset Amount, as determined by the ED, and as set forth in the attached Agreed Order. After receiving notice of failure to complete the SEP, the Respondent shall include the docket number of the attached Agreed Order and a note that the enclosed payment is for the reimbursement of a SEP; shall make the check payable to "Texas Commission on Environmental Quality;" and shall mail it to:

Texas Commission on Environmental Quality
Litigation Division
Attention: SEP Coordinator, MC 175
P.O. Box 13087
Austin, Texas 78711-3087

5. Publicity

Any public statements concerning this SEP and/or project, made by or on behalf of the Respondent must include a clear statement that **the project was performed as part of the settlement of an enforcement action brought by the TCEQ.** Such statements include advertising, public relations, and press releases.

6. Clean Texas Program

The Respondent shall not include this SEP in any application made to TCEQ under the "Clean Texas" (or any successor) program(s). Similarly, the Respondent may not seek recognition for this contribution in any other state or federal regulatory program.

7. Other SEPs by TCEQ or Other Agencies

The SEP Offset Amount identified in this Attachment A and in the attached Agreed Order has not been, and shall not be, included as a SEP for the Respondent under any other Agreed Order negotiated with the TCEQ or any other agency of the state or federal government.

TCEQ TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

RESPONDENT APPLICATION TO CONTRIBUTE TO A THIRD PARTY SEP ADMINISTRATOR

OFFICE OF
LEGAL SERVICES
512.239.0600
sepreports@tceq.texas.gov

1. RESPONDENT INFORMATION

Respondent Name: (Legal name of org):	City of San Marcos	Application date:	
Respondent's Contact Person:	Jon Clack	TCEQ Docket No.:	2014-1188-PWS-E
Telephone:	512-393-8010	Enforcement Case No:	49157
Email:	jclack@sanmarcostx.gov	Enforcement Coordinator:	Michaelle Garza
Payable Penalty Amount:	**$ 345**	**SEP Amount:**	**$345**

How do you want to distribute your contribution? -Double click on the table below to enter information

	Third Party Administrator/Project Title	$ Amount to Each	County Preference	Total for this item
1st preference	Texas State University - San Marcos / Water Quality M	$ 345.00	Hays	$ 345.00
2nd preference		$ -		$ -
3rd preference		$ -		$ -
	Total contribution amount			**$ 345.00**

2. PREVIOUS COMMITMENT CERTIFICATION: NO SEPARATE REQUIREMENT OR PRIVATE COMMITMENTS

I certify on behalf of the Respondent that the Respondent has not previously committed to perform this project including a previous or pre-existing obligation to make the proposed contribution:

1. under any applicable local, state, or federal regulations that would require implementation of this project or any part of this project; or
2. as a part of:
   a) a pollution prevention commitment identified in a plan developed pursuant to the state's Waste Reduction Policy Act (WRPA); or
   b) a commitment made under the Clean Texas Program; or
   c) the U.S. Environmental Protection Agency's Project XL or any other incentive or regulatory flexibility program; or
3. as part of a pledge or other promise of payment to the receiving organization where the promise of payment pre-existed submittal of this application

(See http://www.tceq.texas.gov for links and information about the WRPA, Clean Texas, and Project XL Programs.)

Certification statement: Please accept signature of this application as a certification that the information is true and correct and that the proposed project is being undertaken solely as part of the settlement of the enforcement action.

Exec. Dir. of Public Services — October 7, 2014
Name/ Title — Date

Thomas P. Taggart
Printed Name

ATTACHMENT F22

Attachment F22

City of San Marcos
630 E. Hopkins
San Marcos, TX 78666

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 14, 2017

CERTIFIED MAIL NO.: 91 7199 9991 7036 8816 8719
RETURN RECEIPT REQUESTED

Mr. Donald Bosworth, President
Crystal Clear SUD
2370 FM 1979
San Marcos, Texas 78666-2100

Re: Notice of Violation for the Comprehensive Compliance Investigation at:
Crystal Clear SUD, FM 1979 S of San Marcos, Guadalupe County, Texas
Regulated Entity No.: RN101437994, TCEQ PWS ID No.: 0940015, Investigation No.: 1422444

Dear Mr. Bosworth:

On May 22, 2017, Mr. Chris Friesenhahn of the Texas Commission on Environmental Quality (TCEQ) San Antonio Region Office conducted an investigation of the above-referenced regulated entity to evaluate compliance with applicable requirements for a public water supply. Enclosed is a summary which lists the investigation findings. During the investigation, certain outstanding alleged violations were identified for which compliance documentation is required. Please submit to this office by October 7, 2017 a written description of corrective action taken and the required documentation demonstrating that compliance has been achieved for each of the outstanding alleged violations.

In the listing of the alleged violations, we have cited applicable requirements, including TCEQ rules. Please note that both the rules themselves and the agency brochure entitled *Obtaining TCEQ Rules* (GI 032) are located on our agency website at http://www.tceq.state.tx.us for your reference. If you would like a hard copy of this brochure mailed to you, you may call and request one from either the San Antonio Region Office at (210) 490-3096 or the Central Office Publications Ordering Team at 512-239-0028.

The TCEQ appreciates your assistance in this matter. Please note that the Legislature has granted TCEQ enforcement powers which we may exercise to ensure compliance with environmental regulatory requirements. We anticipate that you will resolve the alleged violations as required in order to protect the State's environment. If you have additional information that we are unaware of, you have the opportunity to contest the violation documented in this notice. Should you choose to do so, you must notify the San Antonio Region Office within 10 days from the date of this letter. At that time, Water Section Manager, Mrs. Lynn Bumguardner will schedule a violation review meeting to be conducted within 21 days from the date of this letter. However, please be advised that if you decide to participate in the violation review process, the TCEQ may still require you to adhere to the compliance schedule included in the enclosed Summary of Investigation Findings until an official decision is made regarding the status of any or all of the contested violations.

If you or members of your staff have any questions, please feel free to contact Mr. Friesenhahn in the San Antonio Region Office at (210) 403-4055.

Sincerely,

Joy Thurston-Cook
Water Section Team Leader
San Antonio Region Office
Texas Commission on Environmental Quality

JTC/cmf/eg

Enclosure: Summary of Investigation Findings

Summary of Investigation Findings

CRYSTAL CLEAR SUD

Investigation # 1422444

Investigation Date: 05/22/2017

, GUADALUPE COUNTY,

Additional ID(s): 0940015

OUTSTANDING ALLEGED VIOLATION(S) ASSOCIATED TO A NOTICE OF VIOLATION

Track No: 646363 **Compliance Due Date: 10/07/2017**

30 TAC Chapter 290.41(c)(3)(K)

Alleged Violation:

Investigation: 1422444 Comment Date: 06/23/2017

Failure to seal the well head and provide a casing vent.

At the time of the investigation, the Hunter well was lacking a casing vent and the well head wasn't adequately sealed.

30 TAC 290.41(c)(3)(K)--Wellheads and pump bases shall be sealed by a gasket or sealing compound and properly vented to prevent the possibility of contaminating the well water. A well casing vent shall be provided with an opening that is covered with 16-mesh or finer corrosion-resistant screen, facing downward, elevated and located so as to minimize the drawing of contaminants into the well. Wellheads and well vents shall be at least two feet above the highest known watermark or 100-year flood elevation, if available, or adequately protected from possible flood damage by levees.

Recommended Corrective Action: Seal the well head using a gasket or sealing compound and install a casing vent.

To document compliance, submit photographic documentation which indicates that well head has been adequately sealed and vented to this office by the compliance due date.

Track No: 646367 **Compliance Due Date: 10/07/2017**

30 TAC Chapter 290.41(c)(3)(J)

Alleged Violation:

Investigation: 1422444 Comment Date: 06/23/2017

Failure to provide adequate concrete sealing blocks for all wells.

At the time of the investigation, the Hunter and Nelson wells were not equipped with concrete sealing blocks which extended at least three feet in all directions from each well's casing.

30 TAC 290.41(c)(3)(J)--In all cases, a concrete sealing block extending at least three feet from the well casing in all directions, with a minimum thickness of six inches and sloped to drain away at not less than 0.25 inches per foot shall be provided around the wellhead.

Recommended Corrective Action: Adequately extend the concrete sealing blocks so that they extend at least 36 inches in all directions from the well's casings.

To document compliance, submit photographic documentation which indicates that concrete sealing blocks have been adequately extended to this office by the compliance due date.

ALLEGED VIOLATION(S) NOTED AND RESOLVED ASSOCIATED TO A NOTICE OF VIOLATION

Track No: 548217

30 TAC Chapter 290.46(m)(4)

Alleged Violation:

Investigation: 1179256 Comment Date: 09/12/2014

Failure to maintain watertight conditions.

At the time of the investigation at the: Pape Plant- the sample tap in the pump house, Ilka Plant- the packing gland (pg) for service pump #1, McCarty Plant- the pg for well #1 and for well #2, Willow Creek Plant- the pressure tank valve and Staples Farmers Plant- the pg for service pump #2 were leaking.

30 TAC 290.46(m)(4)– All water treatment units, storage and pressure maintenance facilities, distribution system lines, and related appurtenances shall be maintained in a watertight condition and be free of excessive solids.

Investigation: 1422444 Comment Date: 06/22/2017

This violation is being resolved.

Recommended Corrective Action: Provide by the compliance due date, documentation indicating that the leaking sample tap, packing glands for service pumps and for the wells and pressure tank valve have been repaired or replaced.

A completed work order, receipt or invoice and/or photographs are acceptable forms of compliance documentation to resolve this violation.

Resolution: During the 05/22/2017 CCI it was confirmed that all plants were be adequately maintained.

Track No: 548218

30 TAC Chapter 290.46(m)

Alleged Violation:

Investigation: 1179256 Comment Date: 09/22/2014

Failure to maintain the facilities.

At the time of the investigation at the: Windmill Plant- barbed wire (bw) was not turned outward at a 45 degree angle (45), Pape Plant- the bw was broken, there were gaps under fence, tree limbs hanging over fence and an overgrowth of vegetation on the fence, Boeder Plant- there was an overgrowth of vegetation and tree limbs hanging over the fence, Ilke Plant- the bw was loose, Wilson aka Kingsbury Plant- the bw was loose and not turned outward at a 45, Redwood Plant- there was an overgrowth of vegetation on the fence and the bw was loose, El Camino Plant- the rungs on the fence were broken and there were gaps under the fence, McCarty Plant- the bw was loose and fence was bent downward, Willow Creek Plant- the bw was loose and there was a gap under fence, Nelson Ground Storage Tank Site- there was an overgrowth of vegetation on the fence and the top of the bw was broken, Havenwood Plant- there were tree limbs hanging over the fence, Kuenstler Plant- the bw was loose and Staples Farmers Plant- the bw was loose as well as broken and there was an overgrowth of vegetation on the fence and tree limbs hanging over the fence.

09/08/2014- The entity submitted a photograph showing that the tree limbs have been cut at the Havenwood Plant.

09/11/2014- The entity submitted photographs showing that the bw has been tightened at the Kuenstler Plant.

09/12/2014- The entity submitted photographs showing that the bw has been turned outward at a 45 at the Windmill Plant.

30 TAC 290.46(m)– Maintenance and housekeeping. The maintenance and housekeeping practices used by a public water system shall ensure the good working condition and general appearance of the system's facilities and equipment. The grounds and facilities shall be maintained in a manner so as to minimize the possibility of the harboring of rodents, insects,

and other disease vectors, and in such a way as to prevent other conditions that might cause the contamination of the water.

Investigation: 1422444 Comment Date: 06/22/2017

This violation is being resolved.

Recommended Corrective Action: Provide by the compliance due date, documentation indicating that broken rungs, loose barbed wire, broken barbed wire, damaged fence has been repaired, barbed wire has been turned outward at a 45 degree angle, the overgrowth of vegetation on the fence and the gaps under the fences have been closed and tree limbs hanging over the fences have been cut back to ensure that the integrity of the intruder resistant fences are not compromised.

A completed work order, receipt or invoice and/or photographs are acceptable forms of compliance documentation to resolve this violation.

Resolution: During the 05/22/2017 CCI it was confirmed that all plants were be adequately maintained.

Track No: 548220

30 TAC Chapter 290.41(c)(3)(N)

Alleged Violation:

Investigation: 1179256 Comment Date: 09/12/2014

Failure to provide well flow meters.

At the time of the investigation, no flow meters were installed on the wells for the Willow Creek and Nelson Plant.

30 TAC 290.41(c)(3)(N)-- Flow measuring devices shall be provided for each well to measure production yields and provide for the accumulation of water production data. These devices shall be located to facilitate daily reading.

Investigation: 1422444 Comment Date: 06/22/2017

This violation is being resolved.

Recommended Corrective Action: Provide by the compliance due date, documentation indicating that wells for the Willow Creek and Nelson Plant have flow meters installed in compliance with the requirements.

A completed work order, receipt or invoice and/or photographs are acceptable forms of compliance documentation to resolve this violation.

Resolution: During the 05/22/2017 CCI it was confirmed that all wells had been equipped with flow meters.

Track No: 548227

30 TAC Chapter 290.121(a)

Alleged Violation:

Investigation: 1179256 Comment Date: 09/12/2014

Failure to provide an up-to-date system monitoring plan.

At the time of the investigation, the monitoring plan for the Crystal Clear WSC (CC) did not have an updated schematic map, sampling site map, and updated language to accurately describe the monitoring plan, and the monitoring plan for the Staples Farmers (SF) did not have a schematic map, sampling site map, and lead and copper, disinfection by product and chlorine residual sampling sites were not identified in the monitoring plan.

09/10/2014- The entity submitted a copy of the monitoring plan for SF; however the entity did not include accurate language regarding the connections, identifying the groundwater well that has a status of being under the influence of surface water, and schematic map which also identifies the location for entry point sampling.

30 TAC 290.121(a)-- All public water systems shall maintain an up-to-date chemical and microbiological monitoring plan. Monitoring plans are subject to the review and approval of the executive director. A copy of the monitoring plan must be maintained at each water treatment plant and at a central location.
Investigation: 1422444 Comment Date: 06/22/2017

This violation is being resolved.

Recommended Corrective Action: Provide by the compliance due date, a copy of the Crystal Clear WSC system monitoring plan which indicates that it is accurate and compliant with the requirements. Since the Staples Farmers water system is now merged with the Crystal Clear WSC, the monitoring plan must reflect it as it pertains to all facets of the monitoring plan requirements.

Resolution: During the 05/22/2017 CCI it was confirmed that an up-to-date monitoring plan was being maintained.

Track No: 548240

30 TAC Chapter 290.46(s)(2)(C)(i)
30 TAC Chapter 290.46(s)(2)(C)(ii)

Alleged Violation:
Investigation: 1179256 Comment Date: 09/12/2014

Failure by the regulated entity to verify the accuracy of manual disinfectant residual analyzers at least once every 90 days using chlorine solutions of known concentrations.

At the time of the investigation, no documentation to indicate that the manual disinfectant residual analyzer was being verified for accuracy at least once every 90 days was provided. In addition, the solutions of known concentrations were expired. The continuous disinfectant residual analyzers were also not being checked for accuracy at least once every seven days or documented.
08/22/2014- The entity submitted an invoice indicating that solutions of known concentrations were purchased on 07/30/2014.

30 TAC 290.46(s)(2)
(C) Chemical disinfectant residual analyzers shall be properly calibrated.
(i) The accuracy of manual disinfectant residual analyzers shall be verified at least once every 90 days using chlorine solutions of known concentrations.
(ii) The accuracy of continuous disinfectant residual analyzers shall be checked at least once every seven days with a chlorine solution of known concentration or by comparing the results from the on-line analyzer with the result of approved benchtop method in accordance with §290.119 of this title (relating to Analytical Procedures).
Investigation: 1422444 Comment Date: 06/22/2017

This violation is being resolved.

Recommended Corrective Action: Provide by the compliance due date, logs indicating that the accuracy of the manual disinfectant residual analyzer is being verified at least once every 90 days and that the accuracy of the continuous disinfectant residual analyzers is being verified at least once every seven days in accordance with requirements.

Resolution: During the 05/22/2017 CCI it was confirmed that the manual disinfectant residual analyzers were being checked for accuracy once every 90 days

Track No: 548329

30 TAC Chapter 290.46(m)(1)(A)

Alleged Violation:
Investigation: 1179256 Comment Date: 09/15/2014

Failure to conduct annual ground and elevated storage tank inspections.

At the time of the investigation, no annual tank inspections had been performed on the

fourteen ground storage tanks, two standpipes and three elevated ground storage tanks. This includes the two ground storage tanks at the Staples Farmers Plant.

08/25/2014- The entity provided copies of ground and elevated storage tanks that indicated that they were conducted in May of 2013. This documentation was inadequate because the tank inspection reports were past one year.

30 TAC 290.46(m)(1)(A)– Ground and elevated storage tank inspections must determine that the vents are in place and properly screened, the roof hatches closed and locked, flap valves and gasketing provide adequate protection against insects, rodents, and other vermin, the interior and exterior coating systems are continuing to provide adequate protection to all metal surfaces, and the tank remains in a watertight condition.

Investigation: 1422444 Comment Date: 06/22/2017

This violation is being resolved.

Recommended Corrective Action: Provide by the compliance due date, copies of the tank inspection forms indicating that the ground storage tanks, standpipes, and elevated storage tanks have been inspected in accordance with the requirements.

Resolution: During the 05/22/2017 CCI it was confirmed that exterior and interior inspections were being conducted on the storage tanks.

Track No: 548330

30 TAC Chapter 290.46(m)(1)(B)

Alleged Violation:

Investigation: 1179256 Comment Date: 09/15/2014

Failure to conduct pressure tank inspections.

At the time of the investigation, no annual exterior or five year interior tank inspections had been performed on the eight pressure tanks. This includes the two pressure tanks at the Staples Farmers Plant.

30 TAC 290.46(m)(1)(B)– Pressure tank inspections must determine that the pressure release device and pressure gauge are working properly, the air-water ratio is being maintained at the proper level, the exterior coating systems are continuing to provide adequate protection to all metal surfaces, and the tank remains in watertight condition. Pressure tanks provided with an inspection port must have the interior surface inspected every five years.

Investigation: 1422444 Comment Date: 06/22/2017

This violation is being resolved.

Recommended Corrective Action: Provide by the compliance due date, copies of the tank inspection forms indicating that the pressure tanks have been inspected in accordance with the requirements.

Resolution: During the 05/22/2017 CCI it was confirmed that exterior and interior inspections were being conducted on the storage tanks.

Track No: 548345

30 TAC Chapter 290.46(f)(2)
30 TAC Chapter 290.46(f)(3)(A)(iv)

Alleged Violation:

Investigation: 1179256 Comment Date: 09/15/2014

Failure to make adequate records available for review.

At the time of the investigation, the dates that dead-end mains were flushed were not provided. This includes Staples Farmers flushing records.

30 TAC 290.46(f)(3)(A)(iv)– The dates that dead-end mains were flushed.

Investigation: 1422444 Comment Date: 06/22/2017

This violation is being resolved.

Recommended Corrective Action: Provide by the compliance due date, flushing records, which indicate that the dead-end mains are being flushed in accordance with requirements.

Resolution: During the 05/22/2017 CCI it was confirmed that flushing records were being maintained.

Track No: 548346

30 TAC Chapter 290.39(e)
30 TAC Chapter 290.39(h)(1)
30 TAC Chapter 290.46(n)(1)

Alleged Violation:

Investigation: 1179256 Comment Date: 09/15/2014

Failure to submit and acquire approval of as built engineering plans prior to operating a public water supply.

At the time of the investigation, the water system provided engineering plans and specifications for the wells, storage and pressure maintenance facilities, but no approval letters or granted exceptions were provided. In addition, no approval letters were provided for the three interconnections. Search of the Integrated Water Utility Database indicated that there were submittals for two elevated storage tanks, but there was no documentation made available to identify which tanks were approved for construction. Review of the entity's file indicated that the service pumps at the Ilka Water Plant were approved.

30 TAC 290.46(n)(1)-- Accurate and up-to-date detailed as-built plans or record drawings and specifications for each treatment plant, pump station, and storage tank shall be maintained at the public water system until the facility is decommissioned. As-built plans of individual projects may be used to fulfill this requirement if the plans are maintained in an organized manner.

30 TAC 290.39(h)(1)-- No person may begin construction on a new public water system before receiving written approval of plans and specifications and, if required, approval of a business plan from the executive director. No person may begin construction of modifications to a public water system without providing notification to the executive director and submitting and receiving approval of plans and specifications if requested in accordance with subsection (j) of this section.

30 TAC 290.39(e)-- Submission of planning material.

Investigation: 1422444 Comment Date: 06/22/2017

This violation is being resolved.

Recommended Corrective Action: Provide by the compliance due date, documentation demonstrating that as-built plans or an exceptions request has been submitted to the Texas Commission on Environmental Quality (TCEQ), Utilities Technical Review Team (UTRT), MC 159, P.O. Box 13087, Austin, TX 78711-3087 and that approval or an exception has been granted.

The entity must ensure that the as-built plans are submitted by a licensed professional engineer. For further assistance regarding submittal contact the TCEQ UTRT at (512) 239-4691.

Resolution: During the 05/22/2017 CCI it was confirmed that all new construction had been approved for construction.

Track No: 548347

30 TAC Chapter 290.45(f)(3)

Alleged Violation:

Investigation: 1179256 Comment Date: 09/15/2014

Failure to provide an up to date purchased water contract for CRWA or provide a Springs Hill WSC purchased water contract.

At the time of the investigation, the entity provided a purchased water contract with CRWA dated 05/01/2007. The contract specifies that 62 gallons per minute or 89,280 gallons per day is the maximum amount of water that can be purchased on a daily basis; however, according to the entity the current maximum daily rate is 254,491 gallons per day or 176.7 gallons per minute.

08/026/2014- A purchased water contract for Springs Hill WSC was provided, but was inadequate do to not having a maximum daily rate at which the entity was allowed to purchase.

30 TAC 290.45(f)(3)-- The contract shall also establish the maximum rate at which water may be drafted on a daily and hourly basis. In the absence of specific maximum daily or maximum hourly rates in the contract, a uniform purchase rate for the contract period will be used.

Investigation: 1422444 Comment Date: 06/22/2017

This violation is being resolved.

Recommended Corrective Action: Provide by the compliance due date, a copy of an updated purchased water contracts that indicates the accurate maximum daily rate with CRWA and Springs Hill WSC.

Resolution: During the 05/22/2017 CCI it was confirmed that all purchase water contracts were up to date.

Track No: 548348

30 TAC Chapter 290.110(c)(4)(B)

Alleged Violation:

Investigation: 1179256 Comment Date: 09/22/2014

Failure to monitor the disinfectant residual at representative locations in the distribution system at least once per day.

At the time of the investigation the entity was using the reading on the continuous chlorine analyzer at various plants in the distribution for their daily chlorine residual readings in the distribution.

30 TAC 290.110(c)(4)(B)-- Public water systems that serve at least 250 connections or at least 750 people daily, and use only groundwater or purchased water sources must monitor the disinfectant residual at representative locations in the distribution system at least once per day.

Investigation: 1422444 Comment Date: 06/22/2017

This violation is being resolved.

Recommended Corrective Action: Provide by the compliance due date, chlorine logs indicating that the daily chlorine residual tests are being taken at representative locations in the distribution system.

Resolution: During the 05/22/2017 CCI it was confirmed that disinfectant residuals were being monitored at locations representative of the distribution system daily.

CRYSTAL CLEAR
SPECIAL UTILITY DISTRICT

The TCEQ Compliance Investigation was done on Monday, May 22, 2017.

Mr. Chris Friesenhahn, of the San Antonio Division, was the Environmental Investigator.

The first two hours were spent going over the list of required documents. Everything was laid out and labeled for easy access. He made a couple of suggestions such as putting daily readings on the Monthly Operating Reports and recording all tolerances when calibrating the colorimeters. Both of these suggestions have already been added to our paperwork as of Tuesday, May 23, 2017.

About 11:00 we left to look at all the plant sites. He spent less than 5 minutes at most of the plant sites. The Exit Interview is attached. There were no repeat violations.

Mr. Friesenhahn also said he could see that we have made a lot of progress from the last inspection.

You will notice, when we go into executive session, the old offices have been renovated by Operations staff. All of the work was done in addition to our regular work.

TCEQ EXIT INTERVIEW FORM: Potential Violations and/or Records Request

Regulated Entity/Site Name	Crystal Clear SUD				**TCEQ Add. ID No.** **RN No (optional)**	0940015	
Investigation Type	CCI	**Contact Made In-House (Y/N)**	Y	**Purpose of Investigation**	Routine		
Regulated Entity Contact	Suzanne Silva			**Telephone No.**	830-372-1031	**Date Contacted**	
	Operations Manager			**FAX #/Email address**	suzie@crystalclearsud.org	**FAX/Email date**	

NOTICE: The information provided in this form is intended to provide clarity to issues that have arisen during the investigation process between the TCEQ and the regulated entity named above and *does not represent final TCEQ findings related to violations*. Any potential or alleged violations discovered after the date on this form will be communicated to the regulated entity representative prior to the issuance of a notice of violation or enforcement. Conclusions drawn from this investigation, including additional violations or potential violations discovered (if any) during the course of this investigation, will be documented in a final investigation report.

Issue		**For Records Request, identify the necessary records, the company contact and date due to the agency. For Alleged and Potential Violation issues, include the rule in question with the clearly described potential problem. Other type of issues: fully describe.**	
No.	**Type[1]**	**Rule Citation (if known)**	**Description of Issue**
1	AV	30 TAC 290.41(K)	Failure to seal the well head and provide a casing vent.
2	AV	30 TAC 290.41(J)	Failure to provide adequate concrete sealing blocks for all wells. The Hunter and Nelson wells were not equipped with concrete sealing blocks which extended at least three feet from each well's casing.

Note 1: Issue Type Can Be One or More of: AV (Alleged Violation), PV (Potential Violation), O (Other), or RR (Records Request)

Did the TCEQ document the regulated entity named above operating without proper authorization?	☐ **Yes**	XX **No**
Did the investigator advise the regulated entity representative that continued operation is not authorized?	☐ **Yes**	XX **No**

Document Acknowledgment. Signature on this document establishes only that the regulated entity (RE) representative received a copy of this document and associated continuation pages on the date noted. If contact was made by telephone, the document will be sent via FAX or Email to RE; therefore, the RE signature is not required.

Chris Friesenhahn	5/24/2017	Mike Taylor	5/25/17
Investigator Name (Signed & Printed)	**Date**	**Regulated Entity Representative Name (Signed & Printed)**	**Date**

If you have questions about any information on this form, please contact your local TCEQ Regional Office.
Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, call 512/239-3282.

ATTACHMENT F28

City of San Marcos
630 E. Hopkins
San Marcos, TX 78666

Attachment F28 - CoSM Licensed Water Operators

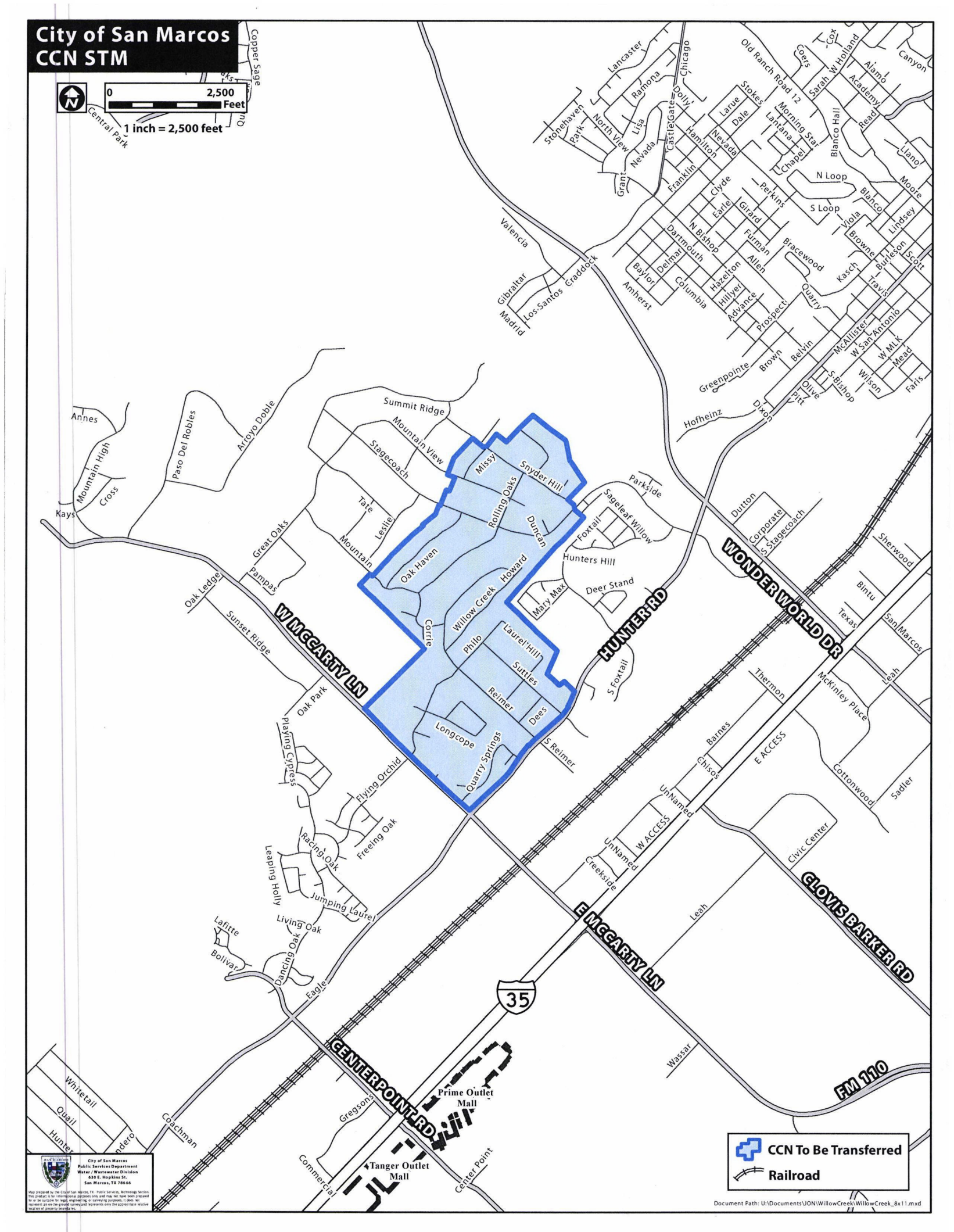
Name	Class of License	License Number
ANDERSON, JOHN	D-WATER	WO0043653
BARRERA, ALEJANDRO	D-WATER	WO0040853
BENAVIDES, PABLO	C-DISTRIBUTION	WD0014618
BLAND, PAUL	C-DISTRIBUTION	WD0012917
BISSETT, ROBERT	B-DISTRIBUTION	WD0012359
	C-GROUND WATER	WG0015867
BOWERS, ROBERT	C-DISTRIBUTION	WD0014336
BRICENO, CARLOS	C-DISTRIBUTION	WD0009549
CARSON, JOHNNY	C-DISTRIBUTION	WD0010343
	C-GROUND WATER	WG0014601
CLARK, BRANDON	C-DISTRIBUTION	WD0013622
CRAYTON, AARON	D-WATER	WO0040941
DELL, DAVID	C-DISTRIBUTION	WD0003327
FLORES, RUBEN	C-DISTRIBUTION	WD0002723
GARCIA, JESUS	C-DISTRIBUTION	WD0013623
GERDES, RICK	C-SURFACE WATER	WS0011585
	C-GROUND WATER	WG0015373
GUARDIOLA, SERGIO	C-DISTRIBUTION	WD0003522
	C-GROUND WATER	WG0008776
HANER, RICHARD	C-DISTRIBUTION	WD0006462
	C-SURFACE WATER	WS0010103
	C-GROUND WATER	WG0013452
HARRIS, LUTHER	C-DISTRIBUTION	WD0011103
HERNANDEZ, RICARDO	C-DISTRIBUTION	WD0006345
HIGGINBOTHAM, JACOB	C-DISTRIBUTION	WD0014858
JENKE, TYLER	C-DISTRIBUTION	WD0012819
JUAREZ, LLOYD	C-DISTRIBUTION	WD0005117
	C-GROUND WATER	WG0008777
KIRBY, CHRIS	C-DISTRIBUTION	WD0014340
KLAPUCH, ZACH	C-DISTRIBUTION	WD0009331
KUPPER, DOUG	C-DISTRIBUTION	WD0008737
	C-GROUND WATER	WG0015117
	C-SURFACE WATER	WS0013505
LEIJA, MATTHEW	D-WATER	WO0040206
LOWRY, BRYAN	C-GROUND WATER	WG0015391
	C-SURFACE WATER	WS0012404
LUCIO, JOSE	B-GROUND WATER	WG0015557
	C-SURFACE WATER	WS0008377
MARTINEZ, ERIC	C-GROUND WATER	WG0014749
McBETH, TAYLOR	D-WATER	WO0043920
McCASLIN, HARRELL	C-DISTRIBUTION	WD0014815
MONTOYA, DANIEL	C-DISTRIBUTION	WD0015190
MUNOZ, PATRICK	D-WATER	WO0042100
MURPHREE, ROGER	C-DISTRIBUTION	WD0014200
	B-GROUND WATER	WG0017107

Attachment F28 - CoSM Licensed Water Operators

Name	Class of License	License Number
NOEL, BRUCE	C-SURFACE WATER	WS0010106
	C-GROUNDWATER	WG0013568
O'DONNELL, PATRICK	B-DISTRIBUTION	WD0004606
	C-GROUND WATER	WG0008778
PATIN, ANTHONY	C-DISTRIBUTION	WD0009954
PEREZ, CHRIS	C-DISTRIBUTION	WD0012142
PETTY, KYLE	C-DISTRIBUTION	WD0014330
QUINTANILLA, JOHNNY	C-DISTRIBUTION	WD0014357
REYNA, VICTOR	C-DISTRIBUTION	WD0007213
RIGGINS, RON	C-DISTRIBUTION	WD0012101
	C-GROUND WATER	WG0015541
	C-SURFACE WATER	WS0012946
SALDANA, ERNEST	D-WATER	WO0043116
SALINAS, JUAN (TONY)	B-DISTRIBUTION	WD0002520
	C-GROUND WATER	WG0008466
SLOAN, CORY	C-DISTRIBUTION	WD0013776
SPECTOR, ERIC	C-DISTRIBUTION	WD0014462
STEPHENS, RICK	A-WATER	WO0040351
TAGGART, THOMAS	A-WATER	WO0003751
VALDEZ, JASON	C-DISTRIBUTION	WD0014359
	C-GROUND WATER	WG0016826
VOLK, MICHAEL	C-SURFACE WATER	WS0001948
WARREN, DEREK	C-DISTRIBUTION	WD0013839
WEST, TYLER	C-DISTRIBUTION	WD0013626

COSM WATER CCN STM

8 X 11 MAP


City of San Marcos
CCN STM
0
2,500
Feet
1 inch = 2,500 feet
W MCGARTY LN
E MCGARTY LN
HUNTER RD
WONDER WORLD DR
GLOVIS BARKER RD
FM 110
CENTERPOINT RD
35
Prime Outlet Mall
Tanger Outlet Mall
Summit Ridge
Mountain View
Stagecoach
Missy
Snyder Hill
Rolling Oaks
Duncan
Oak Haven
Howard
Willow Creek
Corrie
Philo
Laurel Hill
Suttles
Reimer
Dees
Longcope
Quarry Springs
S Reimer
Foxtail
Sageleaf Willow
Hunters Hill
Mary Max
Deer Stand
S Foxtail
Parkside
Dutton
Corporate
S Stagecoach
Sherwood
Bintu
Texas
San Marcos
Leah
McKinley Place
Thermon
Barnes
Chisos
E ACCESS
Cottonwood
Sadler
UnNamed
W ACCESS
Creekside
Civic Center
Wassar
Oak Ledge
Sunset Ridge
Oak Park
Playing Cypress
Flying Orchid
Freeing Oak
Racing Oak
Leaping Holly
Jumping Laurel
Living Oak
Dancing Oak
Eagle
Lafitte
Bolivar
Whitetail
Quail
Hunter
Coachman
Gregsons
Commercial
Center Point
Annes
Mountain High
Cross
Kays
Paso Del Robles
Arroyo Doble
Great Oaks
Pampas
Tare
Leslie
Mountain
Valencia
Gibraltar
Madrid
Los Santos
Graddock
Old Ranch Road 12
Lancaster
Ramona
Chicago
Dolly
Castle Gate
Stonehaven Park
North View
Lisa
Nevada
Grant
Franklin
Hamilton
Larue
Dale
Stokes
Morning Star
Lantana
Chapel
Blanco Hall
Coers
Cox
W Holland
Sarah
Alamo
Academy
Canyon
Read
Llano
N Loop
S Loop
Moore
Blanco
Lindsey
Viola
Browne
Burleson
Scott
Travis
Kasch
Bracewood
Quarry
Prospect
Advance
Hillyer
Hazelton
Columbia
Amherst
Baylor
Delmar
Dartmouth
N Bishop
Earle
Girard
Furman
Allen
Perkins
Clyde
Hofheinz
Dixon
Pitt
Olive
S Bishop
Wilson
Mead
Faris
W MLK
W San Antonio
McAllister
Belvin
Brown
Greenpointe
Hofheinz
CCN To Be Transferred
Railroad
City of San Marcos
Public Services Department
Water / Wastewater Division
630 E. Hopkins St.
San Marcos, TX 78666
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