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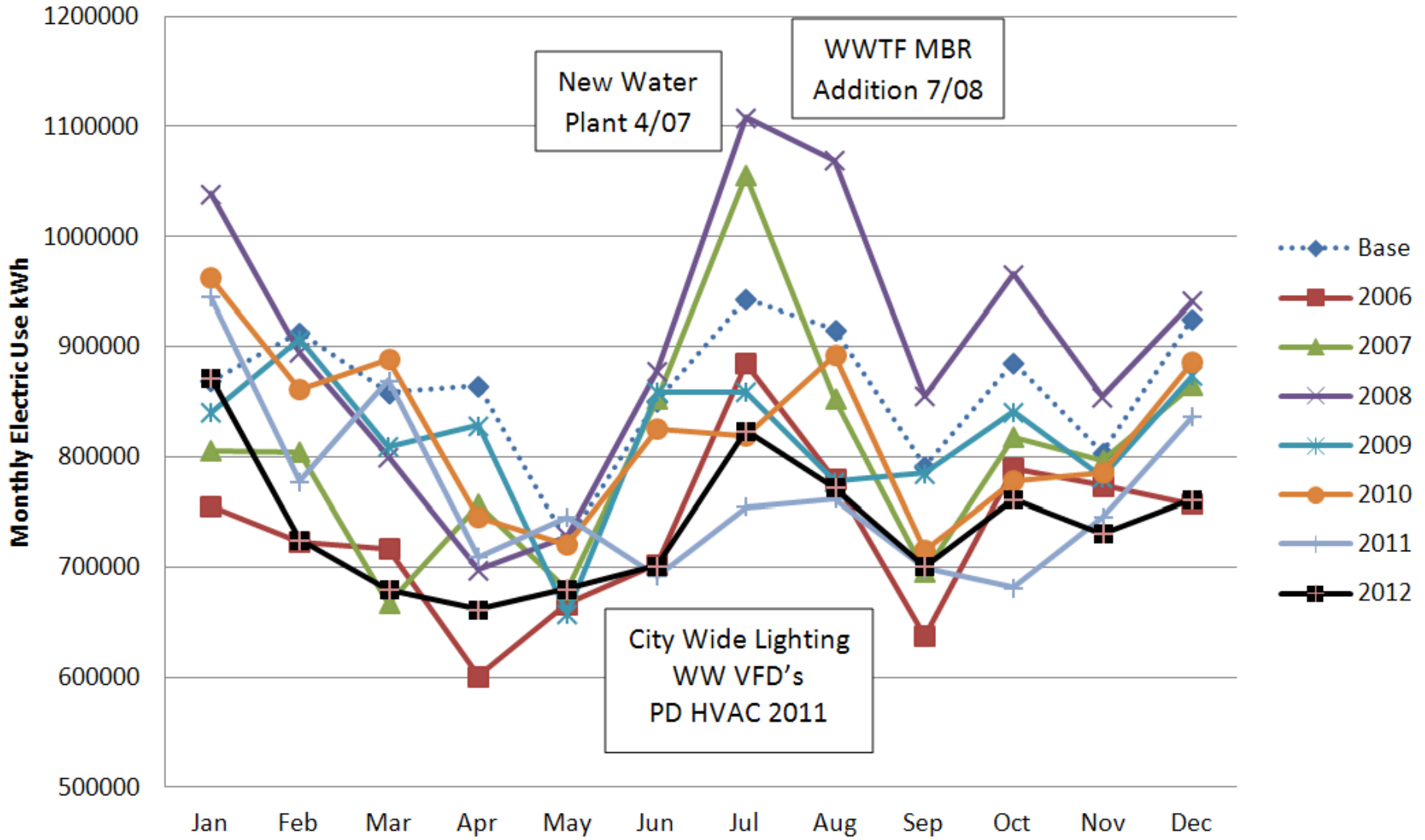
P185 August

	Wastewater Energy Usage 2012												Wastewater Energy Usage 2012											
	January		February		March		April		May		June		July		August		September		October		November			
Location	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing		
Wastewater Plant	334000	2983.70	279400	24725.91	272300	23134.51	295500	24856.35	285000	23968.50	290500	24607.85	257600	22855.02	298700	25061.83	245000	20702.50	274000	22881.80	250600	218		
HATS Lift Station	38.63	231.75	39.93	231.75	39.80	247.93	2010	238.14	2790	316.62	3450	578.27	2170	257.61	2540	295.91	2350	257.20	2660	274.04	2400	2		
Ontario and 4th Lift Station	362000	3148.91						2997.28	32400	3161.88	36000	4189.20	32200	2889.13	34000	2977.32	26800	2317.16	29700	2626.89	26900	23		
Bluff St NE Lift Station	73	16.79	60	16.70	57	16.19	63	15.74	57	15.19	42	13.83	39	13.69	47	14.29	51	14.65	62	15.65	63			
Hwy 15 N Lift Station	332	40.86	293	37.80	251	32.87	290	36.42	251	32.87	205	28.68	177	26.75	221	30.19	222	30.22	243	32.14	270			
Shady Ridge Rd Lift Station	239	32.21	179	26.99	190	27.31	197	27.95	259	33.59	267	34.32	203	29.21	201	28.37	168	25.30	192	27.49	191			
Campbell Lane Lift Station	75	16.37	60	15.70	63	15.74	72	16.56	79	17.20	63	15.74	70	16.63	74	16.76	64	15.83	74	16.74	67			
Stoney Point Lift Station	4455	410.34	3635	345.73	4618	416.04	1160	115.68	1579	153.85	1487	145.47	1119	115.90	990	100.47	823	84.98	983	99.55	991			
West Elementary Lift Station	188	27.48	161	25.28	151	23.76	175	25.84	196	27.86	132	22.03	111	20.50	110	20.05	129	21.75	172	25.67	160			
Hwy 7 W Lift Station	131	22.17	109	20.34	116	20.57	120	20.93	106	19.66	67	16.10	53	15.02	72	16.58	76	16.92	117	20.68	114			
5th Ave SE Lift Station	121	21.24	102	19.68	95	18.65	86	17.83	78	17.11	52	14.74	46	14.35	48	14.38	52	14.74	90	19.20	102			
South Grade Rd Lift Station	504	56.84	378	45.87	407	47.08	481	53.82	541	59.29	388	45.35	344	42.56	386	45.27	1390	136.63	509	56.37	466			
750H Harmony Ln SW Lift Station	299	37.79	246	33.34	248	32.59	279	35.42	385	45.07	422	48.44	213	30.15	232	31.20	219	29.95	280	35.51	263			
151H Darrel Dr SW McDonalds Trailers	586	64.46							874	89.62	761	79.33	573	64.23	527	58.16	418	48.08	481	53.82	458			
Parks Whse. 4th Ave SE	85	17.34							30	12.73	20	12.73	29	12.64	131	22.39	119	20.87	64	15.83	129	21.75	104	
Electric Monthly Total:	377326.63	32629.41	317409.63	28530.94	313553.33	27080.23	335479.33	28536.91	324625.28	28016.04	333869.25	29851.99	295043.14	26413.14	338267.19	28731.65	277826.26	23731.74	309692.28	26206.28	283439.24	245		
Gas Usage (ft³)																								
	January		February		March		April		May		June		July		August		September		October		November			
Location	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing		
Wastewater Plant	805384	7375.89	686935	6300.37	426392	3934.64	259553	2419.74	94313	924.81	880	70.99	660	68.99	15507	203.80	70497	703.11	239976	2241.98	398458	36		
1255 Adams St SE (MBR)	208522	1924.88	108770	1019.13	95023	894.31	1019	176.30	15947	174.30	21556	227.23	0	31.50	220	33.50	16937	185.29	80725	764.48	185866	1		
Parks Whse. 4th Ave SE	34300	342.34	25800	265.76	18600	200.39	9700	119.58	6600	91.43	1400	44.21	700	37.86	800	38.76	2500	54.20	1600	160.00	46.03	10700	1	
Gas Monthly Total:	1048206	9643.71	821505	7585.26	540015	5029.34	285200	2715.62	117240	1190.54	342.43	16527	138.35	16527	276.06	89934	942.20	322301	3052.49	595024	55			
Monthly Utility Total:		42173.12		36116.20		32109.57		31252.53		29206.58		30194.42		26551.49		29007.71		24674.34		29258.77		304		
Water Energy Usage 2012																								
	January		February		March		April		May		June		July		August		September		October		November			
Location	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing		
South Park Well Shelter	1942	200.51	1619	173.61	1529	159.29	1772	181.43	1540	160.29	1207	129.96	1230	136.40	1103	120.80	681	82.04	933	105.00	1200	1		
WTP 439 Prospect St NE	157900	14605.35	116700	11135.92	159000	14268.30	160800	14392.96	183300	16257.21	144600	13165.02	238900	21734.64	215100	19383.10	231000	20048.70	160300	14592.11	143600	133		
Century Ave Water Tower	1220	123.40	1144	118.54	1178	117.32	1078	108.21	988	100.01	677	71.67	666	73.03	631	67.66	576	62.47	580	62.84	472			
Golf Course Rd Water Tower	1597	158.44	1234	127.08	1596	155.40	1231	122.14	1324	130.82	974	98.73	1045	108.90	1087	109.33	899	91.90	1099	110.12	1207	1		
Electric Monthly Total:	162659	15087.70	120697	11555.15	163303	14700.31	164881	14794.74	187152	16648.13	147458	13465.38	241841	22052.97	217921	19660.89	233156	20285.11	162912	14870.07	146479	136		
Gas Usage (ft³)																								
	January		February		March		April		May		June		July		August		September		October		November			
Location	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing		
South Park Water Tower	100	32.41	100	32.41	0	31.50	0	31.50	0	31.50	0	31.50	0	31.50	0	31.50	0	0.00	0	0.00	0	0		
WTP Storage Building 5th Ave NE	8400	107.77	5400	80.53	4900	75.99	700	37.86	700	37.86	500	36.04	600	36.95	600	36.95	500	36.04	700	37.86	2800			
WTP 439 Prospect St NE	191695	1772.09	156172	1449.54	176188	1631.29	143524	1334.70	79296	751.51	11438	135.36	1870	44.48	1540	155.43	3299	61.45	75776	719.55	179487	16		
Gas Monthly Total:	200195	1912.27	161672	1562.48	181088	1738.78	144224	1404.06	79996	820.87	11938	202.90	2470	116.93	2140	113.93	3799	97.49	76476	751.51	182287	16		
Monthly Utility Total:		16999.97		13117.63		16439.09		16198.80		17469.00		13868.28		22189.90		19774.82		20382.60		15627.48		153		
Public Works Energy Usage 2012																								
	January		February		March		April		May		June		July		August		September		October		November			
Location	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing	Usage	Billing		
HATS	37590	3793.92	34150	3533.95	31650	3160.61	31370	3235.97	30050	3102.69	29480	2946.68	40850	3875.26	46770	4168.05	37420	3441.85	39540	3544.10	40210	36		
Christmas Lights	847	47.73	13	0.76	12	0.66	11	0.60	11	0.60	6	0.32	8	0.46	9	0.49	10	0.54	15	0.82	1634			
Holding Vault/Cemetery	1502	149.61	1310	134.29	1101	110.30	865	88.80	592	63.93	387	45.26	800	85.71	693	73.32	537	58.92	883	90.44	460			
Airport HUC	16790	1417.93	12820	1200.29	11560	1046.97	11350	1025.50	9990	913.26	9920	842.10	11300	1061.81	11280	1047.50	9190	860.30	10560	955.27	10800	10		
1678 Butler Field Dr SW	111	20.32	85	18.06	83	17.56	80	17.83	80	17.29	60	15.47	68	16.43	52	14.75	35	13.19	44	14.01	43			
Airport MCCoop #583 #5	1001	144.30	663	90.51	392	69.51	29	24.93	11	22.70	58	28.90	6	22.18	49	28.02	3	21.73	62	37.09	365			
Airport MCCoop 229 #6	701	107.46	541	100.09	675	104.27	561	90.27	593	92.67	513	87.87	543	94.03	650	109.54	513	86.01	609	105.03	529			
Airport MCCoop 521 #16	1513	207.17	1362	188.62	1045	149.70	446	76.15	409	70.20	398	72.97	450	81.60	386	73.72	325	62.33	571	100.30	392	1		
1404 Adams St Se Storage	698	74.88	569	63.99	548	59.92	538	59.01	529	58.19	399	46.35	427	50.41	481	53.95	455	51.45	578	62.66	570			
484 Water St NW HATS	1394	139.57	1241	127.75	1253	124.15	823	84.98	523	31.77	97	18.84	398	47.67	267									

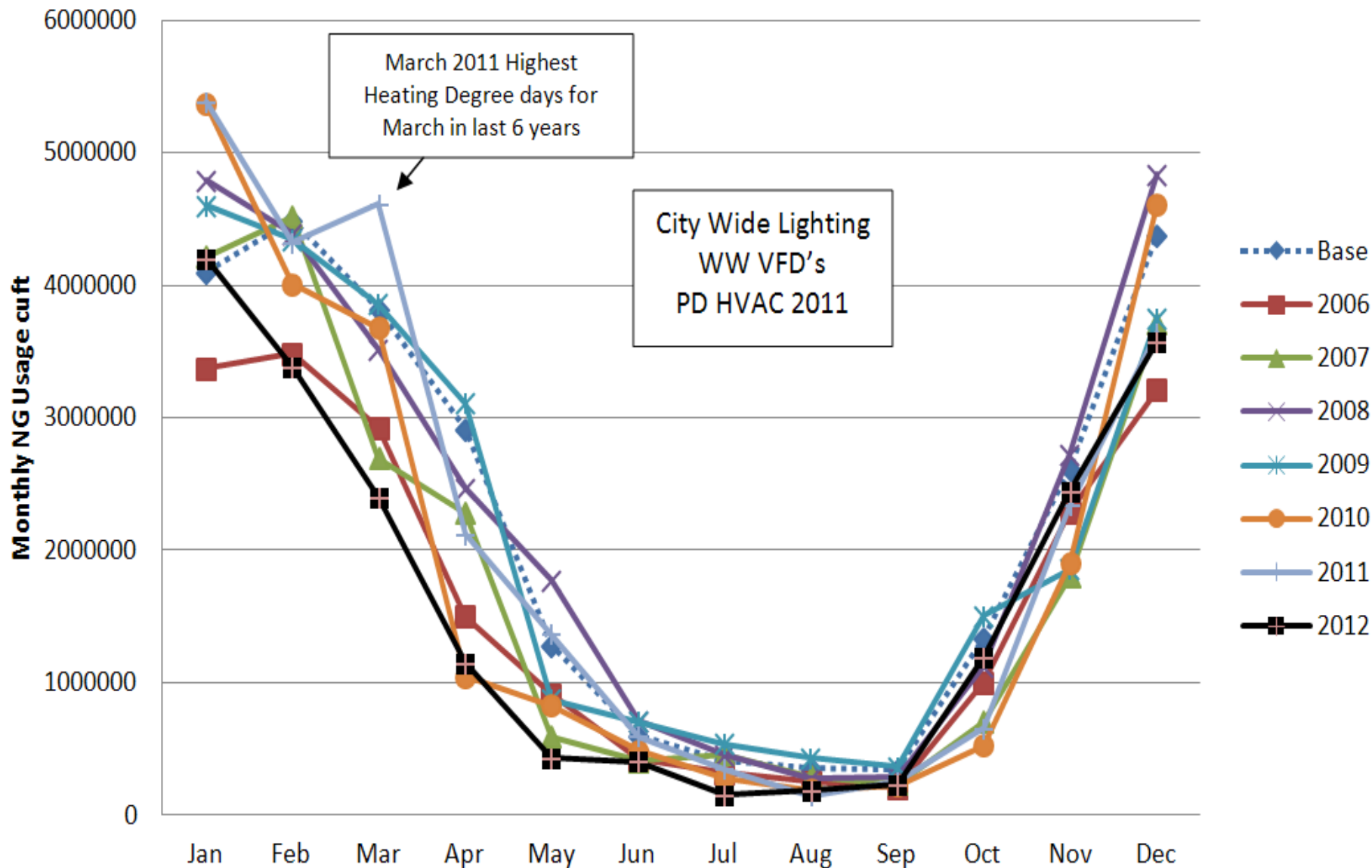
	A	B	C	D	E	F	G
1	Energy Usage			Comparisons			
2	Wastewater	Baseline	2012	Baseline-2012	%City	Dept-City	
3	Electric Usage(kWh)	4904259	3803934	-22.44%	42.88%	-10.12%	
4	Gas Usage(ft ³)	6264079	4793101	-23.48%	24.25%	-5.75%	
5							
6	Water	Baseline	2012	Baseline-2012	%City	Dept-City	
7	Electric Usage(kWh)	2599339	2110395	-18.81%	23.79%	-4.50%	
8	Gas Usage(ft ³)	2267509	1289432	-43.13%	6.52%	-3.82%	
9							
10	Public Works	Baseline	2012	Baseline-2012	%City	Dept-City	
11	Electric Usage(kWh)	693109	629044	-9.24%	7.09%	-0.59%	
12	Gas Usage(ft ³)	3436790	2838340	-17.41%	14.36%	-2.34%	
13							
14	Emergency Services	Baseline06	2012	Baseline-2012	%City	Dept-City	
15	Electric Usage(kWh)	291510	218841	-24.93%	2.47%	-0.67%	
16	Gas Usage(ft ³)	1588900	905500	-43.01%	4.58%	-2.67%	
17							
18	Parks	Baseline06	2012	Baseline-2012	%City	Dept-City	
19	Electric Usage(kWh)	1291361	1239546	-4.01%	13.97%	-0.48%	
20	Gas Usage(ft ³)	6237224	5906512	-5.30%	29.88%	-1.29%	
21							
22	Building	Baseline06	2012	Baseline-2012	%City	Dept-City	
23	Electric Usage(kWh)	526883	391715	-25.65%	4.42%	-1.24%	
24	Gas Usage(ft ³)	1992234	1358311	-31.82%	6.87%	-2.48%	
25							
26	Compost	Baseline06	2012	Baseline-2012	%City	Dept-City	
27	Electric Usage(kWh)	252890	220330	-12.88%	2.48%	-0.30%	
28	Gas Usage(ft ³)	3164564	2167045	-31.52%	10.96%	-3.90%	
29							
30	Liquor Hutch	Baseline	2012	Baseline-2012	%City	Dept-City	
31	Electric Usage(kWh)	317371	257349	-18.91%	2.90%	-0.55%	
32	Gas Usage(ft ³)	647120	506235	-21.77%	2.56%	-0.55%	
33							
34	Total Dept. Usage	Baseline	2012	Baseline-2012			
35	Electric Usage(kWh)	10876722	8871155	-18.44%			
36	Gas Usage(ft ³)	25598420	19764476	-22.79%			
37	Example: -5.90% is a reduction in 2007 from 2006						

Real Results
are easy to
see over time!

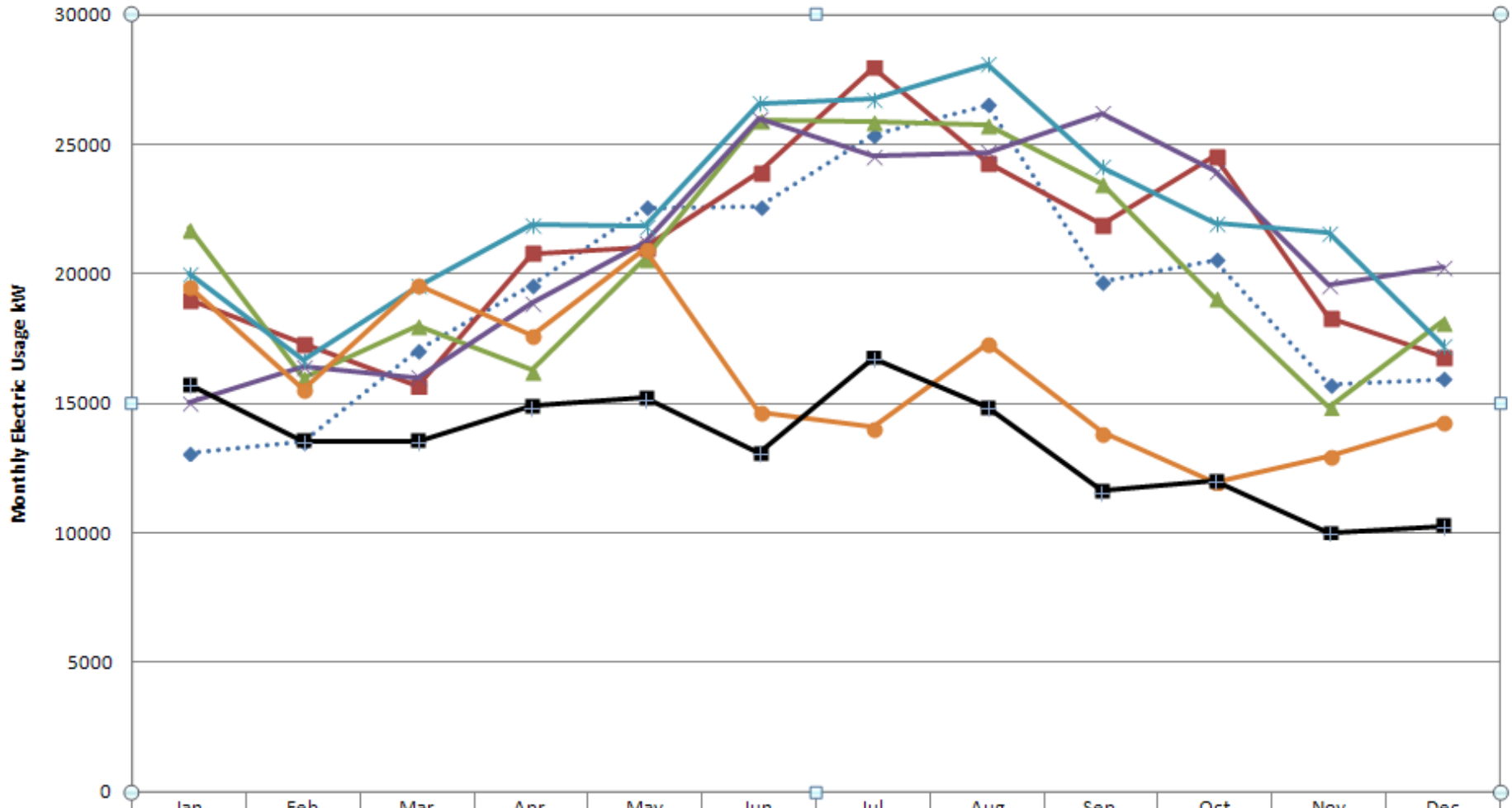
City Wide Electric Use



City Wide NG Usage

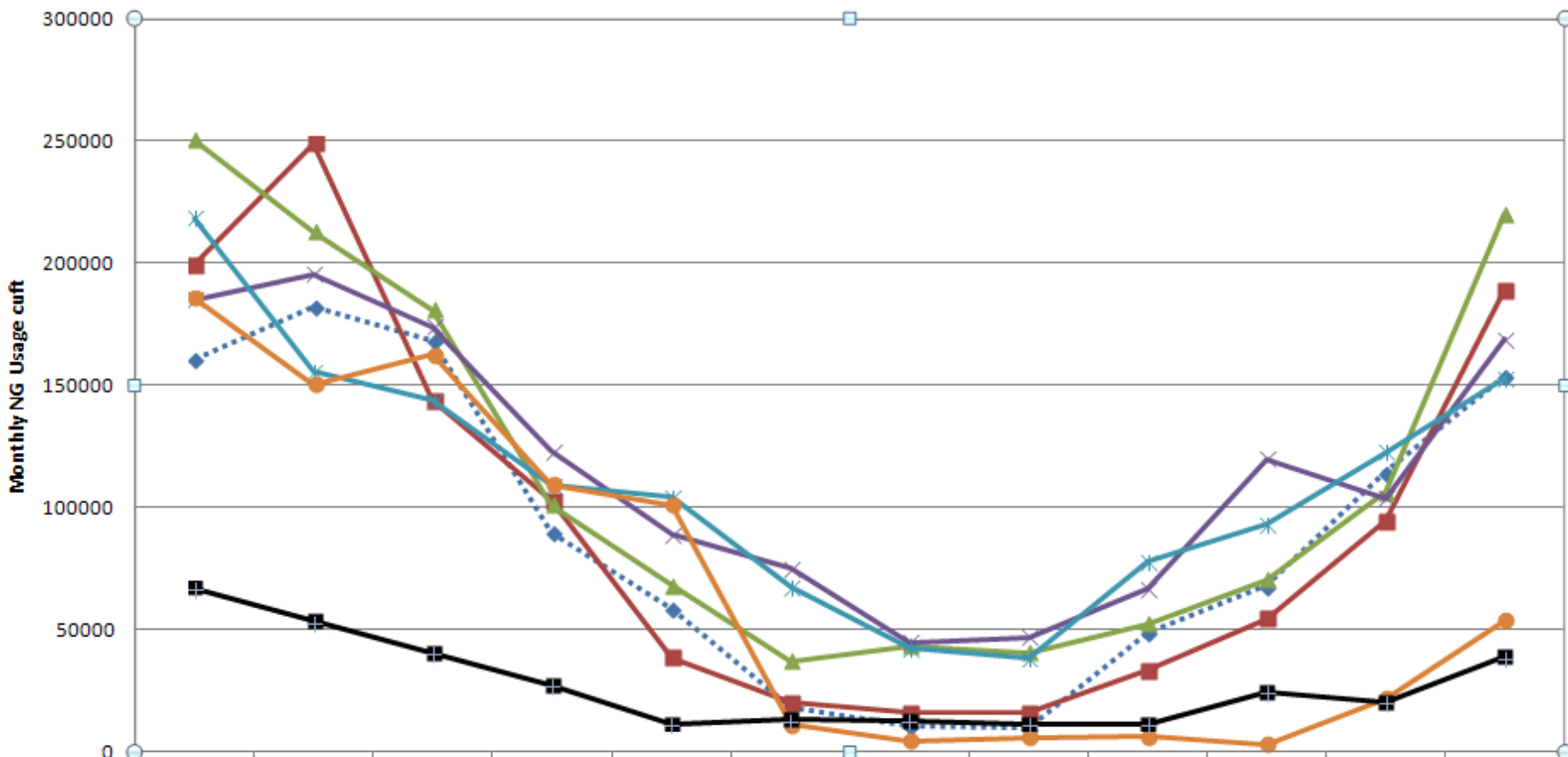


PD Electric Usage



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
◆ Base	13060	13500	17050	19550	22540	22600	25360	26510	19690	20550	15730	15940
■ 2007	18980	17320	15660	20800	21030	23930	27980	24320	21890	24540	18290	16790
▲ 2008	21760	16000	18030	16280	20590	25930	25900	25770	23510	19070	14870	18160
× 2009	15010	16400	16010	18890	21190	25980	24550	24710	26220	23980	19590	20260
* 2010	20000	16650	19530	21910	21850	26580	26760	28100	24130	21950	21570	17230
● 2011	19540	15530	19590	17620	20950	14660	14070	17300	13880	11970	12970	14290
■ 2012	15740	13550	13550	14890	15200	13080	16760	14860	11620	12030	10010	10270

PD NG Usage



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
◆ Base	160500	181900	168100	89900	58400	18200	10700	9400	48800	67800	114400	153800
■ 2007	199600	249200	143800	102900	38500	20200	15900	15700	33400	54500	94200	189200
▲ 2008	250400	213100	180900	101000	68000	37100	43300	40400	52200	70300	106200	220200
× 2009	185200	195600	174100	122800	88900	74900	44700	46700	66700	119700	103800	168900
* 2010	218500	155700	143700	108800	104100	67300	42400	37900	77500	92900	122600	153000
● 2011	185800	150500	162800	109300	101000	10800	4300	5700	6100	2900	21700	53700
■ 2012	67000	53400	40400	27100	11300	12900	12700	11300	11100	24300	20300	38800

VFD's on Scour Blower



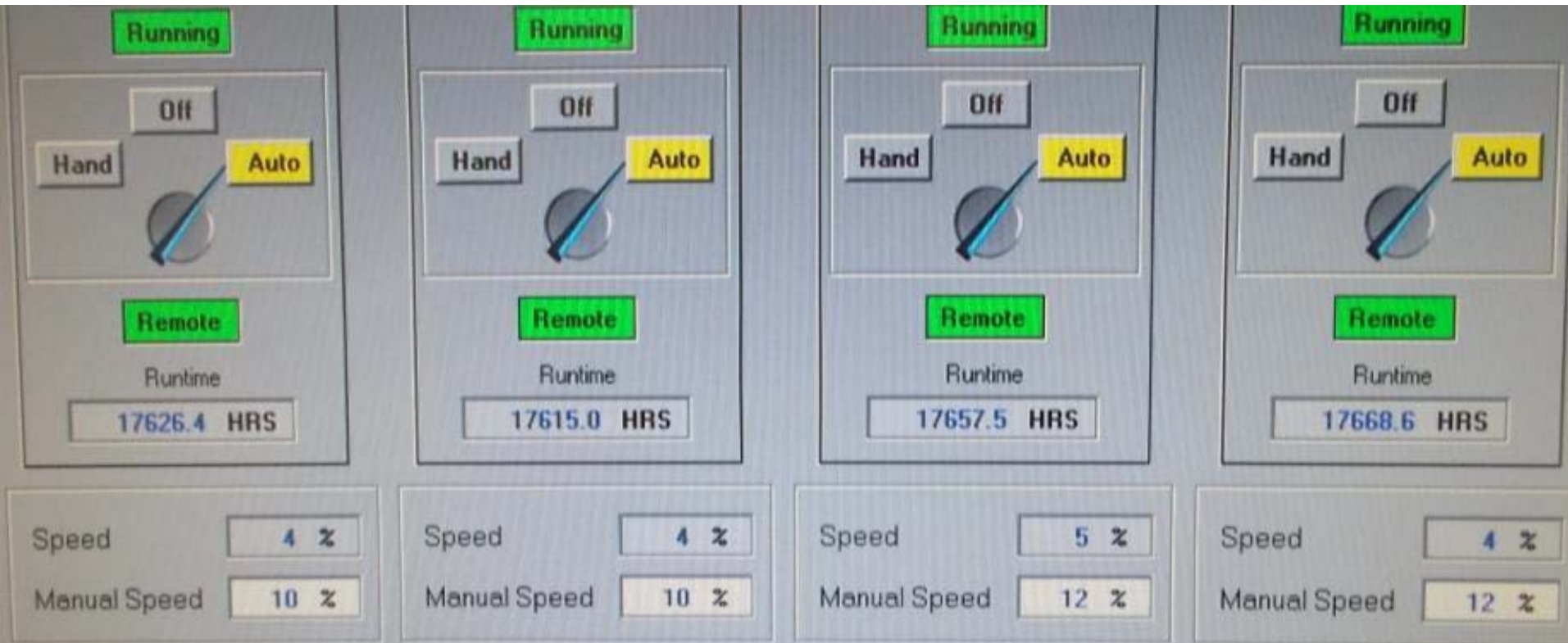
Experimental Aerators

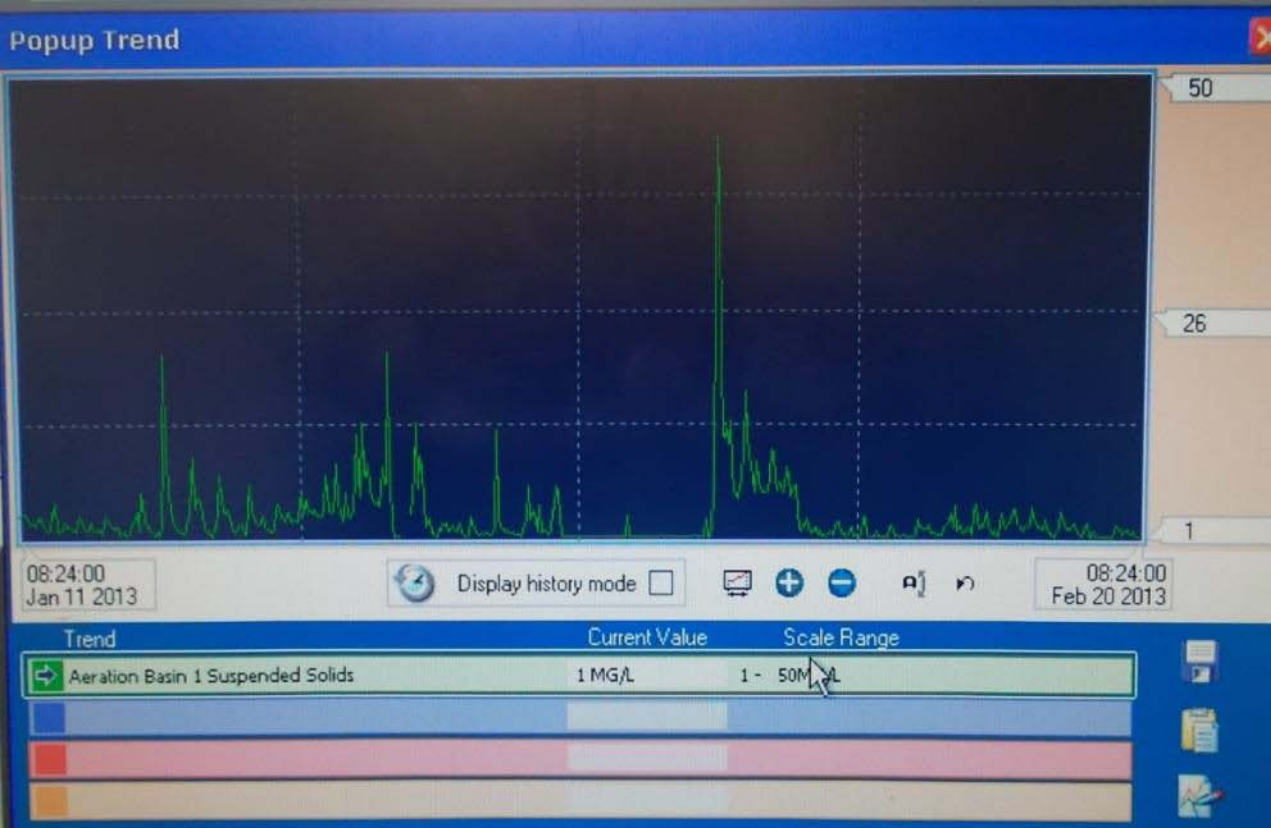


WWTP Overview



Ferric Chloride Pumps





Phospax Analyzer

Speed	4 %	Speed	4 %
Manual Speed	10 %	Manual Speed	10 %
Aluminate to Flow Ratio		Aluminate to Phosphate Ratio	
MBR Inf.	7 %	MBR Inf.	120.0 %
FM Sum	9 %	FM Sum	120.0 %

RW Flow	1.58 MGD	
RWW Flow	0.71 MGD	
Aluminate Sump	Normal	
Phosphate	1.65	

MN Tap Intern



Aerator efficiency?

Q_{IR} / Q_{int} ?

Nitrogen gas

$$w = 67 \text{ ft}$$
$$L = 317 \text{ ft}$$

