



American Water Works
Association

Dedicated to the World's Most Important Resource™

Starting With the End In Mind The Sequel

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2015 National Water System
Optimization Conference
October 28-30, 2015

Outline

- The Opportunity
- The Challenge
- What Worked
- What Didn't Work
- Plant Performance Summary
- Path Forward



The Opportunity

- *What does it mean to start from the design phase and build an advanced treatment plant intended to be bulletproof but staying within budget.*



The Challenge

- *To design a plant that produces water that exceeds all Federal, State regulatory and Partnership for Safe Water goals from the first drop*
- *To use PSW guidelines and the Self Assessment approach on Advanced Treatment Processes*
- *To create a culture where excellence in treatment is the only option*



In the Design

- Incorporate BMP's from the Self Assessment Guide
- Filter design
- Instrumentation
- Unit Process to "Waste" capabilities
- Flexibility of flow streams



During Construction

- Partnering
- Plant is always #1
- Control system/PCN's-tied to operational goals
- Articulate and explain vision so clearly people see it



Start UP



What Worked

- Champions for Each Unit Process
- Establishing goals and reiterating them from day 1
- Partnering/Charter
- Self Assessment Approach
- Worst Filter Run
- Empowerment Of Operators



What Didn't Work

- Micro-managing operations
- Some Operators Didn't fit
- Hurrying
- Algal Management
- Too much OT
- Fire Drills/Shifting Priorities



Day to Day Operations



What Worked

- Internal Training Program
- Data Invalidation Protocol
- River Bank Filtration
- Electronic O&M
- Process redundancy and flexibility
- Lots of Process Drains



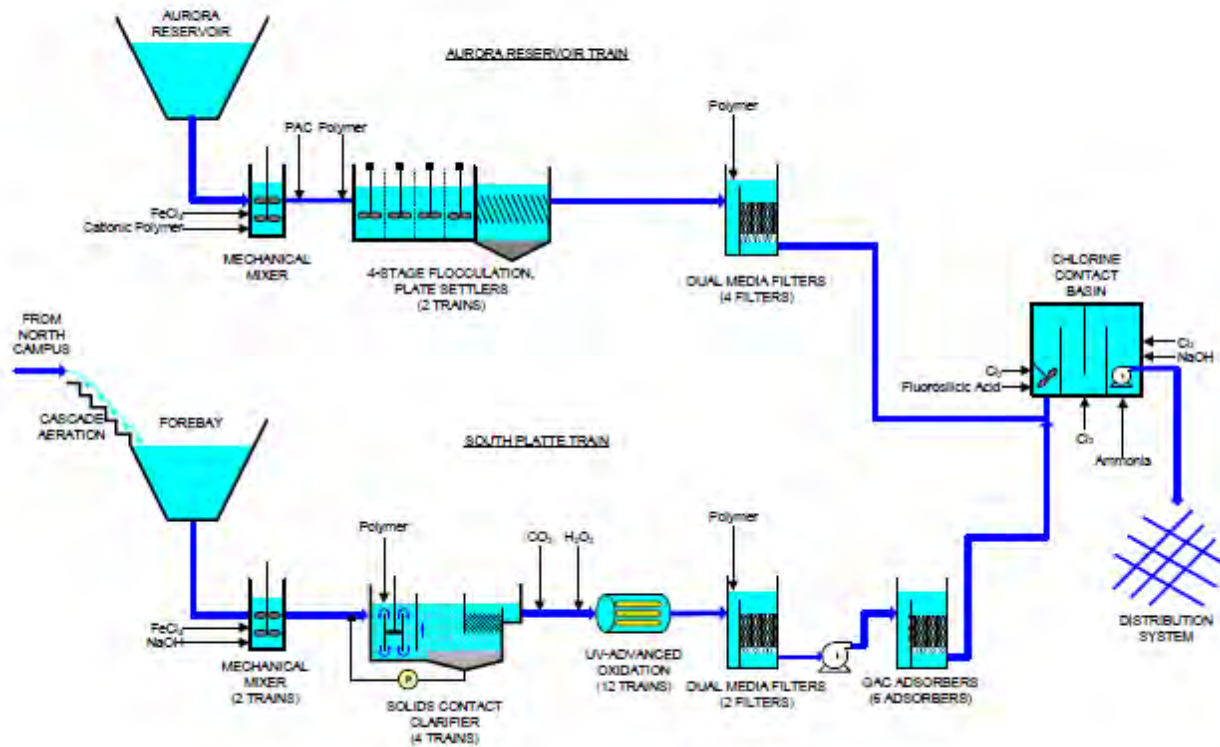
What Didn't Work

- Low Flows
- Initial Softening approach
- Lagoons
- UV internal cleaning system
- Mixers in Softening Process



PFD

BINNEY WATER PURIFICATION FACILITY (TP016)



Plant Performance Summary

	AR SW (combined)*	AR CFE	SP SW (combined)*	SP CFE
2011	0.66	0.04	0.57	0.06
2012	0.29	0.05	0.72	0.04
2013	0.34	0.05	0.58	0.06
2014	0.31	0.05	0.58	0.06
2015**	0.36	0.04	0.70	0.04



12/18/2012 - CEC Sampling of N. Campus and SP Train of BWPF

Analyte	Units	MRL	River	RBF	RWSP -		Softening Eff - WS#2	UV/AOP Eff OW	FESP	Adsorber Eff
					ARR	Forebay				
1,7-Dimethylxanthine	ng/L	10								
4-nonylphenol (semi-quant)	ng/L	100	1400	740						
2,4-D	ug/L	5	33	14						
4-tert-octylphenol	ng/L	50	190	65						
Acesulfame-K	ng/L	20	20000	10000	9400	4600	4100	200	170	
Acetaminophen	ng/L	5								
Amoxicillin	ng/L	20	1600	370						
Atenolol	ng/L	5	620							
Atrazine	ng/L	5	6.4	9.9	12	15	13	6.4		
BPA	ng/L	10	75	26						
Bromacil	ng/L	5	15	10	6.8	7	6			
Caffeine	ng/L	5	250	11						5
Carbamazepine	ng/L	5	200	180	100	120	94	36		
Carisoprodol	ng/L	5	34	56	12	11	11	6.7		
Cotinine	ng/L	10	230							
DACT	ng/L	5		240	270	340	260	250		
DEA	ng/L	5		7.3	11	15	12	11		
DEET	ng/L	10	220	46						
Dehydronifedipine	ng/L	5	47	7.1						
DIA	ng/L	5		38	35	39	28	19		
Diazepam	ng/L	5								
Diclofenac	ng/L	5	56	19						
Dilantin	ng/L	20	99	54						
Diuron	ng/L	5								
Erythromycin	ng/L	10	130	12						
Estrone	ng/L	5	28			9.3	5.4			
Fluoxetine	ng/L	10	78							
Gemfibrozil	ng/L	50	1000	200						
Ibuprofen	ng/L	10	100							
Idohexal	ng/L	10	1200	41						
Iopromide	ng/L	5								
Ketoprofen	ng/L	5	9.7							
Lidocaine	ng/L	5	220	74	9.9	13	9			
Lincomycin	ng/L	10	20							
Lopressor	ng/L	20	340							
Meprobamate	ng/L	5	140	64	18	18	15	11		
Naproxen	ng/L	10	410	19						
Pentoxifylline	ng/L	5	10							
Primidone	ng/L	5	90	60	47	47	40	25	8.2	
Propylparaben	ng/L	5	23	7.9			6.4	6.8		12
Quinoline	ng/L	5	110							
Sucralose	ng/L	10	27000	19000	12000	12000	11000	9700	4900	
Sulfamethazine	ng/L	5								
Sulfamethoxazole	ng/L	5	740	360	41		25			
TCEP	ng/L	10	200	99	31		30	24		
TCPP	ng/L	100	710	210						
TDCPP	ng/L	100	500							
Theobromine	ng/L	10	340	28	17		19	18		
Theophylline	ng/L	20	150							
Triclosan	ng/L	10								
Trimethoprim	ng/L	5	240							



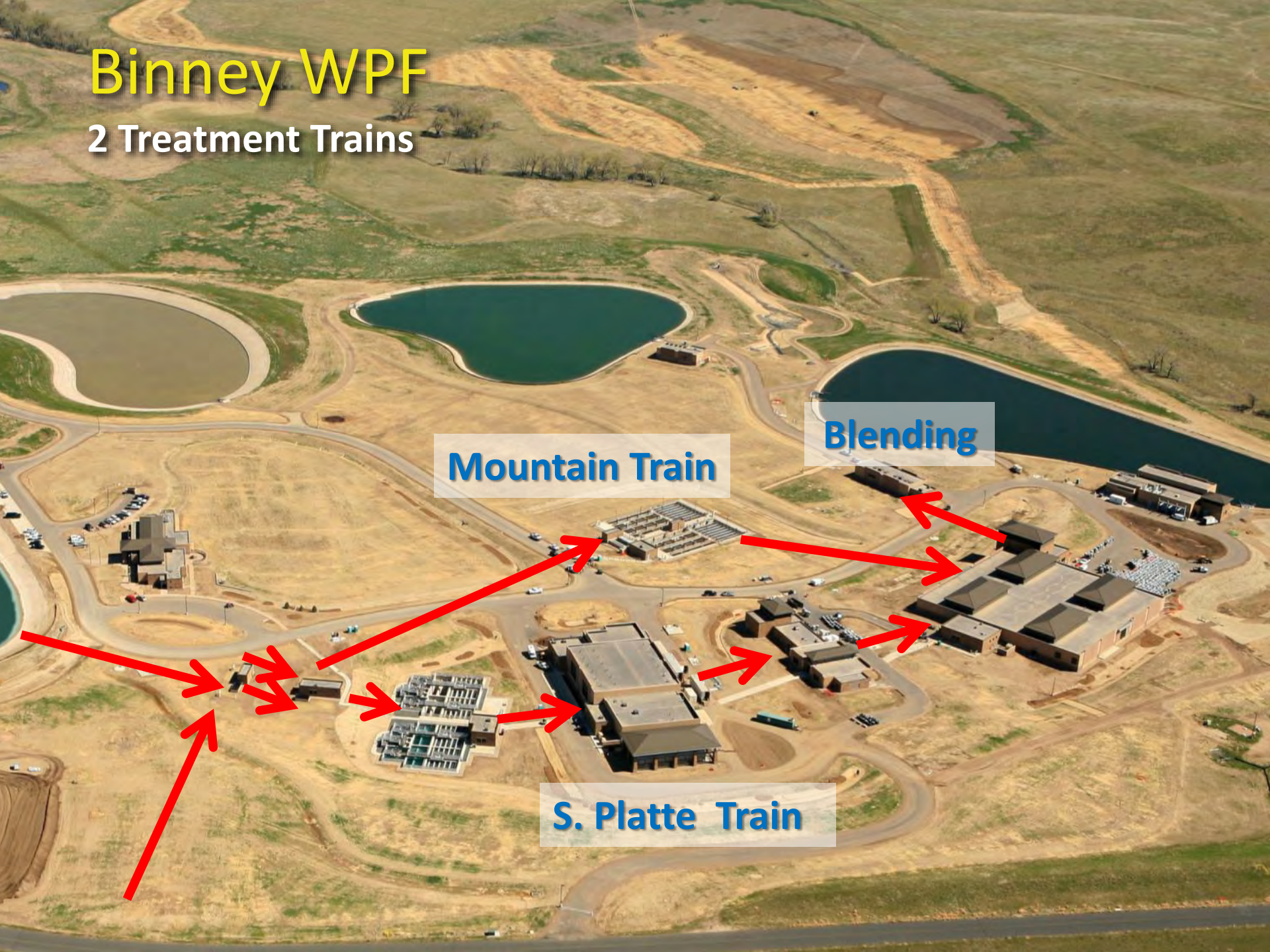
Path Forward

- Received Director's Award 2-2013
- Add 4 more filters
- Convert lagoons to drying beds
- Add Gravity Thickener
- Submitted Phase 4 Application for BWPF
October 8th



Binney WPF

2 Treatment Trains



Mountain Train

Blending

S. Platte Train



Summary

- Unique Opportunity
- Start with the End in Mind
- First Things First
- Empower Operators
- Its all in the details
- Accept Nothing less than Excellence
- Partnership Works for any Treatment Configuration



Questions/Comments

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