Like New! – Renewal and Operation of Auburn's Wells

PNWS 2016

Susan Fenhaus – City of Auburn

Dan Reisinger – Carollo Engineers

CITY OF AUBURN WASHINGTON

carollo Engineers...Working Wonders With Water®

CarolloTemplateWaterWave.pptx

Introductions

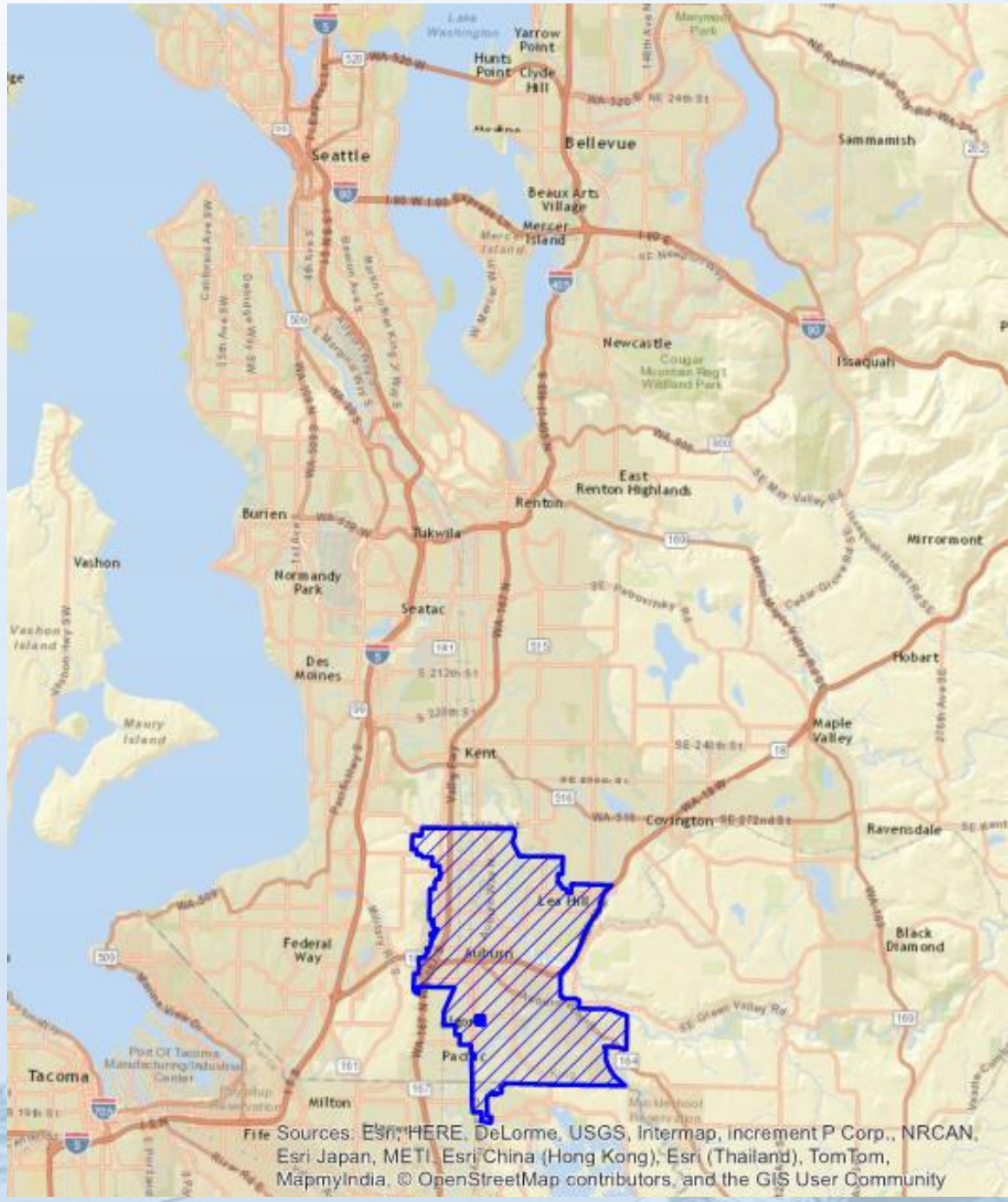
- Susan Fenhaus – Water Utility Engineer, City of Auburn
- Dan Reisinger – Lead Water Resources Engineer, Carollo

Agenda

- Auburn’s Supply Sources
- Supply Renewal Projects
- Water Quality
- Cost-effective Operation
- Questions

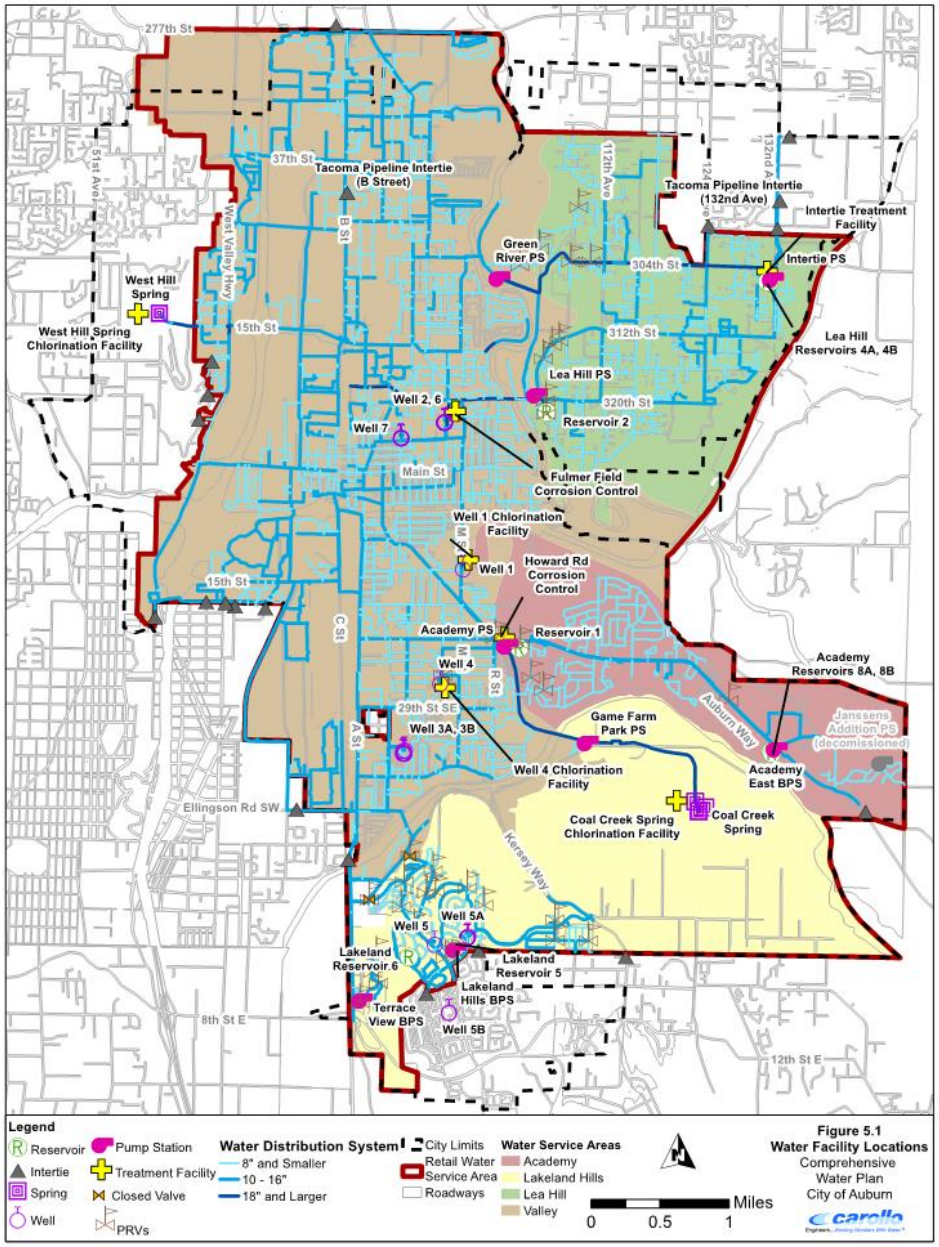
Auburn, WA

- City owned water system (DOH ID 03350V)
- Located in King and Pierce County, WA
- First city supply in 1884
- Serves approximately 56,000 people through 15,000 retail accounts



Auburn's Wells

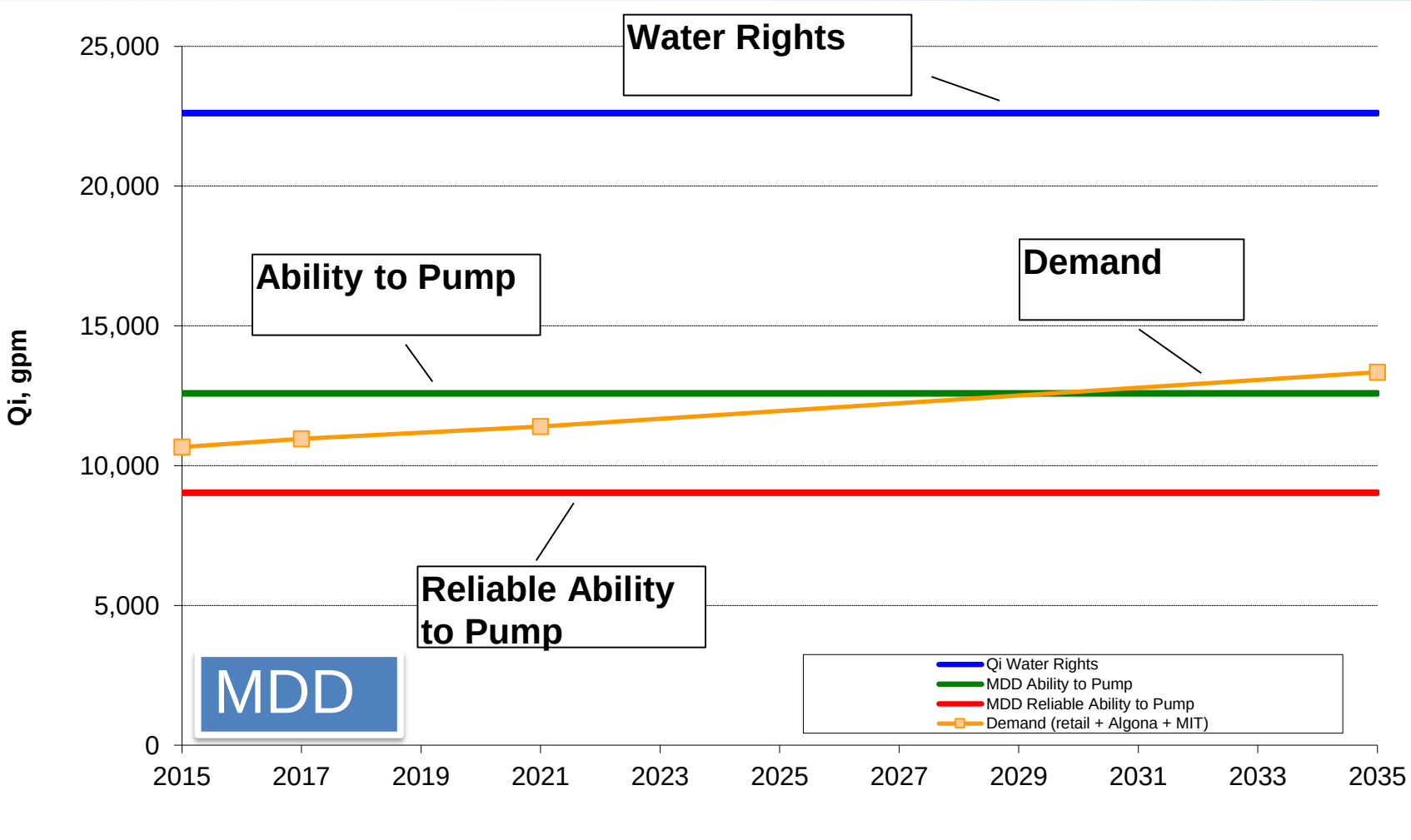
- 10 Wells
- 2 Springs
- 1 Regional Supply



Many supplies are not reliable

Source	Reliable
Coal Creek Springs	★
West Hill Springs	★
Well 1	
Well 2	
Well 3A and 3B	
Well 4	
Well 5, 5A, and 5B	★
Well 6	
Well 7	
RWSS	★

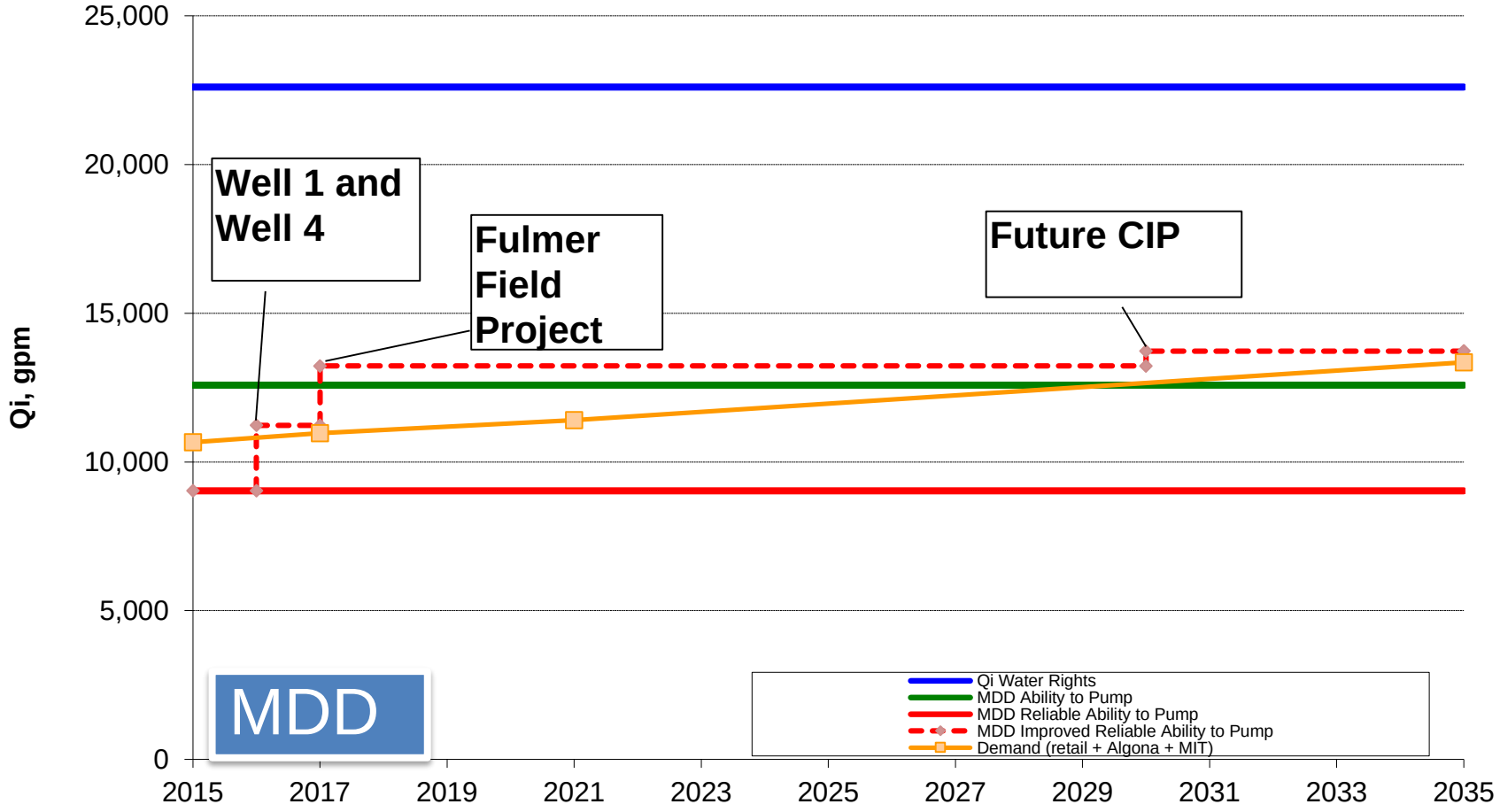
Source reliability and O&M issues spurred supply renewal program



Regional Supplies allowed City to initiate a supply renewal program

Year	Supply Improvement	Improved Capacity (gpm)
2016	Well 1 On-site Improvements Project	2,200
2016	Well 4 Emergency Power Improvements Project	2,600
2017	Fulmer Field Project	4,000

Supply renewal projects will provide reliable supply next 20 years



Well #4 Improvements Project

- Switch from gas to liquid chlorine
- Provide emergency power generator

Well #1 Improvements Project

- New building
- Add chlorination, emergency power
- Pumps to Howard Road facility for corrosion control
- Blends with Coal Creek Springs
- Lesson learned – transmission main needs a hydrant to flush

Fulmer Field Project

- Corrosion
- Bacterial growth
- Iron and manganese
- Clean and rehabilitate
- Pump tests for capacity

Before and after Well 2 cleaning

5/7/13 - Pre-rehab
actual depth 247 ft

5/2/2014 - Post-rehab
actual depth 245 ft

Notes:
-Pre-rehab video dated May 7, 2013
-Post-rehab video dated May 2, 2014

FIGURE **A-3**
WELL NO. 2 SCREEN - 245 TO 247 FEET BGS
City of Auburn/Fulmer Wellfield/WA

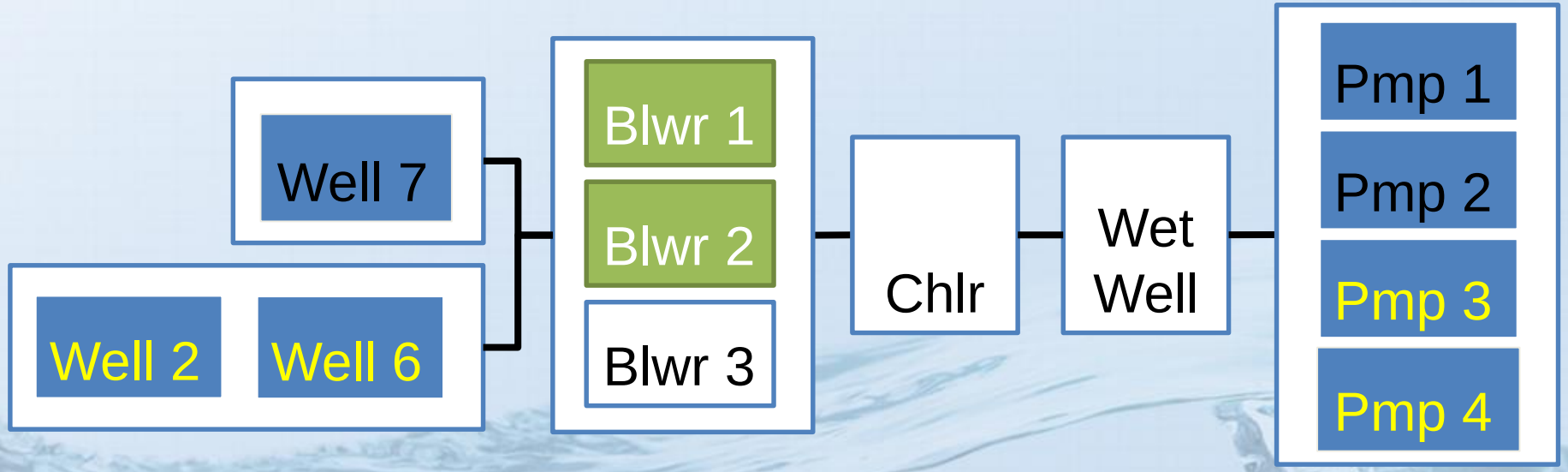
Attachment A - Well 2 Videos.xlsx

Golder Associates

Minimum flows required to maintain water quality

- Minimum continuous flow of 600 gpm at both Well 2 and 6 (1,200 gpm total)
- Well 2 and 6 are same building.
  - Long term City will redrill Well 2 at new location
- Fulmer Field CCTF is not able to pump at low flows

Fulmer CCTF Operation



Operational changes has decreased "Dirty" water calls

- Well 7 use suspended
  - High levels of manganese
- Implemented Unidirectional Flushing (UDF) Program

Table 12.7	Summary Customer Requests Water System Plan City of Auburn					
Category	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Appearance	26	11	16	19	11	5
Odor	2	2	8	5	2	2
Pressure	19	18	5	17	13	17
Taste	3	6	2	4	4	2
Water Quality	3	0	1	3	0	1
Total	**53**	**37**	**32**	**48**	**30**	**27**

2015:
23 Total Requests

How can supplies be operated cost effectively?

- Sufficient supplies to meet its demand using multiple source combinations.
- Evaluated use using total costs:
  - Future Capital Costs
  - Fixed O&M Costs
  - Variable O&M Costs
- Operational needs were considered.

Supply Renewal CIP Costs from 2015 Water System Plan

Source	Capital Costs ($ million)
Coal Creek Springs	$10.93
West Hill Springs	$1.36
Well 1	$0.08
Well 2	$0.08
Well 3A and 3B	$19.64
Well 4	$0.08
Well 5, 5A, and 5B	$7.10
Well 6	$0.08
Well 7	$20.85

Calculated O&M costs based on past bills and usage

From City - Received on 12/11/2014 - "Chlorine costs for 2014. xlsx"

Month	Well 4	Coal Creek Springs	West Hill Springs
Chlorine Gas			
January	$1,035.00	$1,414.18	$1,235.00
February	$0.00	$1,614.18	$0.00
March			
April			
May			
June			
July			
August			
September			
October	$0.00	$1,513.58	$0.00
November	$0.00	$1,512.98	$0.00
December	$0.00	$1,611.95	$0.00

Chemical Costs

Installation:

Business Partner - Long T	Device			Move-Out Date
CITY OF AUBURN	A091666509			12/31/9999

Billing Month	From Date	To Date	Degree Days	Avg Ambient Temperature	Billed Quantity	UOM
11/2014	10/9/2014	11/6/2014	329	53.65517241	2137	Kilowatt h
10/2014	9/10/2014	10/8/2014	120	61.10344828	1801	Kilowatt h
09/2014	8/8/2014	9/9/2014	46	66.15151515	1965	Kilowatt h
08/2014	7/10/2014	8/7/2014	22	68.65517241	1883	Kilowatt h
07/2014	6/10/2014	7/9/2014	100	63.26666667	2047	Kilowatt h
06/2014	5/8/2014	6/9/2014	187	59.81818182	2409	Kilowatt h
05/2014	4/9/2014	5/7/2014	376	52.31034483	2312	Kilowatt h
04/2014	3/11/2014	4/8/2014	529	46.75862069	2974	Kilowatt h
03/2014	2/7/2014	3/10/2014	711	42.78125	3171	Kilowatt h

Electric Usage and Charge

12/22/2014 - "Labor

Coal Creek Spring

Labor	Equ	...ment	Lab
7,371.00	$40	28.00	$1,945

Well 5A

Labor	Equ	...ment	Lab
9,630.00	$21	16.00	$1,945

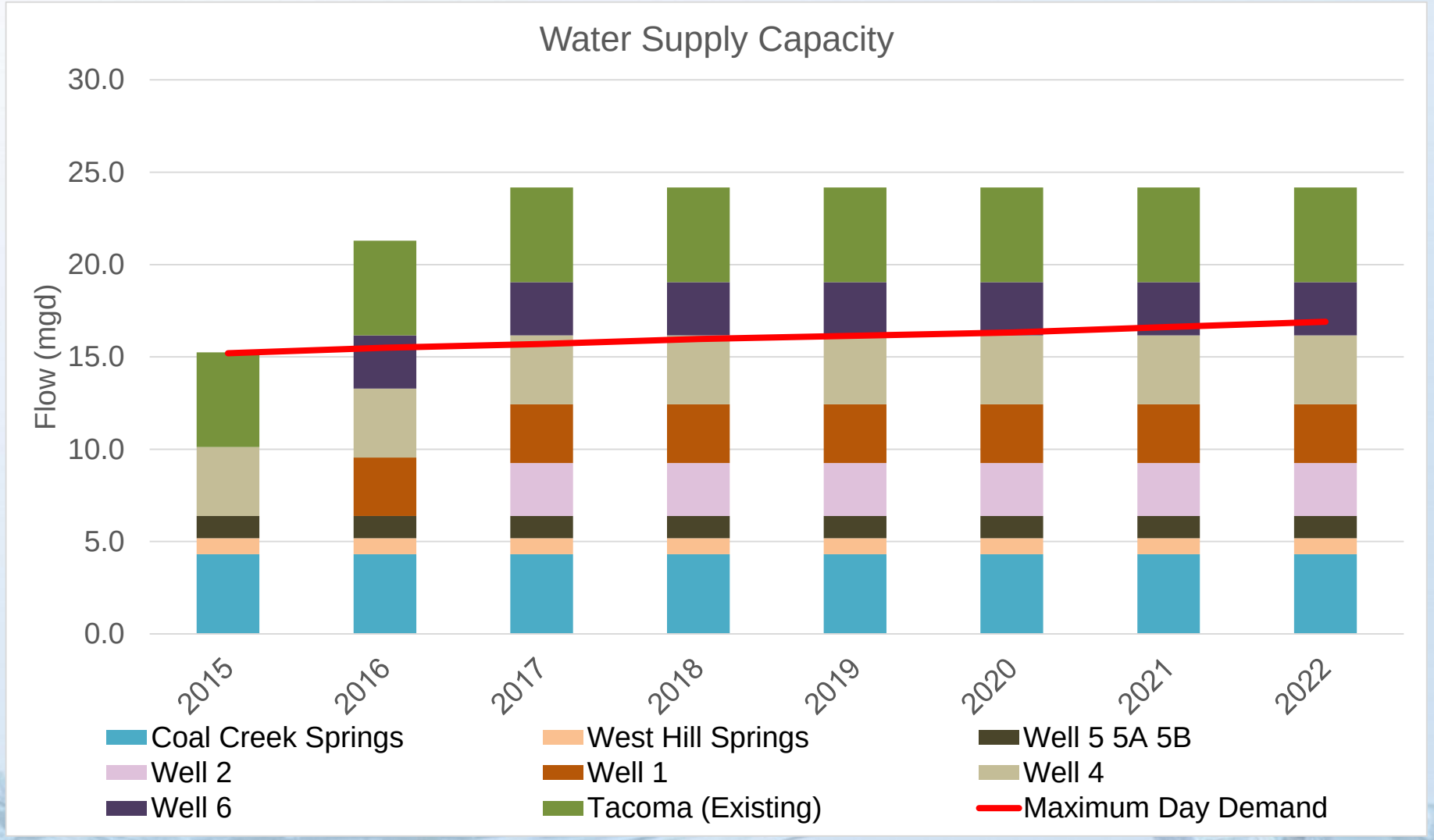
City Labor and Maintenance Records

How can supplies be operated cost effectively?

- The least total cost sources to operate are:
  1. *Coal Creek Springs.*
  2. *Well 4.*
  3. *Fulmer Field (Wells 2 and 6).*
  4. *West Hill Springs.*
  5. *Upland Wellfield (Wells 5 and 5A).*
  6. *Well 1 and RWSS supplies provide redundant capacity when preferred sources are offline.*

- Operating costs largely driven by level of water quality treatment.

City's Sources can cost-effectively provide supply in future



Next Steps

- Construction completion expected:
  - Well 1 and 4 – now
  - Well 2 and 6 on line by end of year with all improvements by 2017
- Unknown – Well 1 blending with Coal Creek Springs and corrosion control treatment – any quality concerns?
- Operate and monitoring manganese levels at Fulmer

Questions?