CITY OF BEND: WATER SUPPLY UPDATE

DROUGHT 2020

FROM PYRAMID POWER TO PUDDING, HOW WE WRESTLE WITH DROUGHT, FIRES, FLOODS, LIGHTNING, AND MORE!

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Water Resources Manager
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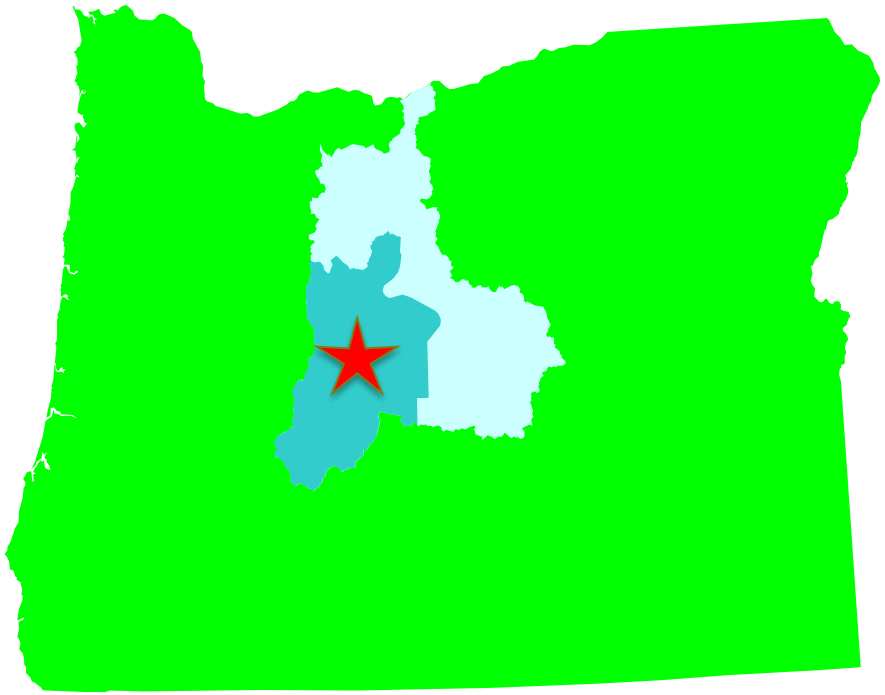
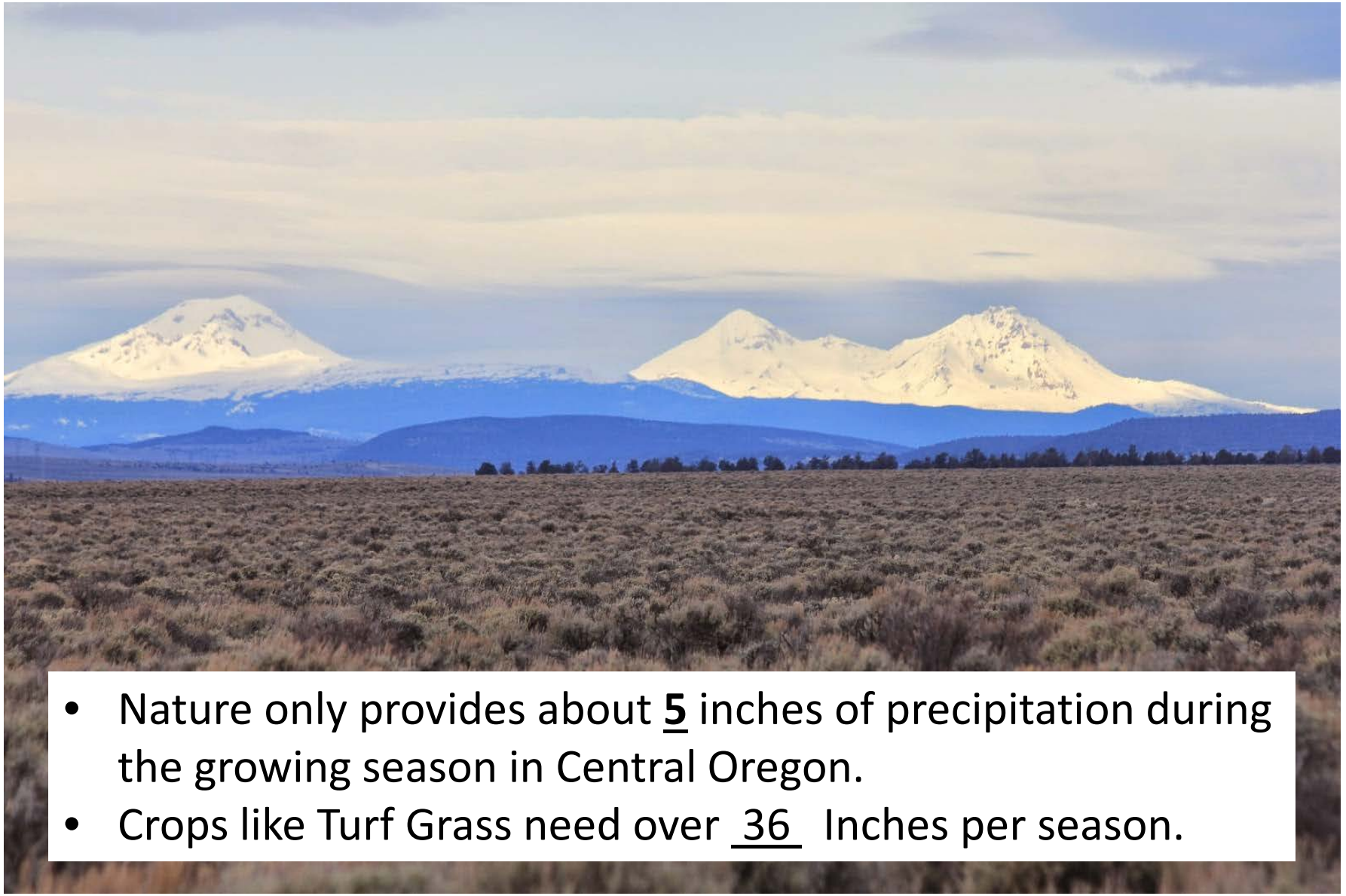
NO WATER
NO BEER®
American Water Works Association
#NoWaterNoBeer #ValueWater

BEND, OREGON



- Three Amigos – Water, Sewer, Stormwater
- Estimated 2020 population ~100,000
- Water Service Area Population ~ 75,000
  - Water connections ~ 30,000
  - Sewer connections ~ 40,000
  - Stormwater customers ~ 40,000
- Annual Water demand ~14,500 AF
- Two primary water sources:
  - Surface Water
  - Groundwater
- Rapid Growth! Estimate 150,000 by 2040

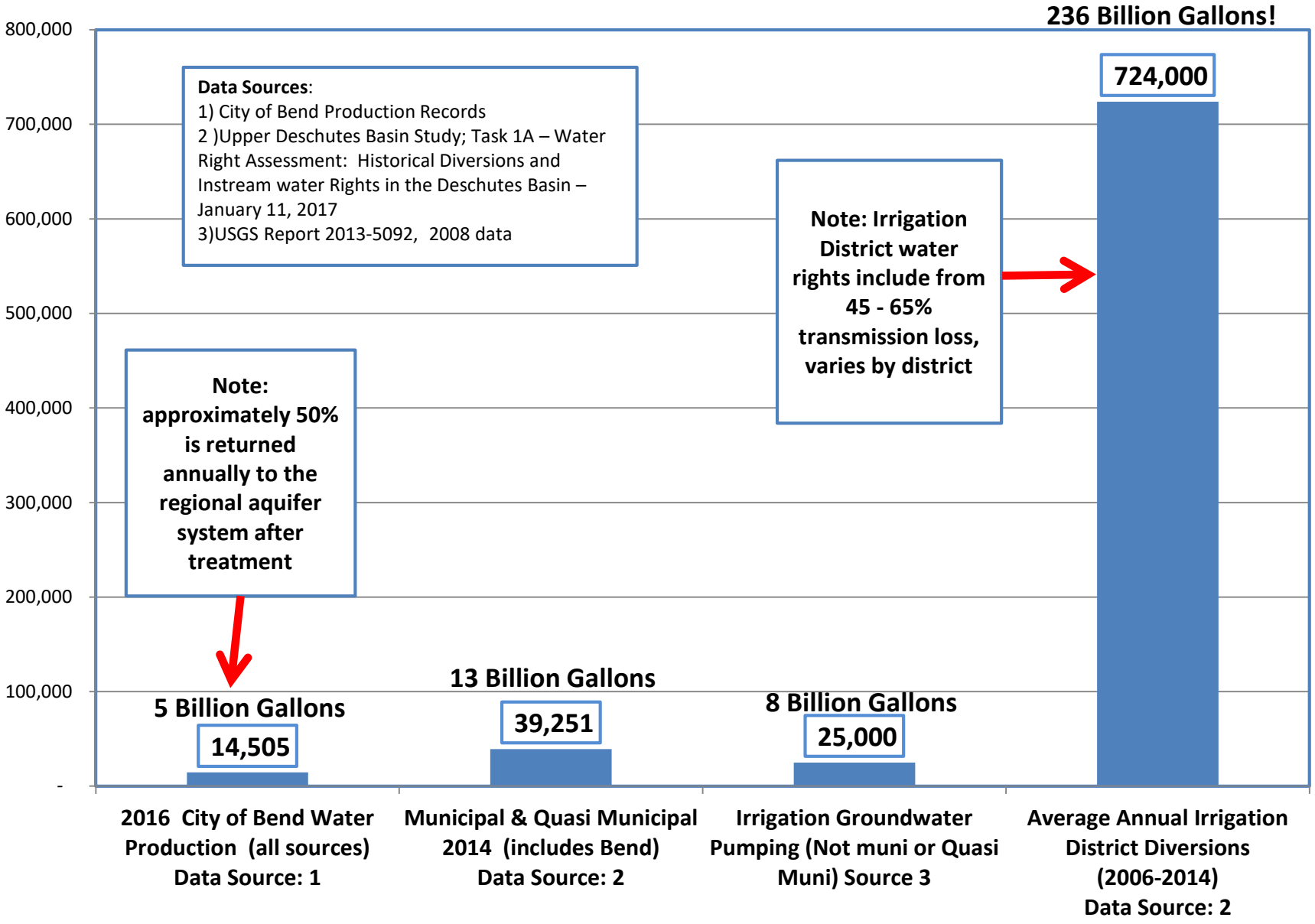


- Nature only provides about **5** inches of precipitation during the growing season in Central Oregon.
- Crops like Turf Grass need over 36 Inches per season.

Deschutes Basin: "Magnitudes of Use Comparison Chart"

Annual Diversion by Major User Groups

(Acre Feet, 1 AF = 325,851 gallons)



2019 Total Daily Water Production (MGD)

2019 Maximum Daily Demand (MDD) 26.3 mgd

2019 Average Daily Demand (ADD) 11.9 mgd

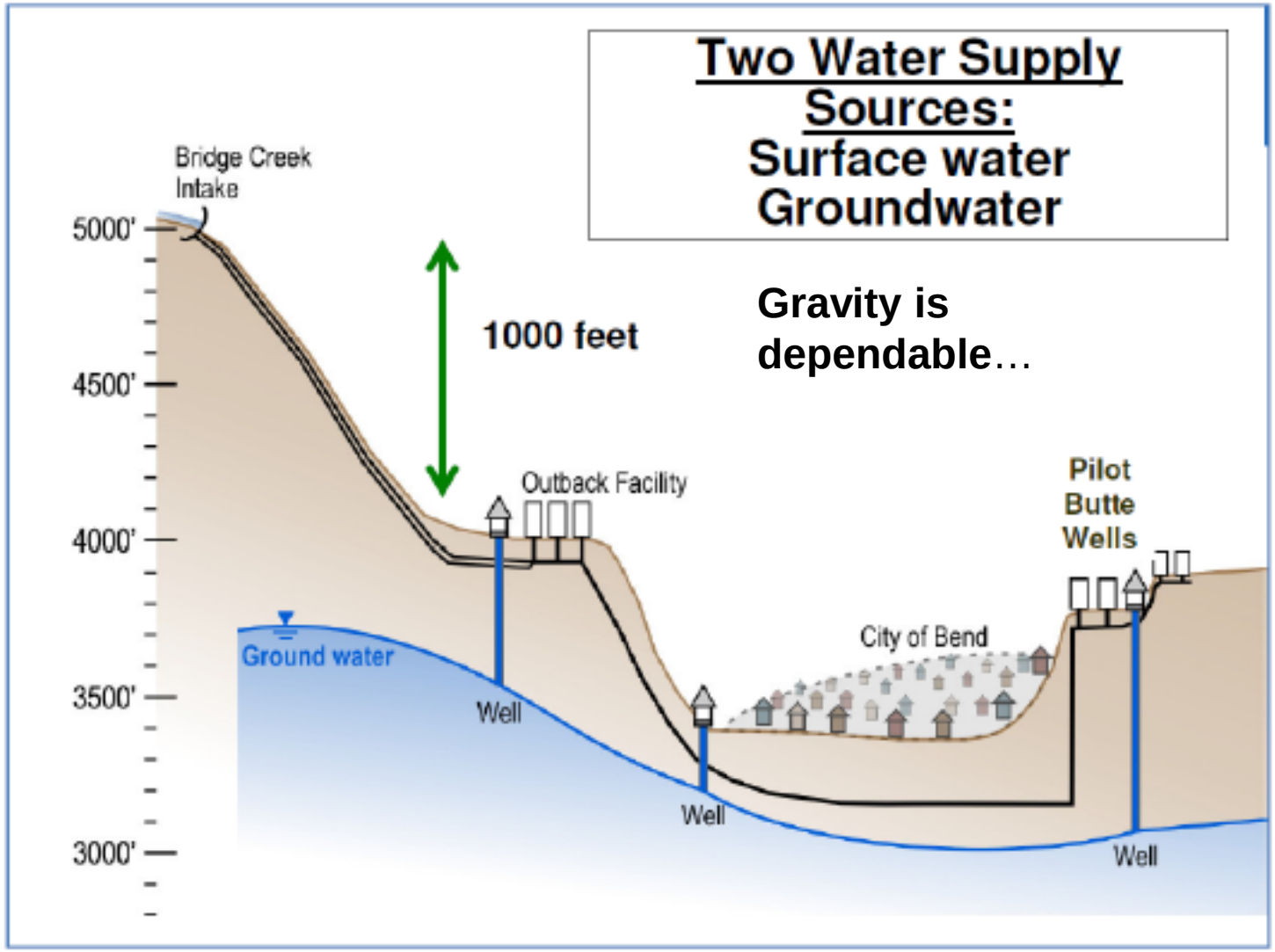


Figure 2. City of Bend's Dual Source Water System: Groundwater pumped from 300- to 750-feet below the City and Surface Water Flowing by Gravity without pumping from 1,320-feet above the City

Third Source of Supply

EXISTING WATERWISE PROGRAMS

Data Driven Investment in Programs and Products

OUTDOOR Irrigation & Landscape*

Programs

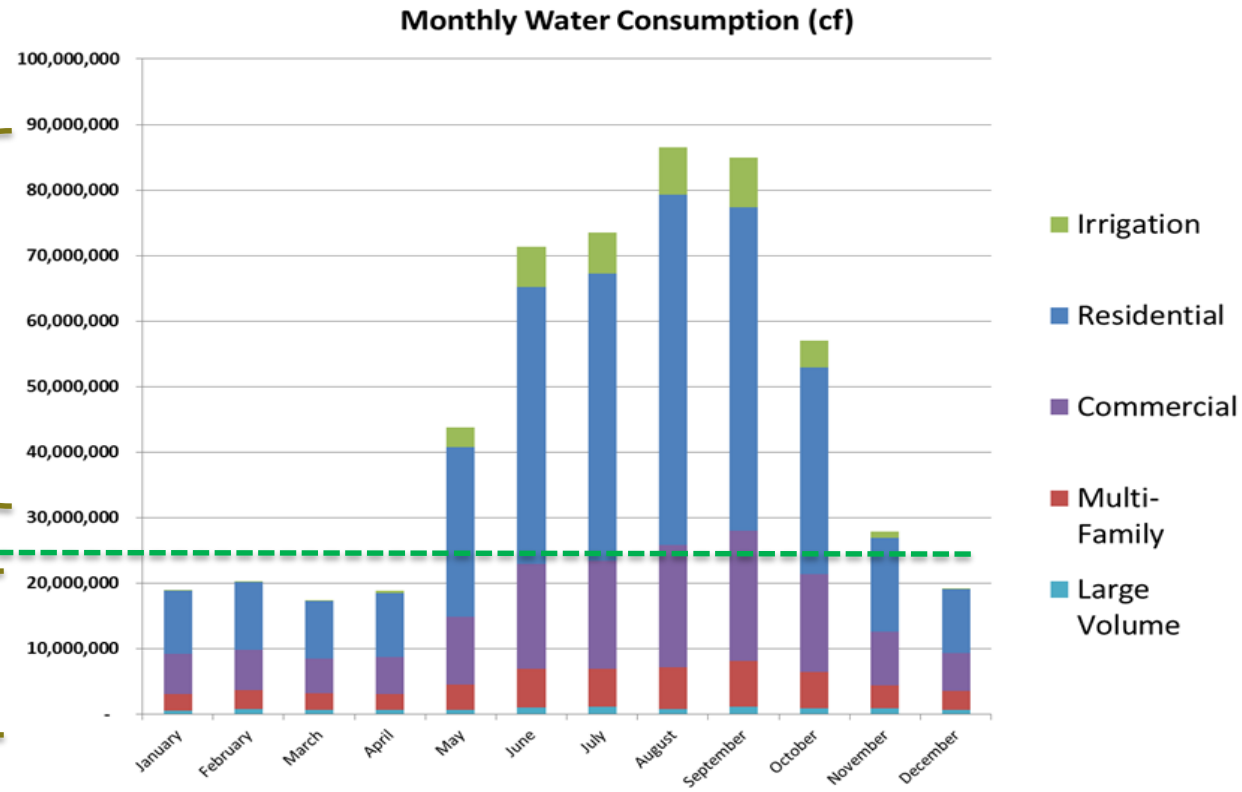
- Large Landscape
- Sprinkler Inspection
- Water Waste Prevention
- Contractor Education

Products*

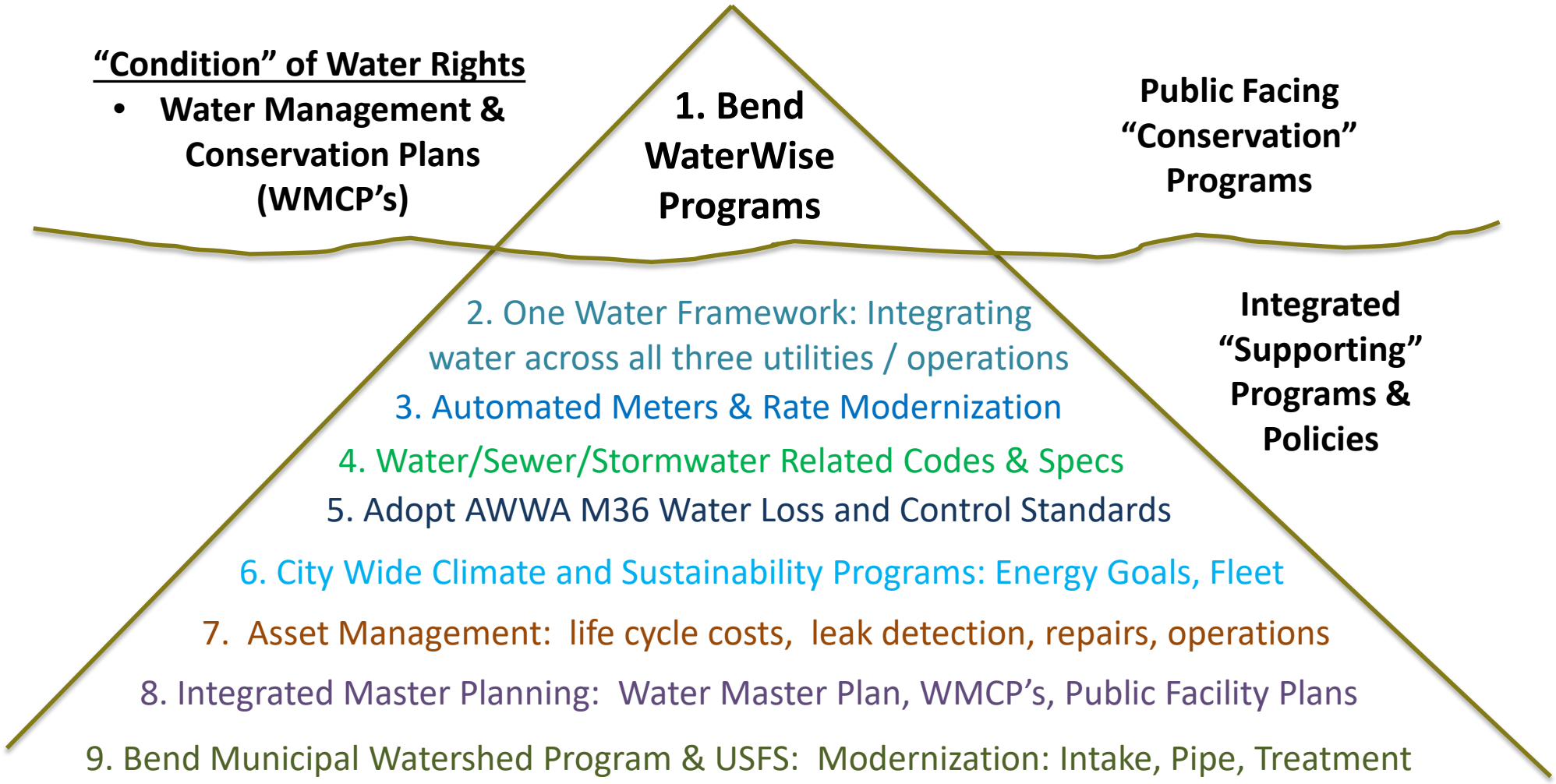
- WaterWise Plant Website
- WaterWise Landscape Guide
- WaterWise Irrigation Guide
- WaterWise Streetscape Guide
- City of Bend / OSU Plant Guide
- Fact sheets and information

INDOOR Water Use*

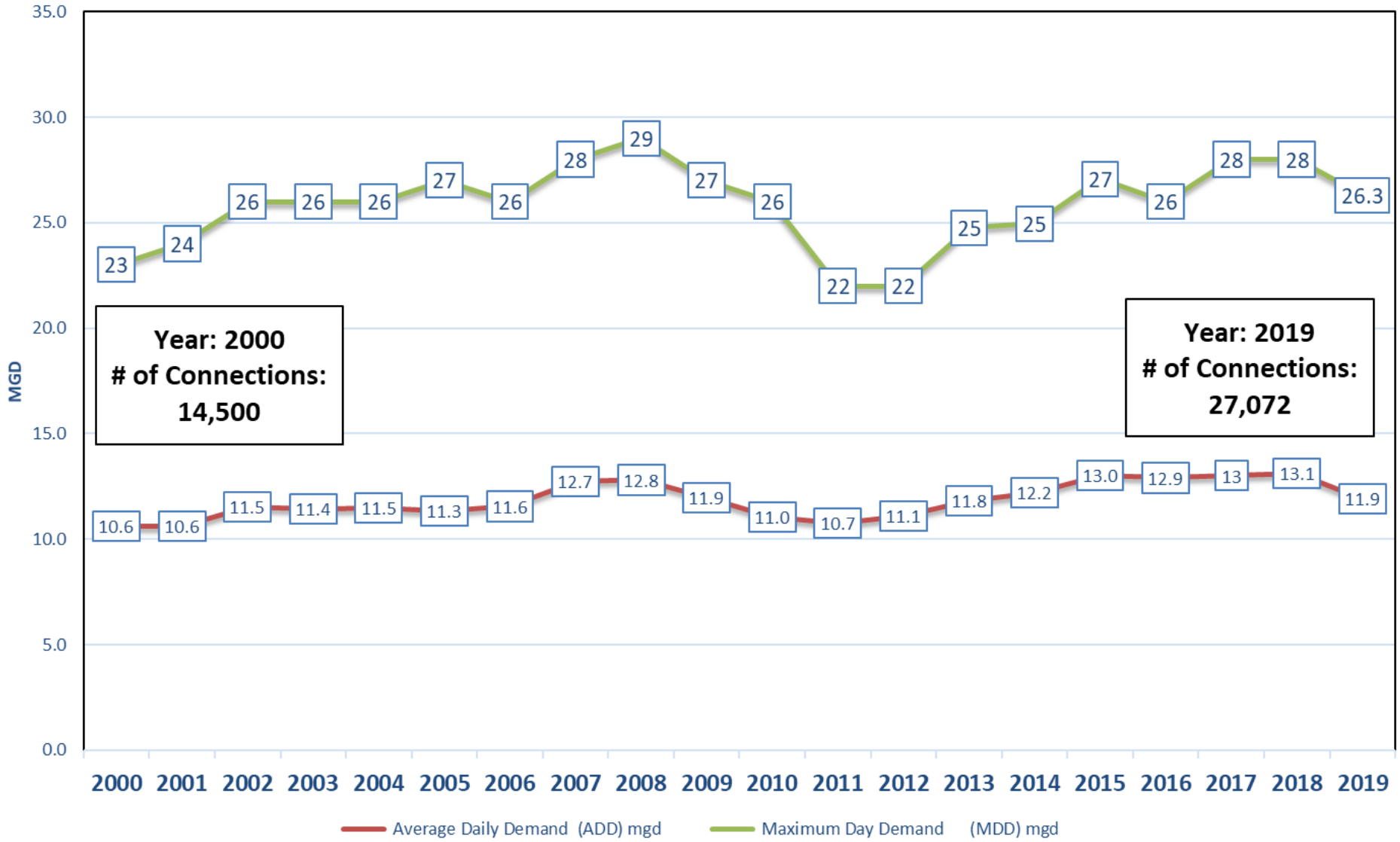
- Residential – Reduce Winter Quarter Average – WaterSense
- Indoor Kits / Plumbing codes / fixtures and appliances



BEND'S WATERWISE FOUNDATION

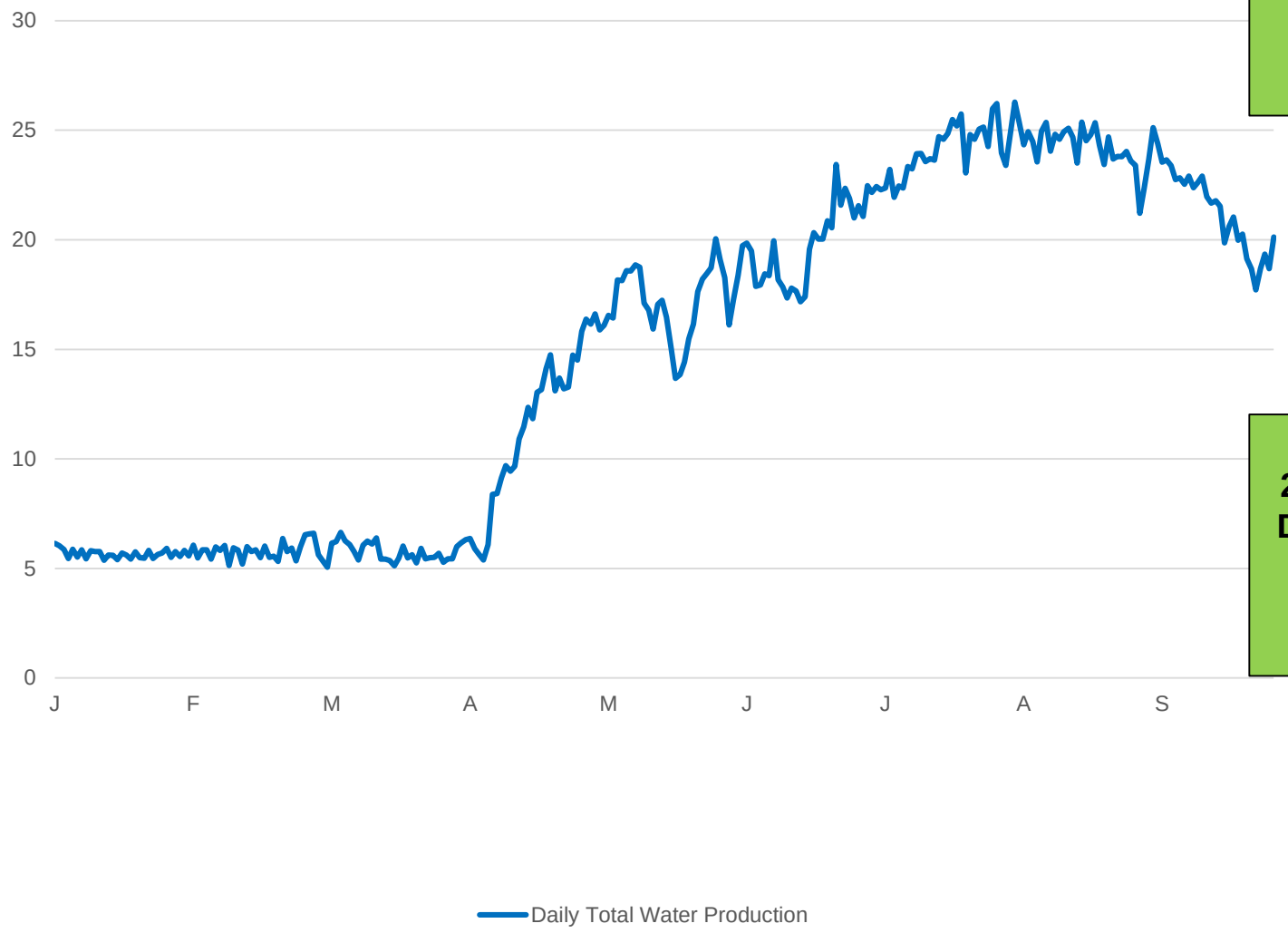


City of Bend Water Production Summary Data 2000-2019
Maximum Day Demand (MDD) & Average Day Demand (ADD)
with Service Connections
(MGD = Million Gallons per Day)



2020 Total Daily Water Production (MGD)

- 2020 Drought declared (County)
- Customers notified
- No curtailment necessary
- COVID conservation?



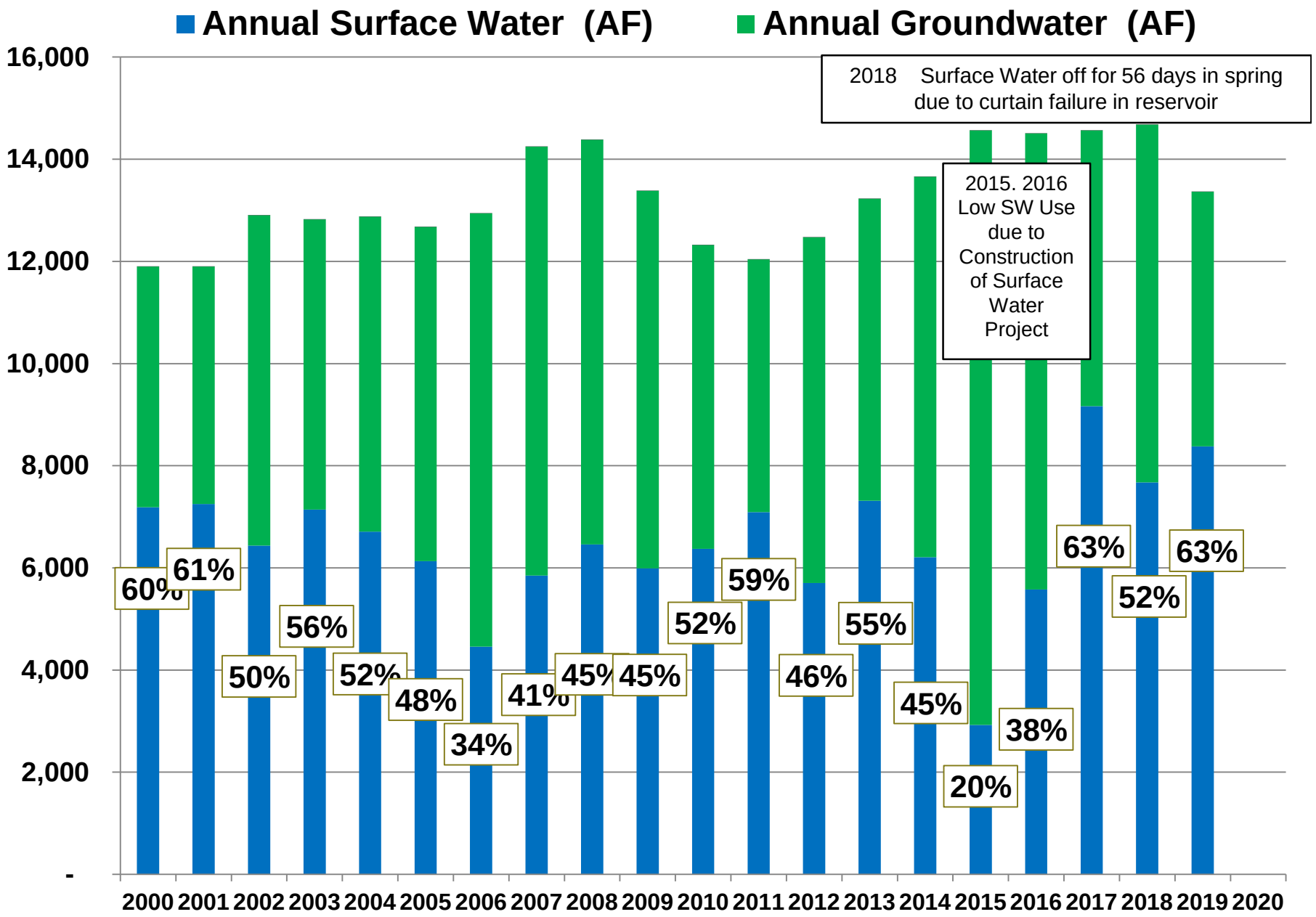
2020 Maximum Daily Demand (MDD) 26.28 mgd

2020 Average Daily Demand (ADD) xx.x mgd

SURFACE WATER SYSTEM INVESTMENT

Recent $70 Million Reinvestment in Surface Water System (2016 completion)

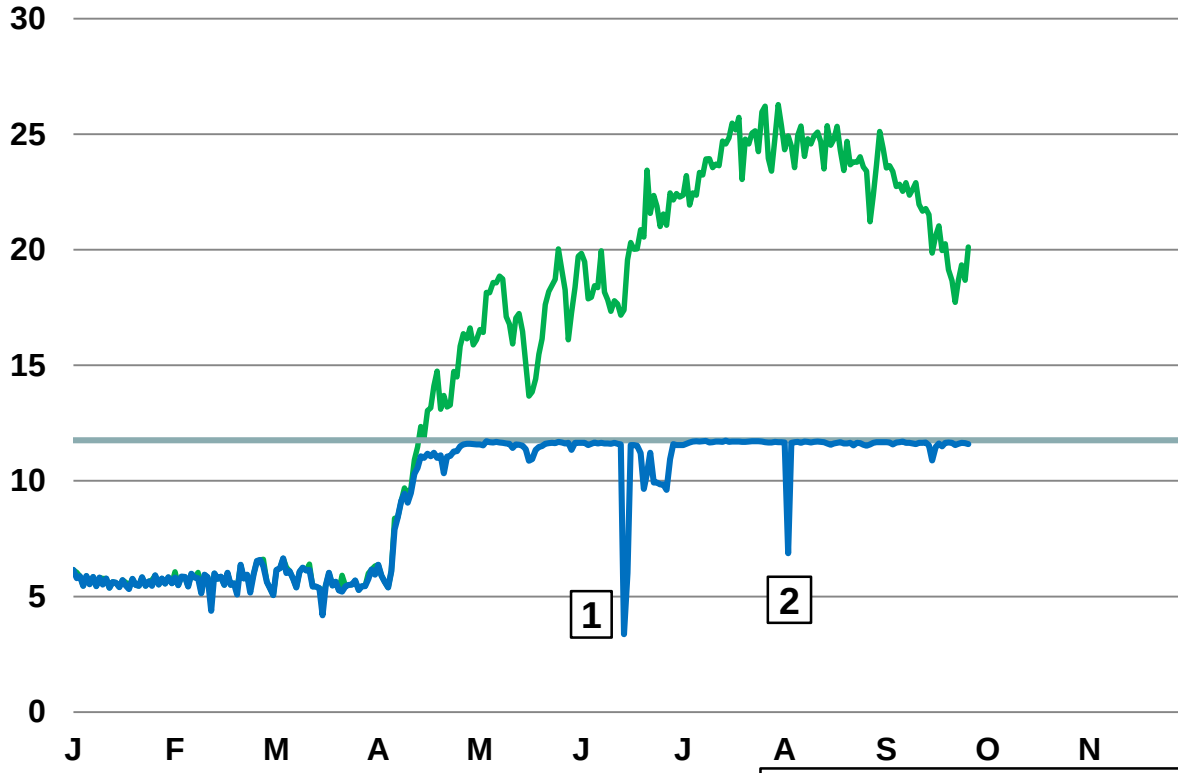
- Diversion limit – 18.2 cfs
- Updated Intake, with fish screens, frazil ice control, monitoring upgrades
- New Transmission Pipeline
- *Water Filtration Added at end of pipeline, compliant with EPA LT-2 Rules for Cryptosporidium*


Annual Surface Water (AF)
Annual Groundwater (AF)
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
-
2018 Surface Water off for 56 days in spring due to curtain failure in reservoir
2015. 2016 Low SW Use due to Construction of Surface Water Project
60%
61%
50%
56%
52%
48%
34%
41%
45%
45%
52%
59%
46%
55%
45%
20%
38%
63%
52%
63%
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

2020 Total Daily Water Production

with surface water production

(MGD)



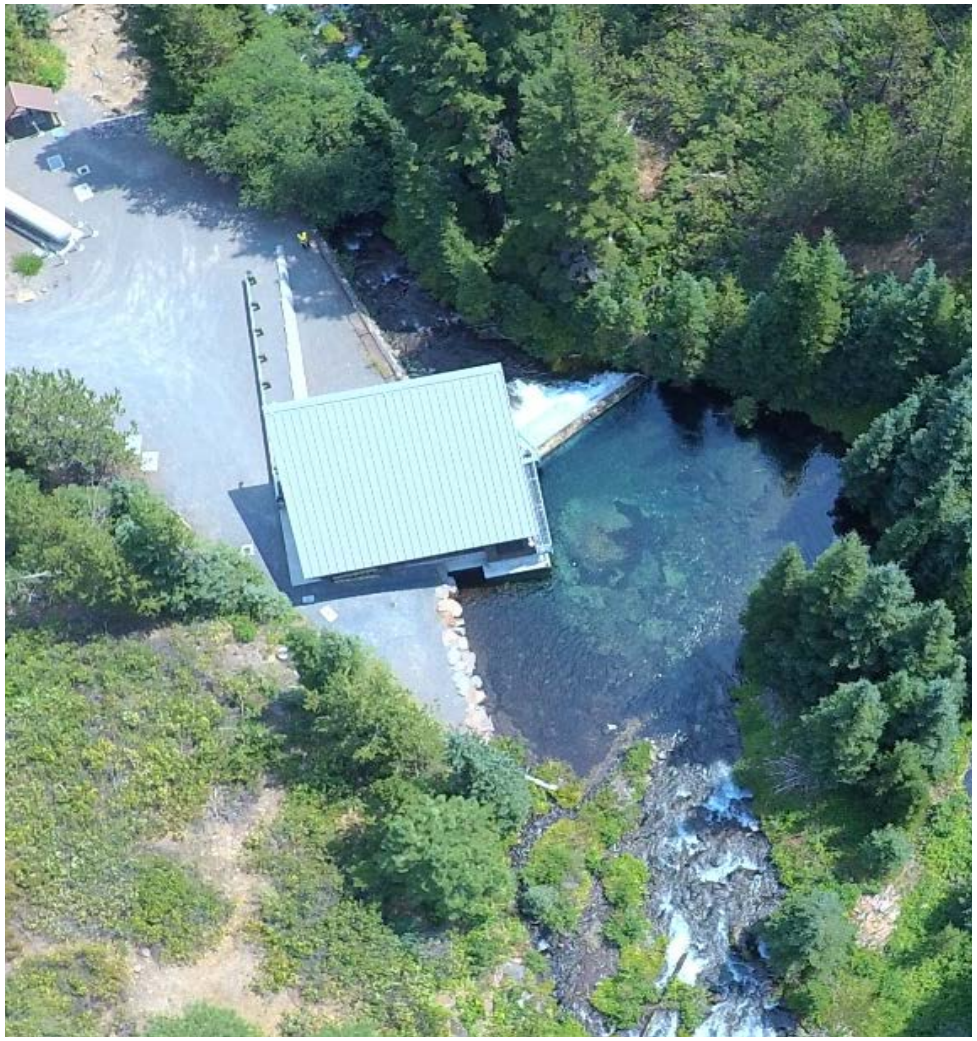
2020 Maximum Daily Demand (MDD) 26.28 mgd

2020 Average Daily Demand (ADD) xx.xx mgd

1: "off" for ball valve and control wire repair from previous lightning hit and related work

2: Temporary cutback due to Thundershower / Turbidity event in watershed

TYPICAL TURBIDITY LEVELS ~ 0.10



Major Thunderstorm Event, April 5, 2020

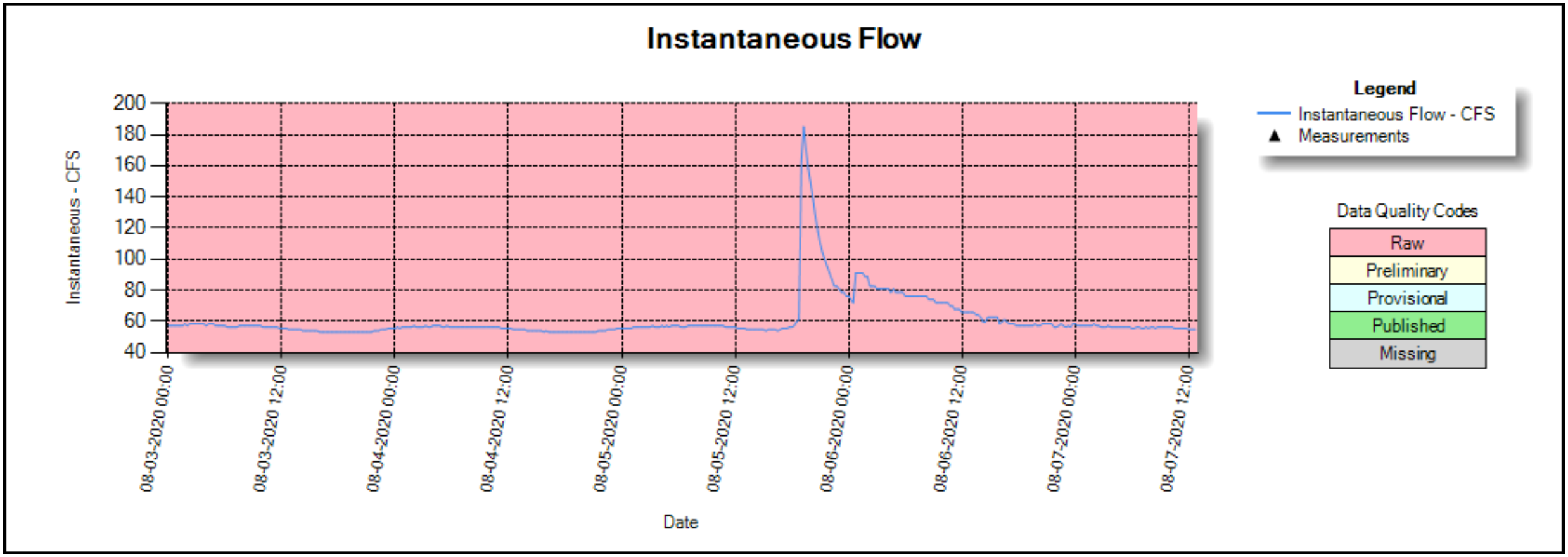
Front Page: Bend Bulletin August 6, 2020

Lightning in the sky, fire on the ground

Ryan Brennecke/The Bulletin

A bolt of lightning fills the sky as an afternoon thunderstorm passes over Bend on Wednesday. The lightning sparked a one-eighth of an acre fire off of Bull Springs Road west of Shevlin Park, according to Bend Fire & Rescue. Crews from the Oregon Department of Forestry and the U.S. Forest Service will be patrolling forest areas over the next several days looking for any smoldering fires caused by the lightning, the fire department said. Thursday is forecast to be mostly sunny with a high of 74 degrees.

TUMALO CREEK WATERSHED - AUG 5, 2020 FLOW EVENT



TURBIDITY EVENT – AUGUST 5, 2020

Partially due to lingering effects from Bridge Creek Fire 1979

Clipped top corner of watershed

TURBIDITY EVENT – AUGUST 5, 2020

PLANNING FOR "HEAVY WEATHER"

- **Lightning Triple Threat: Fire, Flooding, Power Loss & "Zappage"**
  - ***Lightning – Biggest risk - Fire in watershed***. Fire can result in long term ongoing turbidity issues long after the fire is out depending on proximity to stream. Still seeing effects of 1979 Bridge Creek Fire that burned Eastern / bottom edge of watershed above our intake.

  - ***Lightning – equipment strikes – electronics / communication – power loss***
    - Power outages
    - Wells go out of service, pumps fail, control modules get zapped
    - Impact to system wide electronic control systems and telemetry, computers

  - ***Localized Heavy Rain/Flooding Impacts:***
    - ***Heavy Localized Rain Events: Biggest Risk - surface water turbidity events*** – Bend Municipal Watershed – Bridge creek intake location and above
    - ***Heavy Localized Rain events / Flooding***: localized groundwater contamination through stormwater runoff, local flooding events, time of travel zones of GW influence.

ADDITIONAL LONG TERM RESILIENCY PLANNING

- **Adding Pretreatment ahead of New Filtration Facility**
- **Adding Distribution System Flexibility (more source flex)**
- **Expanding WaterWise Programs ~ $11 Million over 20 yrs (Estimated $21M Capital Reduction)**
- **Continue Basin Partnerships – shared water goals**
  - **Deschutes Basin Water Collaborative, recently completed USBR Basin Study (State $, Fed $, local match)**
- **State / Region need clear communication around drought, curtailment and related actions**