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Revision 0

# Perched Well Pumping Status

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

CH2MHILL
Plateau Remediation Company

**P.O. Box 1600**
**Richland, Washington 99352**

Approved for Public Release;
Further Dissemination Unlimited

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10/16/2018

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By Mary P. Curry at 12:11 pm, Oct 25, 2018

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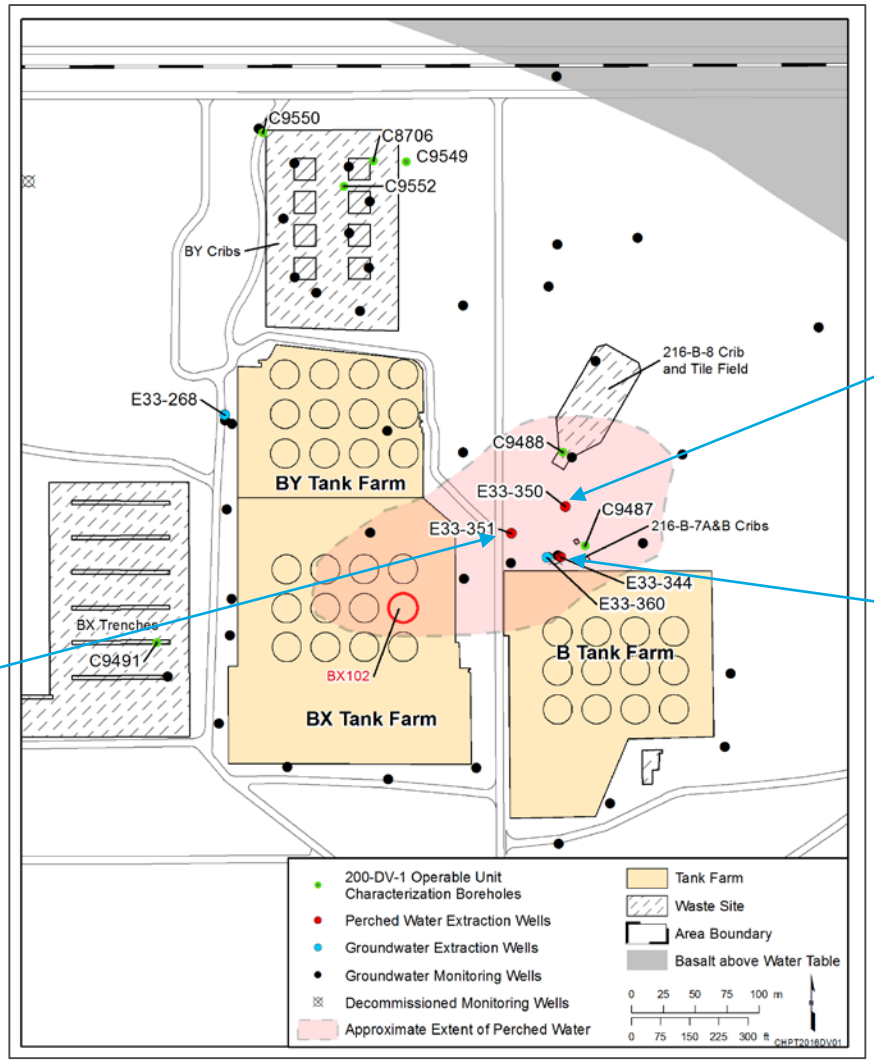
Greg Bergquist, Andrew Esparza, Mark Byrnes
Presented to: Washington State Department of Ecology
Date: October 16, 2018

# Perched Well Location Map

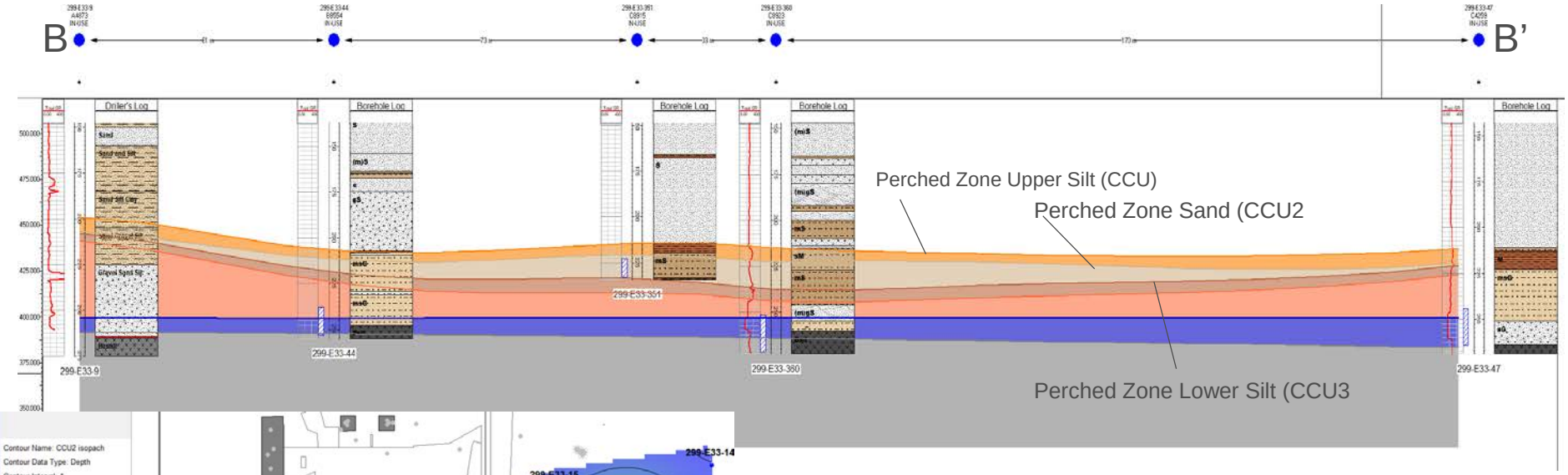


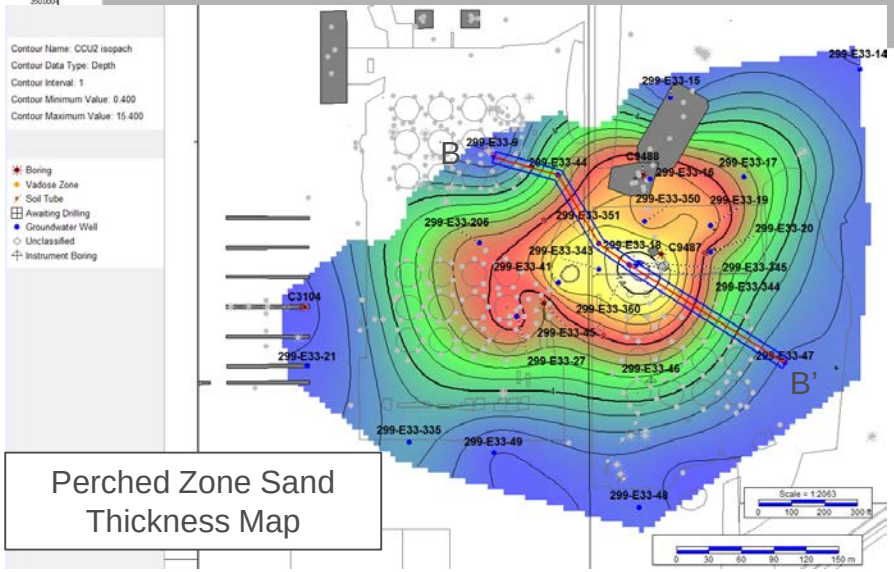

YE29
(2014)

YE28
(2008)

YE30
(2014)

# Perched Zone Conceptual Model

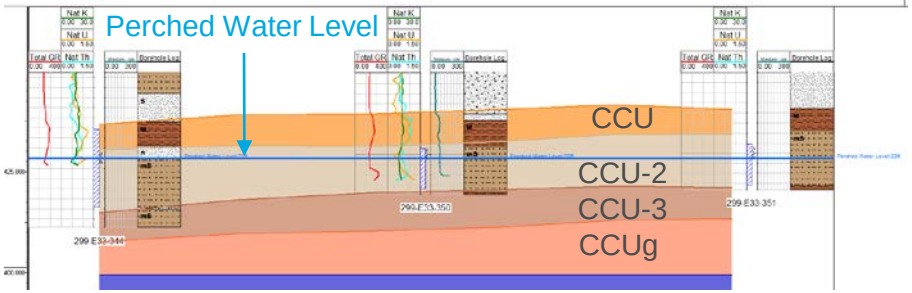



Perched Zone Sand Thickness Map

## Three Extraction Wells:

299-E33-344 — 299-E33-350 — 299-E33-351




These figures come from ECF-200DV1-18-0036 which is still in development and are subject to change

# YE28 (299-E33-344)

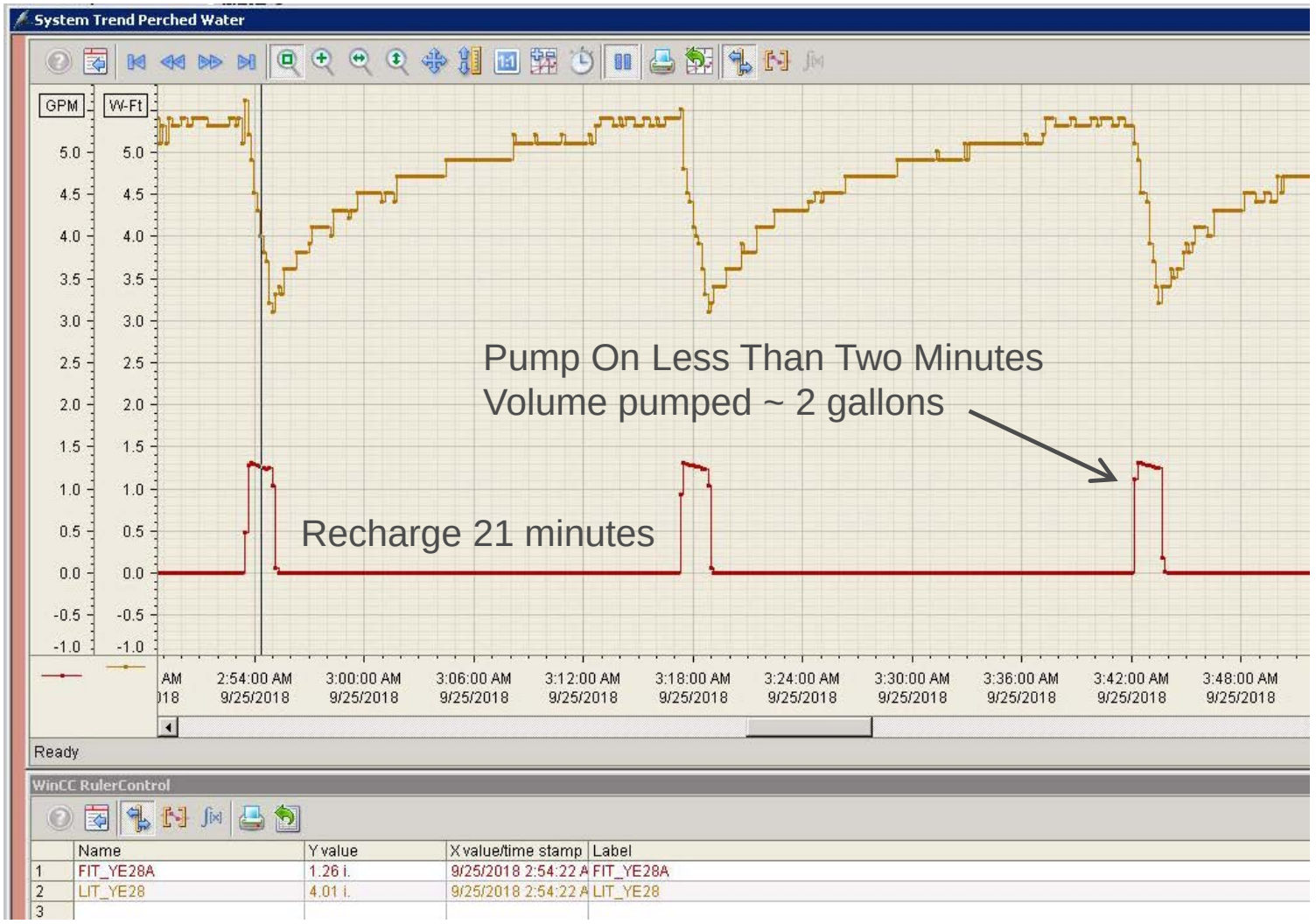
## 4” Well

Pump On 5.5 ft
Pump Off 3.0 ft

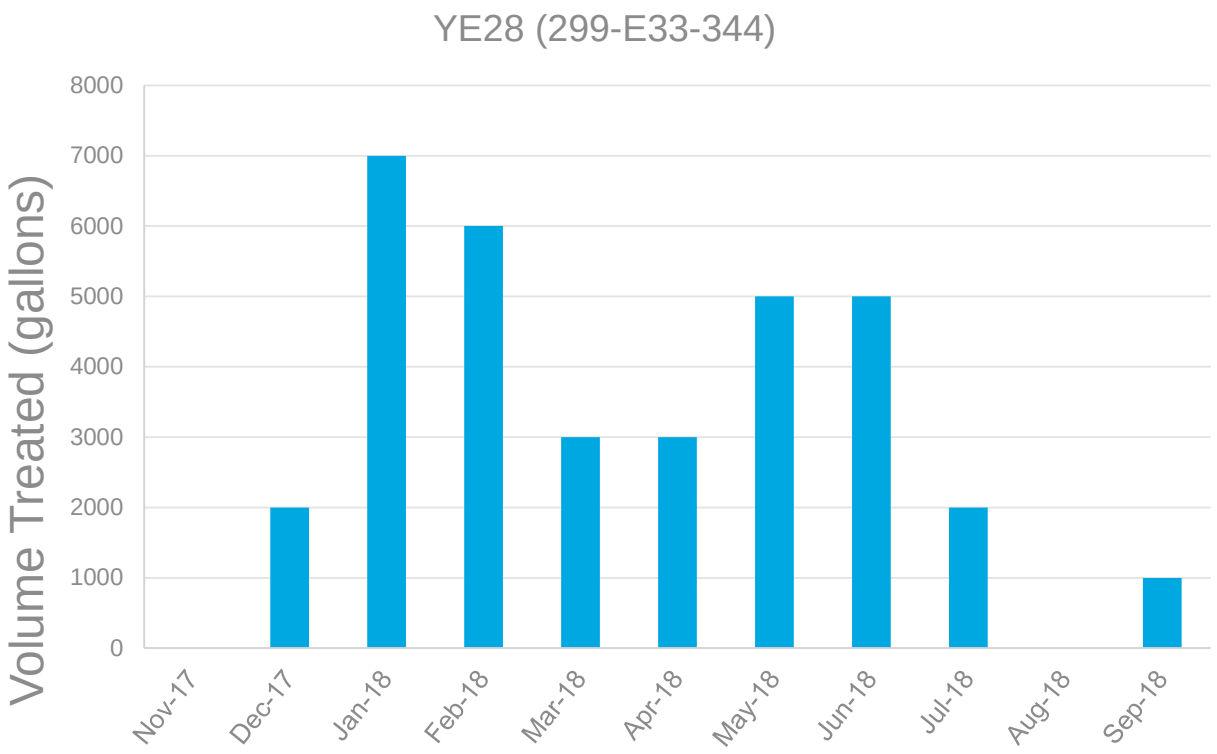
Pump intake located 1.3 ft from bottom of well.

Largest decline in well output of the 3 perched water wells at 100 gal/day.

Redevelopment did not restore to original output of 200 gal/day



# YE28 (299-E33-344)



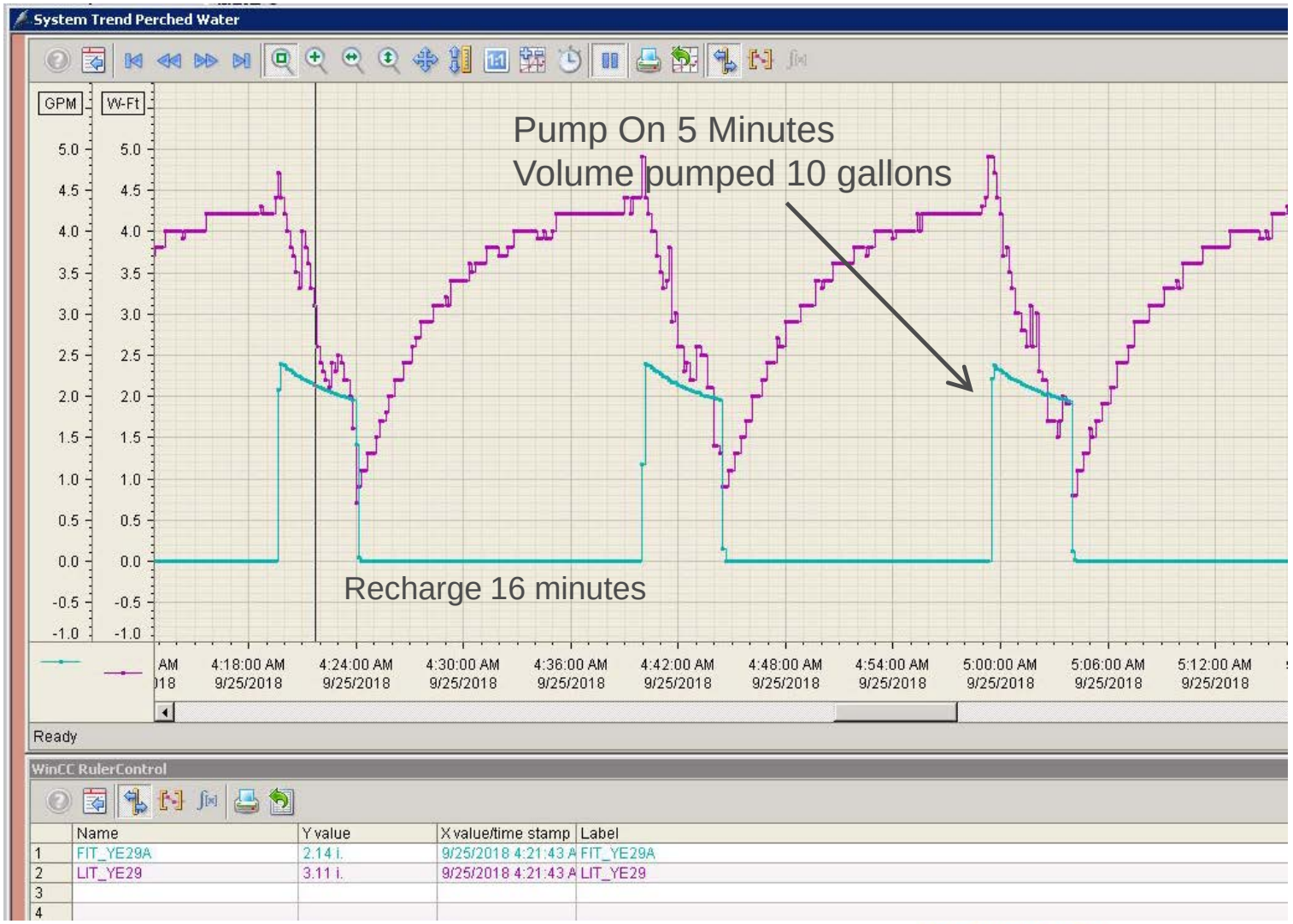
# YE29 (299-E33-350)

6” Well
Pump on 4.5 ft
Pump off 1.1 ft

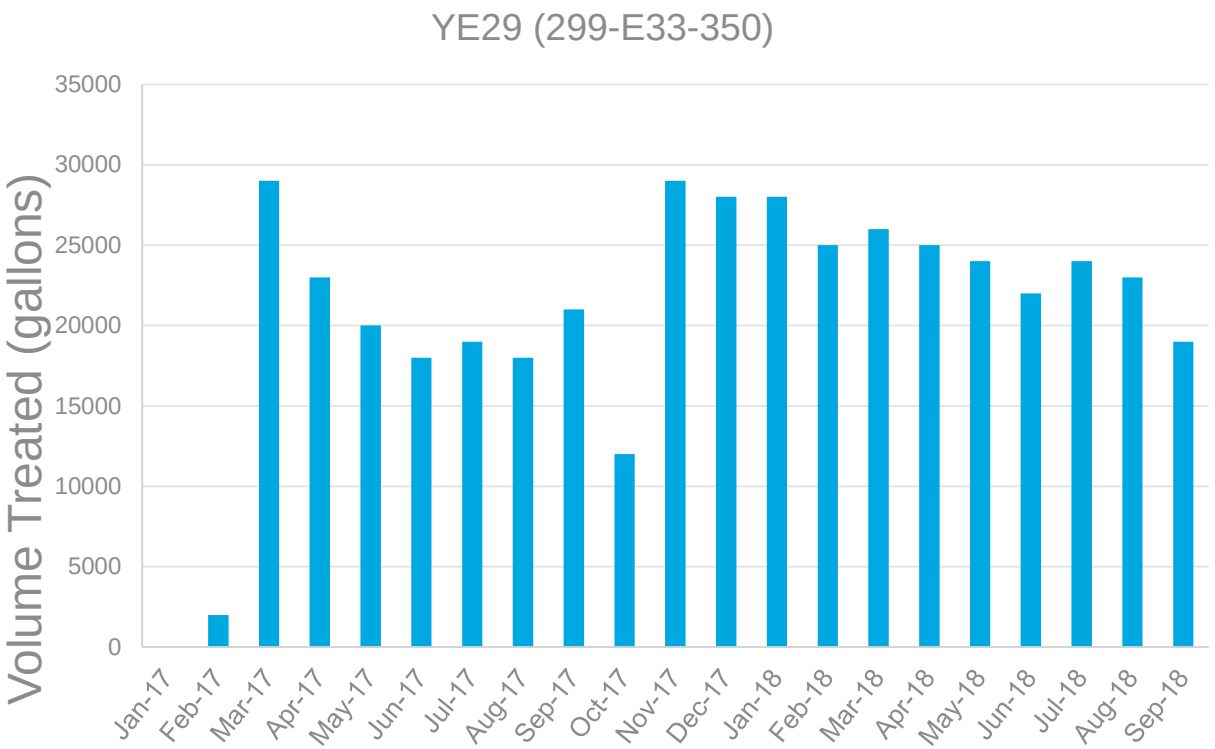
Pump intake located 1.4 ft from bottom of well.

Pumps the largest volume of the 3 perched water wells

Well redevelopment started the week of 9-24-2018



# YE29 (299-E33-350)



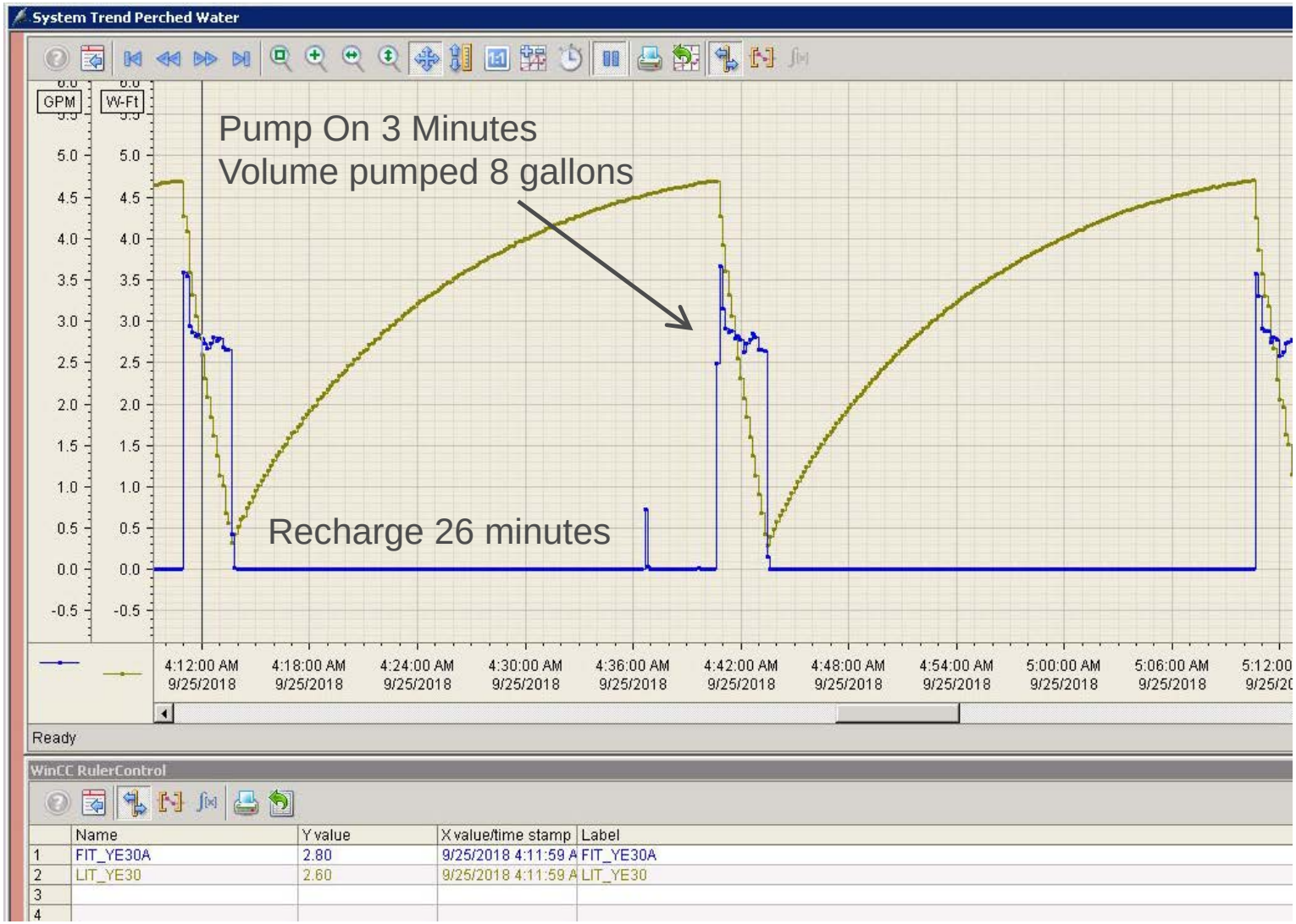
# YE30 (299-E33-351)

## 6” Well

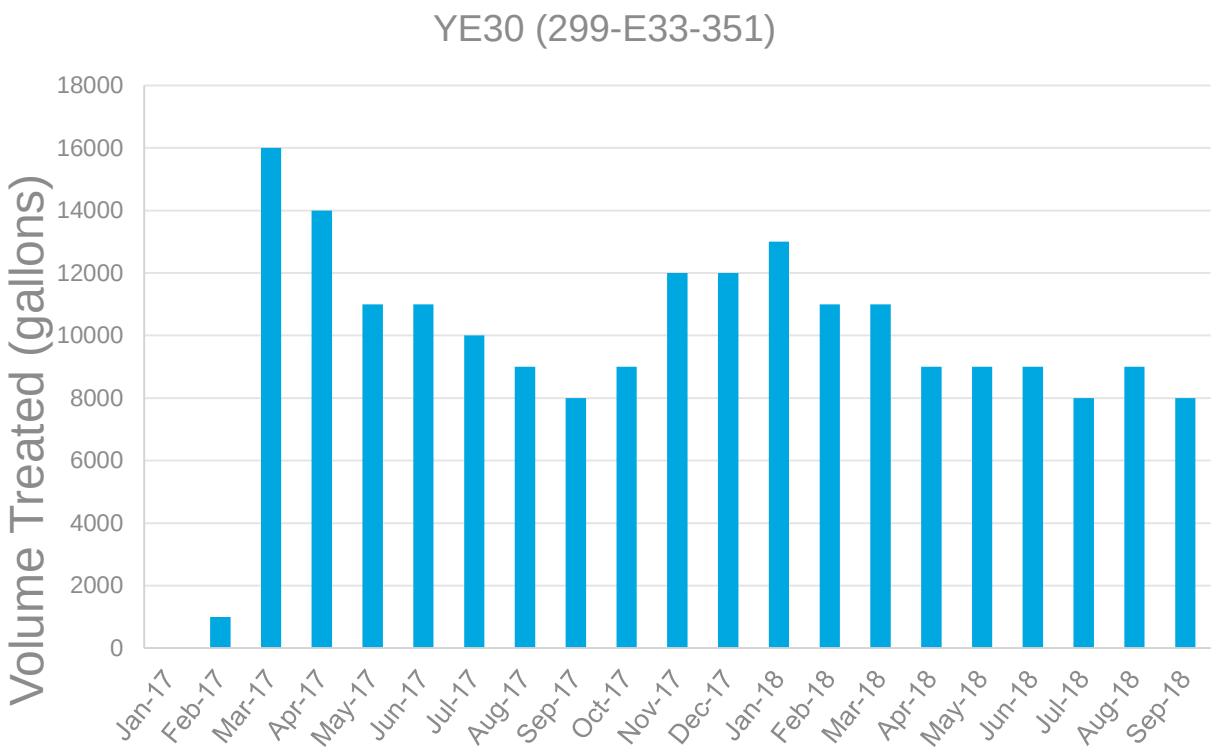
Pump on 4.7 ft
Pump off 0.5 ft

Pump intake located 1.4 ft from bottom of well.

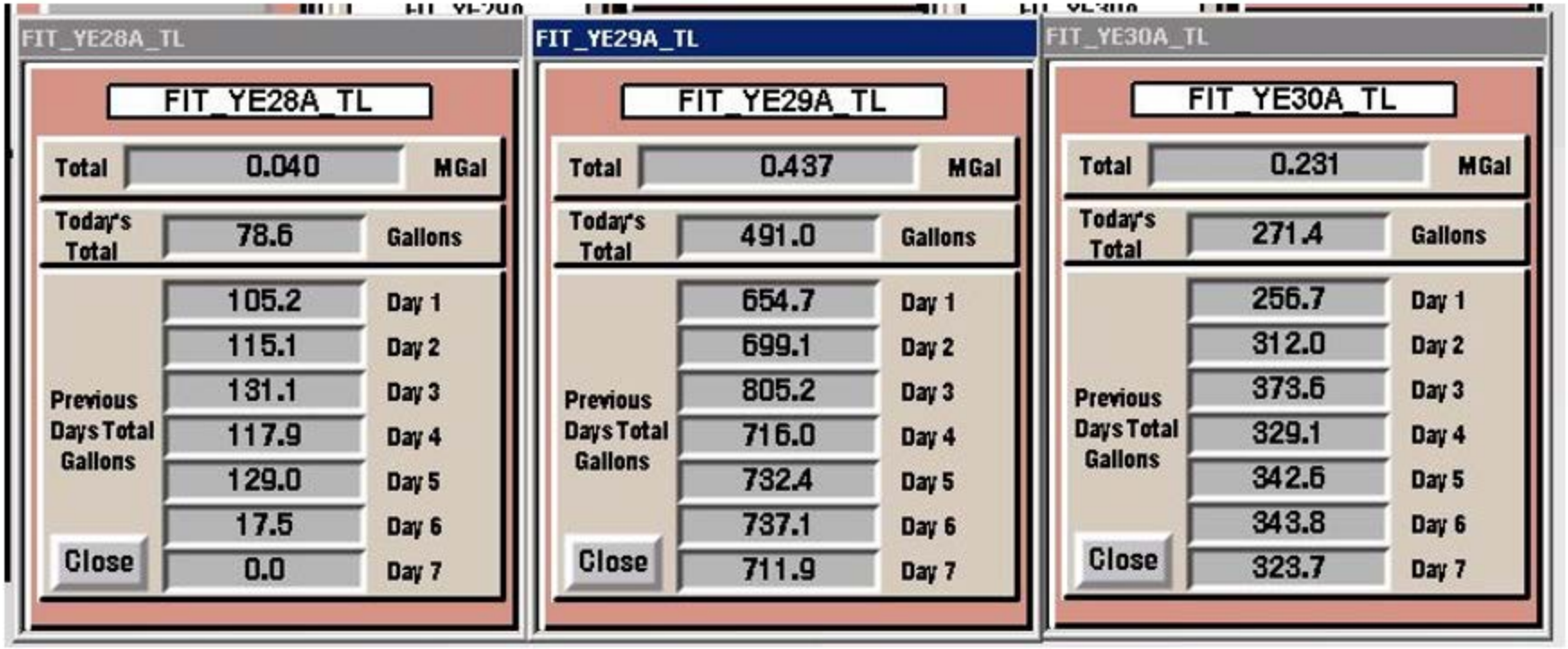
Well redevelopment to start the week of 10-15-2018



# YE30 (299-E33-351)



# Daily Pumping Rates September 18, 2018 (Day 7) through September 24, 2018 (Day 1)



# CY2018 Volume and Mass Removed from Perched Wells

| Well ID | Volume extracted (Gallons) | Mass removed from groundwater CY2018 | | |
|---|---|---|---|---|
| | | Nitrate-N (kg) | Uranium (kg) | Tc-99 (µCi) |
| YE28 | 14,000 | 6.3 | 3.0 | 1,675 |
| YE29 | 116,000 | 80 | 27 | 15,467 |
| YE30 | 46,000 | 61 | 6.1 | 4,799 |
| Total | 176,000 | 147.9 | 35.9 | 21,940 |

*Data from January 2018 through September 2018, based on pumping data and quarterly samples.

# Comparison Daily Removal Volumes/Rates

**January 2018**

- YE28 – 232 gallons
- YE29 – 874 gallons
- YE30 – 495 gallons

- YE28 – 0.16 gpm
- YE29 – 0.61 gpm
- YE30 – 0.34 gpm
- Total – 1.1 gpm

**September 2018**

- YE28 – 119 gallons
- YE29 – 722 gallons
- YE30 – 325 gallons

- YE28 – 0.08 gpm
- YE29 – 0.50 gpm
- YE30 – 0.23 gpm
- Total – 0.81 gpm

# Optimization Efforts

- YE28 Redeveloped in July 2018, no Noticeable Improvement in Recharge/Removal Volumes
- YE29 Redevelopment Starting Week of 9/24/18
- YE30 Redevelopment Starting Week of 10/15/18
- Static Water Levels have Declined in YE28
  - YE28 -224 ft bgs (2008) to -230 bgs (2017)
  - YE29/YE30 no Significant Change

# Path Forward (Pending Funding and Authorization)

- Update Conceptual Site Model
  - Incorporate Recent Information (Sampling and Pumping Rates)
  - Evaluate using Surface Geophysics Define Perched Water Zone
- Develop Approach to Increase Perched Water Recovery. Options being Considered Include:
  - Installing Additional Vertical Extraction Wells
    - Will Consider Larger Diameter Wells, Wells with Very Long Sumps, and/or using a Vacuum Recovery System
  - Installing Vertical Extraction Wells that Screen from top of Perched Water Zone all the way to base of Underlying Aquifer
    - Would allow Perched Water to Drain into Underlying Aquifer. Water Recovered using Groundwater Extraction Wells
  - Installing Horizontal Well(s)
  - Evaluating Options to Reduce Surface Infiltration
  - Evaluating Options to Decrease Uranium Leaching
- Develop Data Quality Objective (DQO)/Sampling and Analysis Plan (SAP) for Characterization of the Perched Water