

# D'Angelis Water Treatment Plant – PFAS Removal Update

Town of Millis Select Board, December 6, 2021

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## Project Purpose & Benefit

- Restore a major Town water source to service (Wells 1 & 2 and D'Angelis Water Treatment Plant)
- New PFAS plant will remove PFAS6 chemicals to non-detectable\* levels
- Required to meet new drinking water standard of 20 parts per trillion (ppt)
- Installation of carbon treatment vessels in a new building
- Long term investment in improved Town water supply



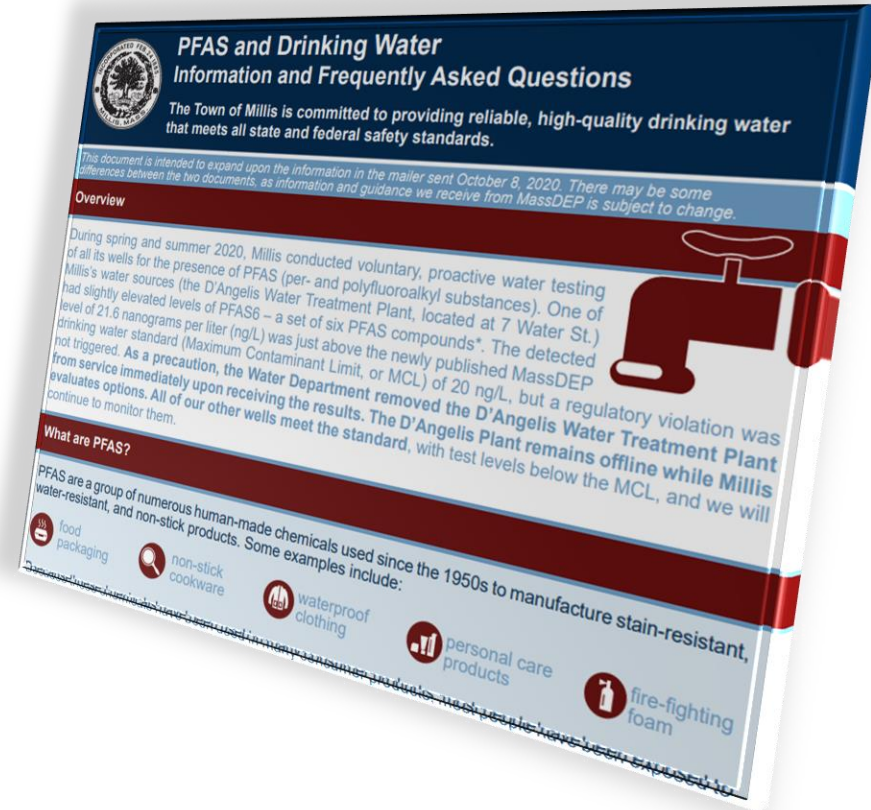
*Existing D'Angelis WTP Building*

(\* Non detectable by current testing methods = to below 2 parts per trillion)

## Timeline and Status

### 2020:

- April – Millis begins proactively testing wells for PFAS
- Sept – Wells 1 & 2 taken offline immediately when results exceed guideline of 20 ppt
- Oct – 20 ppt guideline becomes regulatory standard.
  - Millis launches public information website
- Dec - Kleinfelder submits DEP Grant for Prelim Design



PFAS Fact Sheet, Millis DPW Website

## Timeline and Status

### 2021:

- Jan – Kleinfelder submit estimated Final Design budget
- April – DEP Grant awarded. Preliminary design starts.
- ✓ June – Piloting & Preliminary Design completed on time.
- ✓ July – Begin Detailed / Final Design
- ✓ December – Final Design 95% complete.
- **On Schedule for winter bidding; construction start March 2022**
- ***Millis is at the forefront. Many other Towns are just beginning this process.***



Carbon columns during pilot testing, May 2021

- ***Millis is best positioned for competitive bids and faster completion.***

## Typical design process / schedule:

- Preliminary Design informs budget for Final Design

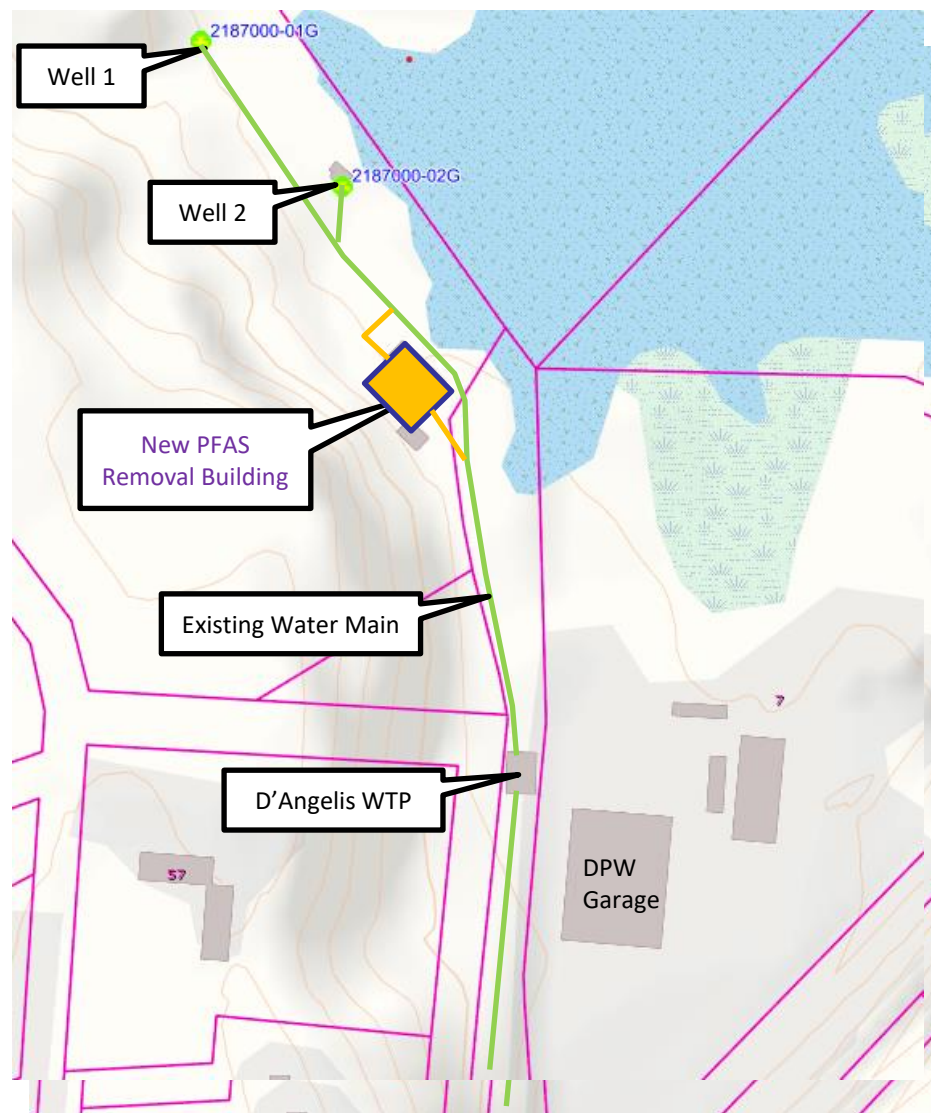
## Millis Accelerated Schedule

- Final design budget estimated before beginning piloting & Prelim design
- Some unforeseen site conditions emerged and had to be incorporated into the design



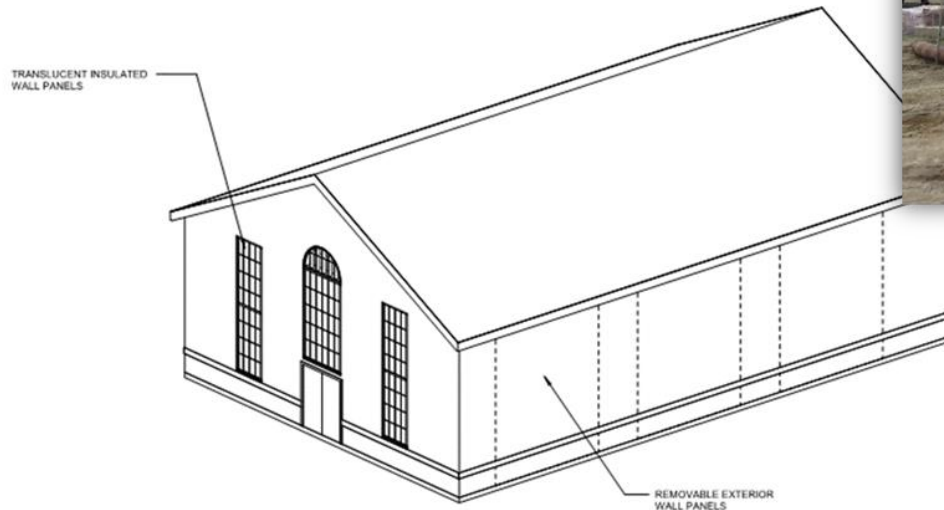
## Design Concepts & Challenges:

- Use existing water mains
- Keep existing processes at D'Angelis WTP
- Preserve traffic flow
- **Limited space on flat ground**
- ✓ **Solution: Demo old storage buildings for new filter building**



## Building & Filter Design

- GAC Contactors (4 x 12-ft diameter)
- Metal building (similar to DPW construction)



*Example of Full size GAC contactors being installed*



# D'Angelis PFAS Treatment Update

- Design Challenge / **Solution:**  
Building - not cost effective to renovate
- Existing unsafe buildings to be demolished
- ✓ **Solution:** hazardous materials inspection & testing;
- ✓ **Solution:** Prepare specialized specifications for bidding; develop costs for construction

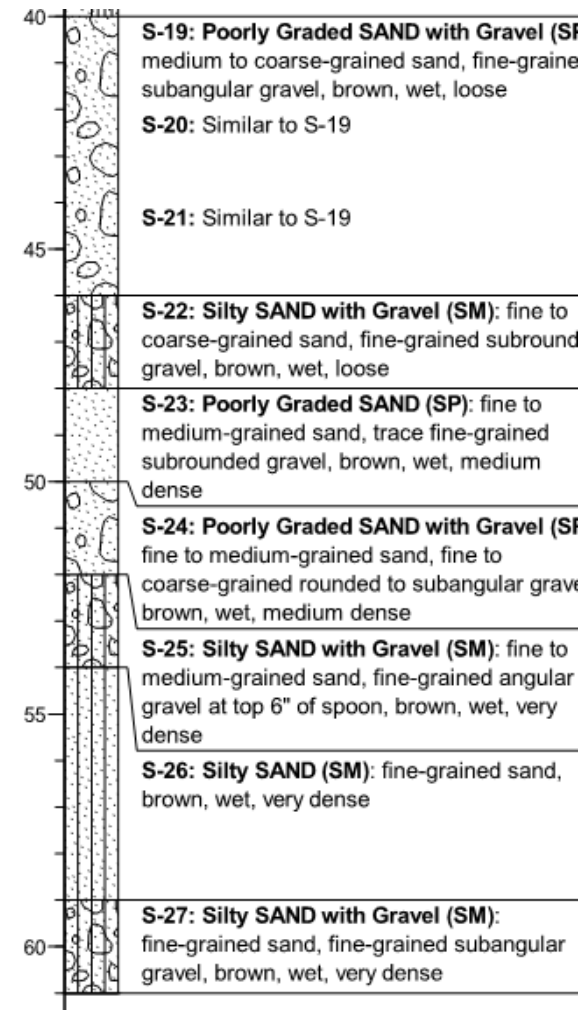




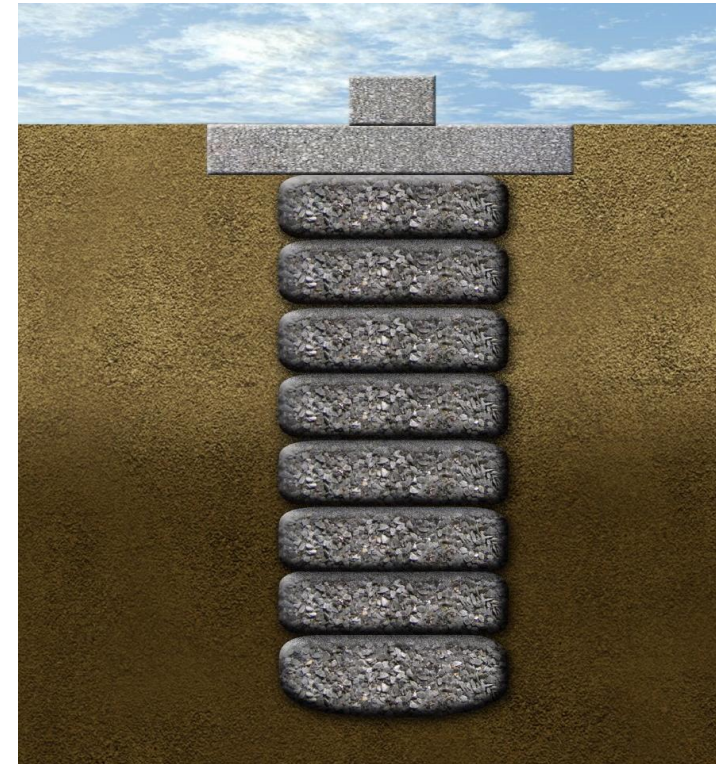
## Design challenge – soils conditions

Additional Geotech testing verified presence of liquefiable soils (loose sands below groundwater) below the area of the proposed building

- ✓ Specialized design was required to prevent risk of foundation settlement
- ✓ Solution: ground improvements via rammed aggregate piers



## Design Solution: Rammed aggregate piers

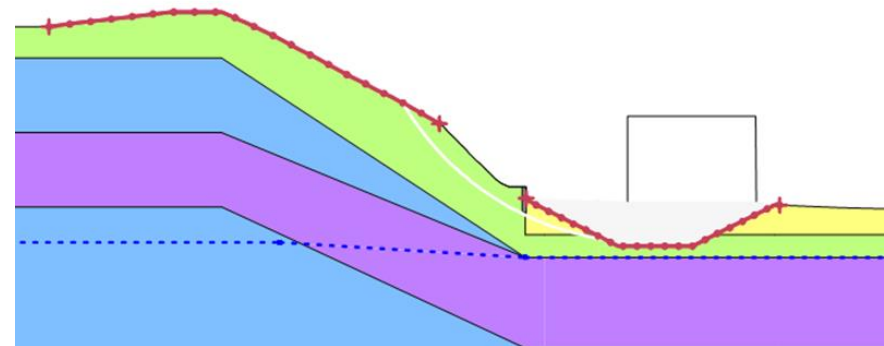
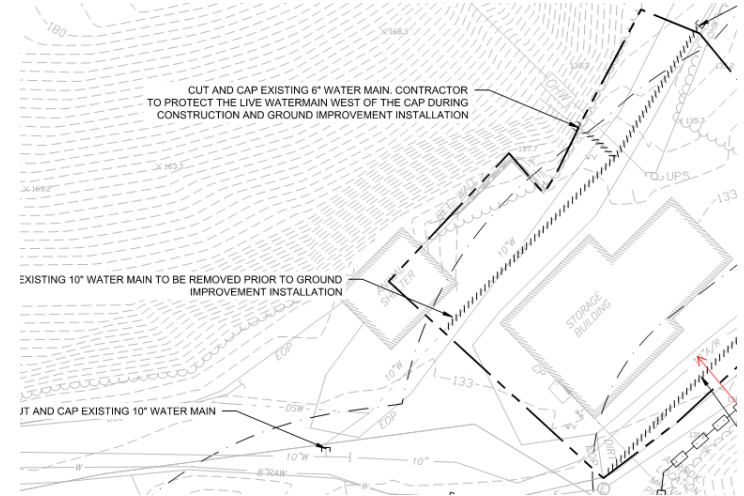


*Graphics: Geopier*

## Design concern – liquefiable soils and slope stability

### Design solution:

- ✓ Verified slope topography & stratigraphy
- ✓ Evaluated existing retaining wall
- ✓ Conducted stability analysis
- ✓ Designed an extension of existing retaining wall
- ✓ Designed rammed aggregate to protect retaining wall





## Basis of requested change order for additional engineering services during final design:

- ✓ Additional Geotechnical drilling & soil testing
- ✓ Additional site survey of adjacent slope
- ✓ Additional geotechnical and structural design calculations & stability analysis
- ✓ Additional geotechnical and structural specifications, drawing preparation & construction cost evaluation
- ✓ Building hazardous materials testing and specifications

## Next Steps

- December –
  - Complete permitting
  - Advertise for bids (late Dec)
- January
  - Bidding
- Feb – March
  - Contract award & begin construction