Conceptual Drinking Water Supply Plan: Scenario Development Update

Hannah Albertus-Benham and Shalene Thomas, Wood

3M PFC Settlement Subgroup 1 Meeting

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Agenda

- ❑ Partial Preliminary Results
- ❑ Groundwater Model update
- ❑ Scenario Development Progress Update

Scenarios Presented in Partial Results

- Treatment – 2020 scenario results only
- Regional – surface water supply scenario results only
  - One large surface water plant
  - Two surface water plants
  - SPRWS

PARTIAL PRELIMINARY RESULTS

Treatment Scenarios – 2020

HI > 1.0 HI > 0.5 PFOS,PFOA, PFHxS > 0 HI > 0

All sampled wells currently not sealed or treated

(only domestic, irrigation, public/non-community supply, "other", and unknown well types)

+

wells (as categorized above) **to be sampled** over the next year in areas where contamination is likely, based on best guess (MDH)

Treatment was applied to municipal wells based on most recent 4-sample average results.

Wells with POETs installed as of 10/24/19 were only counted for O&M costs.

PARTIAL PRELIMINARY RESULTS

Regional Scenarios

- One Regional Surface Water Plant
- Two Regional Surface Water Plants
  - Woodbury served by Mississippi Plant
  - Woodbury served by St Croix Plant
- St Paul Regional Water Services

Used 2040 demands to size systems

Only analyzed costs related to treatment and hydraulic systems; no GW model analysis

Groundwater Model Update

- ✓ Data gathering – COMPLETE ON SCHEDULE
- ✓ Model build – COMPLETE ON SCHEDULE
- ✓ Calibration – NOW COMPLETE (calibration reduced error to 7.9%)

ANALYSES IN PROGRESS

Treatment **50% Complete**

- 2020 – Analyze baseline flow paths
- 2040 – Analyze contamination movement over 20 years and determine flow paths

Regional **60% Complete**

- 2020 – Analyze initial flow paths
- 2040 – Analyze conditions when wells are turned off for surface water scenarios and determine placement of well fields for groundwater scenarios.

Community-Specific **75% Complete**

- 2020 – Determine best fit from community-submitted options and analyze flow paths
- 2040 – Determine contamination movement over 20 years and analyze flow paths

Integrated **25% Complete**

- 2020 – Determine best fit from remaining submitted projects and analyze flow paths
- 2040 – Determine contamination movement over 20 years and analyze flow paths

ANALYSES IN PROGRESS

Treatment Scenarios – 2040

All sampled wells currently not sealed or treated

(only domestic, irrigation, public/non-community supply, “other”, and unknown well types)

+

wells (as categorized above) not sampled in areas where contamination is predicted **using the GW model**

Areas where contamination is predicted will be assigned an HI>1.0; it will not be possible to discern HI>1.0 vs. HI>0.5 vs. HI>0.0

ANALYSES IN PROGRESS

Treatment Scenarios – 2040

Groundwater Modeling

- Particle tracking from current areas of contamination where sampling has occurred

  OR

- Reverse particle tracking to determine if a well location will be in the path of contamination over the next 20 years (particles track back to areas of contamination)

ANALYSES IN PROGRESS

Regional Scenarios

Evaluate conditions when current public water supply wells are turned off

- One Regional Surface Water Plant
- Two Regional Surface Water Plants
  - Woodbury served by Mississippi Plant
  - Woodbury served by St Croix Plant
- St Paul Regional Water Services

Evaluate placement of well fields across the east metro

- One Groundwater Treatment Plant
- Multiple Groundwater Treatment Plants

ANALYSES IN PROGRESS

Regional Scenarios – 2040

One Groundwater Treatment Plant - 52 MGD (Max Day Demand)

- 20+ wells in one area, well sizes would depend on aquifer availability
- Likely places include Denmark and Afton

Multiple Groundwater Treatment Plants – 10-18 MGD each (Max Day Demand) x 3

- 2-4 well fields, well sizes would depend on aquifer(s), at overall average 12,000 gpm and 9 wells each
- To avoid treatment, locations considered include Afton, Denmark, north portions of Lake Elmo and Oakdale, eastern Cottage Grove, and Newport
- Additional areas that would require treatment but are more centralized include Woodbury and Cottage Grove

ANALYSES IN PROGRESS

Community-Specific Scenarios – 2020/2040

- Adjustments to existing systems and creating new systems
  - Baseline existing system models established (Done)
  - Using GW model to determine new well placements where necessary
    - Contamination (PFAS, VOCs, metals) – are there areas where treatment is not necessary?
      - Challenges – GW divide, fractures, buried bedrock valley
    - Availability –
      - Regulatory challenges – White Bear Lake, Mt. Simon aquifer
      - Physical challenges – GW divide, influence on surface water

ANALYSES IN PROGRESS

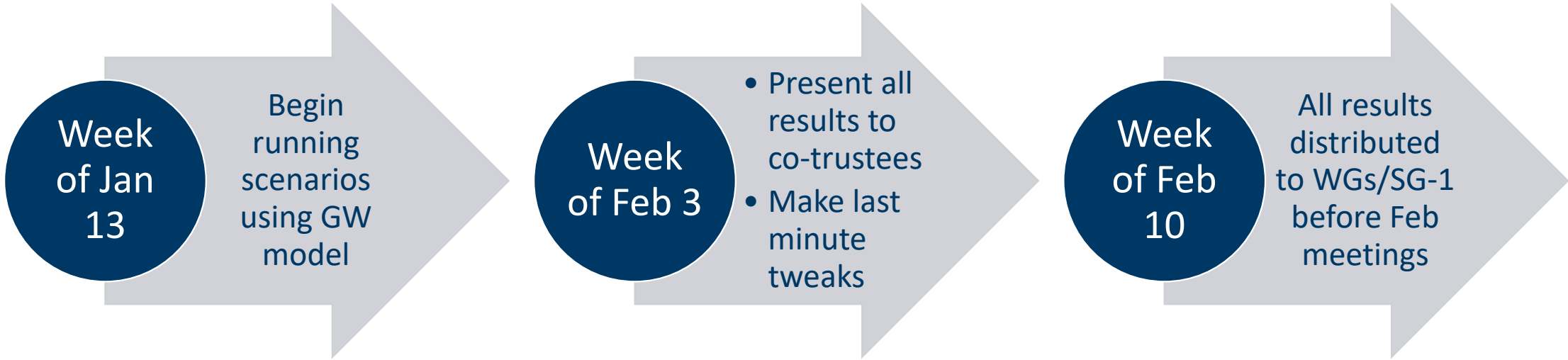
Integrated Scenarios – 2020/2040

- Completing preliminary analyses of different options
  - Neighborhood supply systems determined to be much less cost effective as compared to POETs

Groundwater model considerations same as Community-Specific Scenarios, plus…

- Well fields to serve 2-3 communities, and other connections not explored elsewhere
  - Cottage Grove/Grey Cloud Island/St Paul Park
  - West Lakeland/Lakeland/northern part of Afton
  - Maplewood-Newport/Woodbury

TIMELINE TARGETS



Questions or Comments?

Thank you!

Hannah Albertus-Benham, PE

Wood Environmental & Infrastructure Solutions

Hannah.albertus@woodplc.com

612.252.3657

Shalene Thomas

Wood Environmental & Infrastructure Solutions

shalene.thomas@woodplc.com

612.252.3697

MINNESOTA POLLUTION CONTROL AGENCY