

City of Dayton Water Treatment Working Session

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Agenda

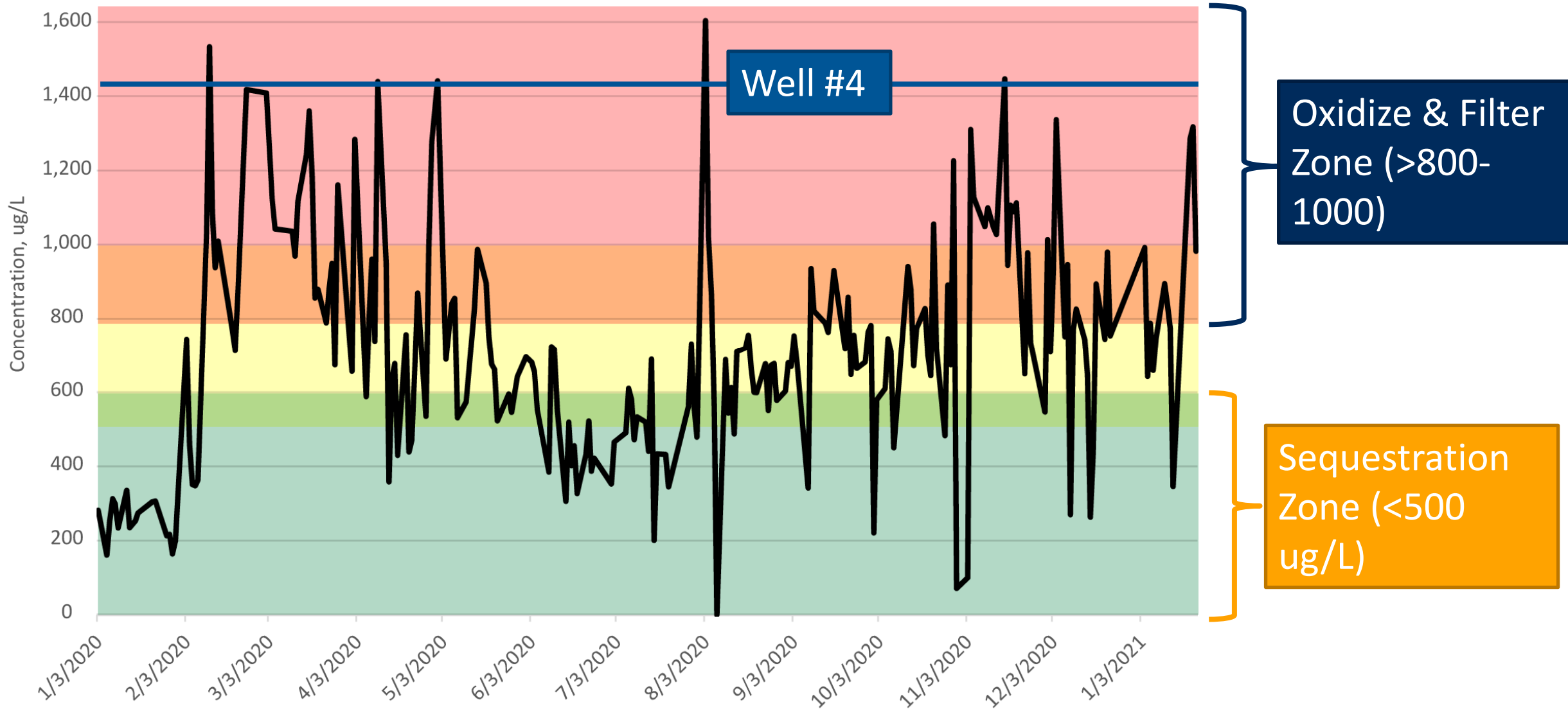
- Background
- Treatment Options
 - In-Home Treatment
 - Wellhead Treatment
 - Centralized Treatment
- Lifecycle Comparison
- Discussion

Background

Water Quality Data

	Target (Secondary Standard)	Well #1	Well #2	Well #3	Well #4
Iron ($\mu\text{g/L}$)	300	1020	980	1010	1420
Manganese ($\mu\text{g/L}$)	50	328	93	195	60

Iron & Manganese – The Larger Issue

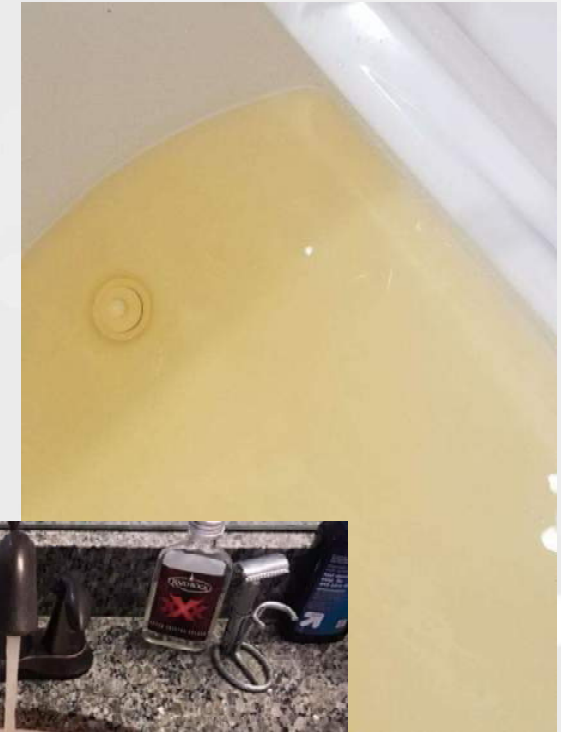


Well #2 Data



Water Quality Implications

- Wells currently designed for adding Chlorine (oxidizing Iron) and Phosphate (sequestering Iron)
- High Iron (over 500 ug/L) will result in
 - Particulate Iron in solution (red water)
 - Metallic tasting water
 - Potential for rotten egg smell



Treatment Options



Treatment Options

- Oxidize Iron with Chlorine
- Filter out with media filter
 - Potentially use Greensand for Manganese removal
- Options
 - In-Home Treatment
 - Wellhead
 - Centralized



Home Systems

- Included iron/manganese treatment systems from 4 manufacturers available online and/or at retail stores.
- Did not include softening in the assessment
- Average purchase cost - \$2,500
- Average annual maintenance cost - \$360



Inclusion in this assessment is not an endorsement of the effectiveness of any particular product

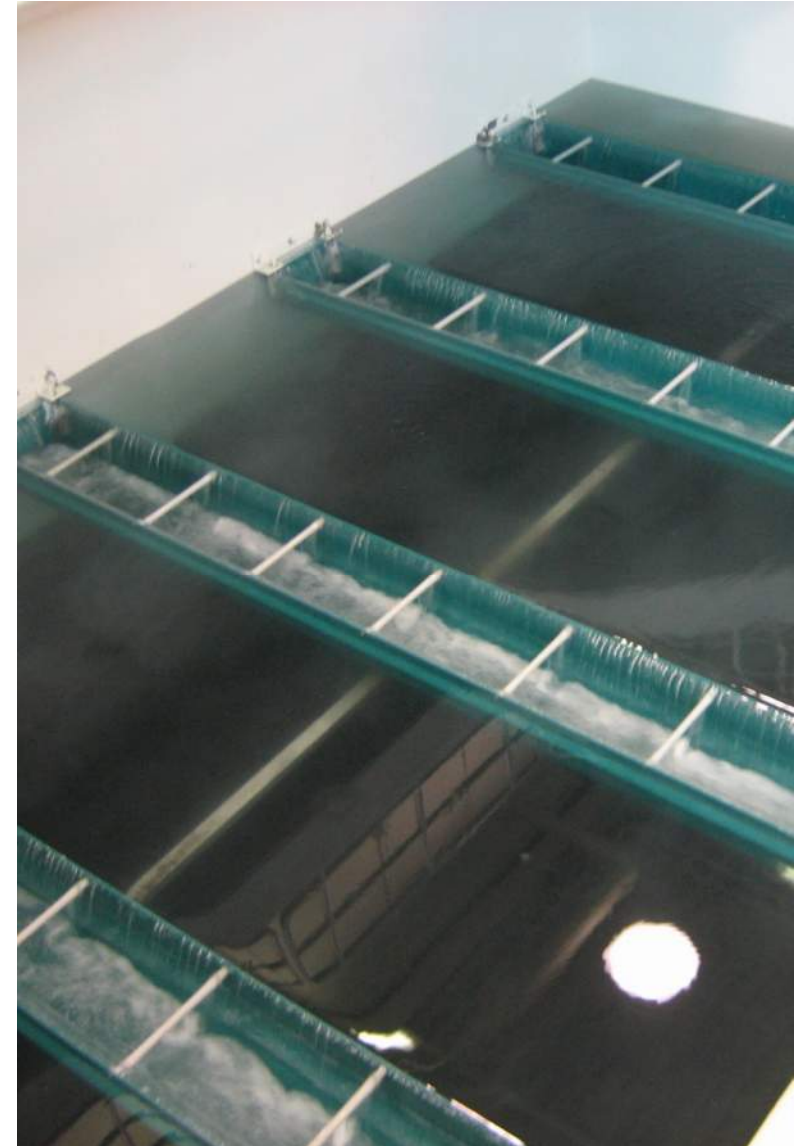
Wellhead Treatment

- Smaller treatment plants designed to treat up to 2 wells.
- Packaged pressure filter technology for removing iron and manganese.
- For 10 MGD, would need 4 treatment facilities
- Assumed Costs
 - \$4M total project cost for treatment facility.
 - \$750,000 rehab every 25 years per facility
 - \$450/MG produced annual O&M cost



Centralized Treatment

- Large 10 MGD treatment facility to treat all water for the NE.
- Envisioned in the 2007 master plan
- Concrete gravity filter technology for removing iron and manganese.
- Assumed Costs
 - \$24M cost for treatment facility.
 - \$2,000,000 rehab every 25 years
 - \$400/MG produced annual O&M cost



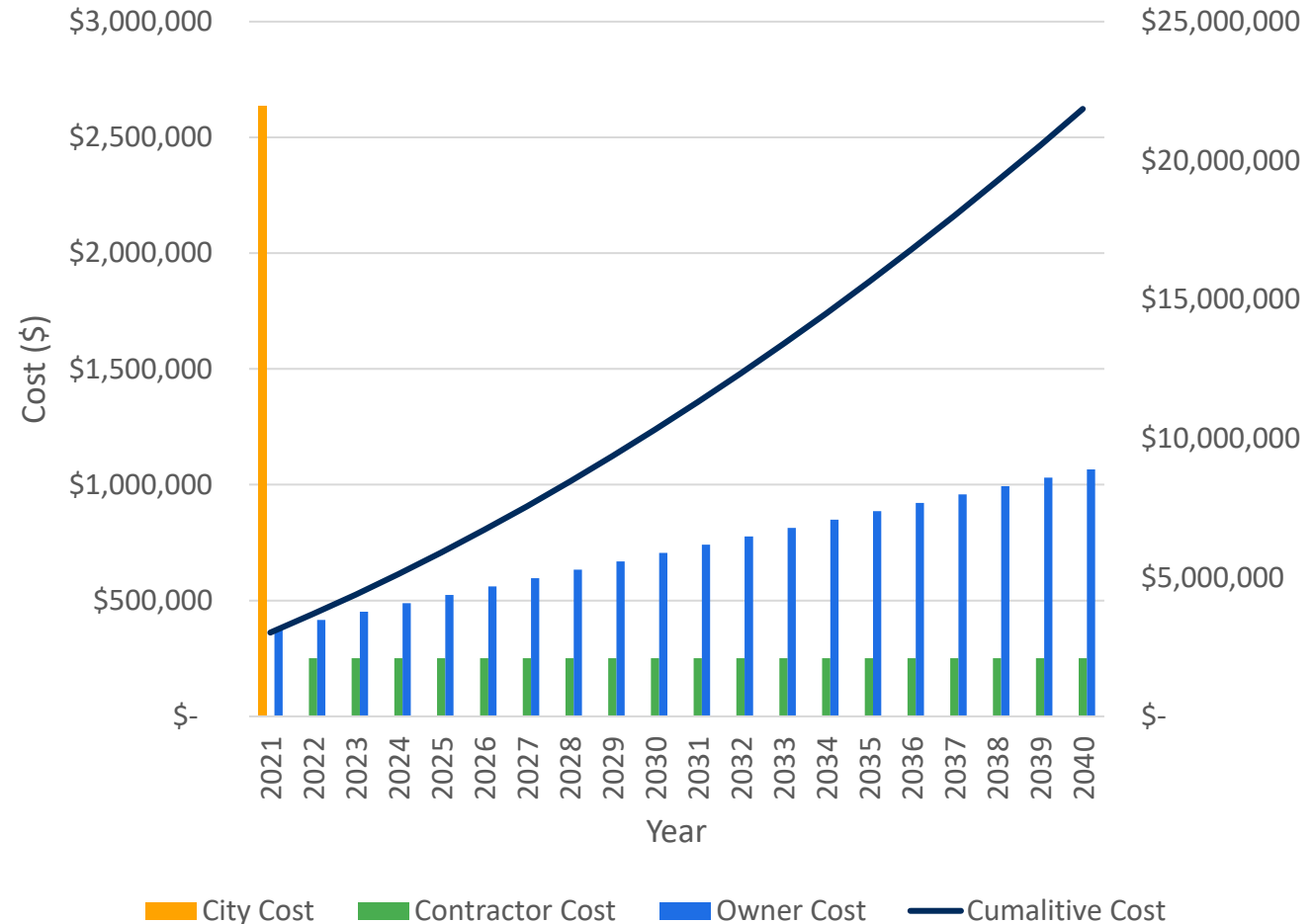
Lifecycle Cost Comparisons

In-Home Treatment

Costs

- **City Cost**
 - **\$2,500 for Existing Customers**
- **Homeowner Cost**
 - **\$360 per household per year**
 - **Replacement of Home System after 20 years.**
- **Contractor Cost**
 - **\$2,500 per unit at 100 houses per year**

20 Year In-Home Treatment Cost

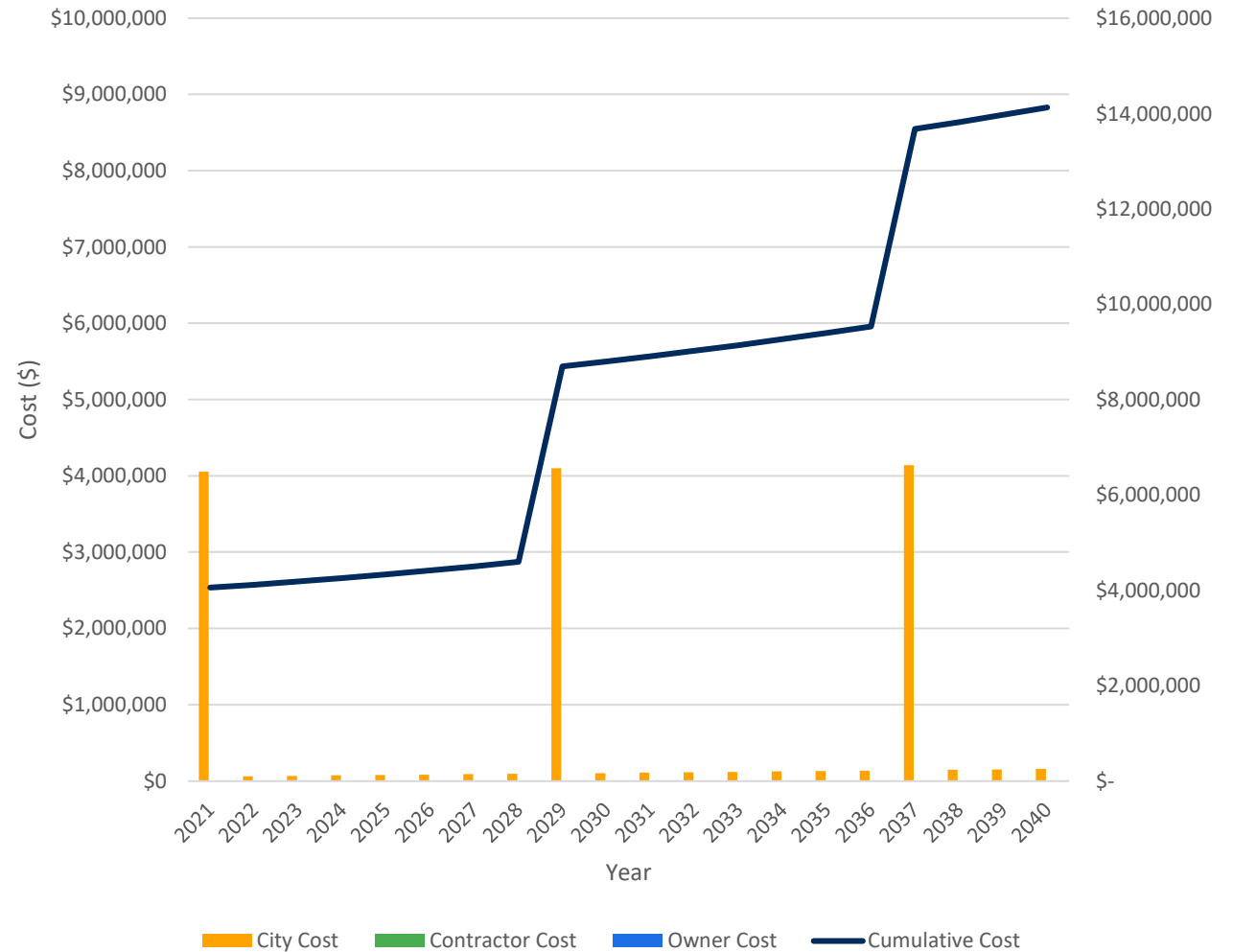


Wellhead Treatment

Costs

- City
 - \$4,000,000/facility
 - \$750,000 every 25 years
 - \$450/MG
- Homeowner Cost
 - None
- Contractor Cost
 - None

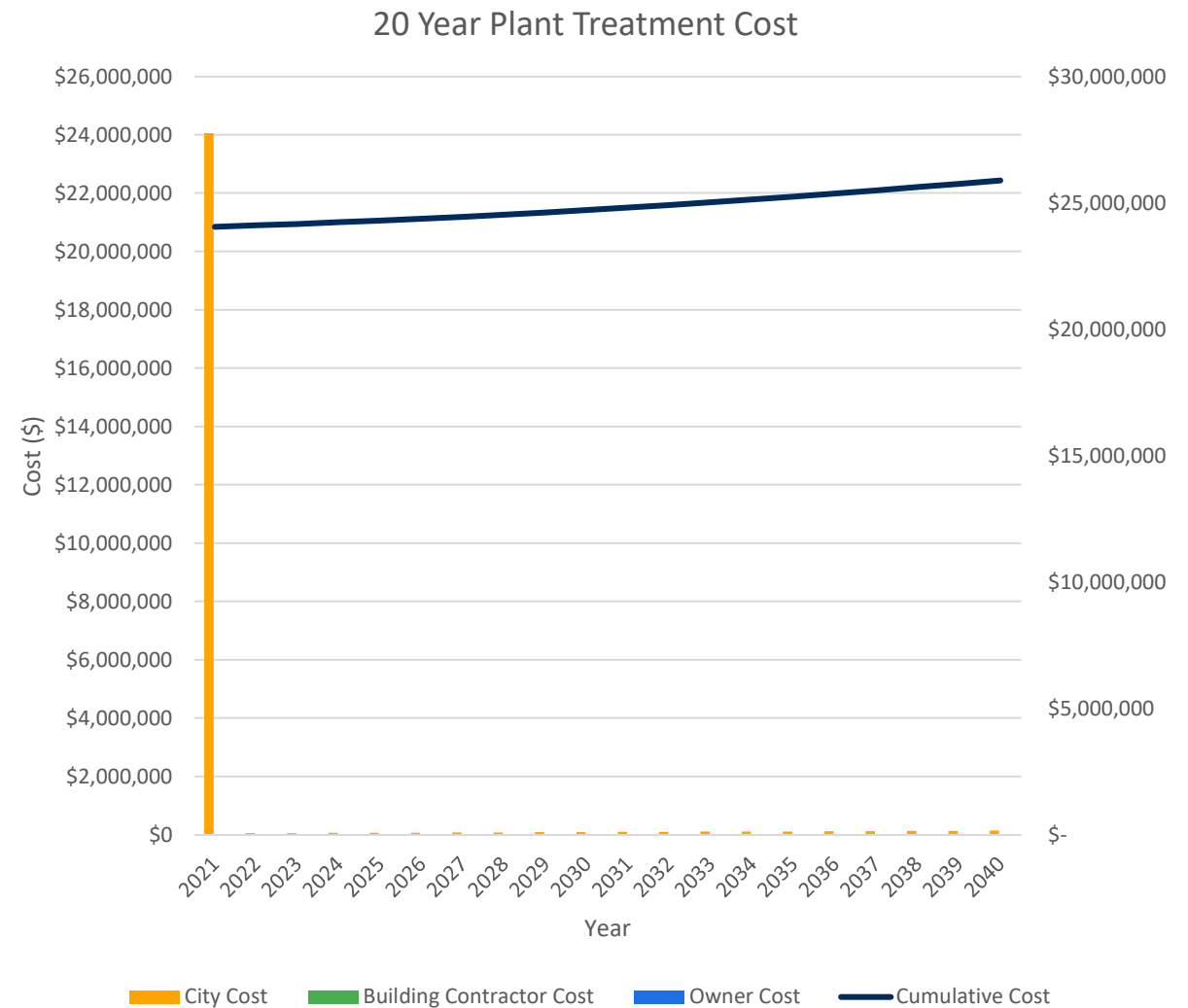
20 Year Wellhead Treatment Cost



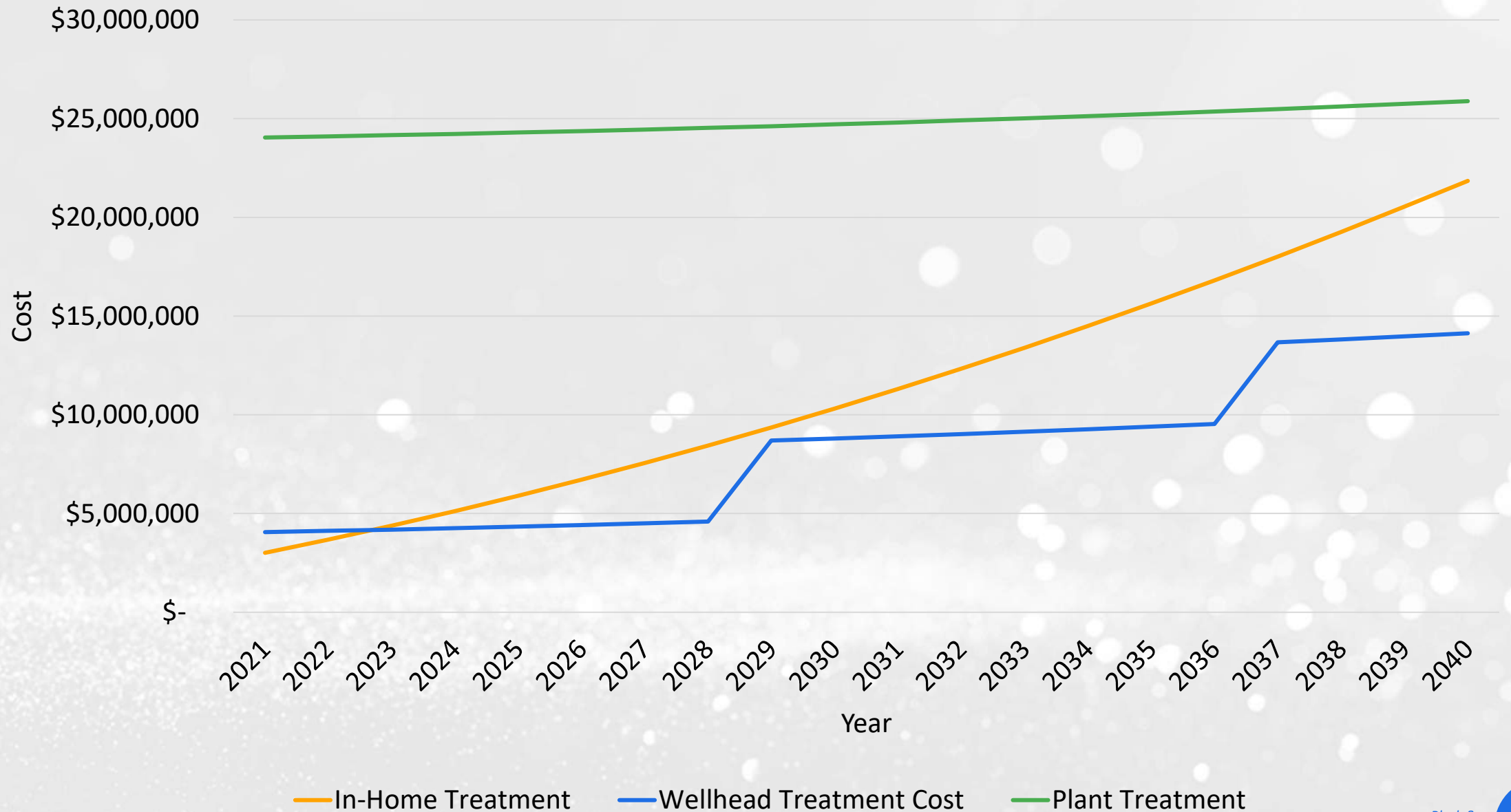
Centralized Treatment

Costs

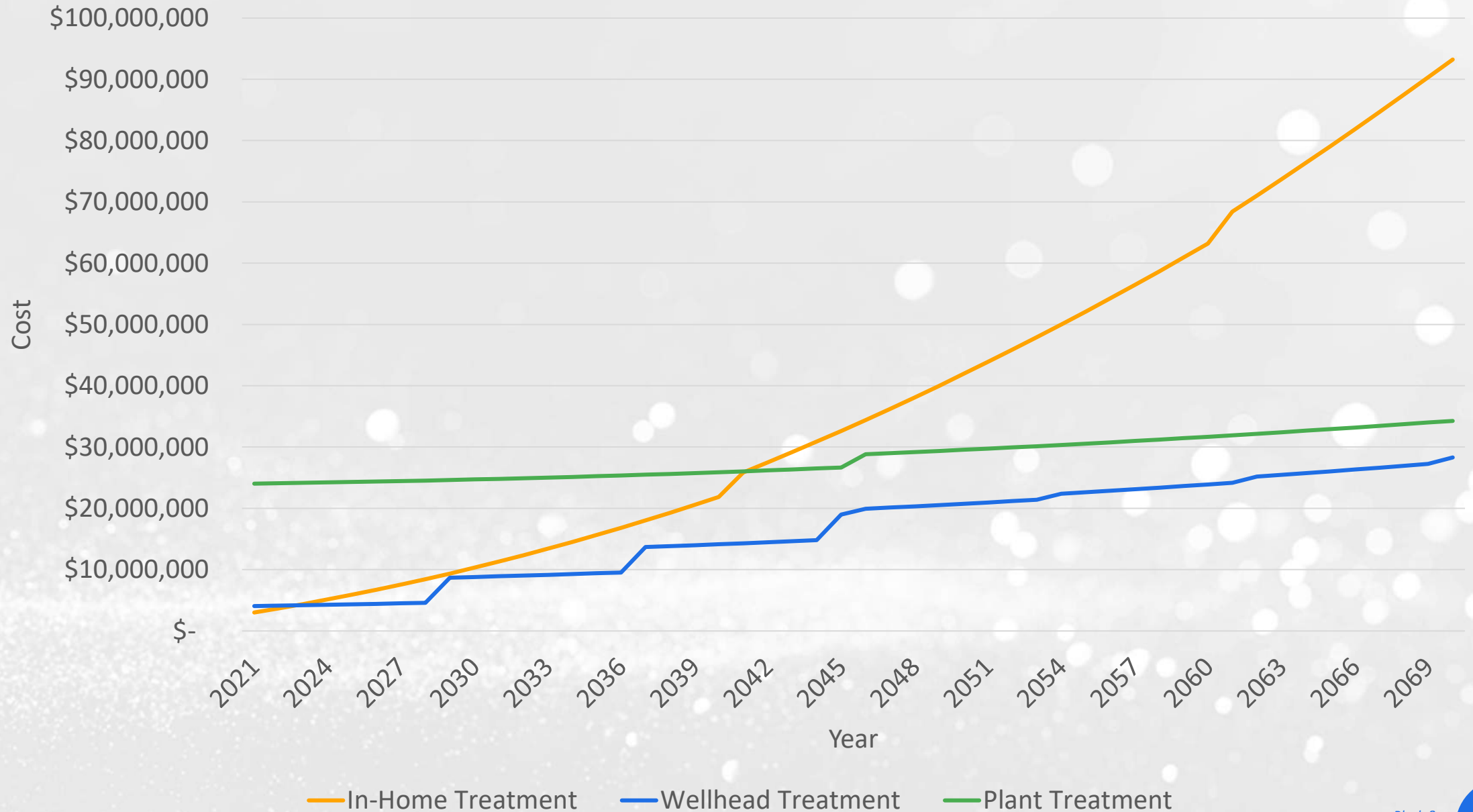
- City
 - \$24,000,000/facility
 - \$2,000,000 every 25 years
 - \$400/MG
- Homeowner Cost
 - None
- Contractor Cost
 - None



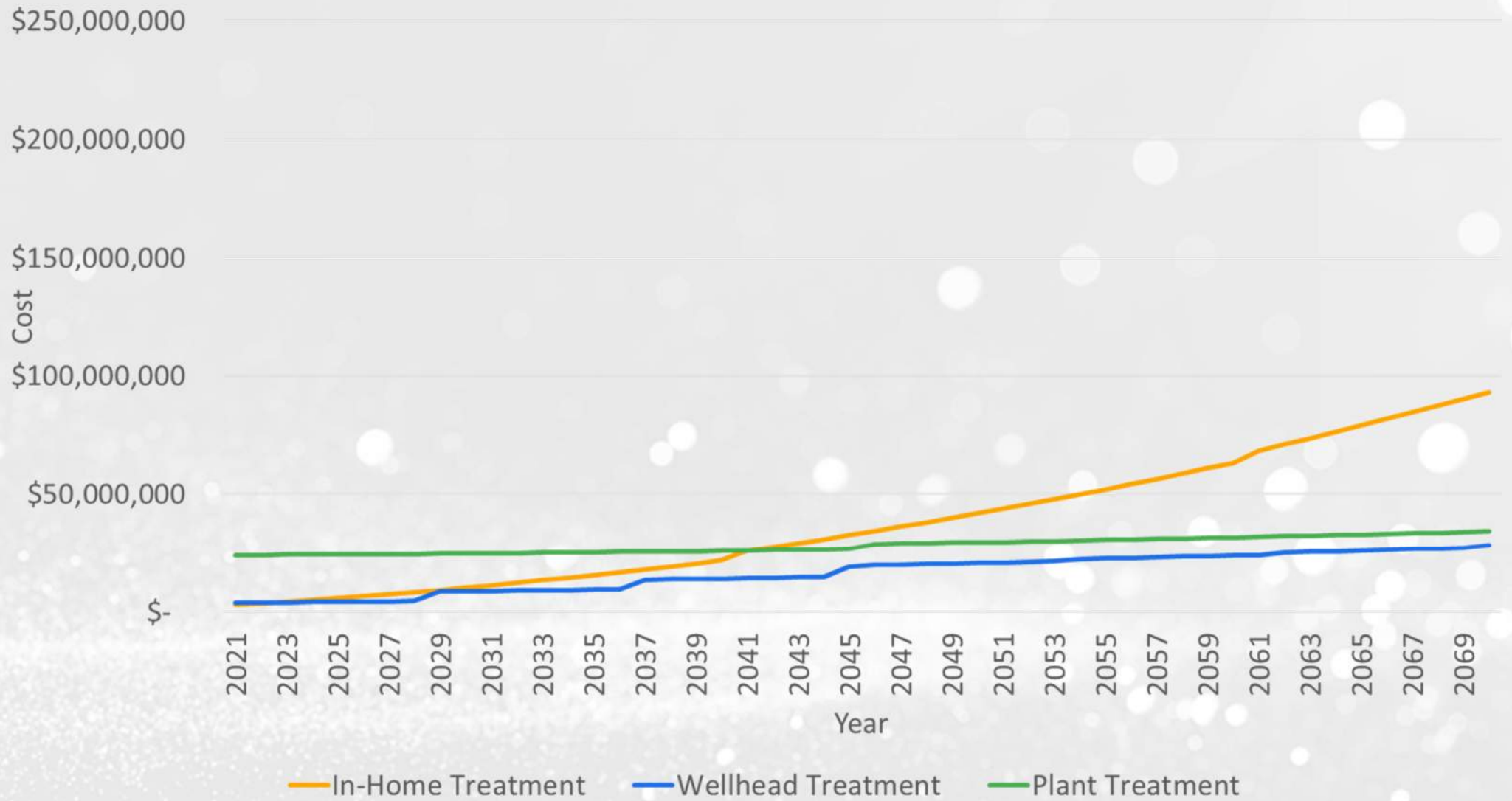
20-year Comparison



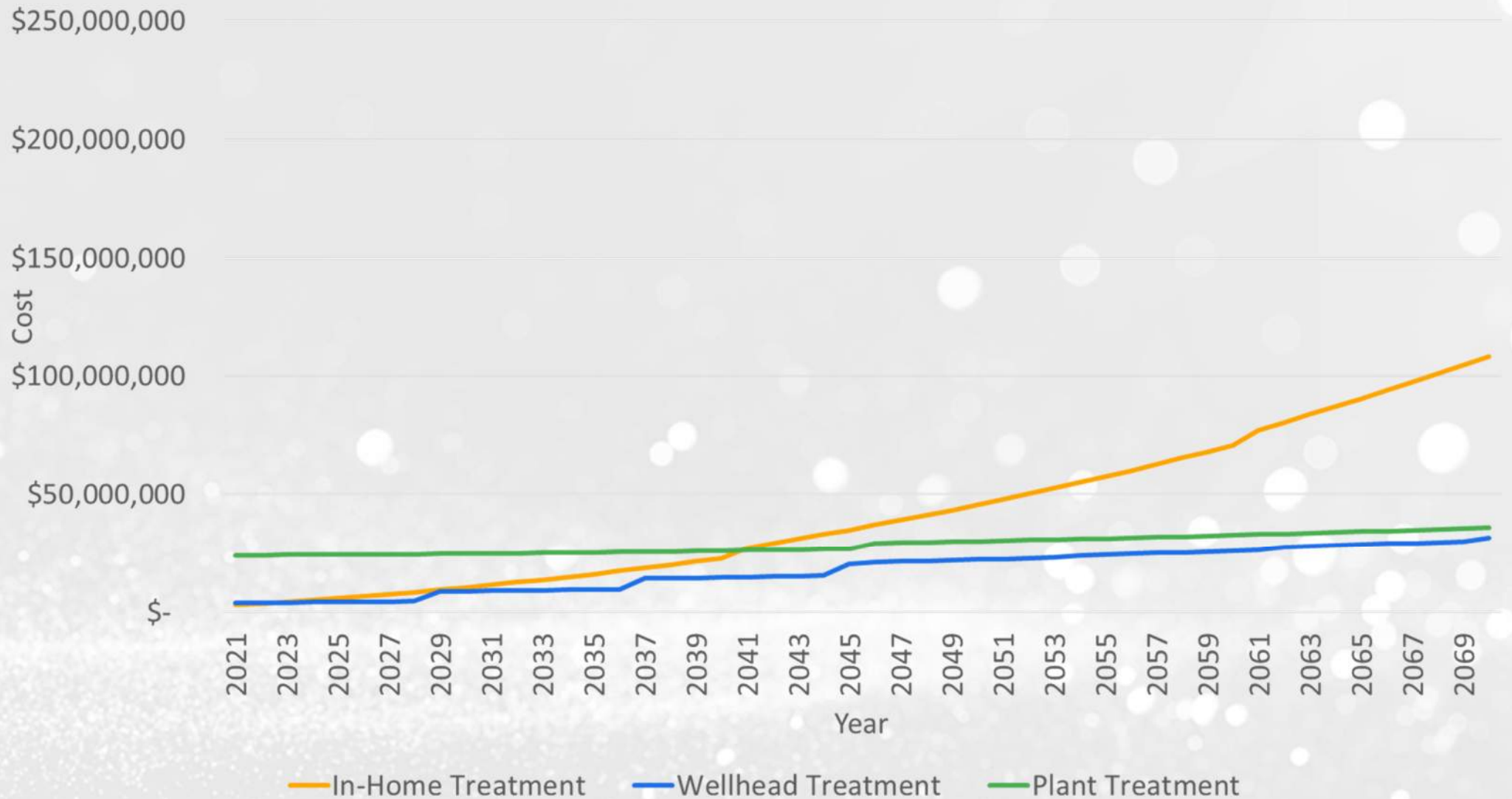
50-year Comparison



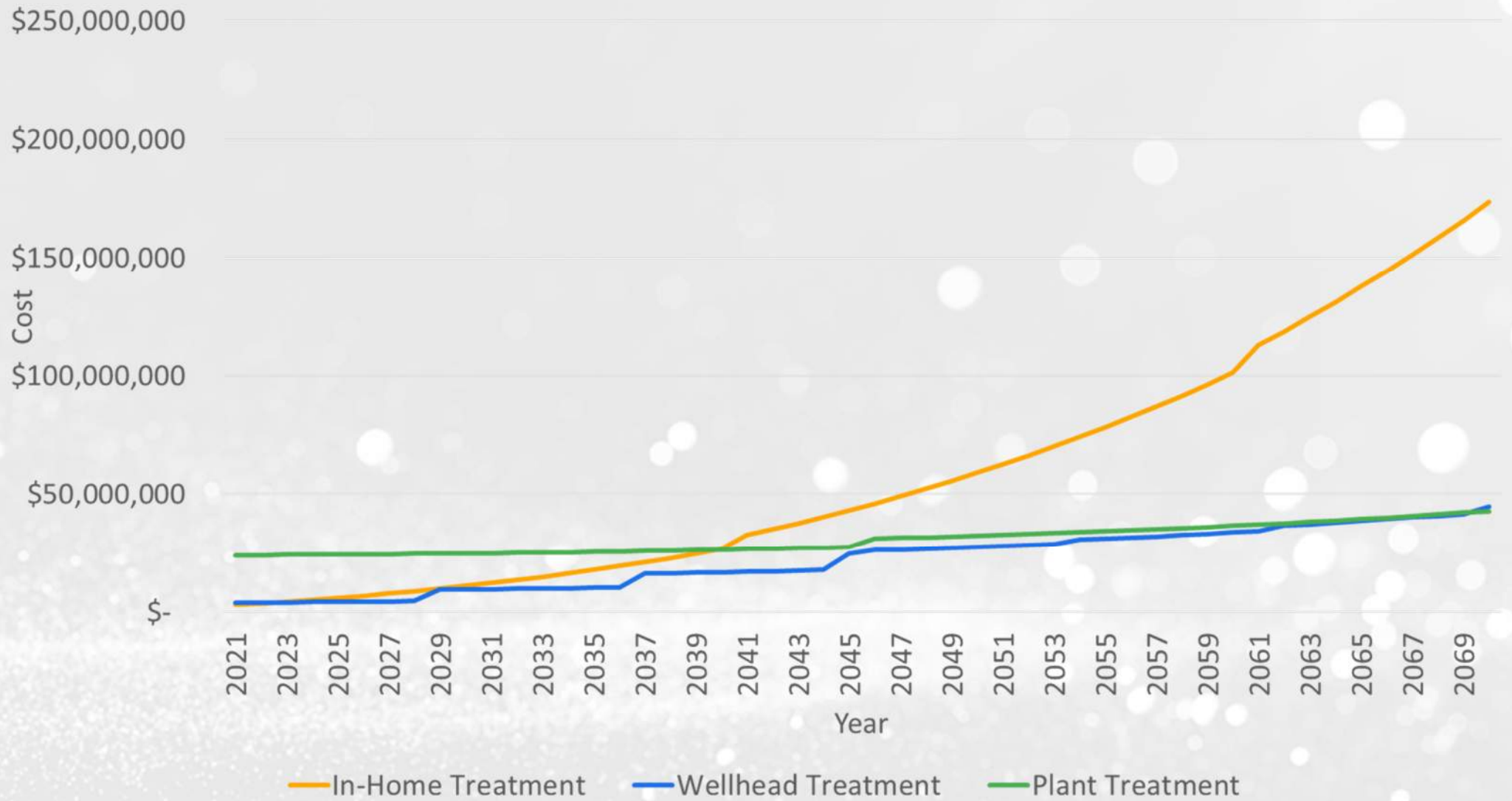
Cost of Money Comparison – 0%



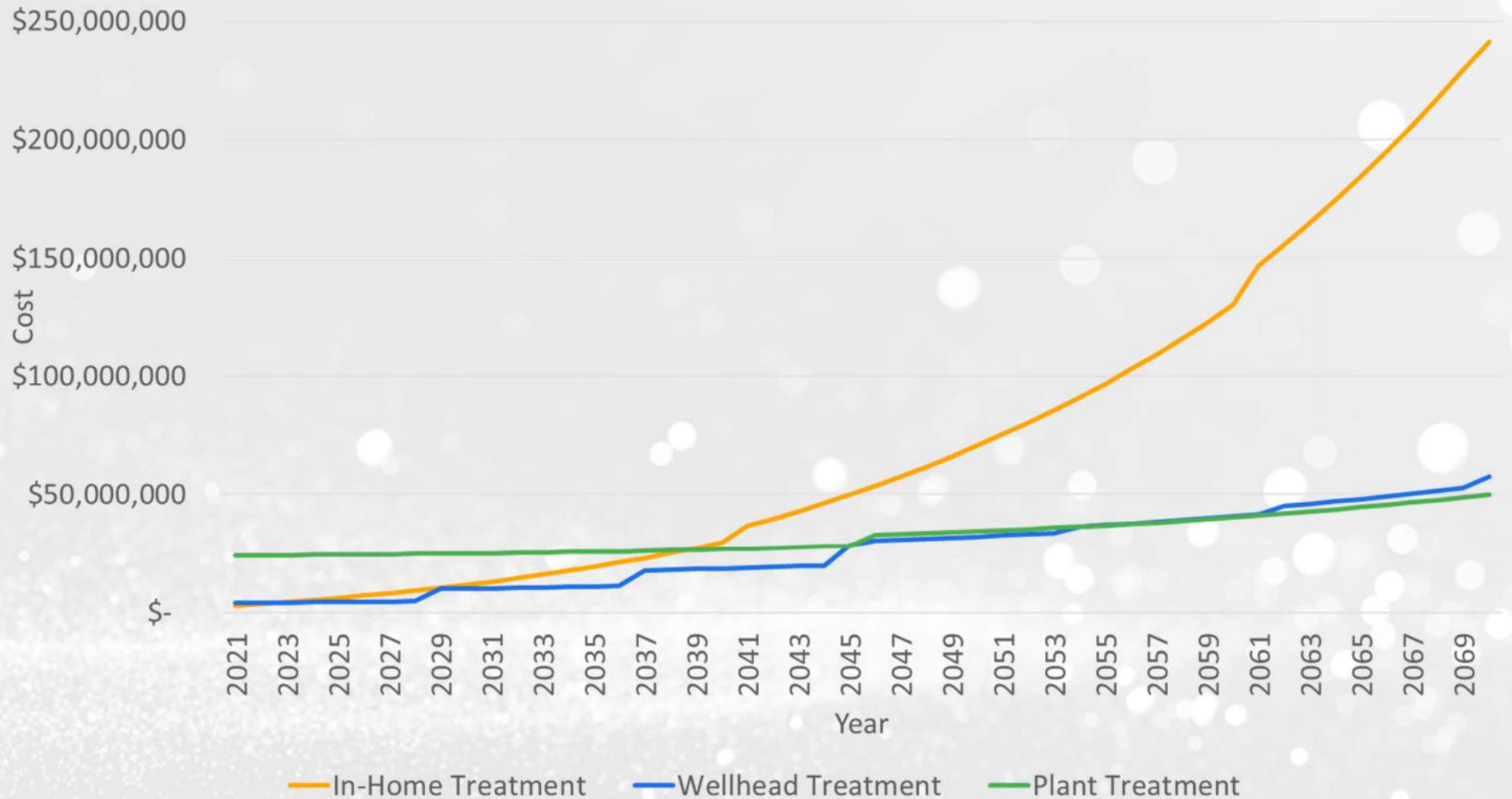
Cost of Money Comparison – 0.5%



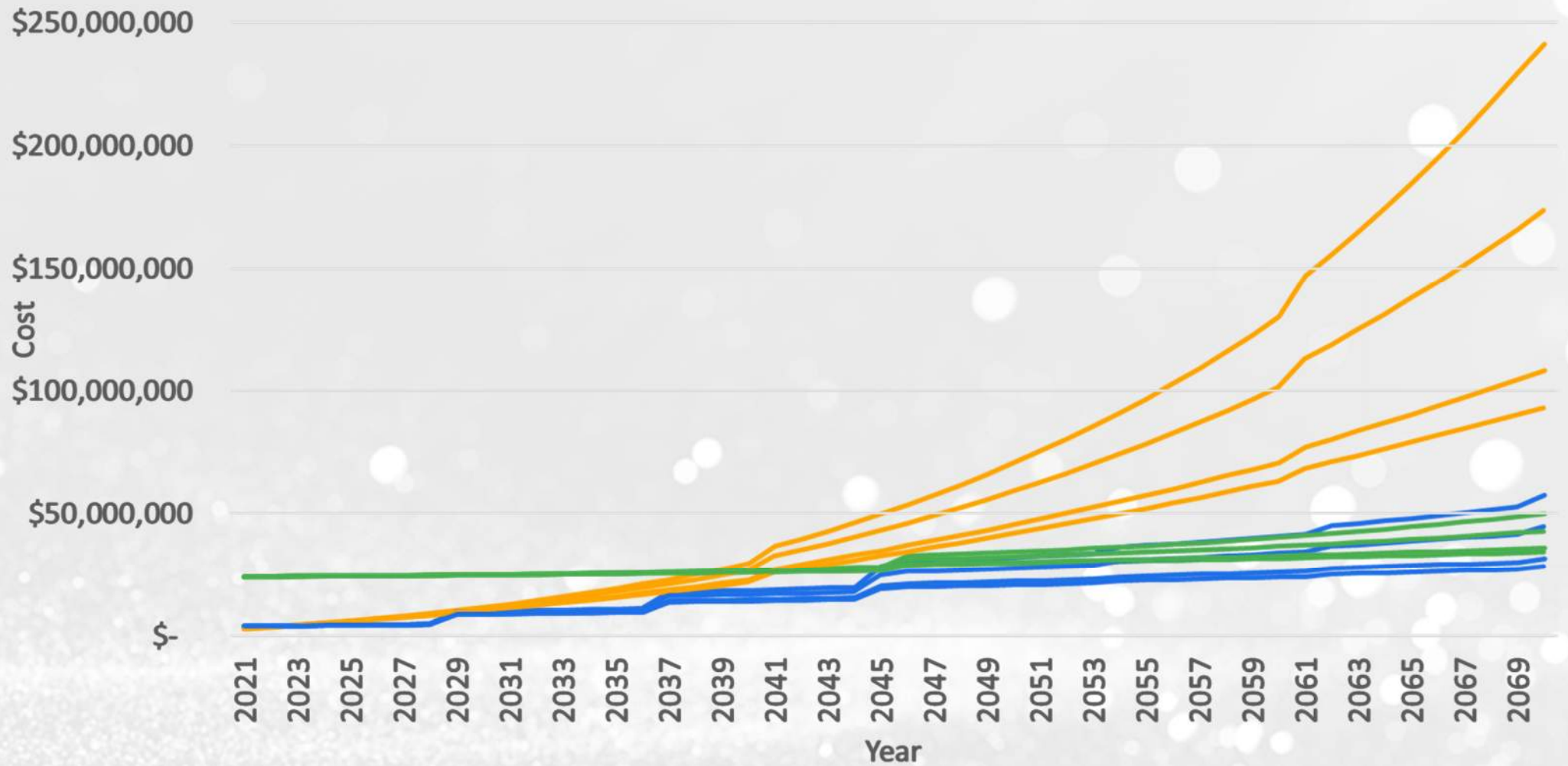
Cost of Money Comparison – 2%



Cost of Money Comparison – 3%



Cost of Money Comparison – 0-3%



— In-Home Treatment — Wellhead Treatment — Plant Treatment

Discussion.