### Nutrient Regulations Impacts to the San José-Santa Clara Regional Wastewater Facility

### Transportation and Environment Committee

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Eric Dunlavey, Program Manager, Environmental Services Jennifer Voccola Brown, Division Manager, Environmental Services



### **Regional Wastewater Facility**

- Operating continuously since 1956
- Largest advanced wastewater facility in West
  - 167 MGD capacity
- Serves
  - 1.5 million people
  - 17,000 businesses
  - 8 cities & County
- Subject to multiple discharge permits



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### **Nutrient Permit**

- SF Bay has much higher nitrogen levels than other large urban Bays
- 2/3 of Bay's nutrients from wastewater treatment plant discharges
- Group Nutrient Permit since 2014



Wastewater

### Why Nutrients Matter?

- Elevated nutrients can lead to excess algae growth
- Excess algae growth can:

Lower dissolved oxygen, suffocating fish



Elevate levels of toxin producing algae (HABs)



### The August 2022 Red Tide

- Heterosigma akashiwo
  - Toxic effects
  - Brown or red water





## San Francisco Chronicle

Poop and pee fueled the huge algae bloom in San Francisco Bay. Fixing the problem could cost \$14 billion



### Lower South Bay Bloom Conditions

# Conditions didn't degrade in Lower South Bay like they did in South and Central Bays.





### **Regulatory Consequences of Bloom**



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egional

### **Regulatory Consequences of Bloom**

- Two Limits proposed by regulators for the new permit:
  - 1. Interim Limit that must be complied with from 2024 2034
  - 2. <u>Final Limit</u> that must be achieved by 2034 and maintained in perpetuity
- The Challenge for RWF:
  - Nitrogen that RWF receives will change due to increased population and flow
  - Increased nitrogen removal efficiency will be necessary to meet fixed limits
  - Removing more nitrogen requires additional management actions, including process improvements that increase capital costs

### **Nutrient Management Options**



Treatment Process Upgrades (will be required)

# Water Recycling (projected expansion)









#### Nature-based Solutions (under evaluation)



### Nutrient Management Options

| Nitrogen Management Strategy     | Importance<br>for<br>Compliance | Cost per kg<br>nitrogen<br>reduced | Implementation<br>timing |
|----------------------------------|---------------------------------|------------------------------------|--------------------------|
| Process Upgrades – Phase 1       | Very High                       | N/A                                | 2029                     |
| Process Upgrades – Future phases | Very High                       | N/A                                | 2032 – 2041              |
| Recycled Water Expansion         | High                            | \$64                               | 2024 - 2034              |
| Potable Reuse                    | Low                             | \$15,560                           | TBD                      |
| Nature Based Treatment Solutions | Medium                          | TBD                                | TBD                      |



## **Conclusion – Ongoing Actions**

- Continue engagement in development of nutrient regulations
  - Positions taken are science-based
  - Ensure RWF requirements account for past upgrades
- **Continue Planning** the initial phases of process upgrades
  - Necessary to meet regulations long term
  - Phase 1 implementation demonstrates commitment
- Continue to explore and implement alternative nutrient management actions as appropriate
  - Non-potable recycling and nature-based treatment provide additional flexibility to future capital upgrade timing.

