TOWN OF PARADISE
SEWER PROJECT

Special Town Council Meeting

July 24, 2025

Meeting Overview

Part 1: Introductions and Background

Part 2: Project Alternative Analysis Process

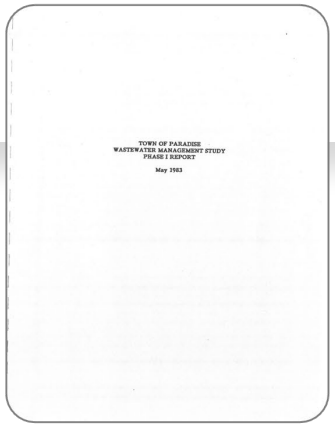
Part 3: Summary of Alternatives

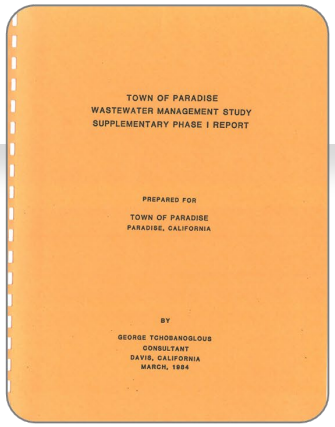
Part 4: Ad Hoc Recommendation & Next Steps

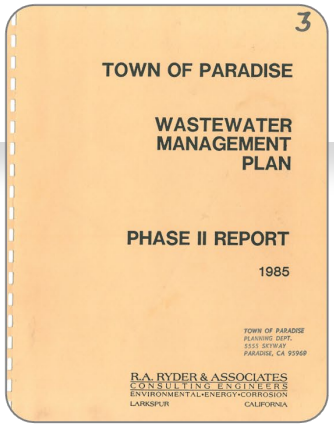
Part 5: Public Comments

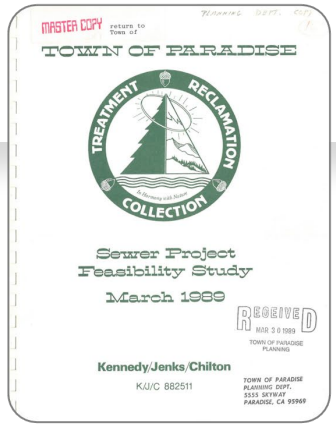
History

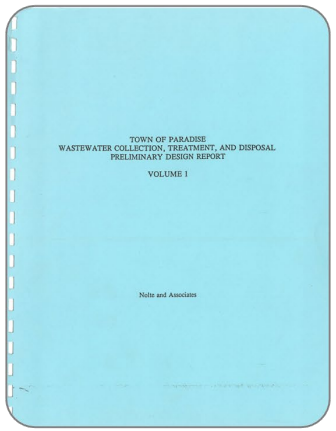
- 1969 Butte County General Plan Water and Sewer Element
- 1972 Basin Sewer Service Area Plan
- 1975 Montgomery Engineering Report
- 1983 Phase I Wastewater Management Study
- 1984 Phase I Supplemental Study
- 1985 Phase II Wastewater Management Study
- 1989 Feasibility study
- 1990 Wastewater District Formed for Commercial only
- 1993 Council action abandoned sewer project
- 1994 Downtown Master Plan
- 2011 Wastewater Treatment & Collection Feasibility Study
- 2017 Paradise Sewer Project Feasibility Study
- 2020 Paradise Sewer Project HDR Engineering Phase I
- 2022 Paradise Sewer Project Environmental Impact Report
- 2024 Collection System and Export Pipeline Basis of Design Report

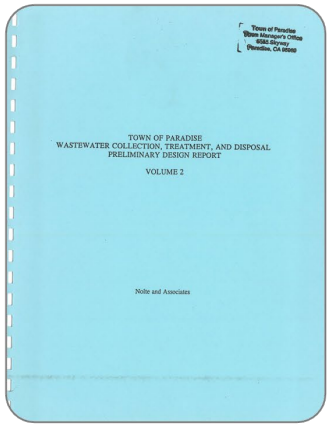


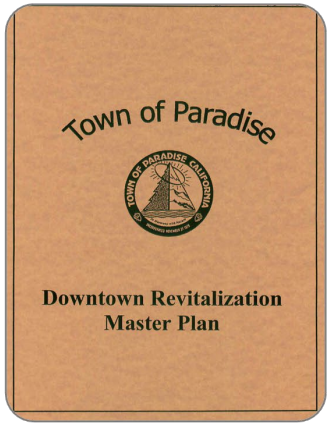


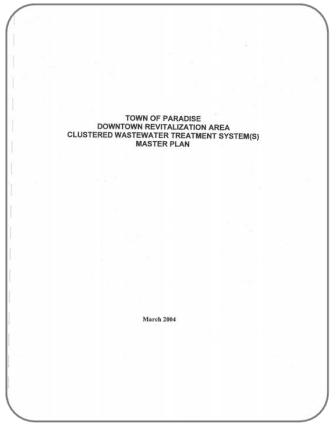


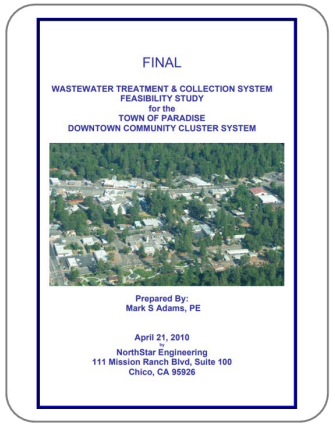


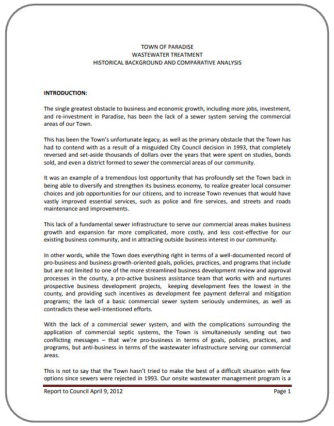


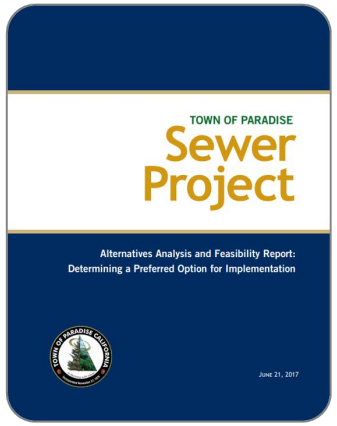


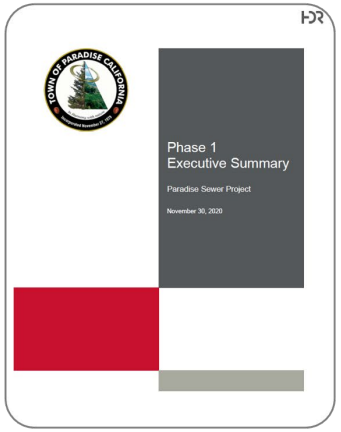












Background


2022 Programmatic Environmental Impact Report
2023 Paradise-Chico Inter-Municipal Agreement
2024 Progressive Design Build Team Hired
2025 Basis of Design Report
Cost Increases
Funding Decreases
January 2025
Special Meeting
Change to Local Treatment Project
Ad Hoc Committee Established
Public Outreach &
Local Alternatives Analysis
July 24, 2025
Present Findings
(TONIGHT)
Review Public Input
August 14, 2025
Consider Formal Action

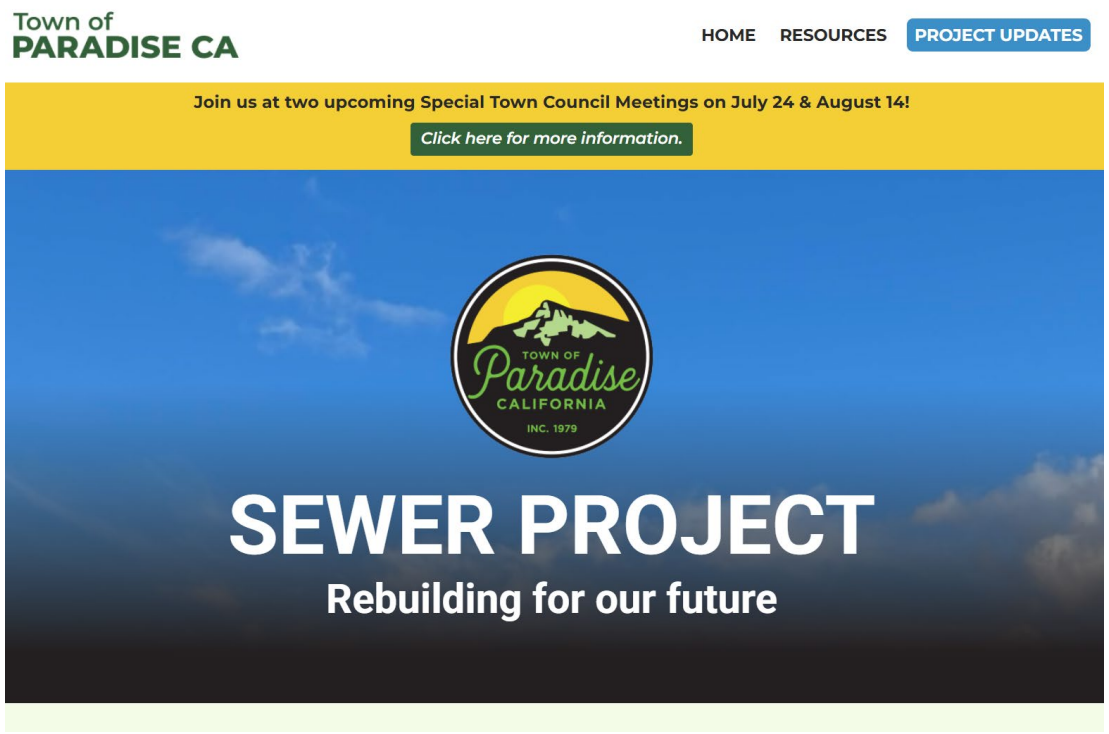
Sewer Project Ad Hoc Committee

- **Committee Purpose:** Increase project momentum while keeping the public apprised of project progress to find a fundable, permittable, scalable wastewater collection and treatment solution.

- **Members:**
  - Mayor Steve Crowder
  - Councilmember Heidi Lange
  - Town Manager Jim Goodwin
  - Town Staff: Marc Mattox, Colin Nelson, Chris Nicoletti
  - Paradise Irrigation District: Kevin Phillips, Bob Mathews, Marc Sulik
  - Technical Advisory – HDR Representatives
  - Regulatory Advisory – Regional Water Quality Control Board

Revised Project Within Budget

- Achieve goals of Ad Hoc Committee (fundable, permittable, scalable wastewater collection and treatment solution)
- Emphasis on delivering an affordable Phase 1 Project with reduced Collection System Area and sited treatment facility and dispersal method.
- Utilize funding secured and probable as quickly as possible to deliver a project – now!



Funding Overview

Secured Funding

(1)	CDBG-DR APA-2 Design	$30,000,000 (active for pre-construction)
(2)	CDBG-DR Town Allocation	$35,000,000 (secured for construction)
(3)	EPA Community Grant	$1,750,000 (pending)

Clean Water SRF Funding Opportunities

(4)	Clean Water SRF (Grant)	$28,097,669
(5)	Clean Water SRF (Grant)	$TBD Future

Additional Funding Pursuits (Future Project Phases)

(6)	USACE 219 - Initial Request	$2,000,000
(7)	USACE 219 - Remaining Butte County Allocation	$48,000,000

Secured & Probable Funding available for the whole project "Cost to Complete" Budget $84,847,669 (Sum of 1-4 minus $10M expended to date)

TOWN OF PARADISE
SEWER PROJECT

Alternative Analysis Process

Project Alternatives Analysis Activities

January
- Council decision to pursue local treatment options & reform the Sewer Project Ad Hoc Committee – 1/21
- Ad Hoc Committee first meeting – 1/30

February
- Public vendor solicitation published – 2/18
- Water Board engagement

March
- Community Input Meeting – 3/6
- Community Poll – 3/6-3/27
- PID participation in Ad Hoc Committee begins

April
- Met with community members & equipment vendors about the project

May
- Staff & Council trip to Washington DC
- Submitted Army Corps LOI

June
- Wastewater facility tours – 6/3-6/4
- Virtual meetings with additional agencies
- Project Alternatives Workshops – 6/23-6/24

July
- Ad Hoc Committee Recommendation
- ***Special Town Council Meeting – 7/24***

August
- Community feedback on recommendation
- ***Special Town Council Meeting – 8/14***
- Town Council Approval of a recommended alternative

Community, Industry, and Public Agency Input Meetings

Community Members

- Jeff Gillingham
- Cliff Jacobsen
- Bill Kellog
- Kelly Konzelman
- Dana Ripley

Equipment Vendors

- AeroMod
- BioFiltro
- Cloacina
- Fluidyne
- Green Toilet
- Innovatreat

Public Agency In-Person Facility Tours

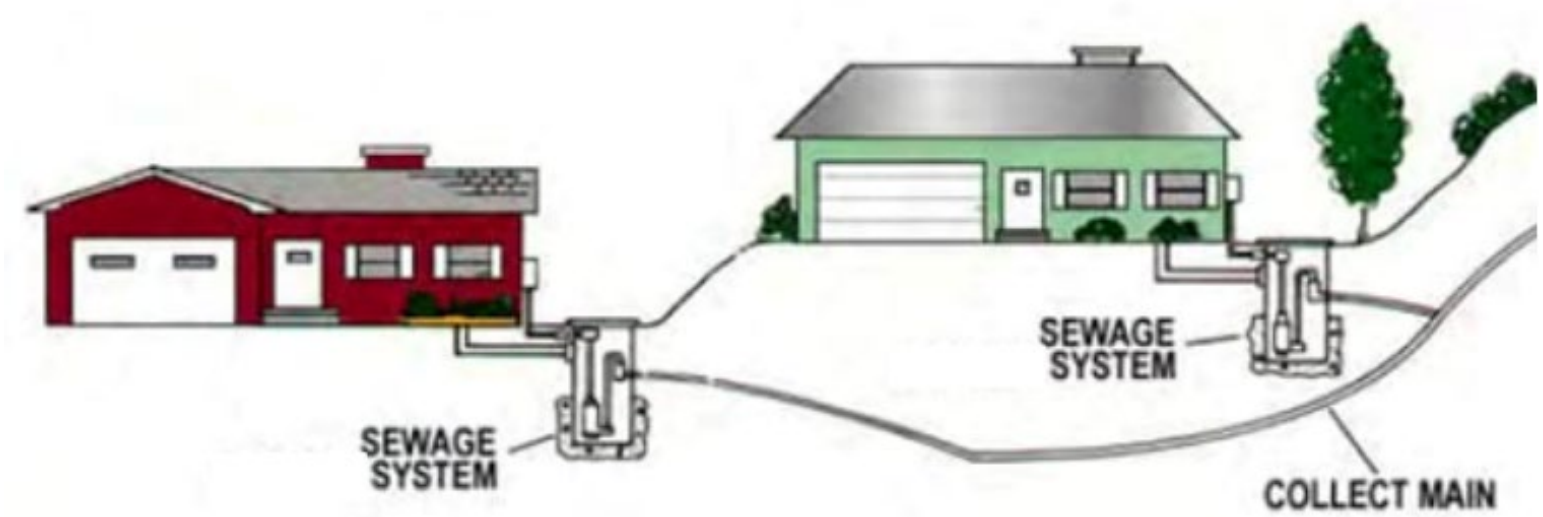
- City of Biggs WWTP
- City of Mt. Shasta WWTP
- Nevada County Lake of the Pines WWTP
- Placer County – North Auburn Sewer Maintenance District 1
- Rio Alto Water District WWTP

Virtual Facility Tours

- Amador County
- Butte College
- City of Eureka
- City of St. Helena
- Community of Robbins

Community Input – Jeff Gillingham

- **Low Pressure Force Mains**
  - Mains at ~40-50 psi
  - Pumps at each service connection
  - Does not require a leach field



(Photo courtesy of https://www.co.jefferson.wa.us/DocumentCenter/View/8260/Pressure-Sewers-Intro?bidId=)

Community Input – Cliff Jacobson

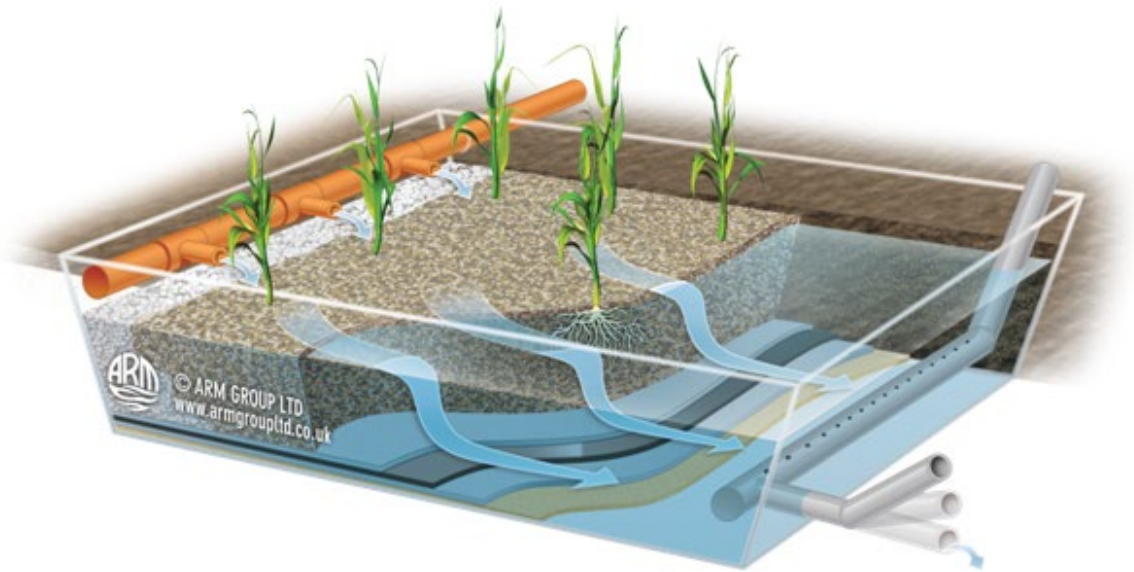
- **STEP Collection System**
  - Pump wastewater from Septic Tank into collection system
  - Solids stay in tank
  - Pressurized collection system
- **Biotrickling Filter Treatment System**
- **Reuse Discharge**
  - Irrigation or Fire Cannon
  - Recycled water back to homes

STEP collection
(Photo courtesy of Orenco Systems)

Fire cannon
(Photo courtesy of https://www.purityfire.com/other-fire-equipment/manual-fire-monitor.html)

Community Input – Bill Kellog

- **Constructed Wetlands**
  - Allows infiltration and evaporation naturally
  - Removes pollutants through biological, chemical, and physical means
  - Would take place of leach lines
  - Needs large area

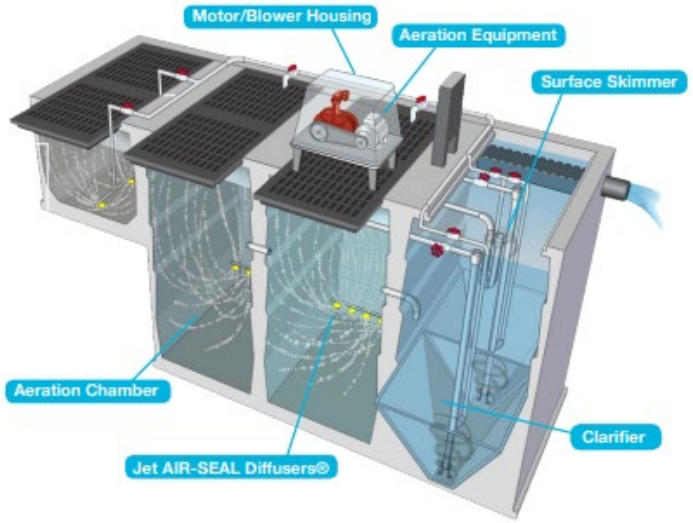


Constructed Wetland Diagram

(Courtesy of https://www.globalwettech.com/about-constructed-wetlands.html)

Community Input – Kelly Konzelman

- **Jet Packaged Plants**
  - 35,000 – 50,000 gpd each
  - 14 installations around Paradise for full buildout
  - Smaller leach fields
  - Smaller footprints
  - Can be installed underground

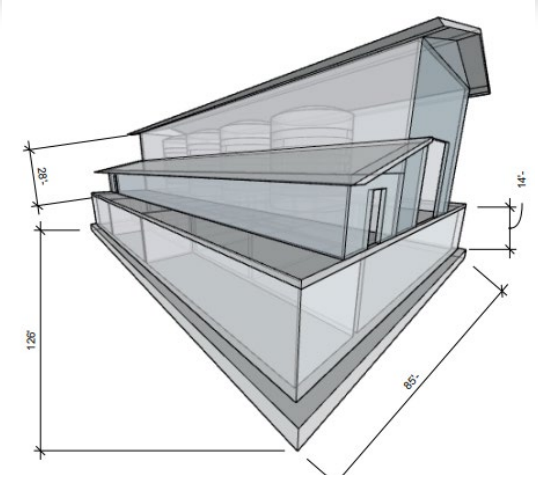


Jet Packaged Plant Diagram

(Photos courtesy of Jet Wastewater Treatment Solutions)

Community Input – Dana Ripley

- **Orenco STEP systems**
  - Pump wastewater from Septic Tank into collection system
  - Solids stay in tank
  - Pressurized collection system
- **Attached-Growth Multi-Stage Trickling Filters**
  - Four tower system
  - Wastewater sprayed over attached-growth media
- **Purple Pipe Reuse**



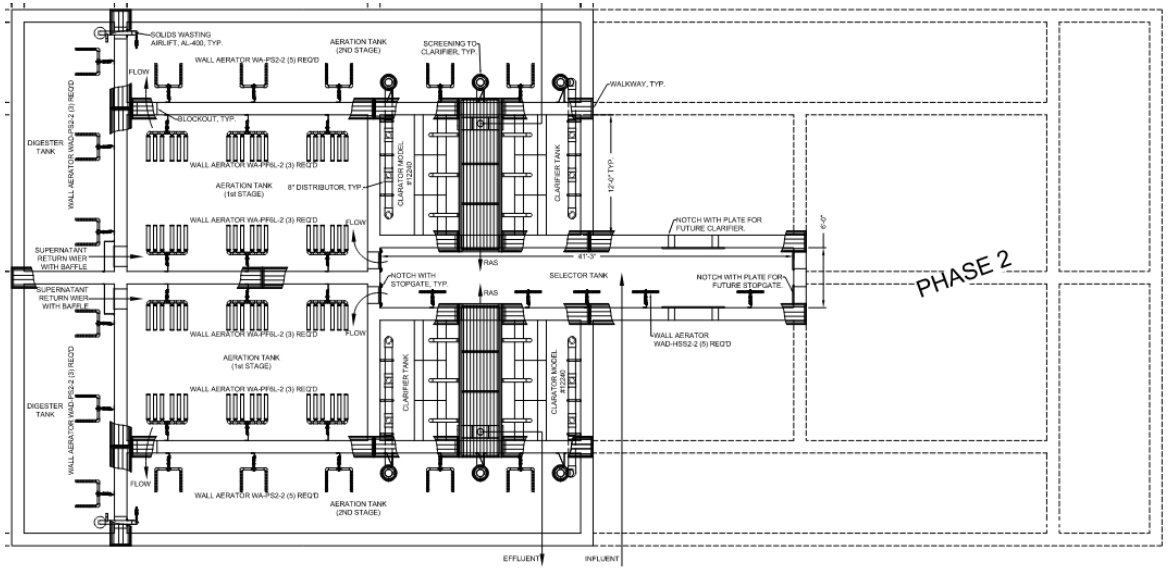
0.5 MGD Facility
(Photo courtesy of Dana Ripley)

STEP collection
(Photo courtesy of Orenco Systems)

Vendor Input – AeroMod

- **Pre-designed activated sludge plant**
  - Includes aeration, settling, recirculation, and digestion
  - Common wall construction
  - Easily expandable
  - Simple O&M

AEROMOD
Wastewater Process Solutions



Paradise Phase 1 Proposal

Quincy, CA (1.1 MGD)

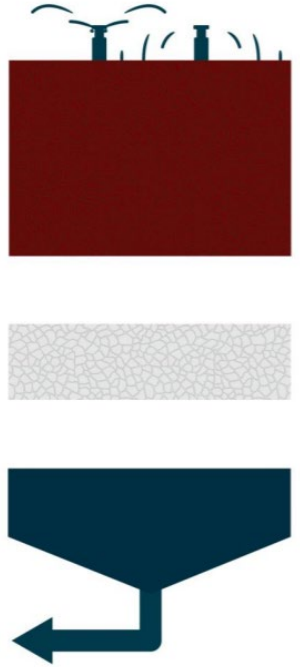
(Photos courtesy of Aero-Mod)

Vendor Input – BioFiltro

- **Biodynamic Aerobic BIDA Vermifiltration System**
  - Layer of soil and worms remove nutrients
  - Layer of gravel for filtration

BIOFILTRO™
WORM-POWERED SOLUTIONS

20,000 gpd installation



BIDA Layered Diagram

(Photos courtesy of BioFiltro)

Vendor Input - Cloacina

- **Packaged Membrane Bioreactor (MBR)**
  - Wastewater is filtered through membrane
  - Pre-designed
  - Built offsite, delivered on truck
  - More reactors can be added on to increase capacity

Cloacina MEMPAC-M installation

(Photos courtesy of Cloacina)

Vendor Input – Fluidyne

- **Sequencing Batch Reactor (SBR)**
  - Aeration and settling happens in the same tank
  - Can be pre-packaged or custom designed
  - 50,000 gpd for one packaged reactor

FLUIDYNE CORPORATION

Underground installation

Two packaged SBRs

(Photos courtesy of Fluidyne)

Vendor Input – Green Toilet

- **Composting Toilets**
  - No water or electricity needed
  - Created in Finland
  - Permitting is challenging in USA, dependent on region

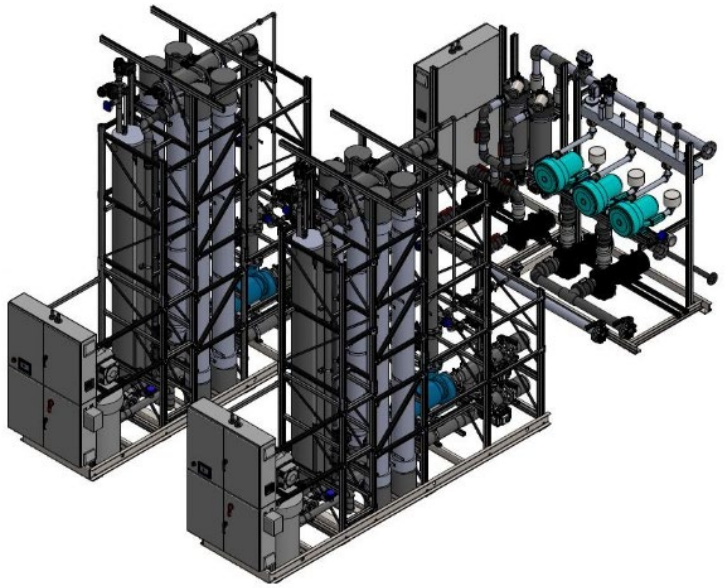
Composting toilet installation

Composting toilet

(Photos courtesy of Green Toilet)

Vendor Input - Innovatreat

- **Membrane Bioreactor (MBR) Skid**
  - Wastewater is filtered through membrane
  - Pre-designed
  - Major equipment assembled offsite
  - More skids can be added to increase capacity



Typical miniMBR 3D rendering

(Photos courtesy of Innovatreat)

Site Tour – Rio Alto

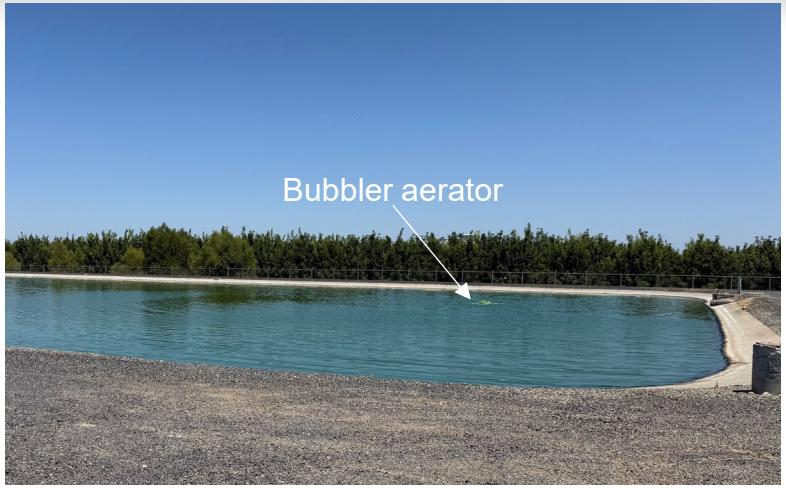
- **Facility Size:** 0.1 MGD ADWF
- **Collection System:** Gravity
- **Treatment:** Bar screens, oxidation ditch, secondary clarifier, chlorine disinfection, sludge drying beds
- **Discharge:** Evaporation/percolation ponds & wetland with public access walking trails
- **Key Takeaways:**
  - Switched from river discharge due to changing NPDES river discharge requirements
  - Title 22 regulations apply due to public access, but the requirements are easier to meet than for river discharge

Oxidation Ditch

Discharge Wetland

Site Tour – City of Biggs WWTP

- **Facility Size:** 0.38 MGD ADWF
- **Collection System:** Gravity
- **Treatment:** Aerated ponds and rock filter
- **Discharge:** Percolation/evaporation ponds with on-site alfalfa irrigation
- **Key Takeaways:**
  - Facility switched from surface discharge to land discharge due to changing NPDES permit conditions
  - Simple operation with only one operator
  - Disinfection not required for land discharge without public access



Aeration Pond

Treated Discharge Pond

Site Tour – Mt Shasta WWTP

- **Facility Size:** 0.8 MGD ADWF
- **Collection System:** Gravity
- **Treatment:** AeroMod activated sludge with nutrient removal, disc filters, and UV disinfection
- **Discharge:** Surface discharge to Sacramento river (winter only); recycled water to neighboring golf course; and land discharge to subsurface leach field
- **Key Takeaways:**
  - Recently upgraded from ponds to AeroMod due to changing surface water discharge requirements
  - New facilities require more operations staff due to complexity
  - Permit violations include mandatory fines that quickly become expensive

Aero-Mod Structure

Aero-Mod Basins

Site Tour – Nevada County Lake of the Pines WWTP

- **Facility Size:** 0.3-0.4 MGD ADWF
- **Collection System:** mostly gravity with a few STEP connections
- **Treatment:** Custom Designed MBR with UV disinfection
- **Discharge:** Surface discharge to Magnolia Creek
- **Key Takeaways:**
  - Facility was upgraded due to changing surface discharge permitting requirements
  - Process is more complex, but allows for more fine-tuned control of effluent quality

Influent, Recycle Pumps

Solids Disposal

Site Tour – North Auburn SMD1

- **Facility Size:** 600 STEP connections; gravity system includes 55 lift stations
- **Collection System:** STEP and gravity sections
- **Treatment & Discharge:** Regional connection to Lincoln WWTP
- **Key Takeaways:**
  - Property owners are responsible for tanks, but County is responsible for O&M of STEP pumps
  - STEP systems require more maintenance than gravity
  - STEP users pay an additional monthly fee ($25-50) on top of base sewer rate
  - STEP septic tanks are pumped every 6-9 years
  - Redundant power supply is a major concern
  - Odor complaints at ARVs at each high point throughout system

Septic Tank & STEP pipe

STEP monitoring station

Virtual Site Tour – Butte College

- **Facility Size:** 10,000 – 20,000 gpd ADWF
- **Treatment:**
  - Activated sludge (aeration)
  - Settling clarifier
- **Discharge:** Evaporation Ponds
- Falls under Water Board's General Order

Treatment plant (left) and discharge ponds (right)

(Photos from Google Earth)

Virtual Site Tour – City of Eureka

- **Facility Size:** 5 MGD ADWF
- **Treatment:**
  - Headworks & Screens
  - Primary Clarifiers
  - Biotrickling Filters
  - Secondary Clarifiers
- **Discharge:** ocean outfall
- **Key Takeaways:**
  - Process is robust with few upsets
  - Changing NPDES requirements have been challenging to meet

Biotrickling filters (top, white circles), clarifiers, and effluent storage (right) [Solids pond and ocean outfall not shown]

(Photos from Google Earth)

Virtual Site Tour – City of St Helena

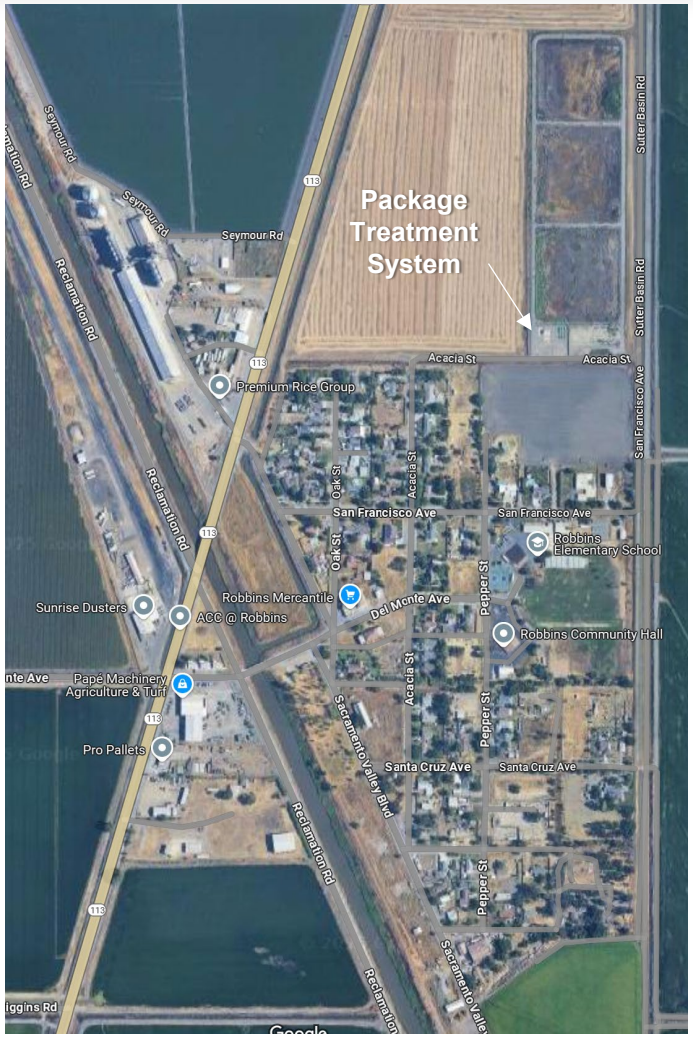
- **Facility Size:** 0.5 MGD ADWF
- **Treatment:** Transitioning from aerated lagoons to packaged MBR
- **Discharge:** river discharge in the winter, spray irrigation in summer
- **Key Takeaways:**
  - MBR is very modular in operation
  - Startup has been challenging and required more chemical addition than anticipated
  - Energy use increased 20-30%

Treatment ponds (top) and spray irrigation (bottom)

(Photos from Google Earth)

Virtual Site Tour – Community of Robbins

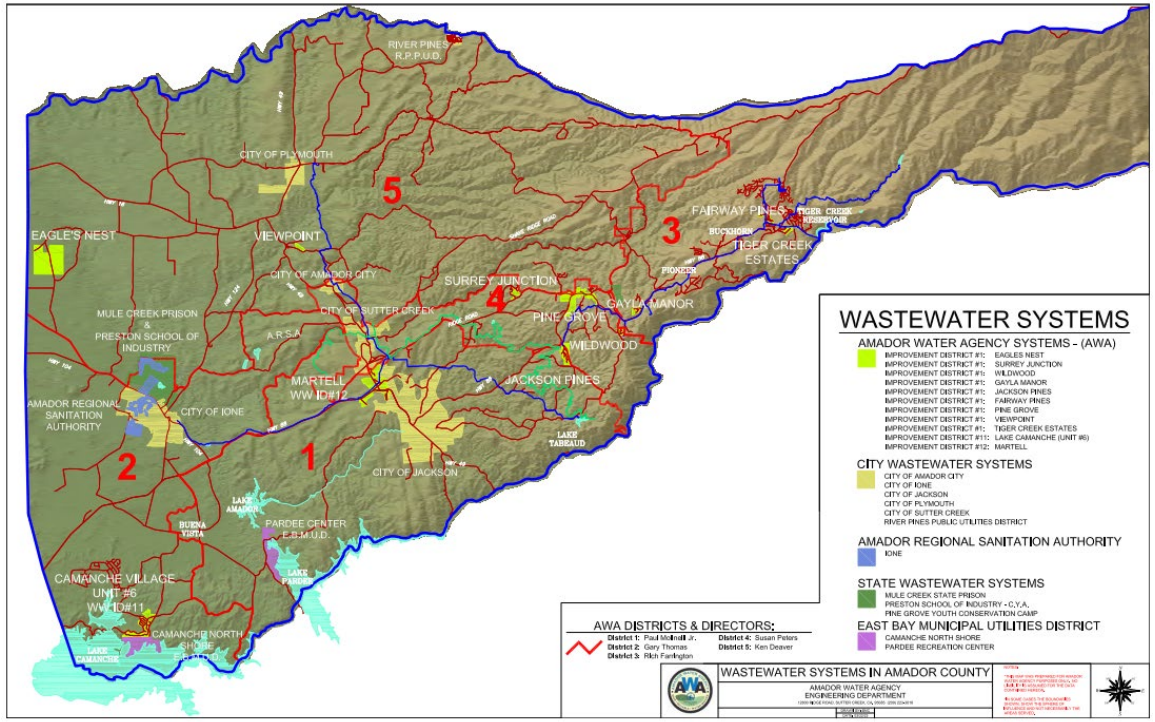
- **Facility Size:** Less than 100 connections
- **Collection System:** STEP only
- **Treatment:** Prefabricated Orenco activated sludge treatment
- **Discharge:** Evaporation ponds
- **Key Takeaways:**
  - STEP was implemented due to high groundwater that limited construction depth for gravity
  - County takes responsibility for O&M for septic tanks and STEP pumps
  - STEP tanks pumped every 4 years on average
  - County employs a contract operator for STEP collection and treatment system O&M



Robbins Service Area & Treatment Plant
(Photos from Google Earth)

Virtual Meeting – Amador County

- Have both STEP and gravity connections
- No longer allowing new STEP connections
- STEP users pay an additional monthly fee for O&M
- County receives 400 work orders per year for 500 STEP units



Ad Hoc Committee: Process Review Comments

Rio Alto Water District

Lake of the Pines WWTP

TOWN OF PARADISE
SEWER PROJECT

Summary of Alternatives

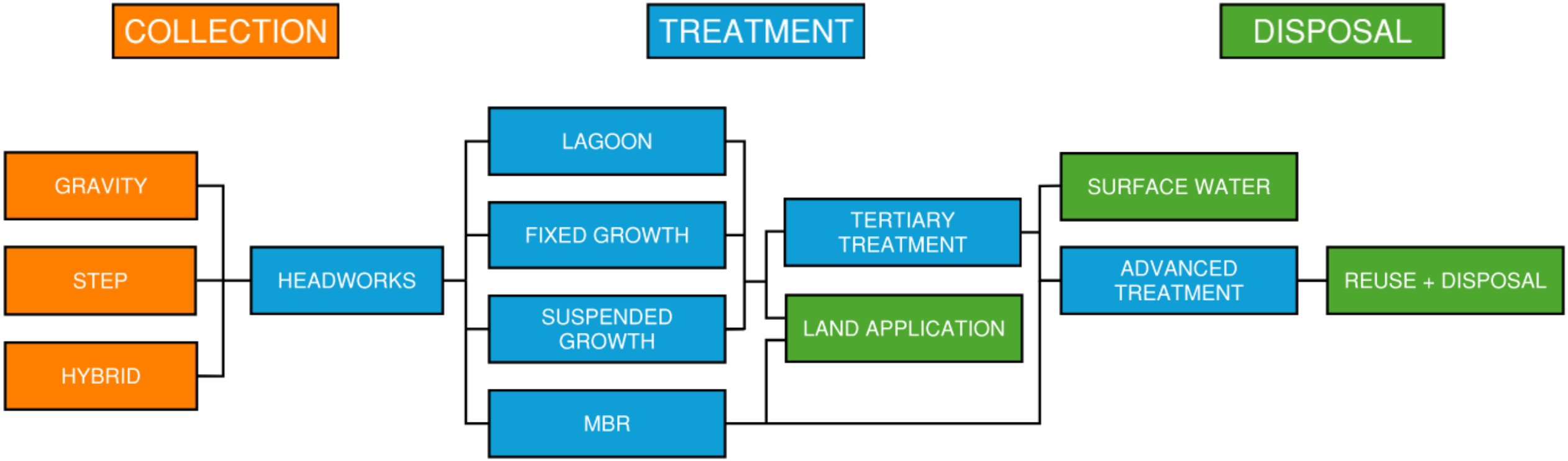
Project Components

(1) Collection

(2) Treatment

(3) Dispersal

Whole Project Alternatives

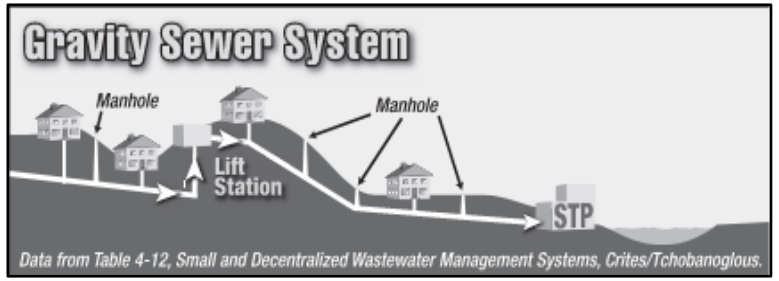


Types of Collection Systems

Original Design

Gravity Sewer

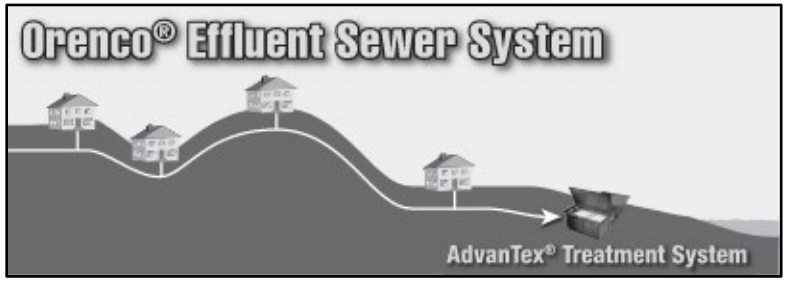
- Pipelines installed at a constant slope
- Minimum velocity required
- Manholes for change in direction
- Lift stations for change in elevation



Community Proposal

STEP Sewer

- On-site septic tanks with liquid effluent pumps at every property
- Low-pressure pipelines installed at varying elevation
- Air release valves (ARVs) at high points and blowoff valves at low points
- Isolation valves at regular intervals



Hybrid Proposal

Hybrid Gravity/STEP Sewer

- Gravity trunk lines down primary corridors remain but with low-elevation properties connected via individual STEP systems at each property
- Shallower trunk mains than a pure gravity system

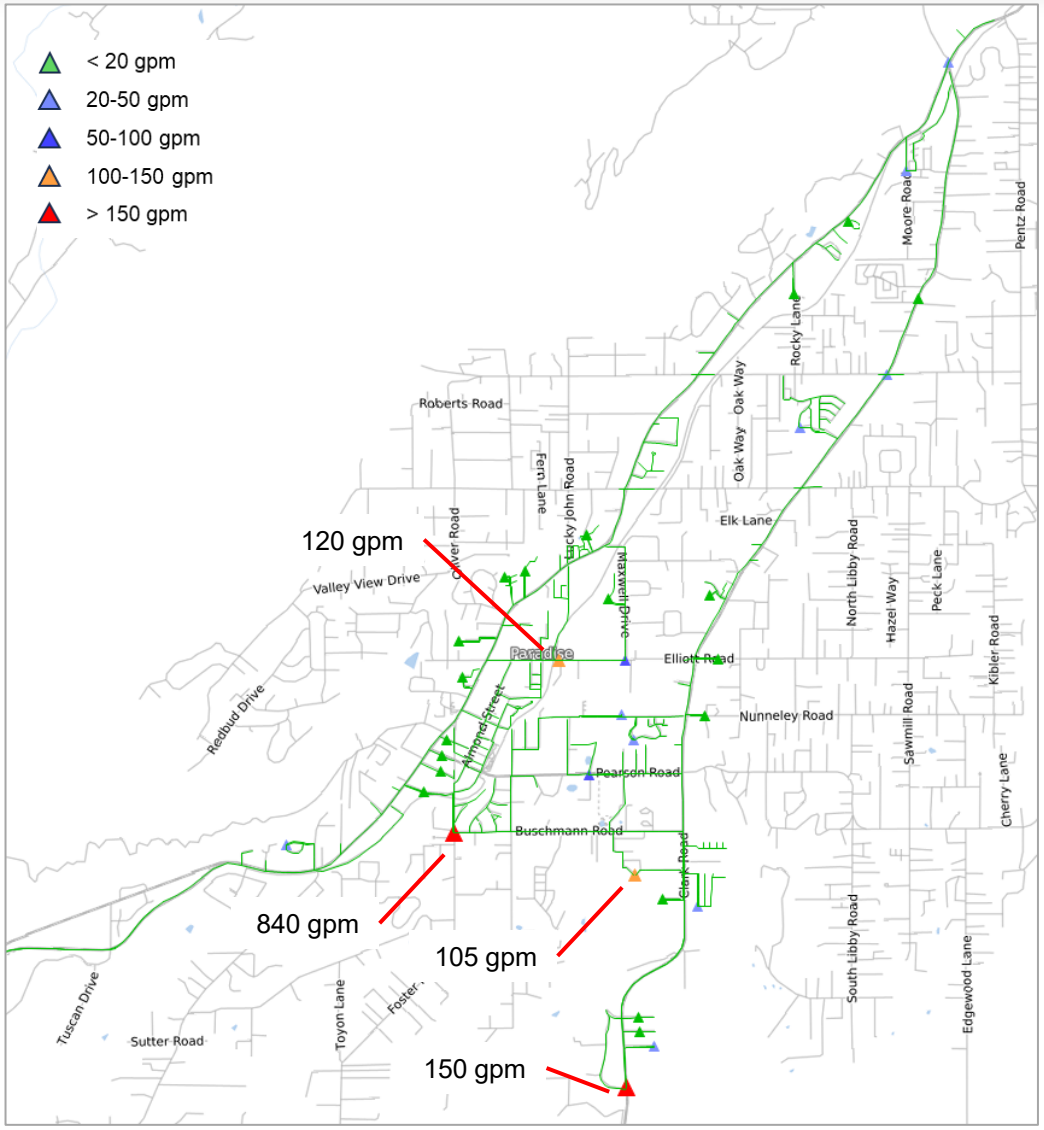
Figures from Orenco Systems Effluent Sewer Design Manual, Rev 3.0, dated 07/2017

Modeled Maximum Pump Rate - Gravity

- Majority of pump stations have a maximum pumping rate of less than 100 gpm

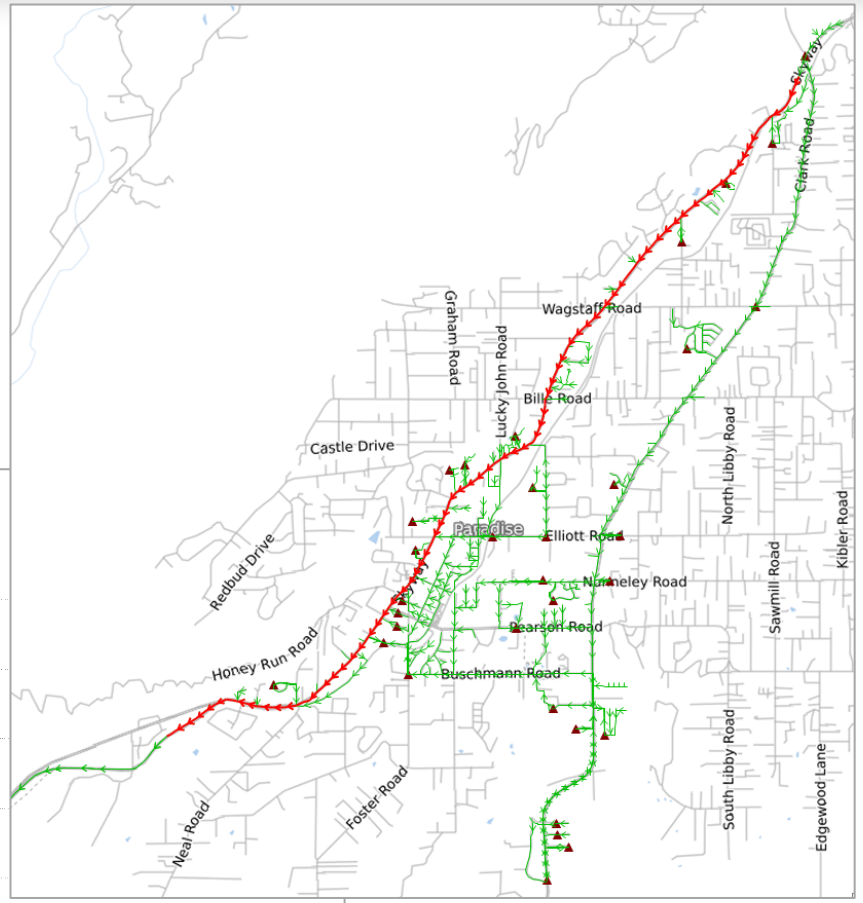
Maximum Pumped Flow	Count
Less than 20 gpm	18
20 to 50 gpm	9
50 to 100 gpm	2
100 to 150 gpm	2
Greater than 150 gpm	**2**

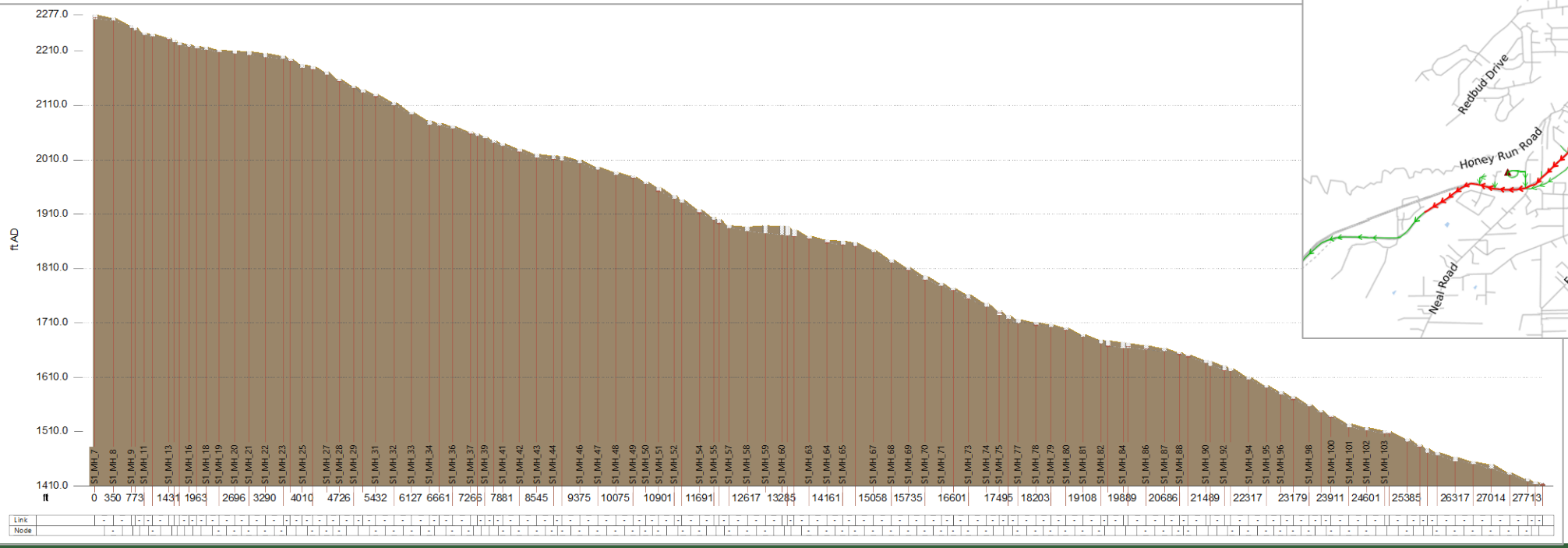
- STEP pumps are typically 5-10 gpm for single-family residences *(Orenco Design Manual)*



Elevation and System Pressure

- Elevation change of over 810 ft (2,227 ft to 1,410 ft)
- Static pressure at the WWTP of over 350 psi
  - *Orenco high-head pumps max of <u>108 psi</u>*
- **<u>Conclusion:</u>** A purely low-pressure (STEP) system is not technically feasible for full-system buildout





Collection System Implementation

- Capital Costs
  - Installation costs expected to be 30% greater for traditional gravity vs. STEP
- Constructability
  - Open-trench construction is recommended for most of Paradise for STEP or gravity system installation. Directional boring is not compatible with cobbles/rocky geology and uncertain utility locations.
  - Sewer pipelines must be installed at a lower elevation than all other utilities per CA regulations.
- Operational Considerations
  - Gravity systems must maintain minimum scour 2-3 fps to prevent solids deposition. Periodic system flushing can mitigate solids deposition for lower flows.
  - STEP systems have greater O&M demand due to more distributed pump stations (more points of failure, see examples on next slide)

STEP Agency Tours and Feedback

- **Placer County – North Auburn SMD1**
  - County has O&M responsibility for STEP pumps and septic pumping
  - STEP users pay an additional monthly fee for STEP O&M service
  - New connections – builder pays for tank/pump, designed to meet County standards
  - Power safety shutoffs – sewer loses power but water does not
  - Air relief valves (ARVs) are source of odor complaints
- **Nevada County – Lake of the Pines & Penn Valley**
  - Septic effluent-only sent to treatment plants designed for full municipal WW cause operational challenges
  - STEP works well after installation but has O&M challenges as system ages
- **Sutter County – Community of Robbins**
  - County takes responsibility for tanks and motors – costly to maintain
  - System not expected to expand due to outside factors (flood zone, treatment capacity)
- **Amador County**
  - High O&M and administrative burden – STEP users pay an additional fee
  - No longer allowing new STEP connections

Septic Effluent-Only Treatment

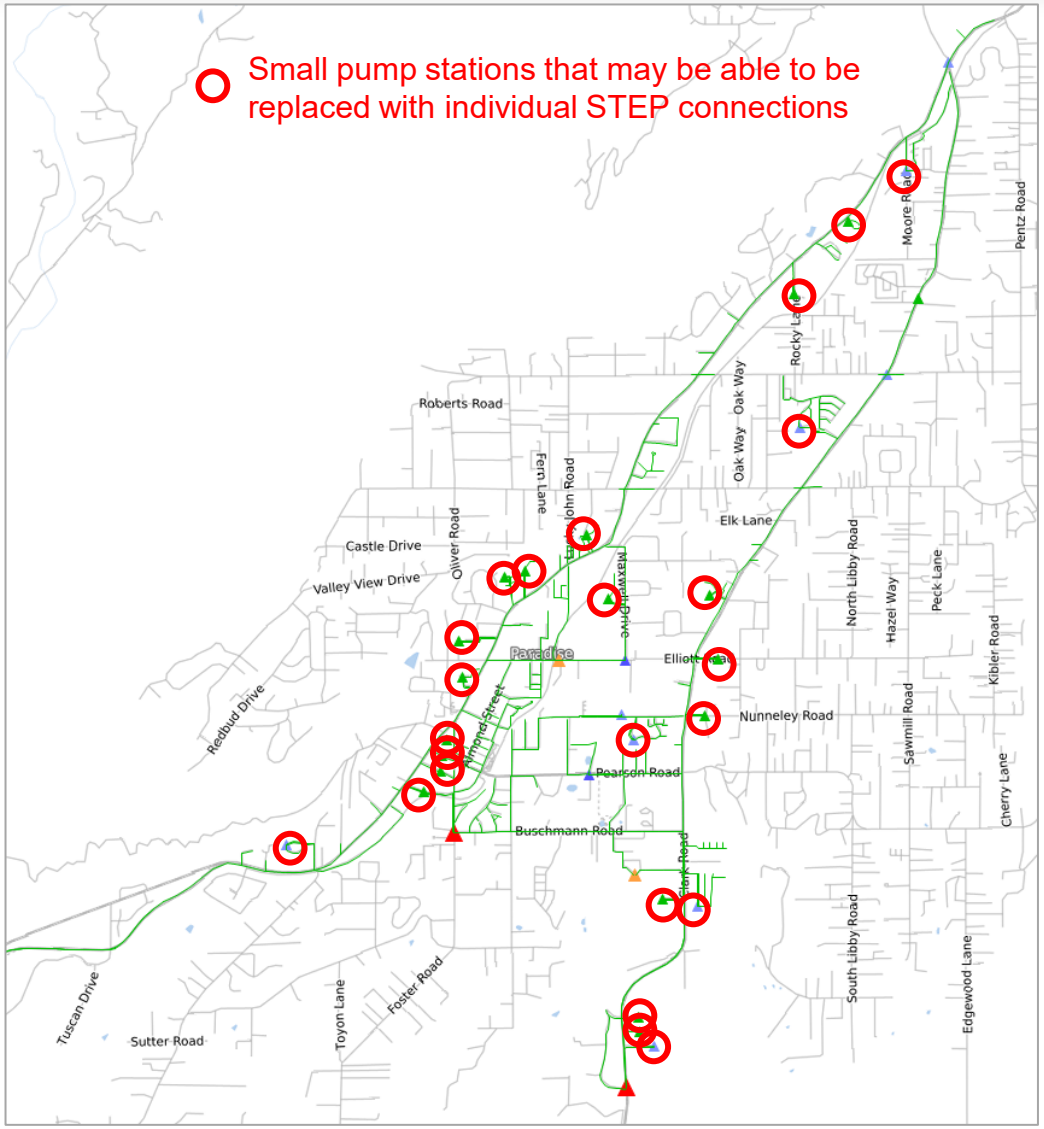
- Treatment process difference is minimal for STEP or gravity at small flows
  - Primary treatment is typically not needed for typical domestic wastewater or for septic tank effluent for small flows (see Rio Alto, City of Biggs)
  - Both STEP and gravity will require secondary and/or tertiary treatment to meet Water Board discharge requirements
  - Solids management strategy is required for all secondary treatment processes to manage biological accumulation

Constituent	Units[a]	Typical Domestic Wastewater	Septic Tank Influent	Septic Tank Effluent	Secondary Treatment Effluent	Equivalent to Secondary Treatment Effluent
Biochemical Oxygen Demand	mg/L	200-290 [b]	155-286 [c]	140-200 [d]	30-45 [e]	65 percent reduction [f]
Total Suspended Solids	mg/L	200-290 [b]	155-330 [c]	50-100 [d]	30-45 [e]	[p]
Ammonia (as N)	mg/L	6-18 [b]	4-13 [c]	--[g,o]	--[g,h]	--[g,h,i]
Total Nitrogen	mg/L	35-100 [b]	26-75 [c]	40-100 [d]	50% [m]	43-80% [k,h,i]
Nitrite and Nitrate (as N)	mg/L	<1 [b]	<1 [c]	--[g,o]	--[g,h]	--[g,h,i]
Total Phosphorus (as P)	mg/L	6-12 [b]	6-12 [c]	5-15 [d]	51% [m]	50% [k,h,i]

Source: STATE WATER RESOURCES CONTROL BOARD ORDER WQ 2014-0153-DWQ

Hybrid Gravity/STEP Sewer Concept

- Gravity trunk mains along Skyway, Clark, Pearson with low-elevation areas/properties connected via on-site STEP systems
  - Most compatible solution for Paradise
  - STEP system on individual properties in low elevation zones
  - Owners retrofit existing septic tanks, if in good condition
  - Replaces small grinder pump stations with regions connected via STEP
- Main trunk lines installed at shallower depth than original gravity design
- A phase 1 project prioritizing downtown may not require any central lift stations

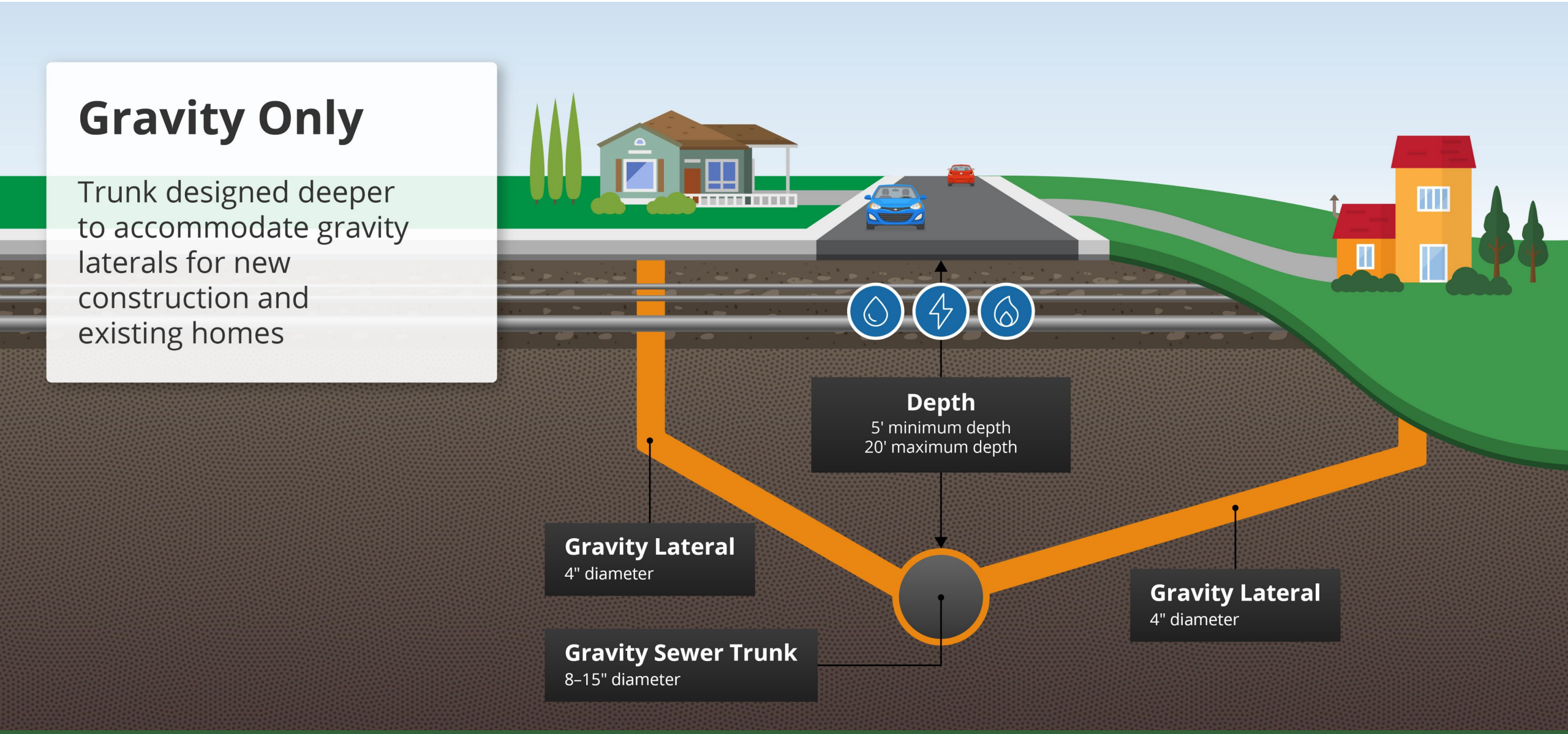


TOWN OF PARADISE
SEWER PROJECT

Collection System Design Criteria for Gravity

Gravity Only

Trunk designed deeper to accommodate gravity laterals for new construction and existing homes



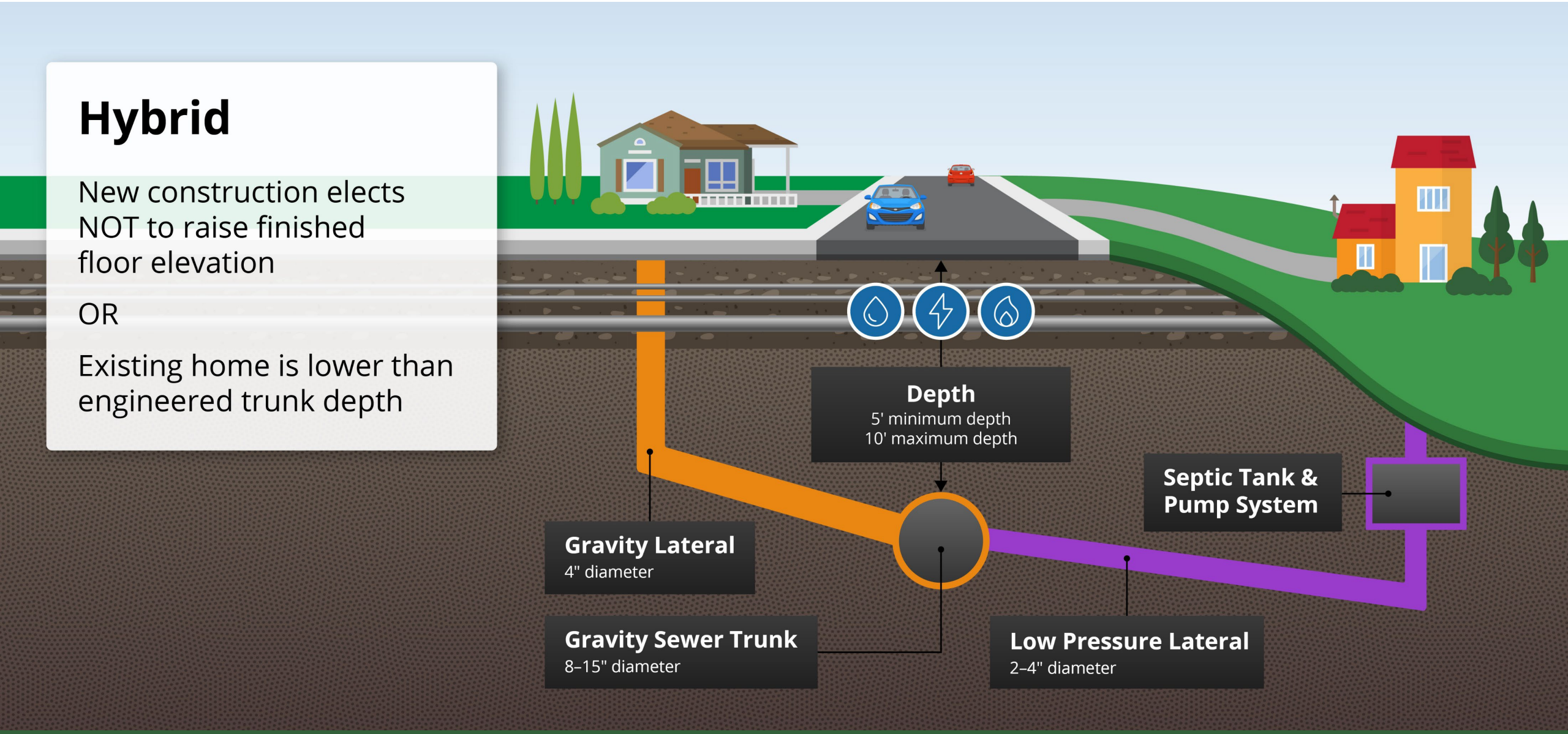
Collection System Design Criteria for Hybrid — Scenario A

Hybrid

New construction elects NOT to raise finished floor elevation

OR

Existing home is lower than engineered trunk depth



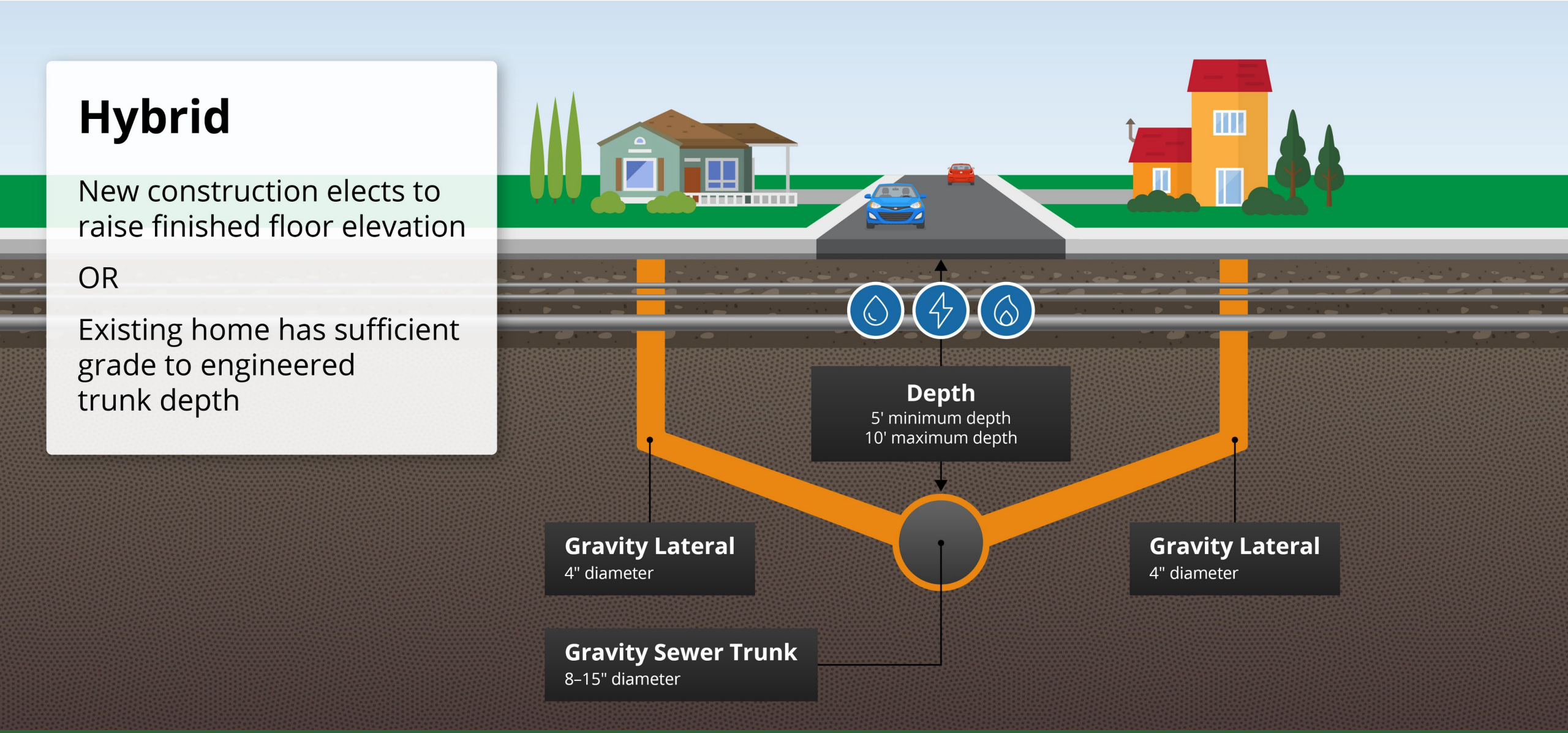
Collection System Design Criteria for Hybrid — Scenario B

Hybrid

New construction elects to raise finished floor elevation

OR

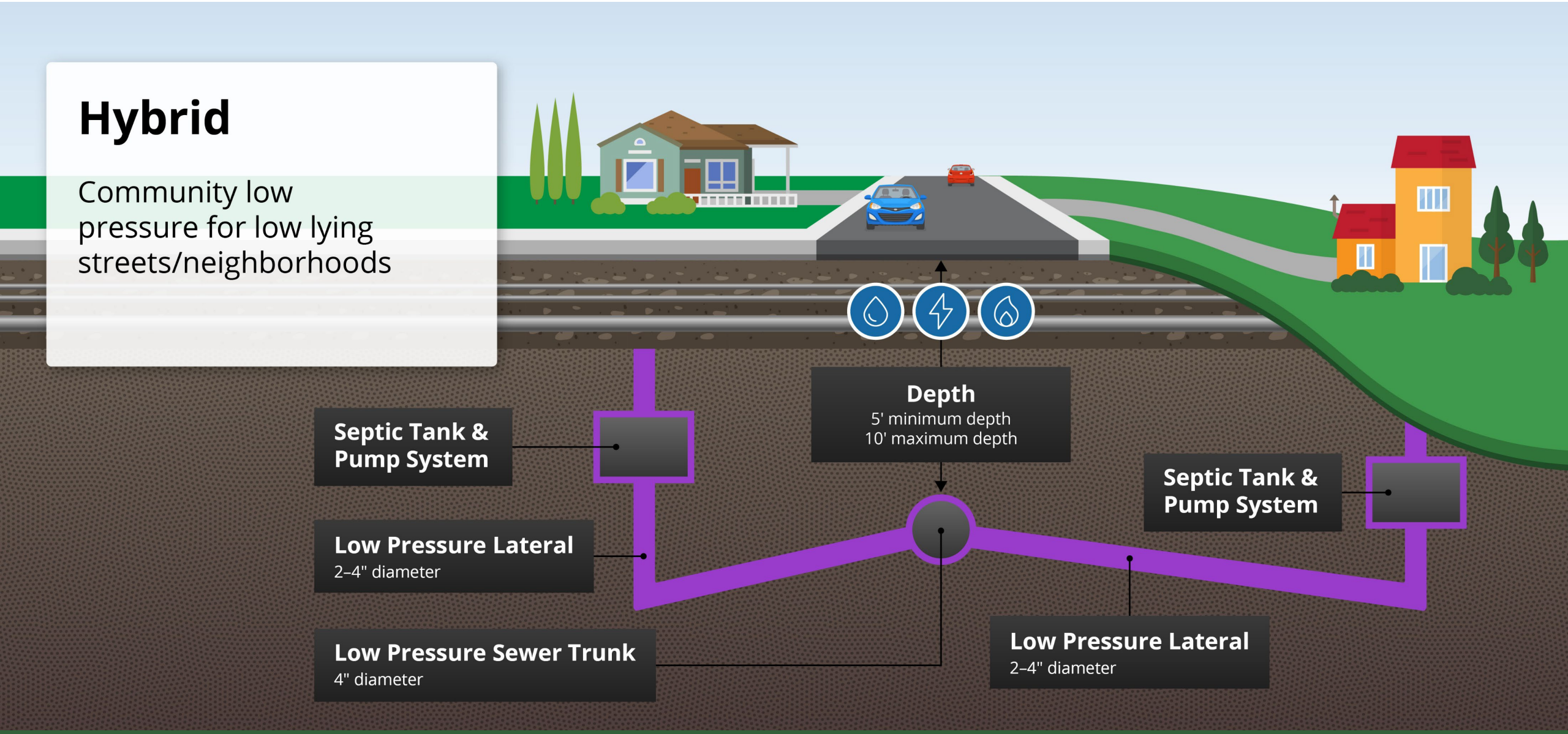
Existing home has sufficient grade to engineered trunk depth



Collection System Design Criteria for Hybrid — Scenario C

Hybrid

Community low pressure for low lying streets/neighborhoods



Collection System Recommendation

- **Hybrid Gravity/STEP Collection:**
  - Gravity trunk mains down Skyway, Clark Rd., and other hydraulic main-line corridors
  - Flexibility for low-elevation areas or properties to connect via individual on-site STEP units at each property
  - Gravity trunks set at higher elevation than previous gravity systems (set at an engineered depth just below conflicting utilities).
  - Incorporates benefits of STEP system while maintaining scalability for future system expansion and minimizing operational impacts and user rates
  - Phase 1 project to serve downtown may not require any central lift stations

Wastewater Treatment Alternatives

Aerated Lagoon/Pond


City of Biggs

Fixed Growth (Trickling Filter)


Sewerage Agency of Southern Marin

Suspended Growth (Activated Sludge)


Rio Alto Water District


Mt. Shasta

Membrane Bioreactor (MBR)


Lake of the Pines

Treatment Alternatives Summary

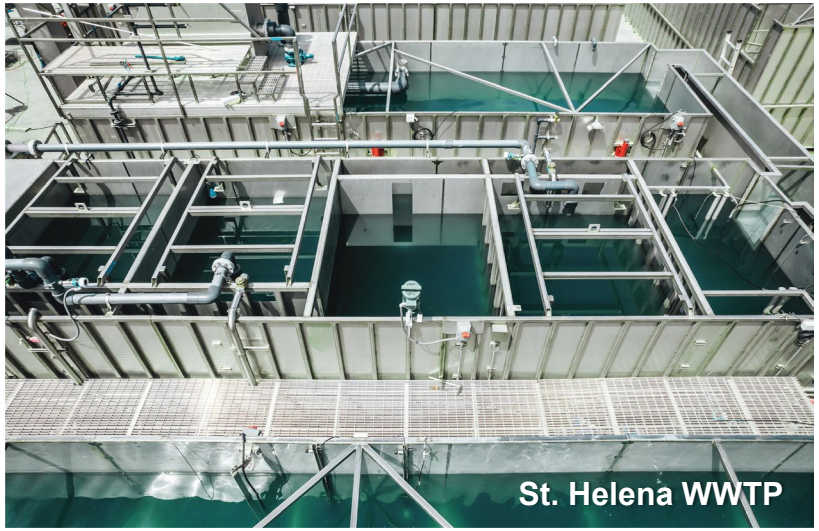
	Aerated Pond	Trickling Filter	Activated Sludge	MBR
Capital Cost	Lowest			Highest
O&M Cost	Lowest			Highest
Scalability	Moderate	Lowest	Moderate	Greatest
Footprint	Largest			Smallest
Readiness for Reuse or NPDES	Least			Most
Operational Complexity	Simplest			Greatest
Energy Use	Lowest			Highest

Treatment Recommendation

- **Recommended Alternative 1: Aerated Ponds**
  - Most cost effective (Capital and O&M)
  - Simple operation – less operator experience required
  - Less sensitive to smaller/inconsistent flows
  - Largest footprint
  - Expand or repurpose ponds to scale up
  - Could produce water for agricultural reuse with disinfection

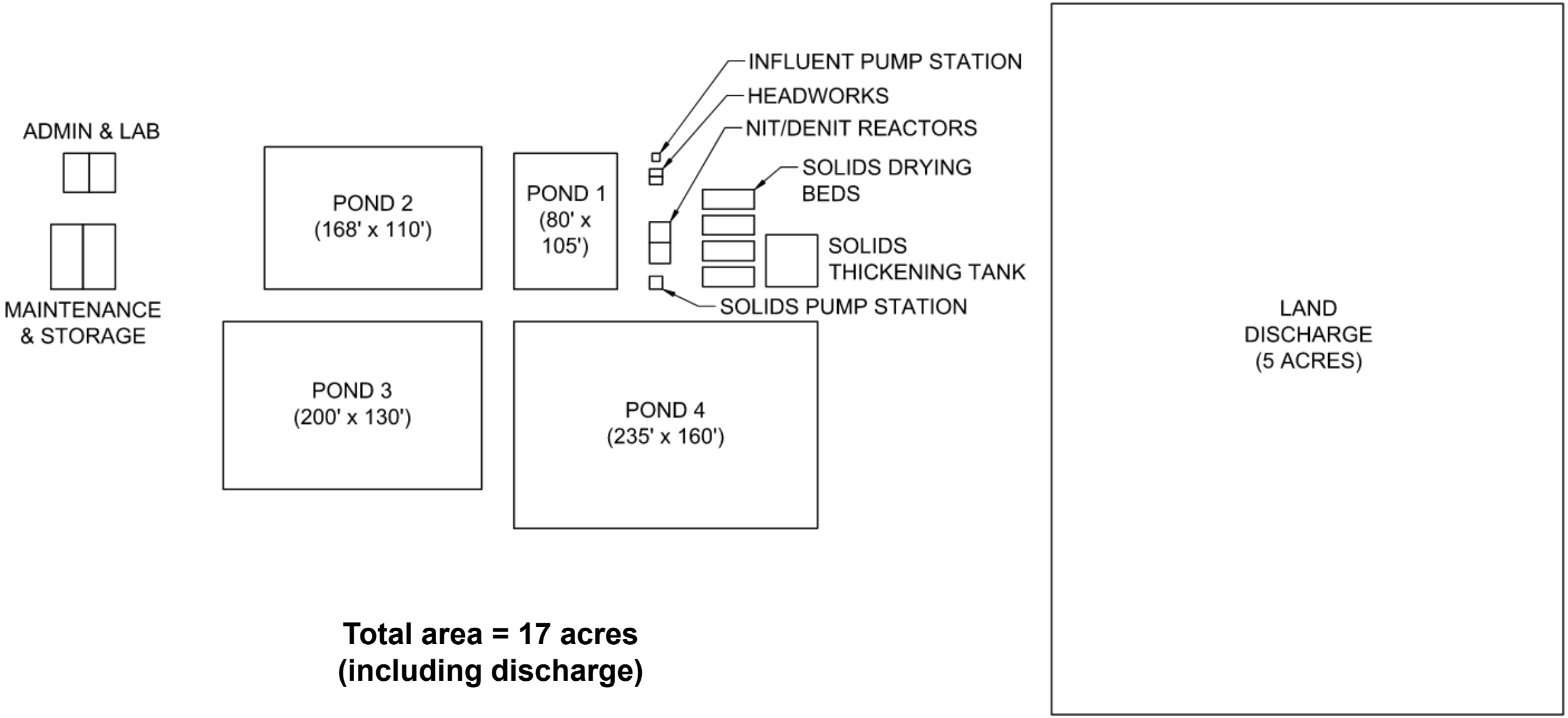

City of Biggs WWTP

- **Recommended Alternative 2: MBR**
  - Highest capital cost and O&M cost
  - Can be pre-engineered design and pre-fabricated for quick construction
  - Future-proof – high quality effluent can produce tertiary treated water for reuse or surface discharge
  - Smallest footprint, can be hidden inside structures


St. Helena WWTP

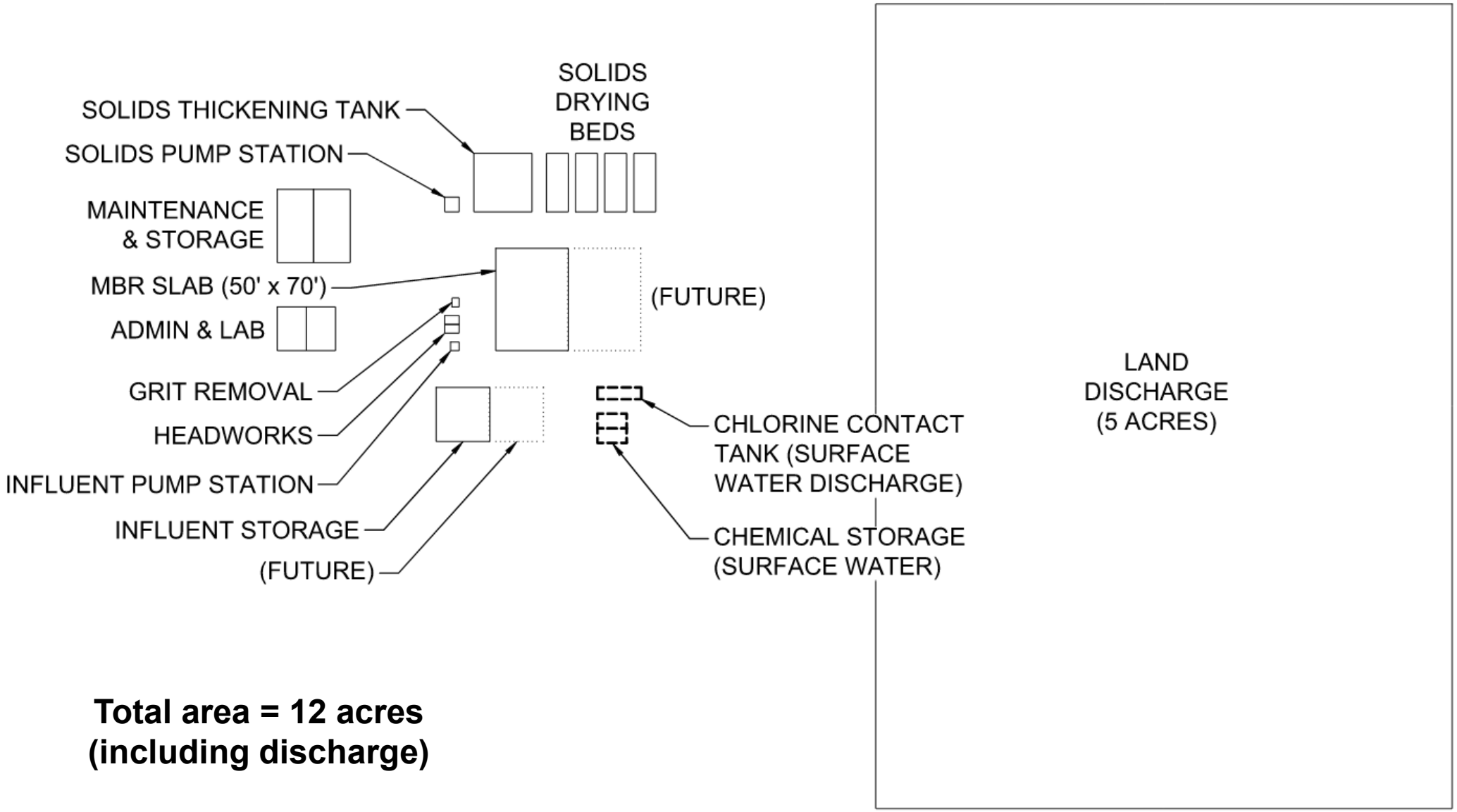
Source: Cloacina
https://www.cloacina.com/municipal-system-upgrade

Example Site Layout – Aerated Ponds



Total area = 17 acres (including discharge)

Example Site Layout – MBR



Total area = 12 acres (including discharge)

Project Examples – MBR

City of Hot Springs, Arkansas

Treatment plant is contained inside facilities modeled after local barns

Treated Effluent Discharge Alternatives

1. **Surface Discharge**
   - Discharge to creeks, rivers, or lakes
2. **Land Discharge**
   - Evaporation & percolation ponds or wetlands
   - Crop irrigation (non-food crops)
3. **Beneficial Reuse**
   - “Purple Pipe” or “Title 22” water
   - Landscape/golf course irrigation
   - Fire suppression
   - Crop irrigation


Bozeman Water Reclamation Facility


Rio Alto Water District


City of Lodi

Surface Discharge

- All receiving waters near Town are expected to require tertiary treatment
- NPDES Permitting Process
  - Requires multiple studies of treated effluent and of receiving waters
  - Permit renewal every 5 years can have changing requirements
- Mandatory Minimum Penalties (MMPs)
  - $3,000+ per penalty for exceeding limits
  - More difficult to meet limits with low or inconsistent flows
  - Metals limits can be difficult to meet even with more high-tech secondary treatment
- Permits require frequent sampling & water quality testing

CVWQCB strongly recommends avoiding surface water discharge for a Phase 1 project

Beneficial Reuse – CA Title 22

- Both STEP and gravity collection influent can produce water for reuse, reuse capabilities are dependent on treatment processes
- Agencies operating reuse systems report that it is easier to meet Title 22 requirements than surface discharge permit
- Reuse increases Phase 1 project costs
- Reuse can be implemented in a future project phase
- Specific requirements depend on end-use and potential for human contact:

Uses of Recycled Water	CA Title 22 Water Quality Standard
Food crops, parks and playgrounds, schools, residential landscaping, unrestricted golf courses, decorative fountains, structural firefighting	Disinfected tertiary
Restricted recreational impoundments	Disinfected secondary-2.2
Cemeteries, restricted access golf courses, dairy pastureland, non-edible vegetation with controlled access, landscape impoundments, non-structural firefighting, concrete mixing, dust control	Disinfected secondary-23
Orchards, vineyards, seed crops not consumed by humans, sewer flushing	Undisinfected secondary

Reuse Implementation Challenges

- Priority to identify high-volume users (typically golf course, agriculture, parks, etc.) to reduce distribution infrastructure and administrative burden
- Demand varies seasonally – requires additional discharge method or large storage reservoir
- Requires additional distribution infrastructure – pumps, piping, etc. (added capital cost and maintenance costs)
- Disinfected reuse distribution piping must maintain minimum horizontal and vertical separation from sewer pipe, per CA regulations

Recommendation: Consider reuse in future project phases as more funding becomes available and potential customers are identified

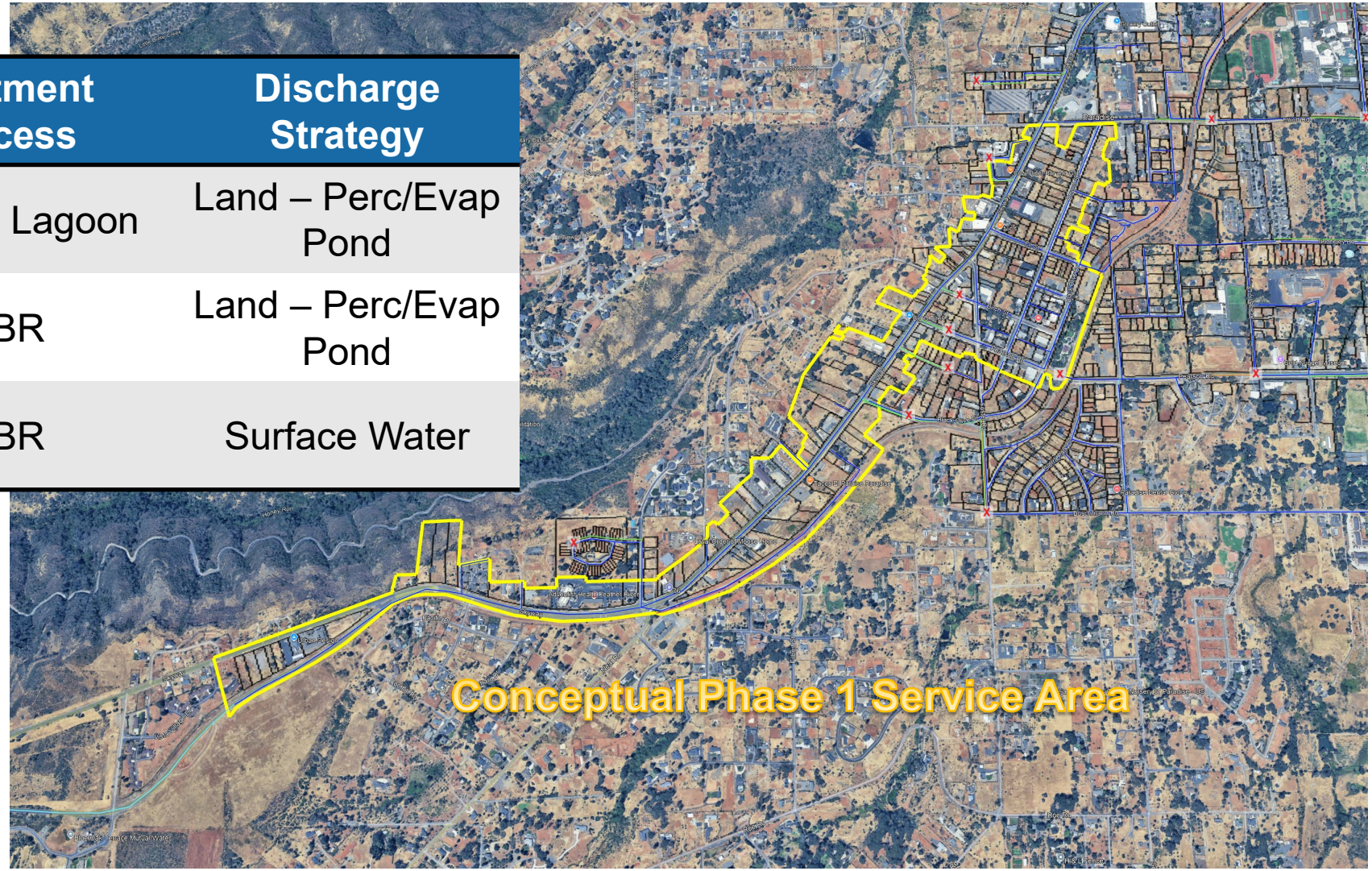
Land Discharge

- Permit renewal every 10 years
- Expect to need to meet low total nitrogen limits (<10 mg/L)
- Typical permit requirements include quarterly groundwater monitoring
- Irrigation requires greater acreage than percolation/evaporation pond discharge
- Irrigation may be seasonally limited, requiring a seasonal storage pond

Recommendation: Land discharge via percolation/evaporation ponds

Phase 1 Alternatives for Evaluation

Alt	Collection System	Treatment Process	Discharge Strategy
1	Hybrid Gravity/STEP	Aerated Lagoon	Land – Perc/Evap Pond
2	Hybrid Gravity/STEP	MBR	Land – Perc/Evap Pond
3	Hybrid Gravity/STEP	MBR	Surface Water



Collection System – Phase 1

- Collection system can be reduced to serve only Skyway from Town limits up to Elliott and downtown (Pearson/Black Olive/Elliott/Skyway block)
  - 225 total parcels
  - 83 currently occupied parcels
- Reduced Phase 1 SSA with hybrid gravity/STEP collection system has **no central lift stations**
- Treatment and disposal sized for 100,000 gpd ADWF
  - Estimated startup flow = 40,000 gpd
- Phase 1 gravity main (with 88 STEP connections) would be installed nearly at same depth as a STEP pressurized main – and more reliable!

Conceptual Phase 1 for cost estimate, values are approximate

	Current Occupancy	Full Area Buildout
Total Parcels Served	83	225
Gravity connections	62	167
STEP connections	21	88
ADWF (gpd)	40,000	100,000
PWWF (gpd)	110,000	260,000

Whole Project Capital Cost Estimate

Project Cost Components	Alternative 1 Hybrid Collection Aerated Lagoon Perc/Evap Pond	Alternative 2 Hybrid Collection MBR Perc/Evap Pond	Alternative 3 Hybrid Collection MBR Surface Water
Engineering & Preconstruction	$ 14,000,000	$ 15,000,000	$ 15,000,000
Town, OA (including Environmental) & Legal	$ 4,500,000	$ 4,500,000	$ 4,500,000
Real Estate Acquisition & Professional Services	$ 5,600,000	$ 5,500,000	$ 5,500,000
Environmental Permit / Agency Costs	$ 100,000	$ 100,000	$ 100,000
Environmental Mitigation	$ 500,000	$ 500,000	$ 500,000
Collection System Construction	$ 51,000,000	$ 51,000,000	$ 51,000,000
Wastewater Treatment & Discharge Construction	$ 19,300,000	$ 28,100,000	$ 24,600,000
Engineering Services During Construction	$ 3,100,000	$ 3,400,000	$ 3,300,000
Construction Management & Inspection	$ 8,300,000	$ 11,000,000	$ 9,900,000
Town Cost & Contingency	$ 6,600,000	$ 7,500,000	$ 7,100,000
Estimated Total Project Cost	**$ 114,000,000**	**$ 128,000,000**	**$ 122,000,000**

Notes: Costs are escalated to midpoint of construction in 2028 for system sized to 0.1 mgd buildout.
Range of estimate follows Association for the Advancement of Cost Engineering (AACE) guidelines for Class 5 cost estimate (-50% to +100%) – conceptual level estimate

Cost Estimate Disclaimers

- Cost Exclusions and Disclaimers
  - STEP pumps and lateral connections on private property are only included for currently occupied parcels. Lateral stub-outs to property line included for all parcels.
  - MBR costs do not include aesthetic improvements (enclosure in a building, burying subsurface, etc.)
  - Capital costs do not reflect the operational costs and complexities, especially related to surface discharge (see next slide)
  - Does not include startup operational costs (i.e., equipment, trucks, etc.)
  - ROW costs assume purchase of adequate property to allow for Phase 1 and future expansion(s)
  - Costs consider production rates, prevailing wage requirements, and industry standard contingency factors

Operational Costs & Considerations

MBR

- More complex operation, requires higher level of operator experience
- More energy intensive
- Receiving STEP-only influent would likely require chemical/carbon addition to achieve nitrogen removal

Surface Discharge

- Attaining NPDES permit will be a long and challenging process requiring studies on both the treated effluent and the receiving waters
- NPDES requirements frequently change (5-year permit cycle) and can require process changes to meet new limits
- Violations will incur minimum penalty fines ($3,000+ per instance)

Example Operating Costs

Agency	Treatment	Discharge	Flow (MGD)	2024-25 Sewer Operating Cost (Collection & Treatment)	2025 Monthly Rates
City of Biggs	Aerated Lagoon	Land	0.38	$475,431	Residential/Apartment Total: $81.35 Base Charge: $72.65 Sewer Improvement Fee: $8.70
Rio Alto	Oxidation ditch	Land	0.1	$792,347	Single Family Residence: $115.52
Lake of the Pines	Custom MBR	Surface	0.72	$3,292,509	$157.66/EDU
City of St. Helena	Packaged MBR	Surface & Land	0.5	$4,983,225	Residential Base Charge: $96.95 Residential Use Charge: $10.71

Committed Town Rate Subsidy

- On August 8, 2023, Paradise Town Council conceptually approved a rate subsidy plan...
  - The Rate Study would establish potential average rates near $85.66/month (target 2% of MHI).
  - The O&M Financing Assistance would establish an up-front operating reserve of $1,200,000 and commit $526,000 annually for the first ten years of the utility's operation.
  - This total commitment was estimated to be $6,460,000.
  - Source of funds being Paradise Recovery & Operations (PRO) Fund Project Reserves

Rate Subsidy will need to be reviewed in the lens of the revised project scale and project costs (part of larger rate setting requirements).

Ad Hoc Committee Recommendation

Alternative 1: Hybrid Gravity/STEP collection system, aerated lagoon treatment, and land discharge to percolation/evaporation pond(s)

- Serves Downtown where growth has lagged
- Optimizes operational costs and rate payer burden
- Serves the mission of the project to be fundable (affordable), permittable, and scalable to meet Paradise's needs today and into the future


Mt Shasta WWTP

- Funding Secured and Probable is $84.8M
- Phase 1 Estimated at $114M
- Town Council has options to consider redirecting funds to reach a constructable project now.

Project Forecast

August

- Public feedback on proposed alternative
- Special Town Council Meeting – August 14th, 6-8 pm

September

- Begin Subsequent EIR
- Begin procurement of treatment facility designer
- Resume funding application(s)

Fall 2025

- Resume collection design
- Begin wastewater treatment facility siting

2026

- Continue design of collection & treatment facilities
- Complete Subsequent EIR
- Begin Environmental permitting
- Begin ROW Acquisition

2027-2029

- Complete design
- Begin and complete construction

Why is this time different?

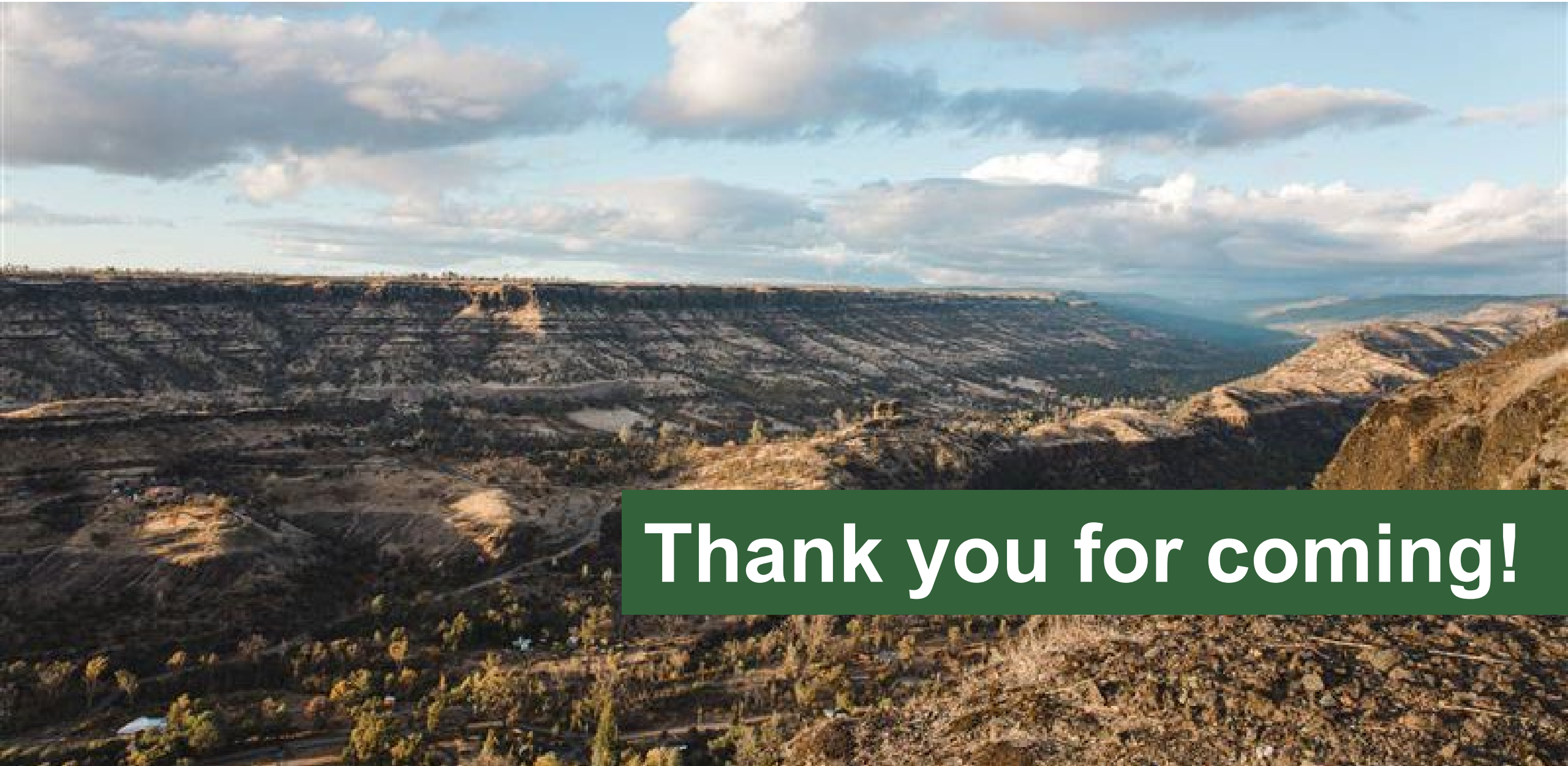
- We have the most experienced and capable team to deliver the project with the insight and knowledge from professionals who have built these facilities before.
- We know more now about what it takes to build a new sewer utility in Paradise than any preceding approach to this project.
- For the first time in the last 30+ years, the Paradise Sewer Project has a path to construction with funding secured, probable and available.
- Town Council has already committed to a rate subsidy as the Sewer is an investment into our recovery.
- Project recommended is the most scalable and affordable to design and construct now and operate into the future.
- Town has full support of the Regional Board for a local option.
- Further delays will reduce our ability to use critical CDBG-DR funds on the project with no replacement source in sight.

Next Steps

- **Receive Public Comments**
  - 3-Minute Limit (standard Council meeting)
- **Need more time? Don't want to present now? Couldn't Make it?**
  - To submit comments or schedule a meeting with Town staff to discuss this analysis prior to August 14th, contact Kieran Jellema at kjellema@townofparadise.com

- **Special Town Council Meeting** – August 14th, 6-8pm
  - Location: Paradise Performing Arts Center (PPAC)
    - 777 Nunneley Road, Paradise, CA 95969
  - Objective: Council to provide formal direction to commence efforts on a revised project description including resuming environmental and design efforts

TOWN OF PARADISE
SEWER PROJECT



Thank you for coming!