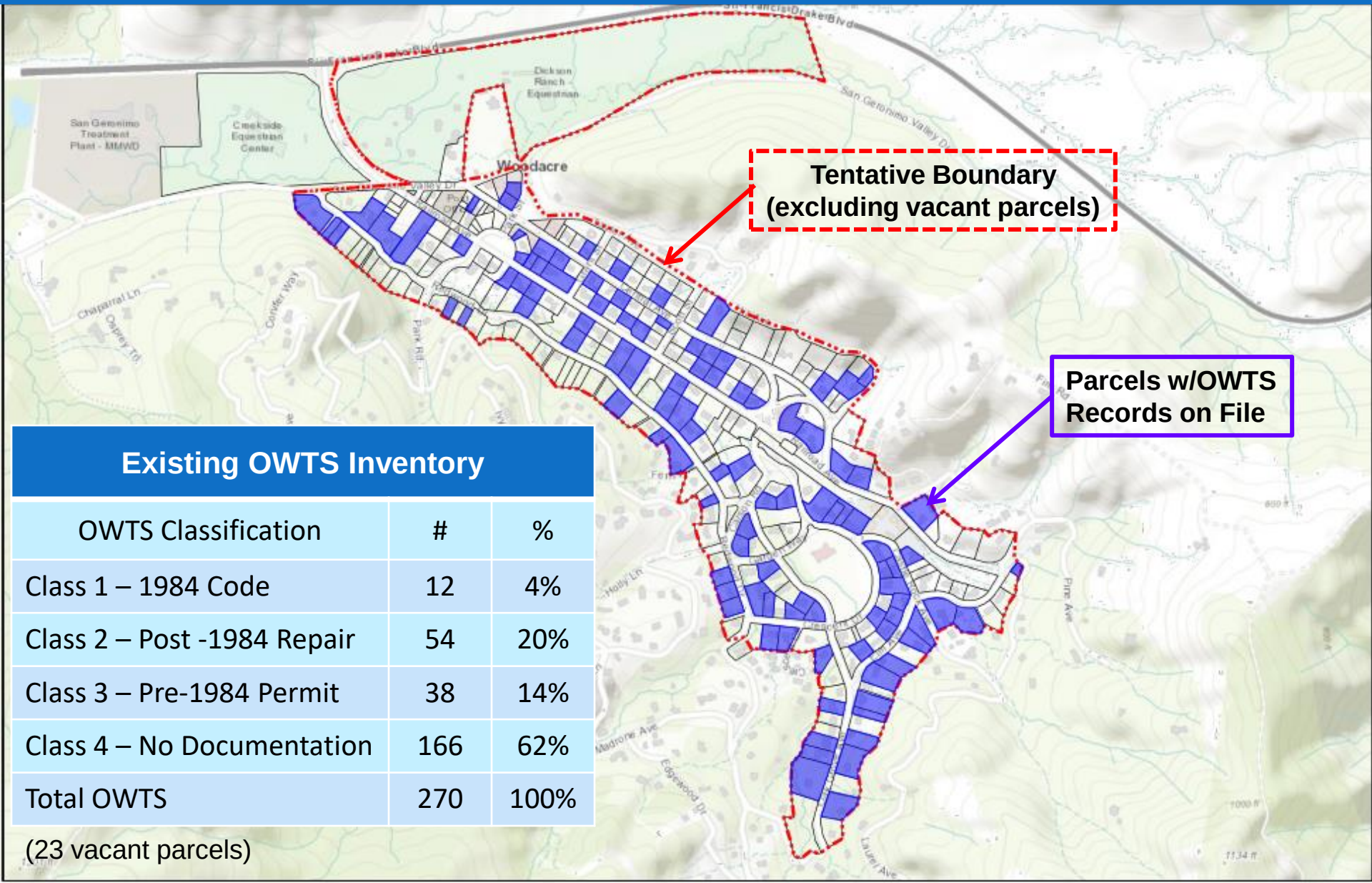
# Woodacre Wastewater Chronology

- 2004-05 and 2007-07: Confidential Septic System Inspections under "Septic Matters" program
  - 62 out of 135 were for Woodacre residences
  - 2/3 of Woodacre OWTS found marginal to unacceptable
- 2006-07 and 2008 – Water quality sampling in Woodacre area by Tomales Bay Watershed Council; contamination found
- 2007 Woodacre Flats Wastewater Group began meeting to pursue local septic system solutions
- 2010 - Woodacre Flats Wastewater Feasibility Study
- 2016 - Water Recycling Grant for expanded water recycling alternative
- 2022 - County authorized expanded study of local community leachfield for Woodacre

# Woodacre Flats – March 2023

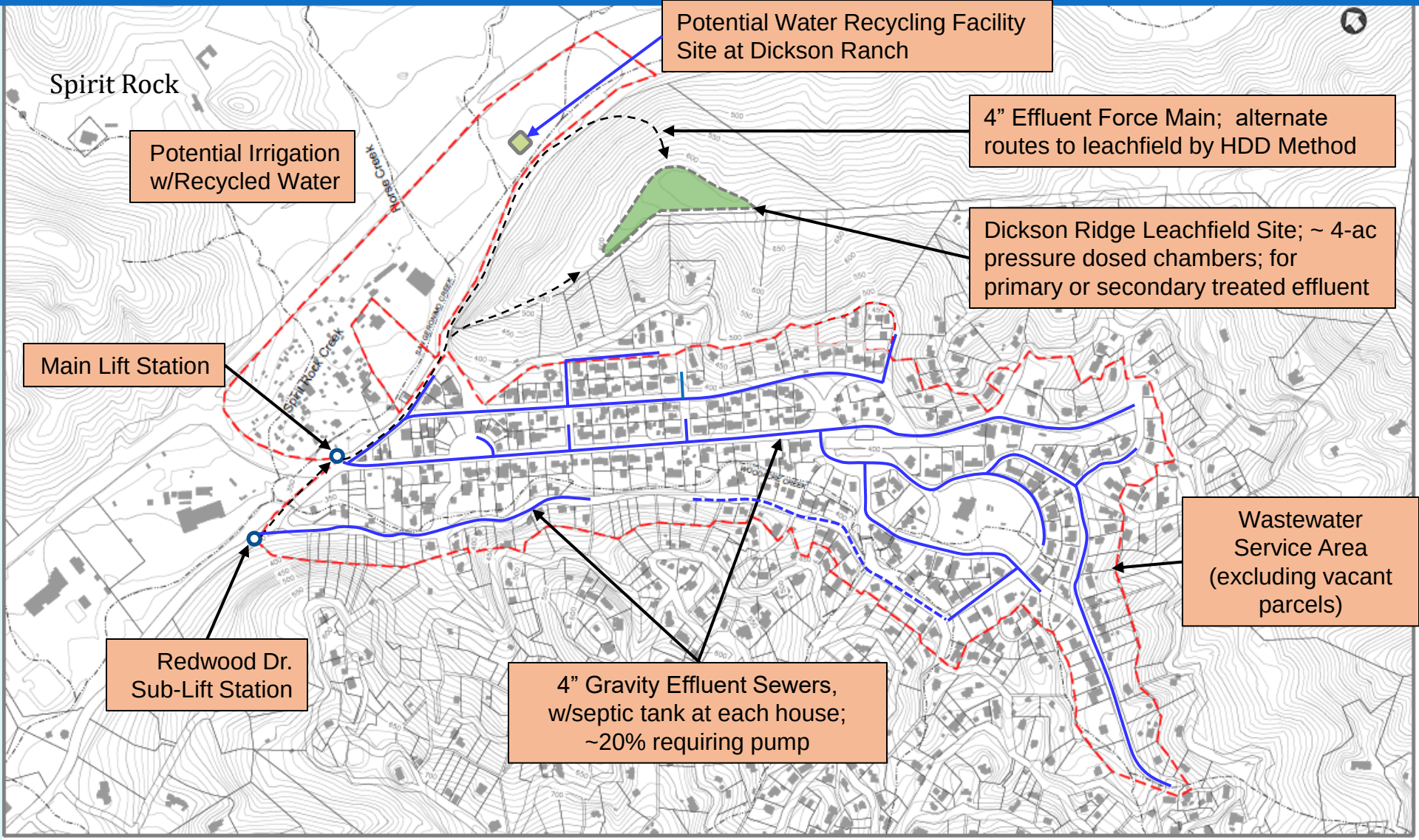
# Wsoodacre Community Wastewater Service Area (Preliminary)




| Existing OWTS Inventory | | |
|---|---|---|
| OWTS Classification | # | % |
| Class 1 – 1984 Code | 12 | 4% |
| Class 2 – Post -1984 Repair | 54 | 20% |
| Class 3 – Pre-1984 Permit | 38 | 14% |
| Class 4 – No Documentation | 166 | 62% |
| Total OWTS | 270 | 100% |

(23 vacant parcels)

# Community Wastewater Alternatives



# Woodacre Wastewater Alternatives

| No. | Description | Estimated Connections |
|---|---|---|
| 1 | **No Project – Status Quo** | N/A |
| 2 | **OWTS Upgrades and Management Program** | N/A |
| 3 | **Primary – Septic Tank Treatment & Community Leachfield** | 100 - 150 |
| 4 | **Secondary Treatment & Community Leachfield** | 250 – 300+ |
| 5 | **Secondary Treatment w/Community Leachfield and Limited Seasonal Irrigation (TBD)** | 250 – 300+ |
| 6 | **Tertiary Recycled Water Treatment w/Community Leachfield (winter) and Tertiary Recycling (TBD)** | 250 – 300+ |

# Alternative 2
# OWTS Upgrade Alternative

- Formation of an Onsite Management District "Zone"
- Establish local standards for system upgrades
- Systematic evaluation & as-needed upgrade of OWTS
- Water quality sampling program for surface & groundwater
- Possible financial assistance for upgrades
- Consider wide range of technologies to deal with high groundwater and soil percolation constraints

# Community Wastewater System Elements

- **Collection** - Effluent Sewer System

- **Treatment**
  - Primary - Septic tanks for solids removal
  - Secondary - Biofiltration or aeration process
  - Tertiary - Micro-filtration and disinfection

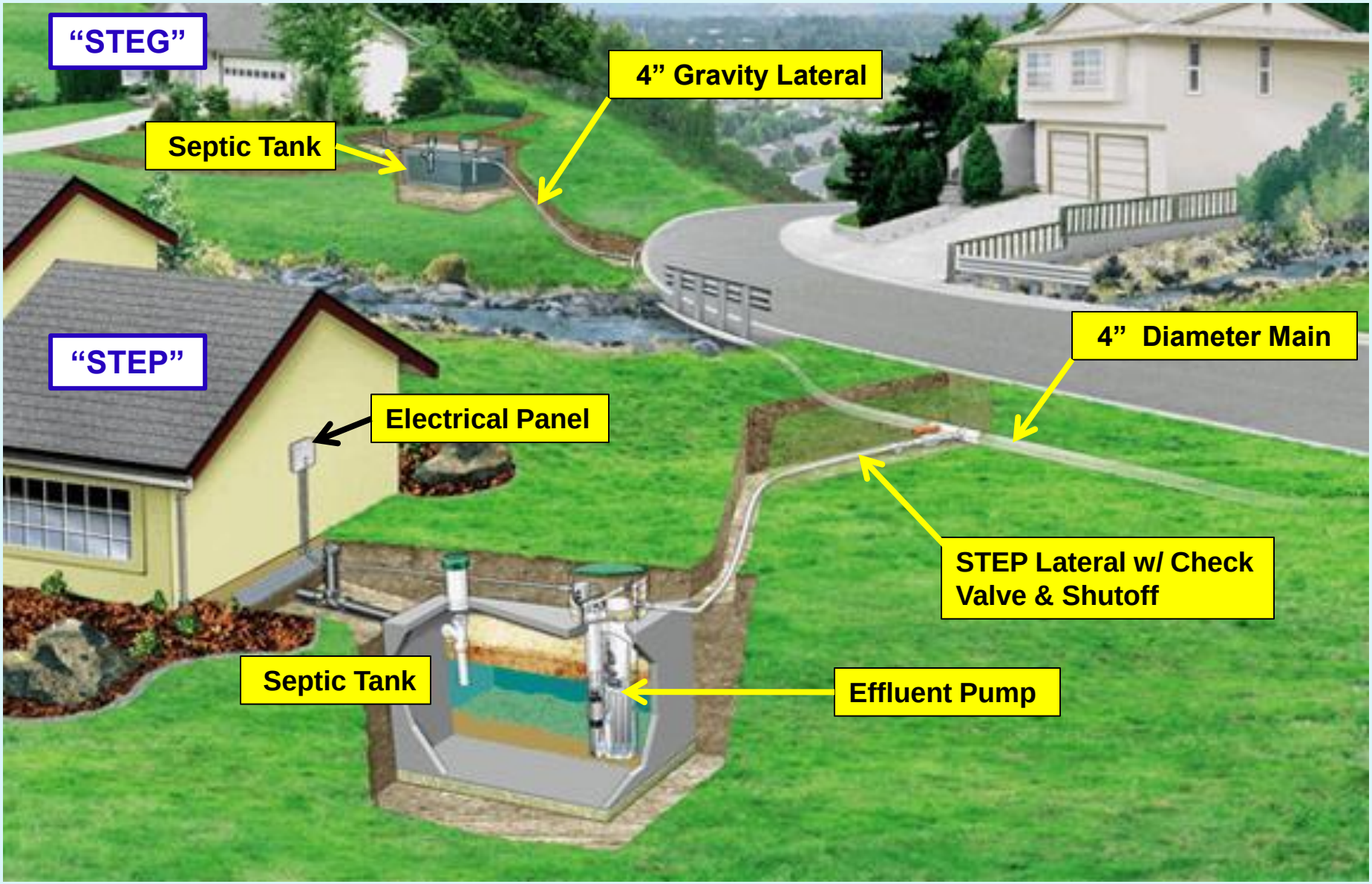
- **Disposal** - Community Leachfield

- **Recycling** – Seasonal irrigation and other approved uses for secondary or tertiary treated water

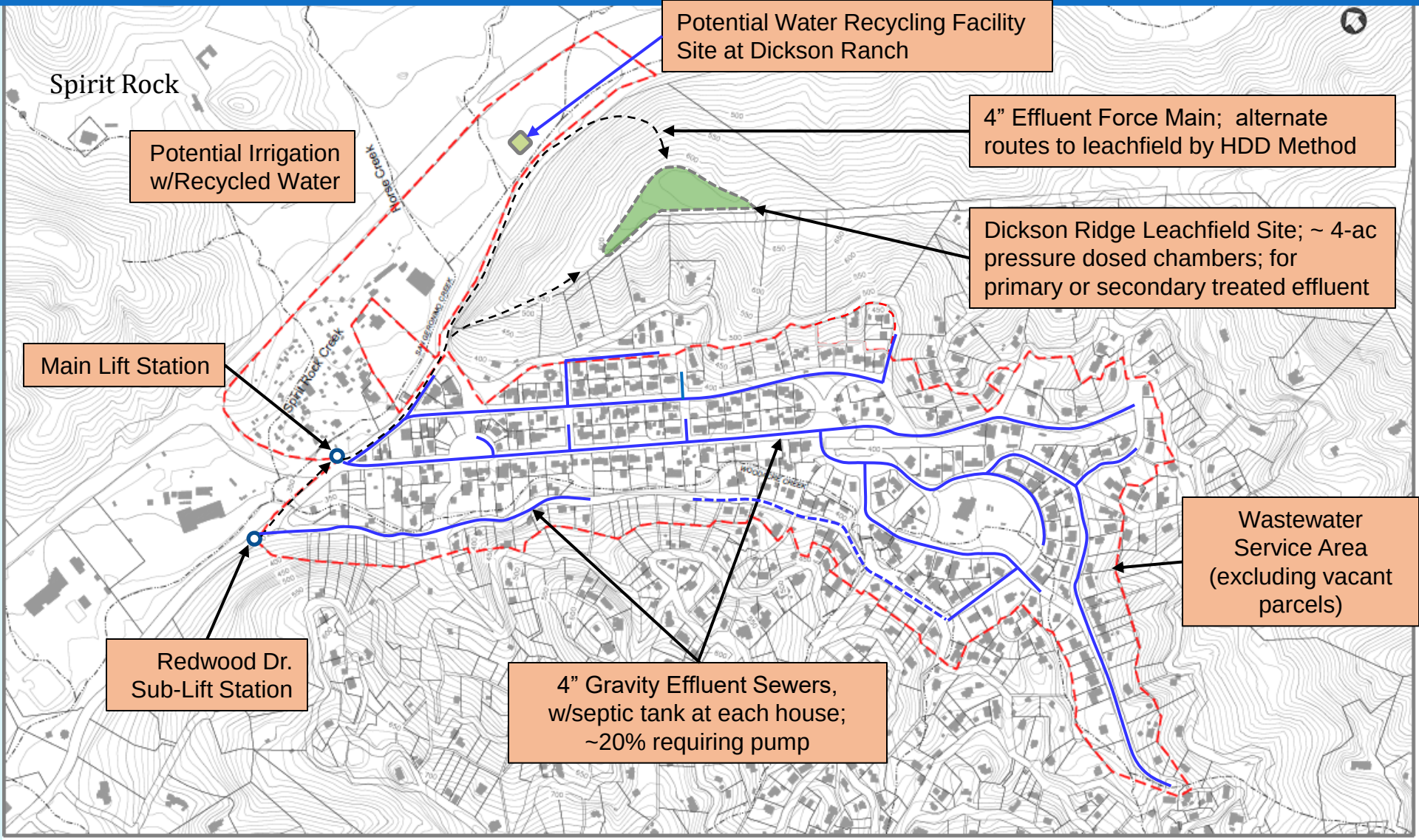
# Wastewater Collection System "Effluent Sewer"

- Network of 4" diameter "effluent sewer" pipes installed in streets leading to lift station or treatment-disposal site
- Each house has septic tank with gravity lateral or pump connection to "effluent sewer" main
- Sewer conveys only septic tank effluent from each house; solids are retained in septic tanks for normal pump-out
- **Advantages:** Smaller pipes; No manholes; Avoids groundwater infiltration; Less street disturbance; Less maintenance

# Effluent Sewer System



# Community Wastewater Alternatives



# Alternative 3
# Primary Treatment with Community Leachfield

- Effluent sewer collection system
- Main lift station at NE corner of Railroad & SG Valley Dr
- Effluent force main to leachfield site via SG Valley Dr
- 100% community leachfield at Dickson Ridge site, plus reserve area

# Alternative 4
# Secondary Treatment with Community Leachfield

- Effluent sewer collection system
- Main lift station at NE corner of Railroad & SG Valley Dr
- **Effluent force main to secondary treatment site at Dickson Ranch**
- **Treated water force main from treatment site to community leachfield at Dickson Ridge site**
- 100% community leachfield at Dickson Ridge site, plus reserve area; **smaller leachfield/greater capacity**

# Alternative 5
# Secondary Treatment with Leachfield & Seasonal Recycling

- Effluent sewer collection system
- Main lift station at NE corner of Railroad & SG Valley Dr
- Effluent force main to secondary treatment site at Dickson Ranch, **with added disinfection**
- Treated water force main from treatment site to community leachfield at Dickson Ridge site
- 100% community leachfield – **winter use**
- **Seasonal irrigation and other approved secondary recycled water uses (TBD)**

# Alternative 6
# Tertiary Treatment with Leachfield & Seasonal Recycling

- Effluent sewer collection system
- Main lift station at NE corner of Railroad & SG Valley Dr
- Effluent force main to **tertiary treatment** site at Dickson Ranch
- Treated water force main from treatment site to community leachfield at Dickson Ridge site
- 100% community leachfield – winter use
- Seasonal irrigation and other **approved tertiary recycled water uses (TBD)**

# Dickson Ranch
# Wastewater Treatment Plant Site

# Community Wastewater Treatment System Example

# Wastewater Disposal
# Leachfield at Dickson Ridge
## ~ Site Conditions ~

- North slope of 25-acre wooded site
- Topography - <10% to 35% slopes
- Sandy loam soils over weathered sandstone
- Investigated February 2023 in wet weather conditions – no groundwater to 8 feet
- Moderate to fast soil percolation (20 mpi ave)
- (2) Ephemeral drainages >100 feet setback
- Site carrying capacity limited by: (a) area for trenches; and (b) cumulative nitrogen loading

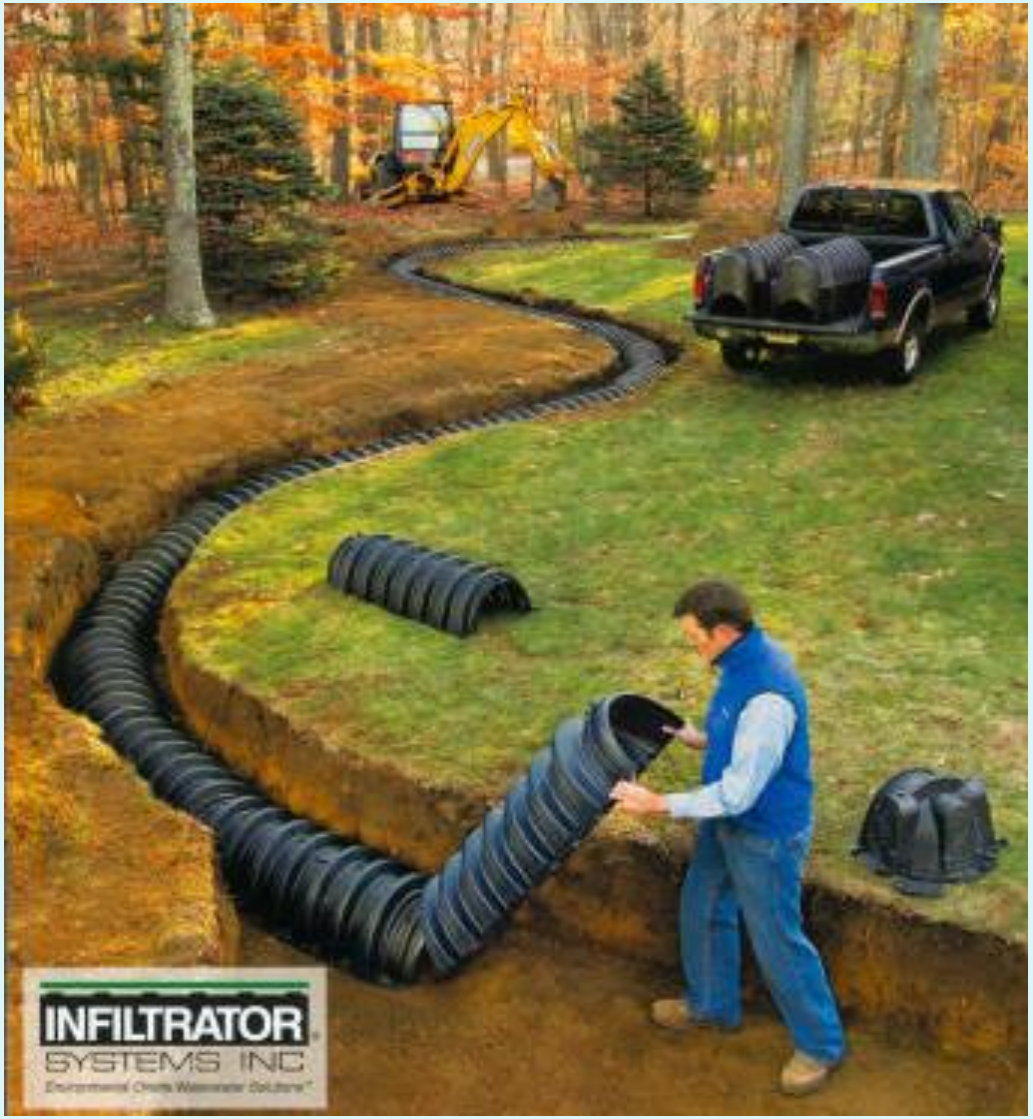
# Arborist Assessment
## (Arborscience, Kent Julin, PhD)

- Tolerance to Construction Impacts for Protected Species:
  - Good: Coast Redwood, Douglas Fir, Coast Live Oak
  - Moderate: California Bay
  - Poor: Pacific Madrone
- Recommended tree protection mitigation measures
- Leachfield nutrients and water will benefit tree health
- Thinning will improve forest health and reduce wildfire hazards to retained trees

# Wastewater Disposal
# Leachfield at Dickson Ridge
## ~ Design ~

- Shallow trenches (24 to 30” deep) between trees
- Leachfield “chambers” with pressure distribution
- Automatic dosing siphon(s)
- No pumps or electrical requirements
- Everything underground, installed with small excavator
- Suitable for year-round use or winter only
- Install 100% field; designate 100% reserve area
- Total trench length required – 3,000 to 5,000 feet
- Site carrying capacity limited by: (a) area for pipe installation and (b) cumulative nitrogen loading

# Infiltrator Chamber Leachfield



# Community System Project Costs

## Capital Costs

- Engineering,  environmental, planning, permitting & construction
- Construction of community facilities **including homeowner septic tanks**
- Paid for by a combination of grants and local property assessments
- Property assessments require 51% approval of service area
- Cost to homeowners spread over 30 years through bonds/low interest loans
- Expected annual assessment (on tax bill) in range of $1,500 to $2,000

## Operation and Maintenance

- Labor, equipment, utilities, vehicles, supplies, service, repair, replacement
- Costs to homeowners paid as annual wastewater service fee on tax bill
- Expected annual cost per connection in range of $1,000 to $1,300

## Additional Homeowner Costs

- Abandonment of existing septic tank, if replaced with new tank
- Re-routing house plumbing to new tank location, as required
- Pump-out of septic tank, as needed
- Electrical costs if connection to effluent sewer requires pump system (STEP)