Pure Water Phase 2 Planning Workshop

Metro JPA
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Doug Owen, Stantec
Consultant Team Manager
Pure Water Program

The City of SAN DIEGO

Acknowledgements

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Agenda

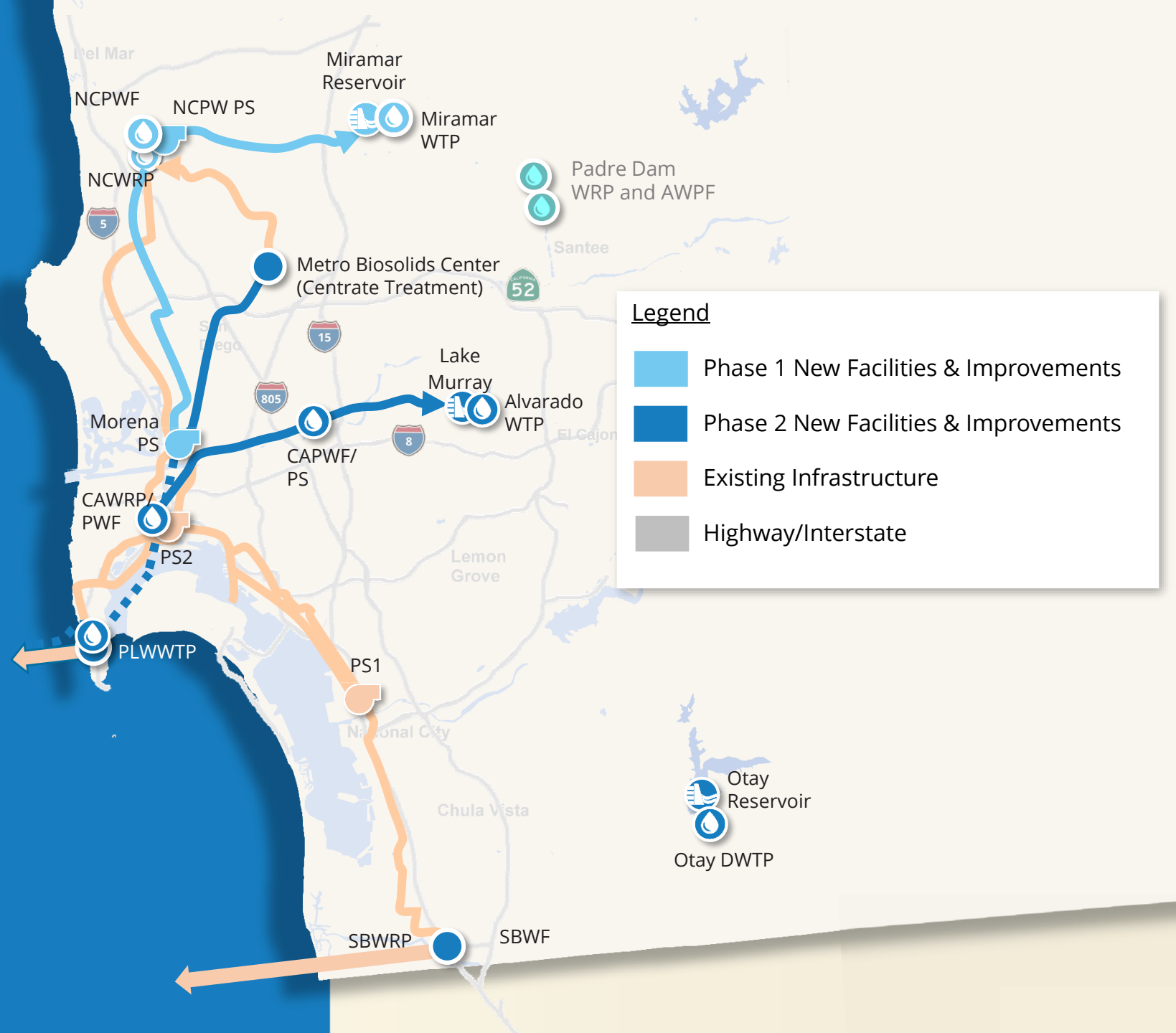
- Review of Phase 2 Alternatives
- Alternatives Refinement Update
  - *Treatment*
  - *Conveyance*
- Next Steps

How We Got Here – 2018 PLWTP Considerations

- Maximize use of assets at the PLWTP
  - *Keep wastewater treatment "centralized" at PLWTP*
- Repurpose the existing primary sedimentation basins for water reclamation plant
  - *Membrane Bioreactors*
- Straightforward expansion of secondary treatment if waiver is lost and no secondary equivalency
- Reduce the amount of facilities constructed on "new" parcels
  - *Stadium site was uncertain with potential SDSU West development*

Alternative Development includes combinations of:

- Water Reclamation Plant
  - Point Loma
  - Harbor Drive
- Purified Water Facility
  - Harbor Drive
  - Mission Valley
- With and Without Waiver/Secondary Equivalency
- Brine/Centrate bypass of PLWTP directly to ocean outfall
- Padre Dam 11.5 mgd ECAWP facility a part of a “regional” 83 mgd solution



Summary of Alternatives

Alt	Secondary Equiv	Brine/Treated Centrate Bypass	Regional Purified Water Production	CAWRP/CAPWF Combined at Harbor Dr	Phase 2 Pure Water Production (mgd)
1A	X				53
1B					53
1C	X	X			53
1D		X			53
1E	X		X		41.5
1F		X	X		41.5
1G	X		X	X	41.5
1H		X	X	X	41.5
3A	X	X			53
3B		X			53
3C	X	X	X		41.5
3D		X	X		41.5

Alt 1x – CAWRP at Harbor Drive; Alt 3x – CAWRP at PLWTP

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1D		X			53
1E	X		X		41.5
1F		X	X		41.5
1G	X		X	X	41.5
1H		X	X	X	41.5
3A	X	X			53
3B		X			53
3C	X	X	X		41.5
3D		X	X		41.5

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1E	X		X		41.5
1F		X	X		41.5
1G	X		X	X	41.5
1H		X	X	X	41.5
3A	X	X			53
3B		X			53
3C	X	X	X		41.5
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1F		X	X		41.5
1G	X		X	X	41.5
1H		X	X	X	41.5
3A	X	X			53
3B		X			53
3C	X	X	X		41.5
3D		X	X		41.5

Alt 1x – CAWRP at Harbor Drive; Alt 3x – CAWRP at PLWTP

What We've Learned

- Centrate significantly impacts water reclamation plant sizing and treatability
  - *Bypass brine/centrate around water reclamation plant*
  - *For Alternative 3, centrate must be treated for ocean discharge*
- Existing primary sedimentation basins at PLWTP cannot be retrofitted for secondary treatment
  - *Insufficient volume, too shallow, and can't accommodate membrane bioreactors*
  - *For Alternative 3, different processes for water reclamation plant and secondary conversion (loss of waiver)*
- The City has secured the Mission Valley site

Treatment Layouts

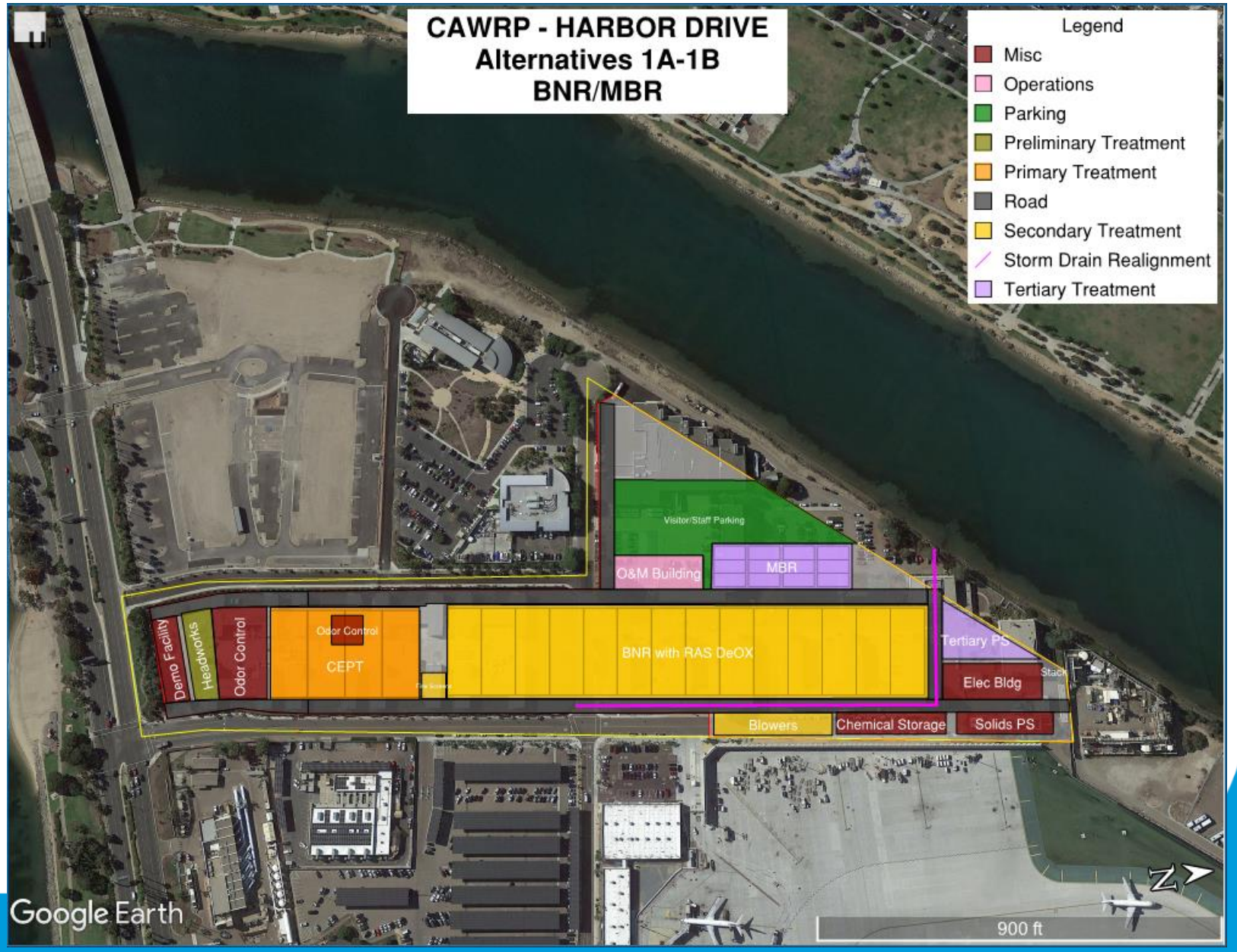
Treatment Elements

- Discharge to Murray Reservoir
  - *Direct Potable Reuse – Raw Water Augmentation*
- Water Reclamation Plant
  - *Enhanced primary treatment*
    - *Chemically-enhanced primary treatment or Densadeg®*
  - *Biological nutrient removal*
  - *Membrane Bioreactors*
- Purified Water Facility
  - *Ozone/biologically active carbon*
  - *Membrane filtration*
  - *Reverse Osmosis*
  - *Ultraviolet/Advanced Oxidation Process*
  - *Pipeline chlorination*

Alternative 1 (53 mgd) - Harbor Drive CAWRP Site Plan

- Treatment options for:
  - *Primary Treatment*
    - CEPT (as shown)
    - DensaDeg
  - *CAWRP Secondary/Tertiary Treatment*
    - BNR/Secondary Clarifiers/Tertiary Filters (insufficient land)
    - Fine Screens/BNR/MBR (as shown)

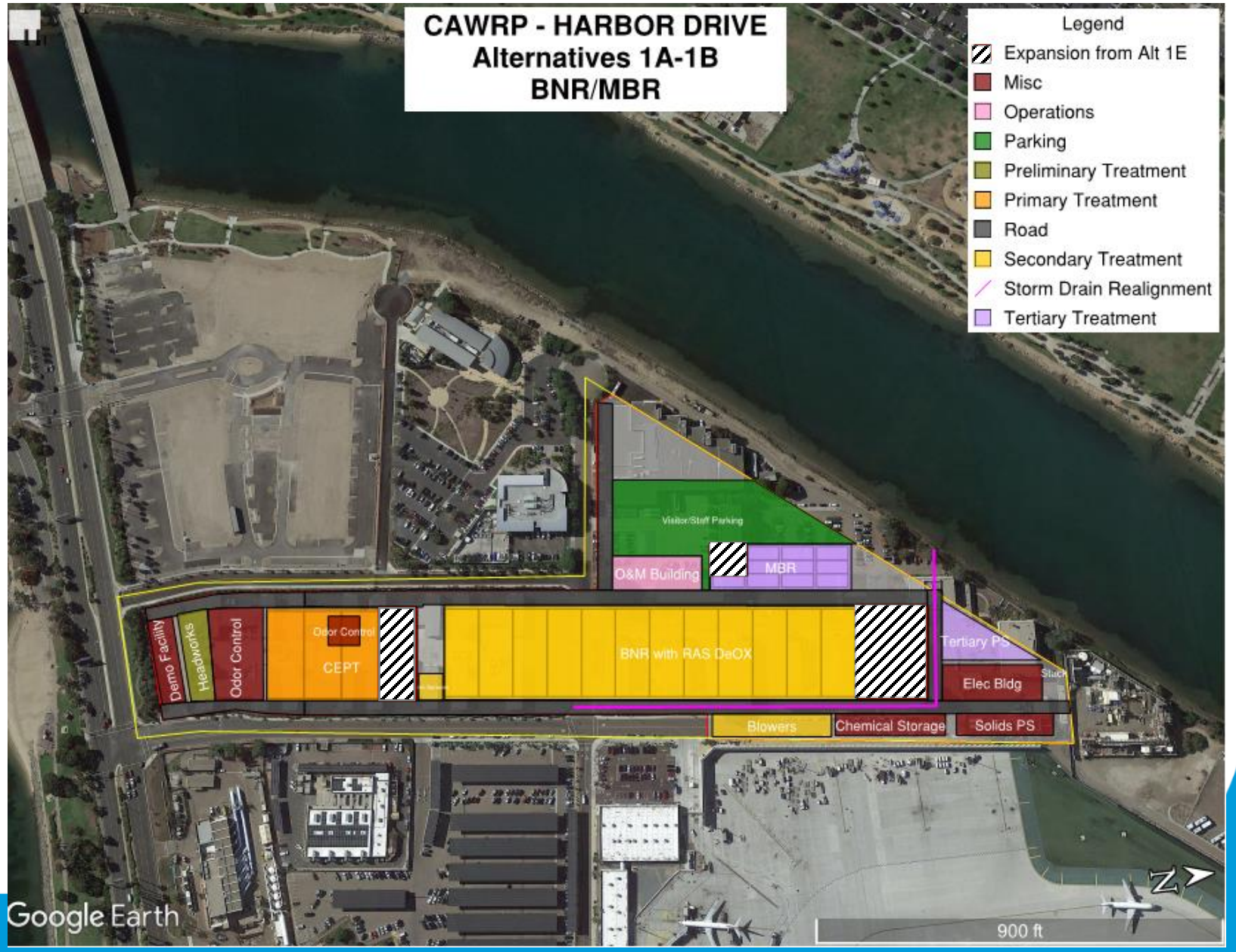
Alt	Influent AADF (mgd)
1A, 1B	69



Alternative 1 (42 mgd) - Harbor Drive CAWRP Site Plan

- Treatment options for:
  - *Primary Treatment*
    - CEPT (as shown)
    - DensaDeg
  - *CAWRP Secondary/Tertiary Treatment*
    - BNR/Secondary Clarifiers/Tertiary Filters (insufficient land)
    - Fine Screens/BNR/MBR (as shown)

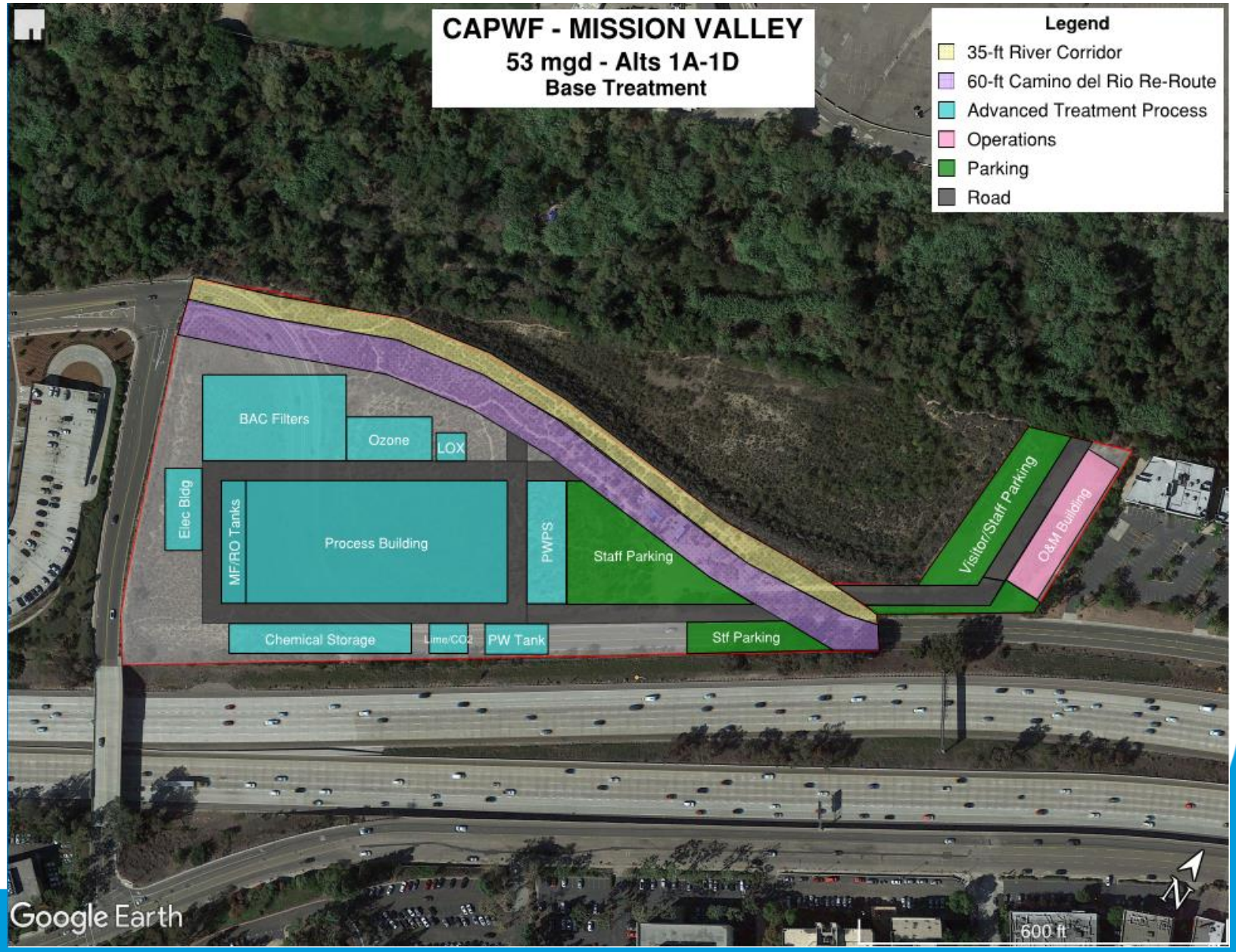
Alt	CAWRP Influent AADF (mgd)
1A - 1B	69
1E	53



Alternative 1 (53 mgd) – Mission Valley CAPWF Site Plan

- Treatment processes include:
  - *Ozone*
  - *BAC*
  - *MF*
  - *RO*
  - *UV/AOP*
  - *Post Treatment*

Alt	CAPWF Influent (mgd)
1A-1D	66



Full Secondary Treatment at Point Loma

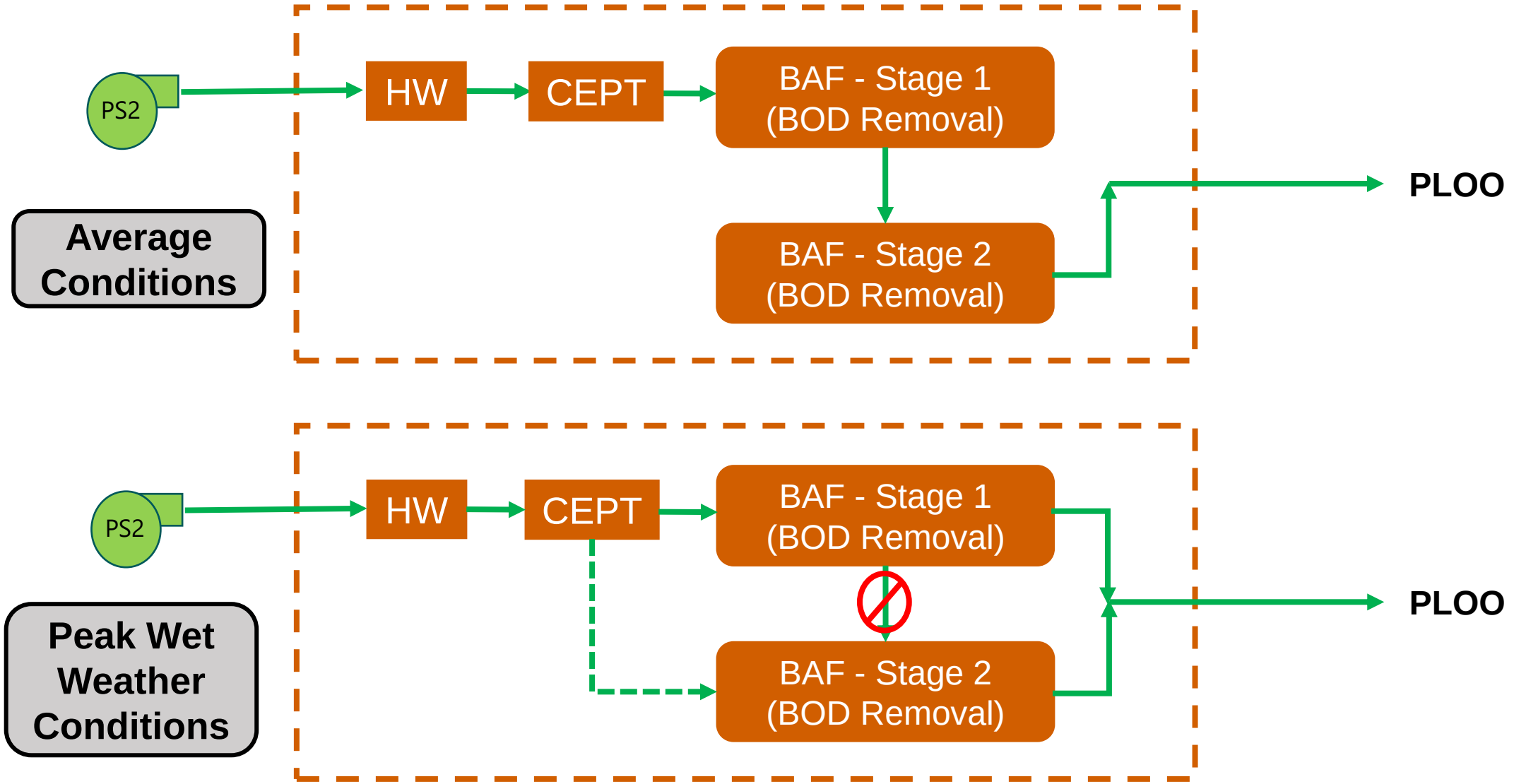
Discharge Limits – Secondary Effluent Standards

Parameter	30-d Average (Average Monthly)[a]	7-d Average (Average Weekly)[b]
BOD_5	30 mg/L (or 25 mg/L $CBOD_5$)	45 mg/L (or 40 mg/L $CBOD_5$)
TSS	30 mg/L	45 mg/L
pH	Within the limits of 6.0-9.0	
BOD_5 and TSS removal (concentration)	$\geq$ 85%	

a Calendar Month in accordance with 40 CFR 122, Section 122.45(d)(2)
b Calendar Week in accordance with 40 CFR 122, Section 122.45(d)(2)

Exhibit 5-2 in Chapter 5 of the NPDES Permit Writer's Manual (2010)

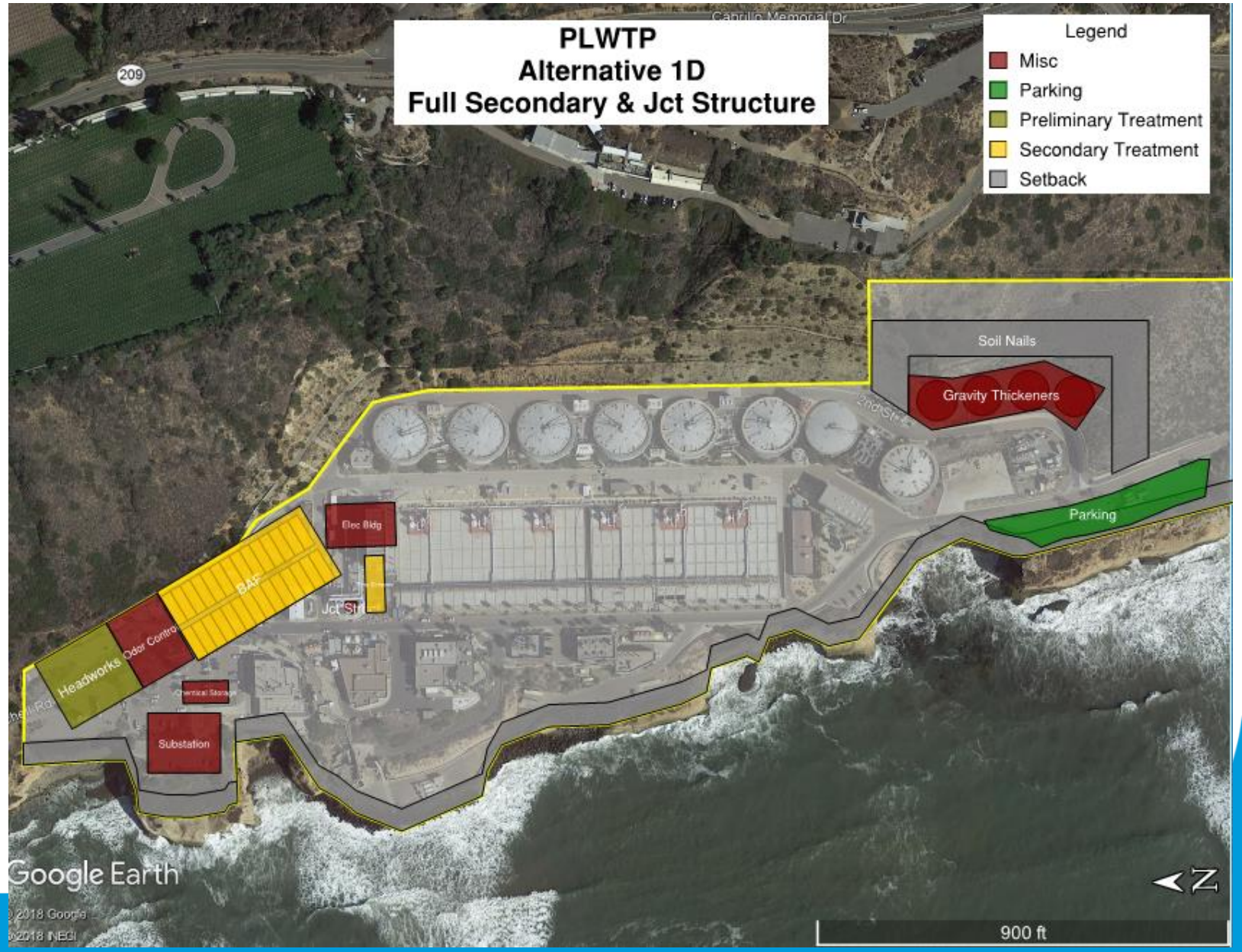
Biological Aerated Filter Configuration at PLWTP



Alternative 1 – PLWTP Site Plan (Full Secondary)

- Treatment options for:
  - *PLWTP Primary Treatment*
    - CEPT (evaluating)
    - DensaDeg (as shown)
  - *PLWTP Secondary Treatment*
    - Fine Screens/BAF
  - *Sludge Thickeners*
    - Gravity Thickeners

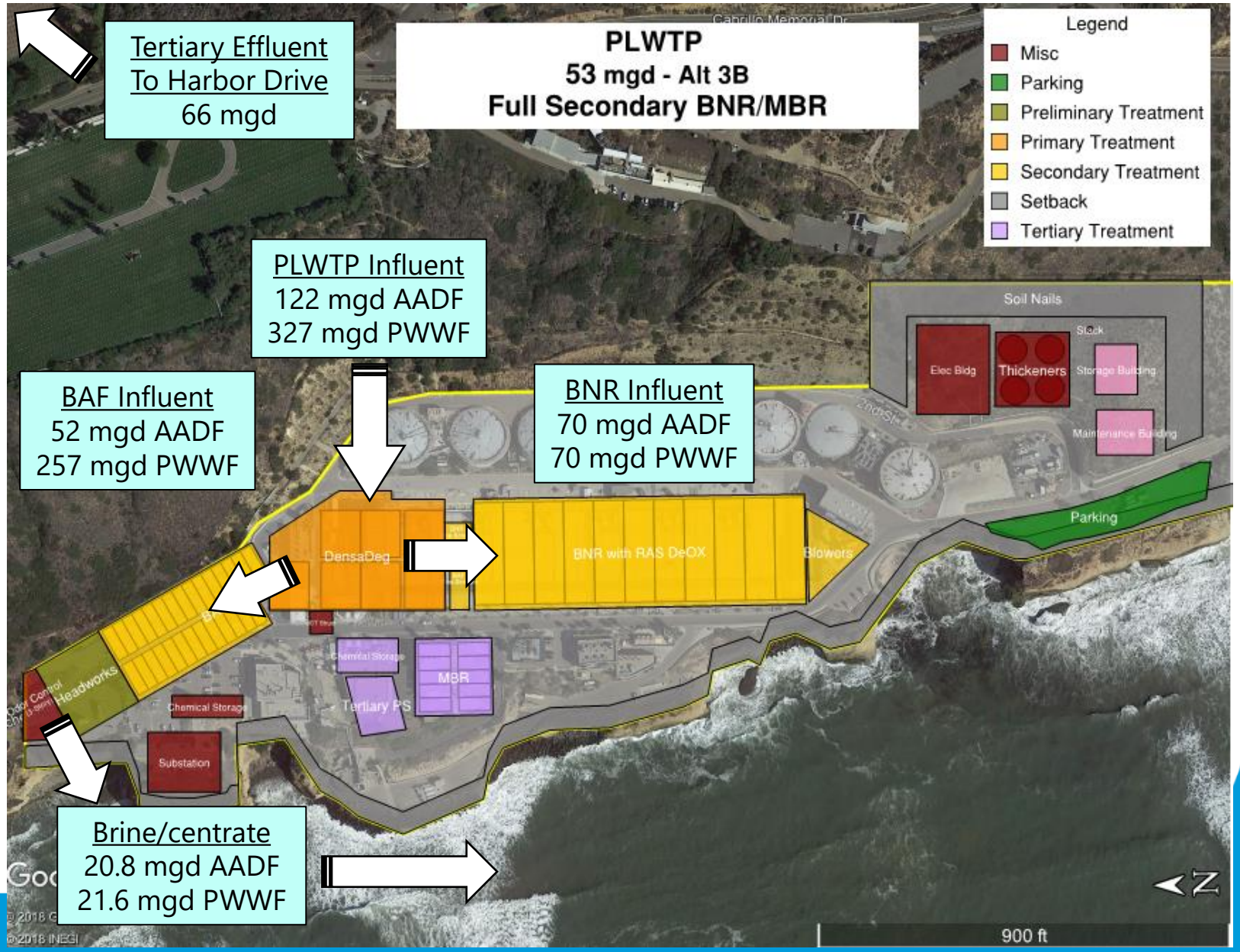
Alt	PLWTP Influent/Effluent (mgd)		CAWRP Combined Sludge Flow (mgd)
	AADF	PWWF	
1B	78/76	285/279	3.2 - 4.9



Alternative 3 – PLWTP Site Plan (Full Secondary)

- Treatment options for:
  - *PLWWTP & CAWRP Primary Treatment*
    - CEPT (insufficient land)
    - DensaDeg (as shown)
  - *PLWWTP Secondary Treatment*
    - Fine Screens/BAF (as shown)
  - *CAWRP Secondary/Tertiary Treatment*
    - BNR/Secondary Clarifiers/Tertiary Filters (insufficient land)
    - Fine Screens/BNR/MBR (as shown)
  - *Sludge Thickeners*
    - Gravity Thickeners

Alt	PLWTP Influent PWWF (mgd)	CAWRP Influent AADF (mgd)
3B	327	70



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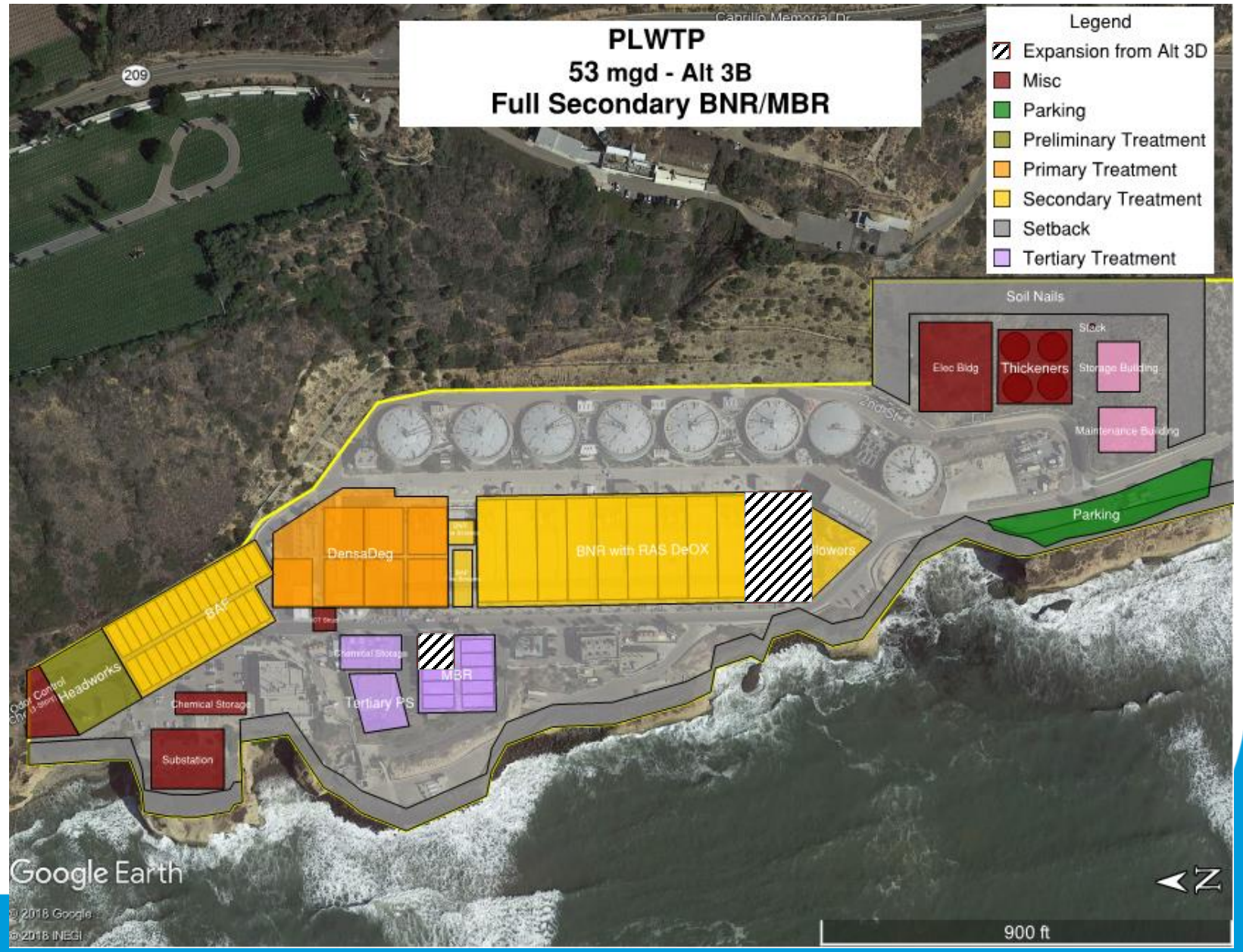
  - *Sludge Thickeners*
    - Gravity Thickeners

Alt	PLWTP Influent PWWF (mgd)	CAWRP Influent AADF (mgd)
3B	327	70
3D	327	55



Alternative 3 – Harbor Drive CAPWF Site Plan

- Treatment processes include:
  - *Ozone*
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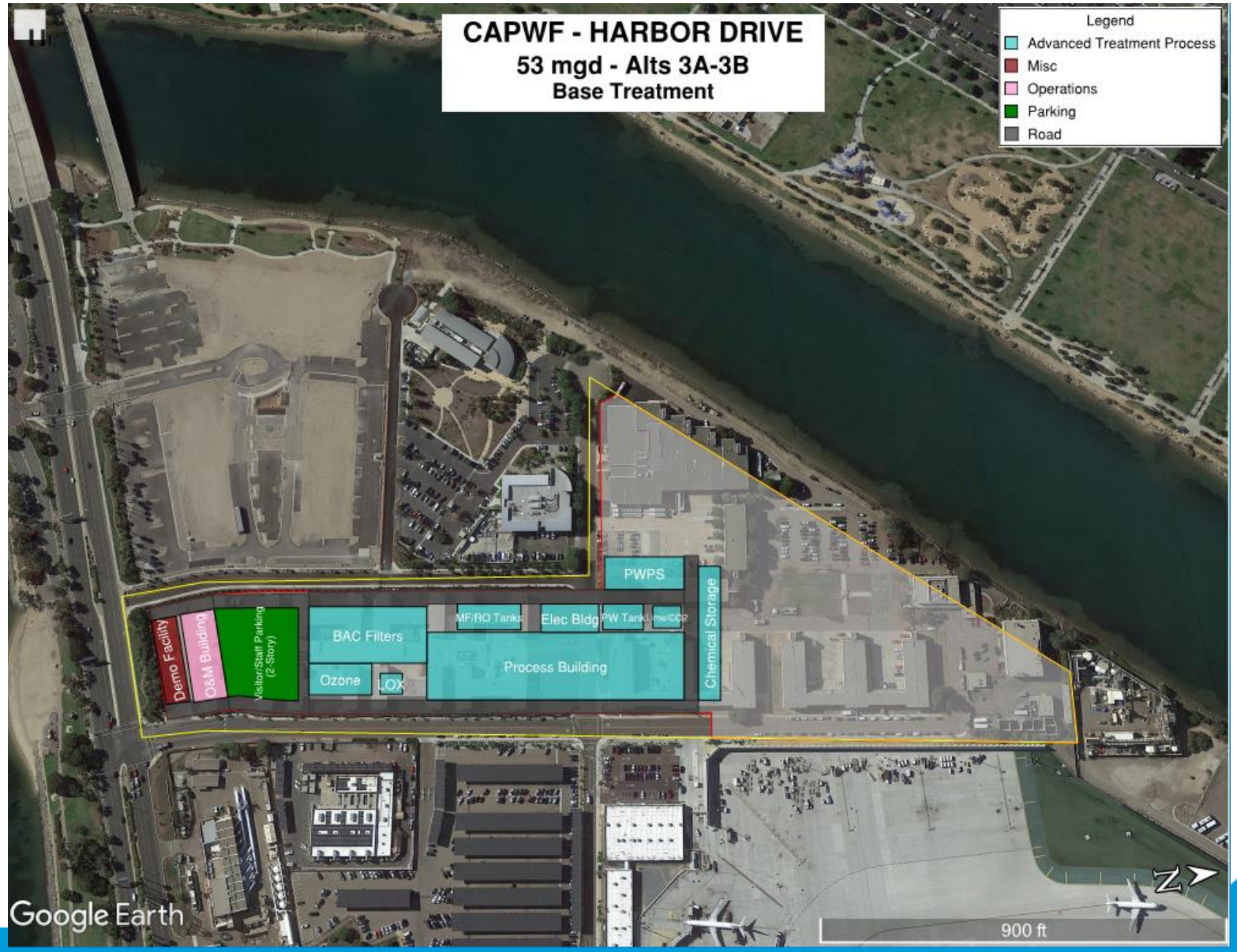
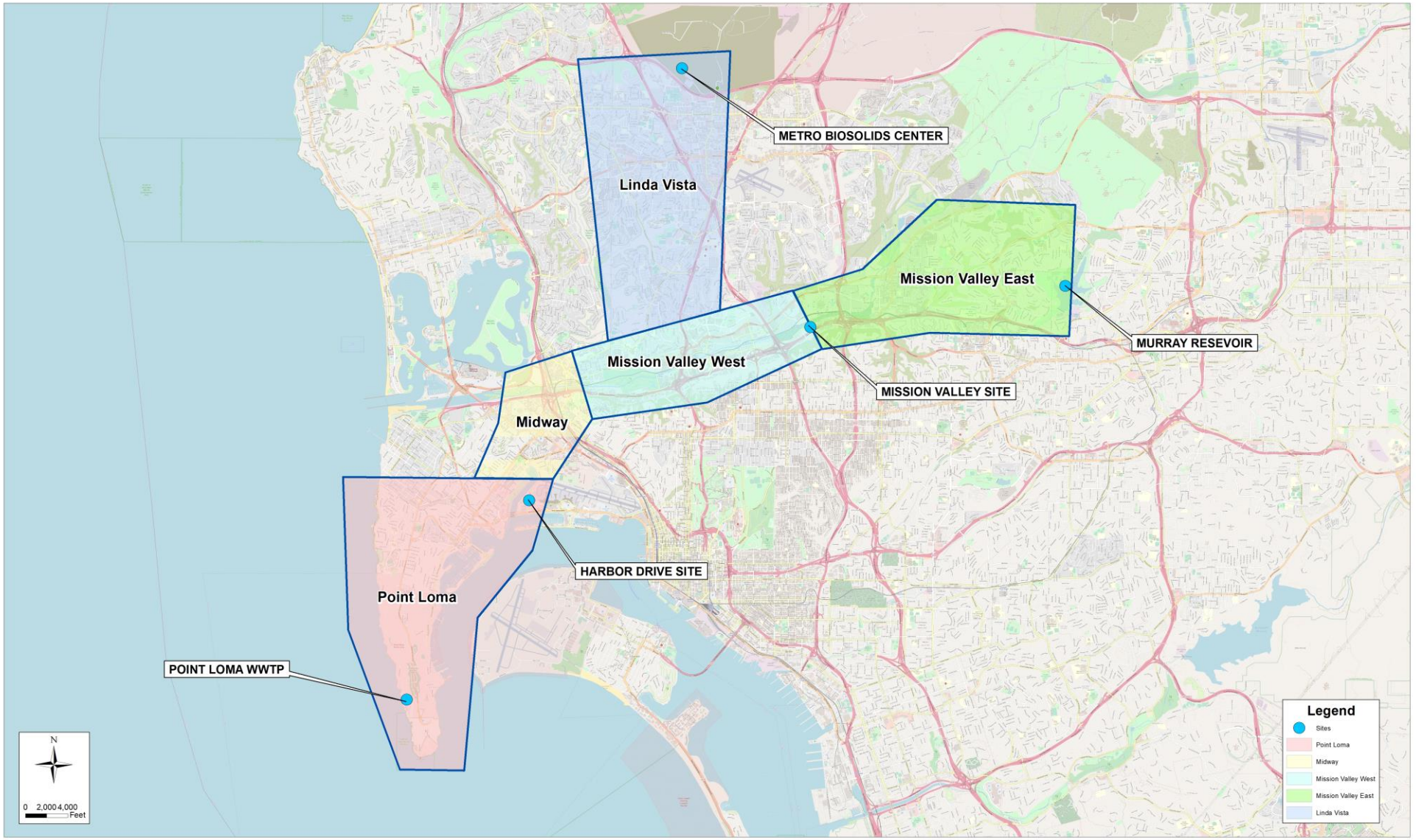
  - *MF*
  - *RO*
  - *UV/AOP*
  - *Post Treatment*

Alt	CAPWF Influent (mgd)
3A, 3B	66
3C, 3D	52



Conveyance Options

Conveyance Evaluation Areas



Point Loma Conveyance Options

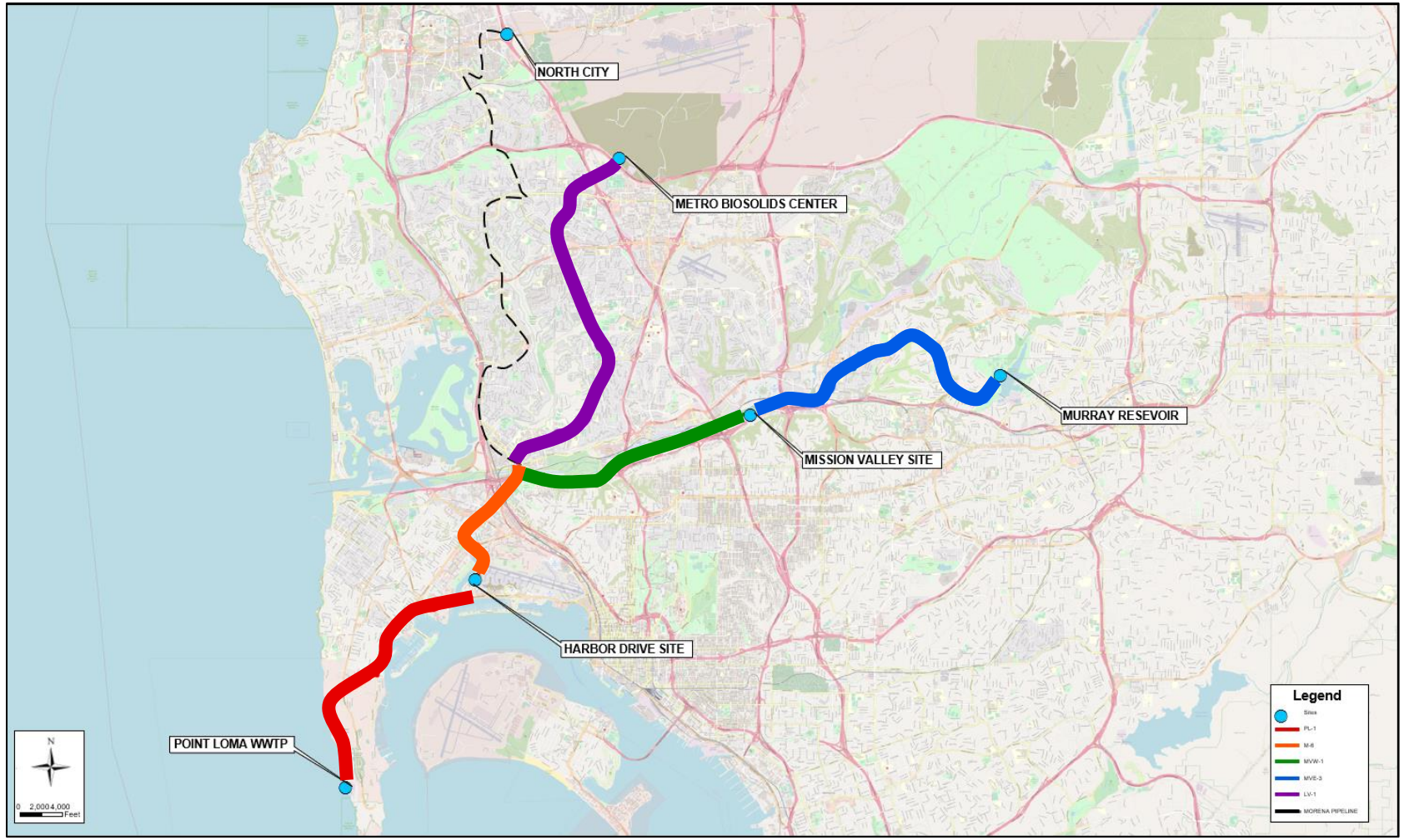
- 6 Routes analyzed
- 2 Bay options
- 2 Navy Channel crossing locations
- New tunnel location vs. existing tunnel location

Conveyance Evaluation Criteria

- Health and Safety
- Community Impact
- Environmental Impact
- Property and Easements
- System Complexity
- System Efficiency
- Operational Reliability and Flexibility
- Ability to Implement

Cost

Conveyance Alignments for Evaluation



Note: Alignments are not final and will be further evaluated under future Phase 2 planning. Only for purposes of determining potential costs.

Conceptual Phase 2 Schedule Milestones

Milestone	Phase 2
Phase 2 refinement of alternatives	January 2020 – March 2021
City recommends alternative for Phase 2	March 2021 – June 2021
Demonstration testing	February 2020 (planning) - 2026
10% Design	October 2024 – July 2025
Environmental Permitting	July 2025 – February 2030
30% Design	August 2026 – May 2027
Final Design	2027 - 2029
Construction	2029 – 2034 (1)

1. 2035 deadline for Pure Water production

Next Steps

- Finalize Alternatives Definition
- Prepare Cost Estimates
- Populate and Assess Evaluation Matrix
- Prepare Technical Memorandum

Questions