DELTA CONVEYANCE DESIGN & CONSTRUCTION AUTHORITY

STAKEHOLDER ENGAGEMENT COMMITTEE (SEC)

Stakeholder Engagement Committee (SEC)

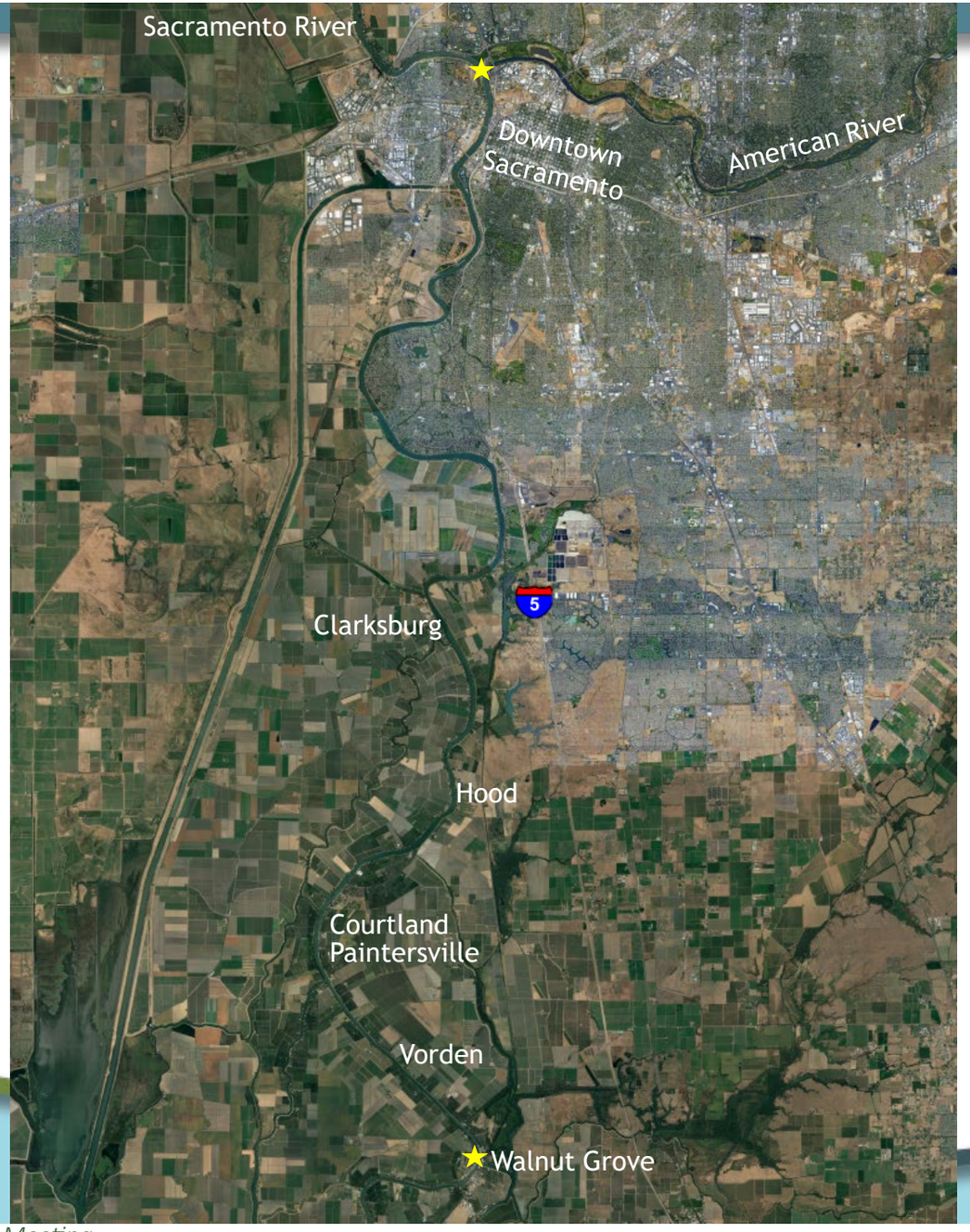
Abridged Presentation: Introduction to Intakes

Presented at the January 22, 2020 SEC Meeting

Intake Siting

- Siting study area is from the American River to Sutter Slough
- Sites on the east bank viable with the NOP corridors
  - West bank not viable due to poor access
- 1 to 3 intake sites required for likely alternatives

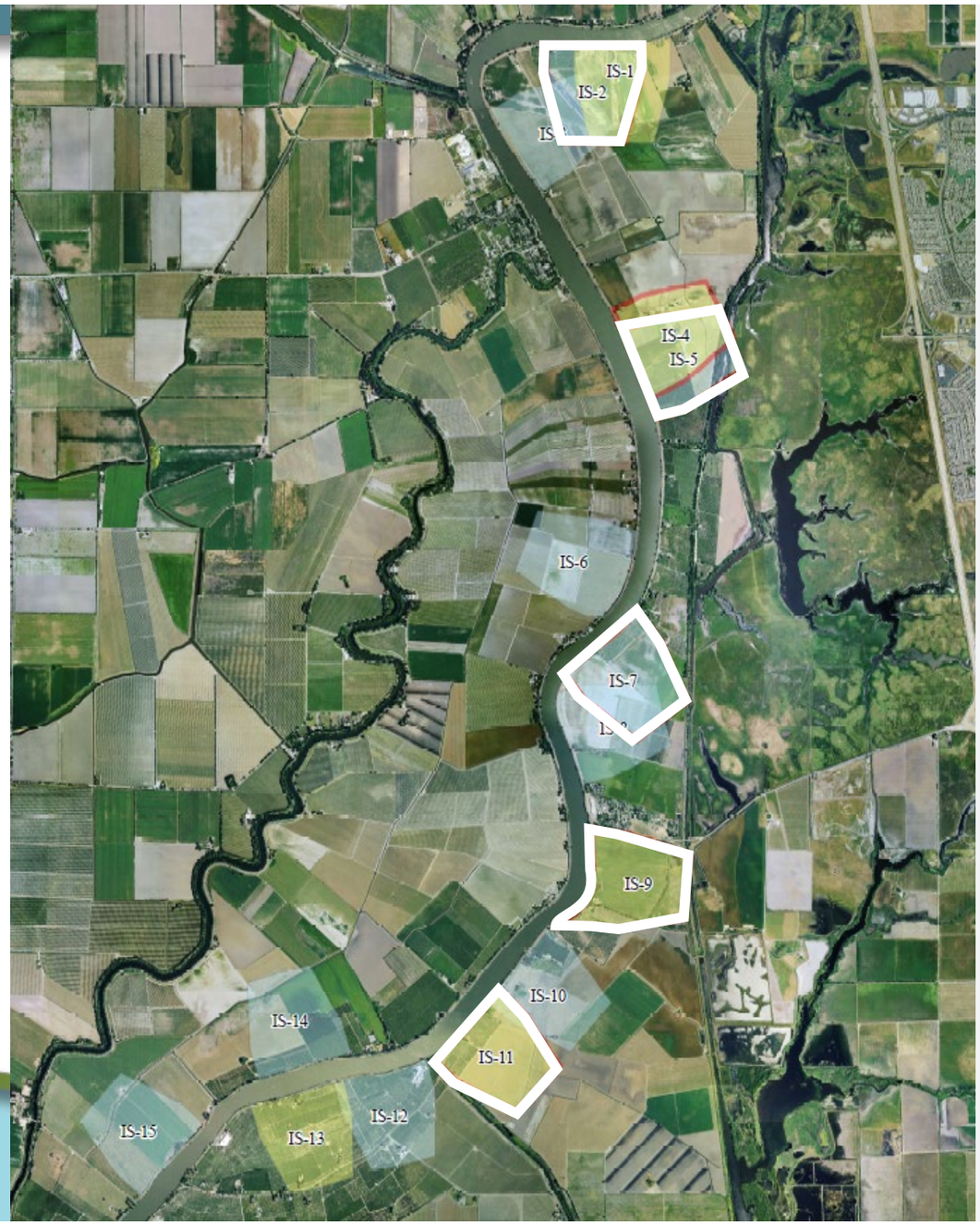
Capacity	Number of Intakes
3000 cfs	1 intake
4500 cfs	2 intakes
6000 cfs	2 intakes
7500 cfs	3 intakes



Intake Site Investigation

Potential siting informed by Fish Facility Technical Team (FFTT) as well as subsequent efforts

- Outside of bends best
  - Deeper is better (12 feet min)
  - 1 mile spacing
  - Non-shoaling (no sediment accumulation)
  - Adequate straight length for structure
  - Negligible effect on flood levels
- Landside Effects
  - Property effects
  - Proximity to existing development
  - Built environment effects
- Geotechnical Concerns
- Environmental and Habitat Disruption
- Access
  - Roads and traffic effects



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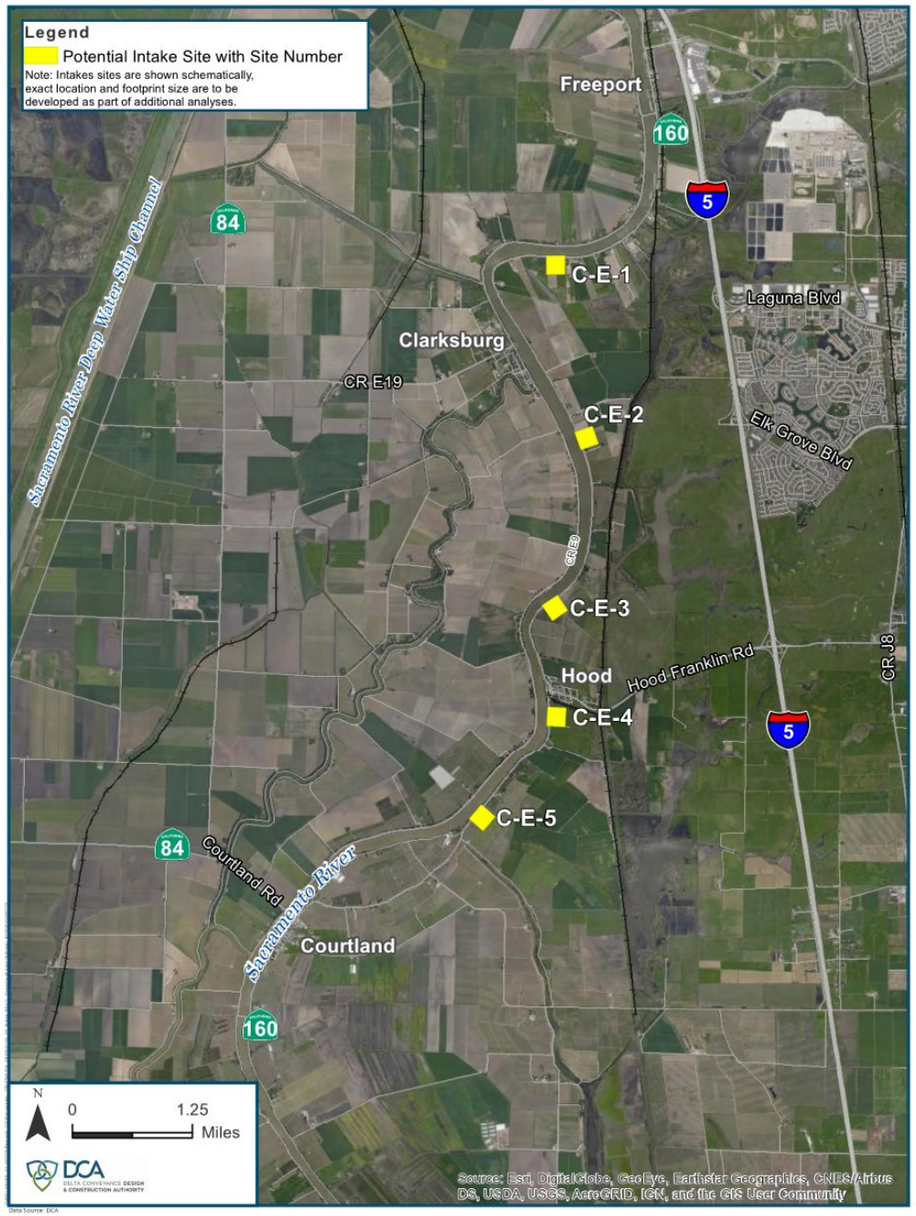
Candidate Sites

- Reach of river has been exhaustively studied
  - Same sites as previously identified
  - Studied new land use, flows, and river bathymetry
  - No additional viable sites on the east side of the river
  - West side is not logistically feasible
- Conceptual position developed at each site as basis for comparison
- Intake sites are feasible for either Central or Eastern Corridors



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Evaluation Results

Sites C-E-1 and C-E-4 ranked as least favorable and not recommended for use unless other 3 sites not implementable

- Land use
- Proximity to existing development
- Geotechnical issues

Site C-E-3 is apparent best site

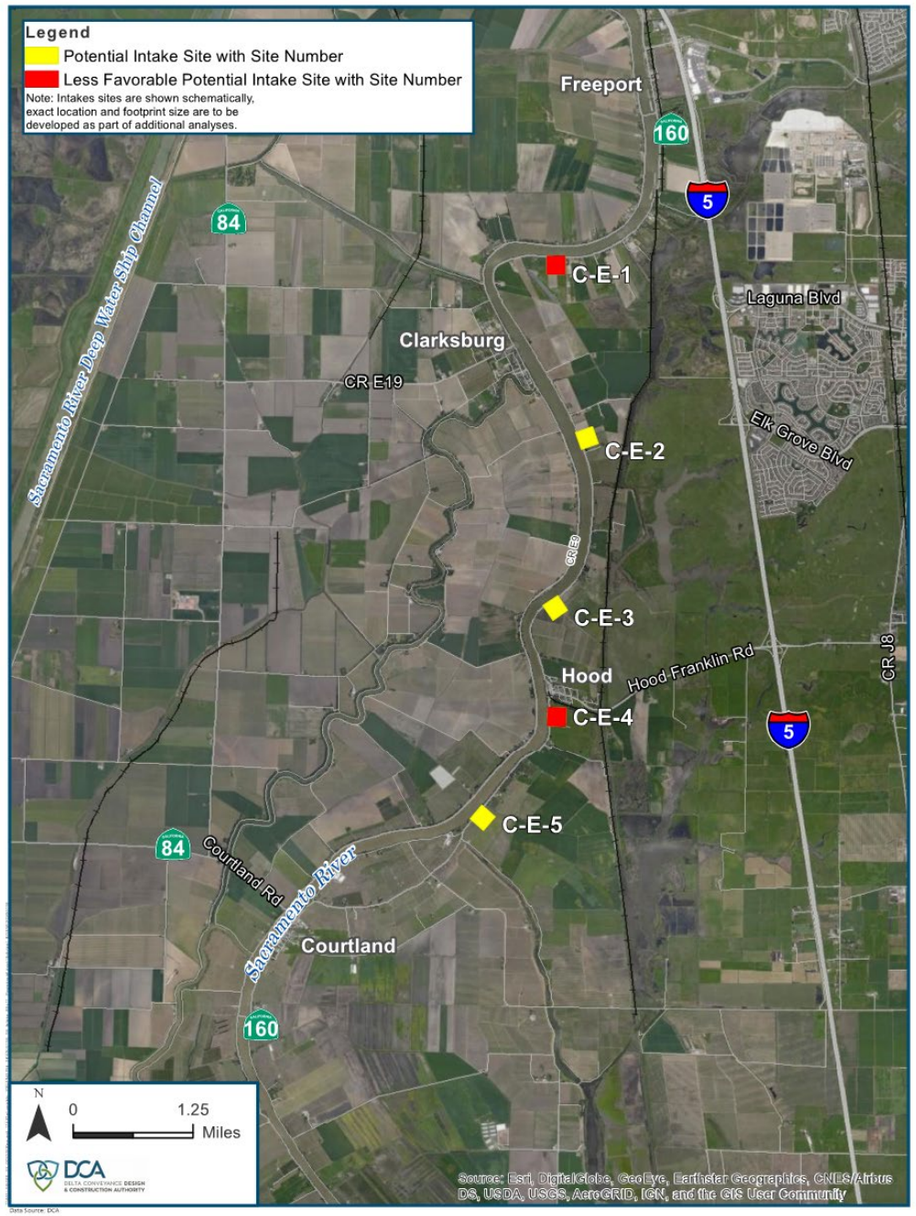
- Lowest effects on existing property and features
- Excellent river conditions

Site C-E-5

- Low effects on existing property and features
- Good river conditions

Site C-E-2

- Longest intake structure
- More substantial property effects
- Adequate river conditions



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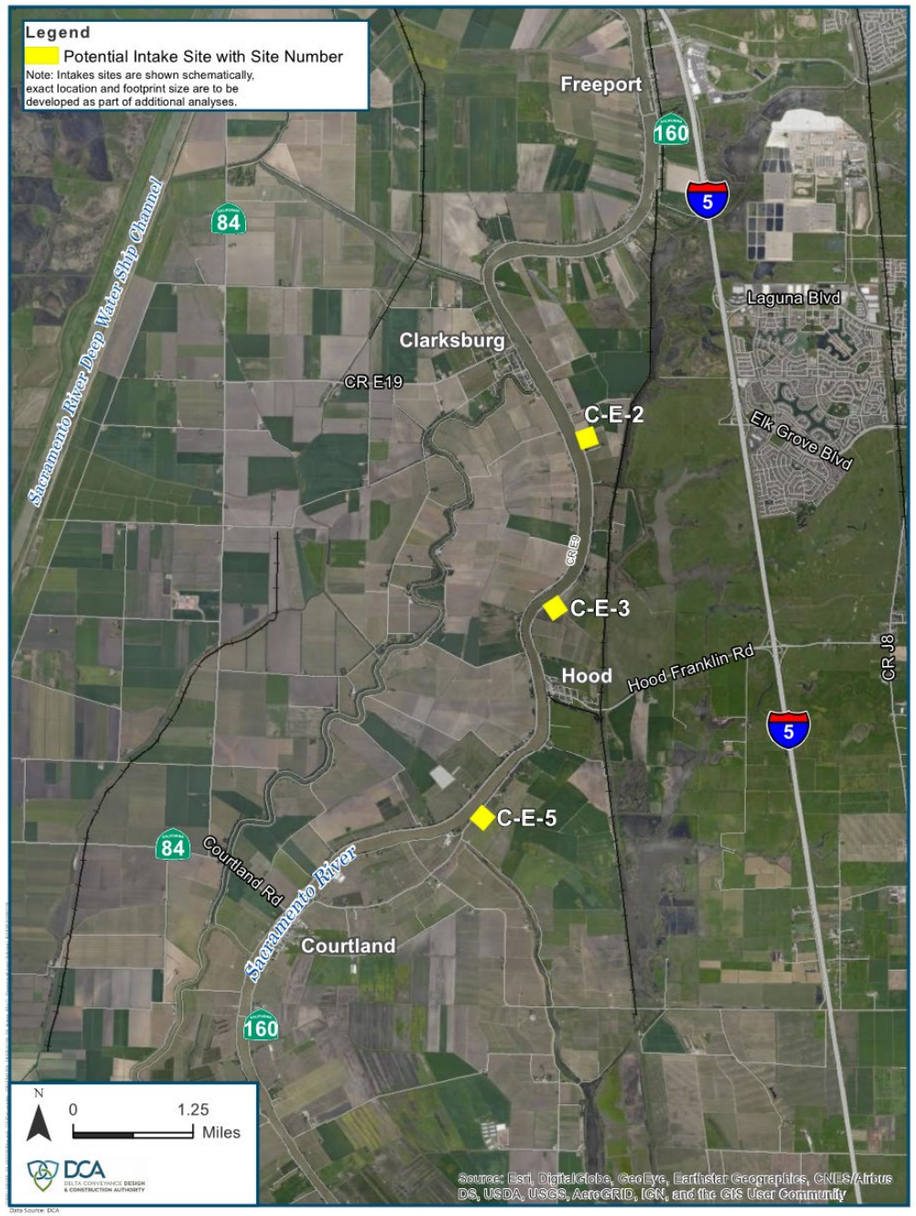
Evaluation Results

Path Forward

- Select intake sites as part of environmental documentation process
- Conceptual development of footprint and Engineering Project Report with information for selected sites



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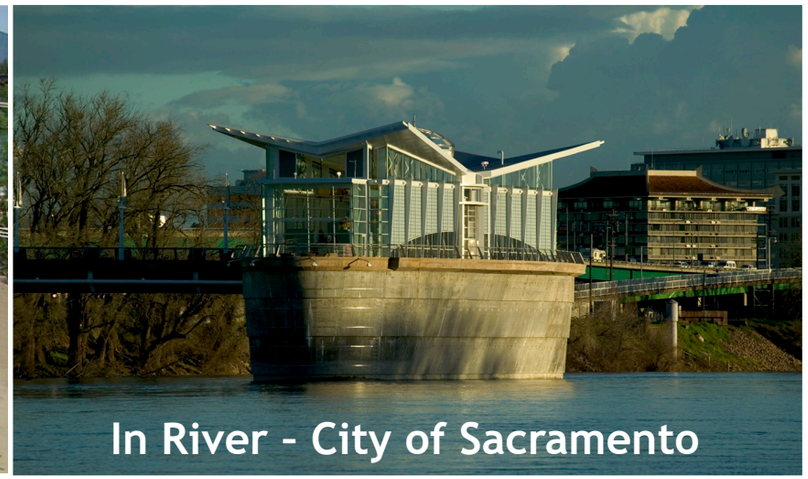
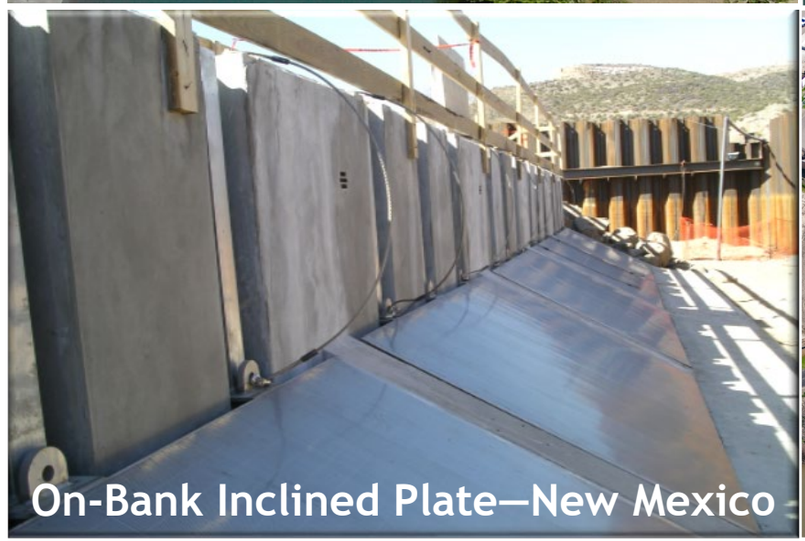
Intake Structures Types - Plate


In Channel (Vee Type)—ACID


In River - City of Sacramento


On-Bank Inclined Plate—New Mexico


On-Bank—FRWA

Intake Structure Types - Cylindrical tee


Vertical - Montana


Inclined - Alameda County

Intake Structure Types


Vertical Cylindrical Tee On-Bank


Vertical Plate On-Bank

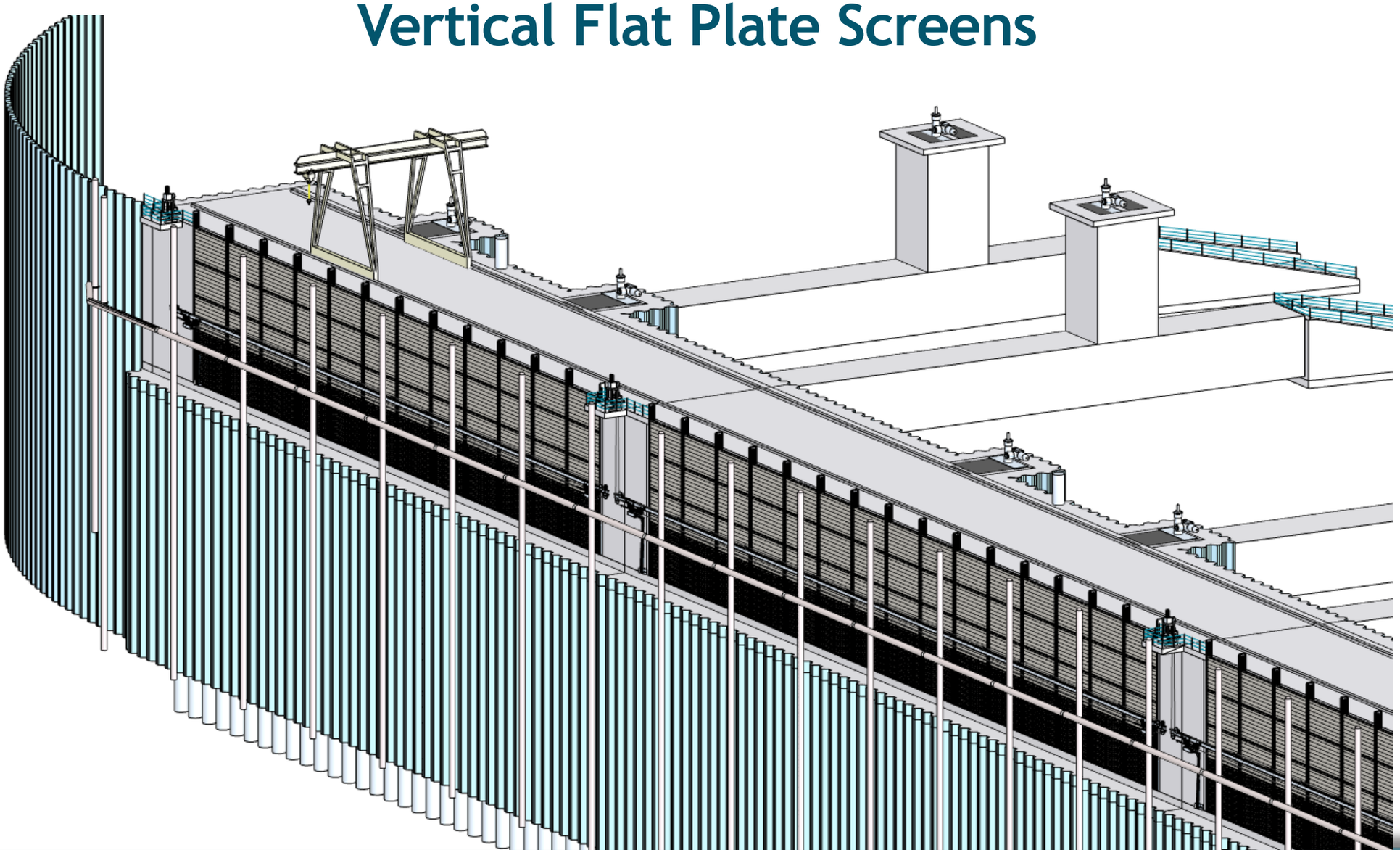
Current Focus:

- Vertical Cylindrical Tee with On-Bank Structure
- Vertical Plate with On-Bank Structure

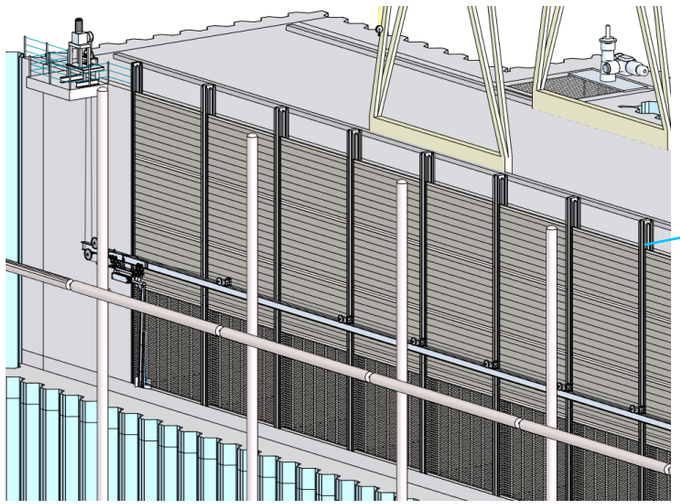
Fish Screens

- Target species
  - Juvenile salmon/steelhead
  - Juvenile Delta fish species (Delta smelt)
- Approach velocity
  - 0.33 fps salmonids
  - 0.2 fps Delta smelt
  - Sets screen length (w/flow & depth)
- Screen System
  - Fish screen
  - Baffle system (velocity uniformity)
  - Screen cleaner

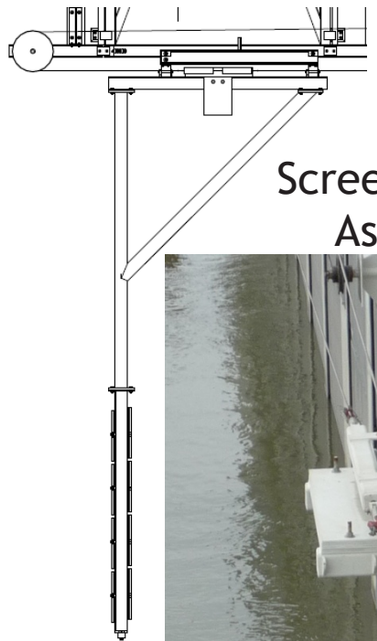
Vertical Flat Plate Screens



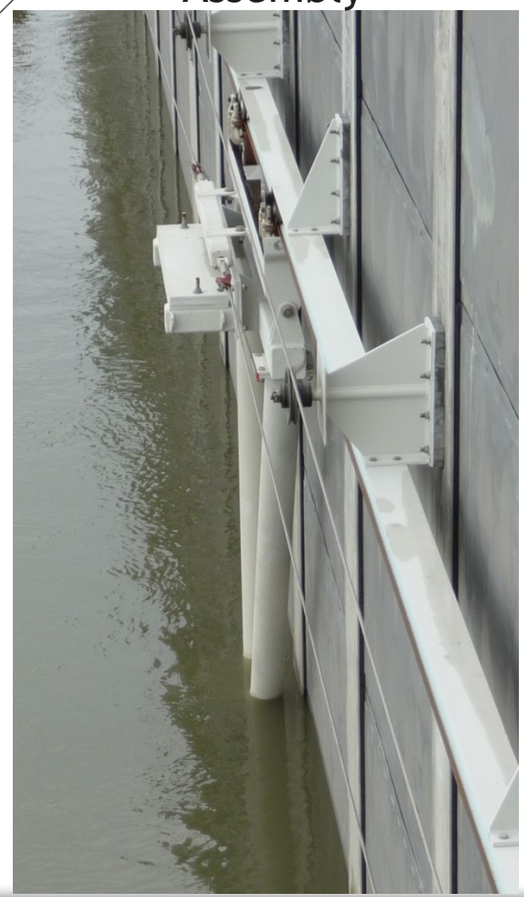
Intake Screens and Screen Cleaners



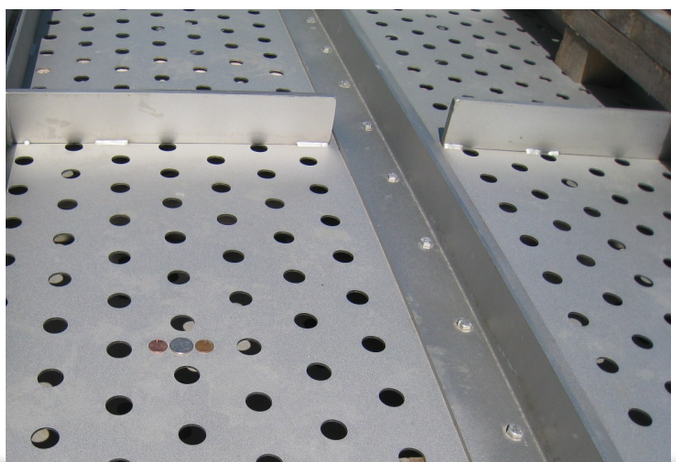
Panel Guide Rails



Screen Cleaner Assembly



Flow Baffle Panel

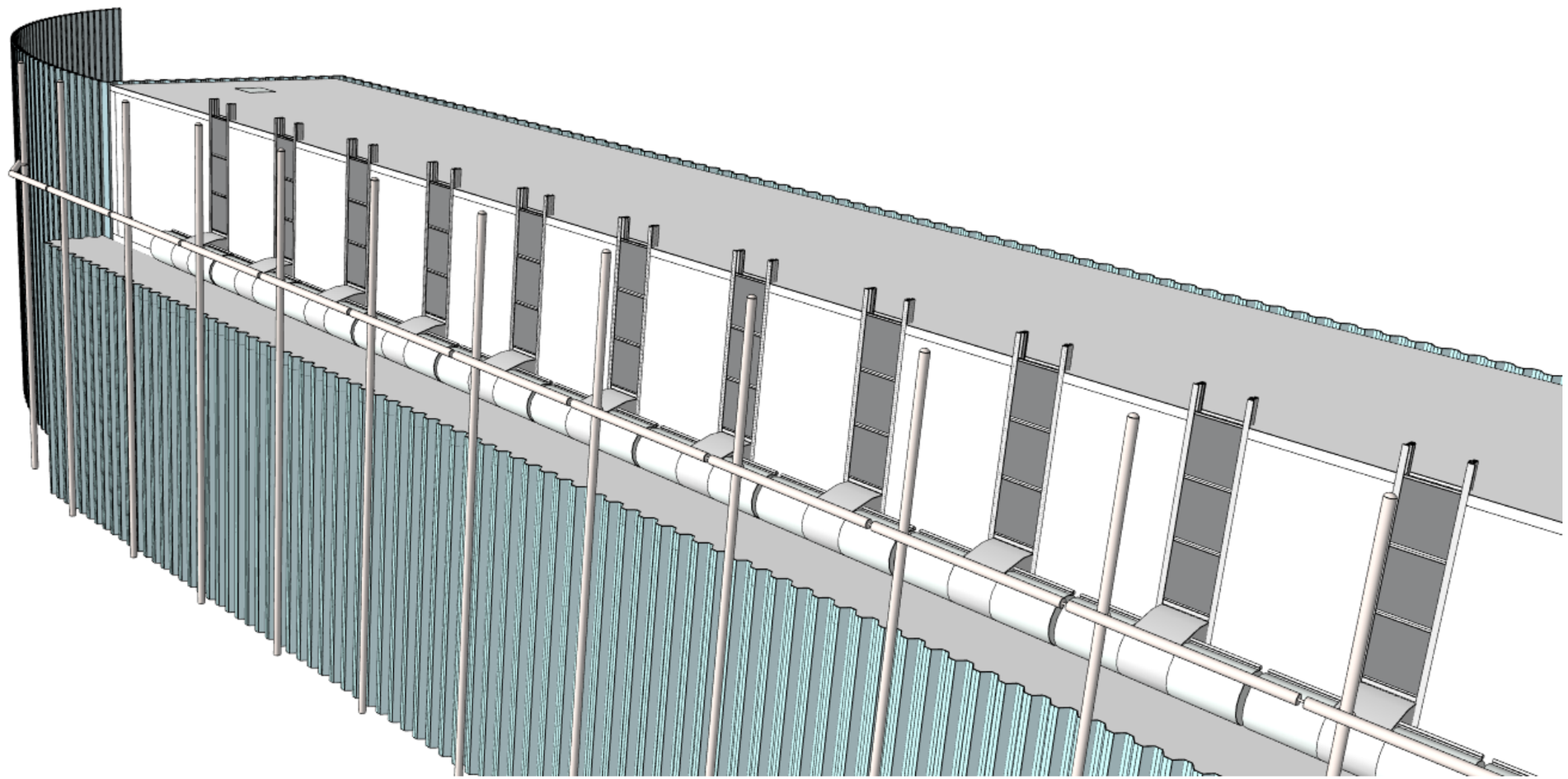


Cleaner Brush

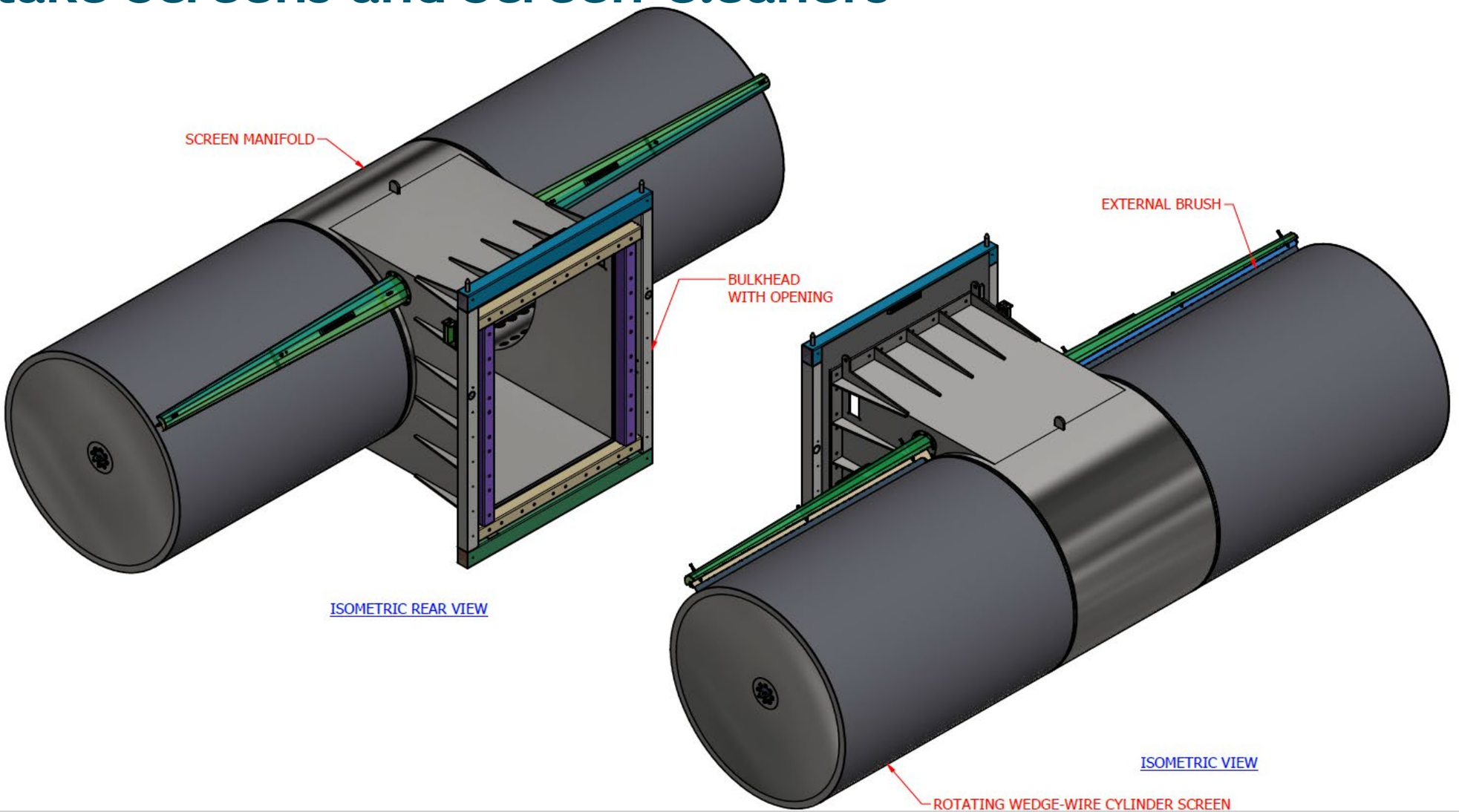
ANIMATION:
VERTICAL PLATE SCREEN CLEANING

File available at dcdca.org

Cylindrical Tee Screens



Intake Screens and Screen Cleaners

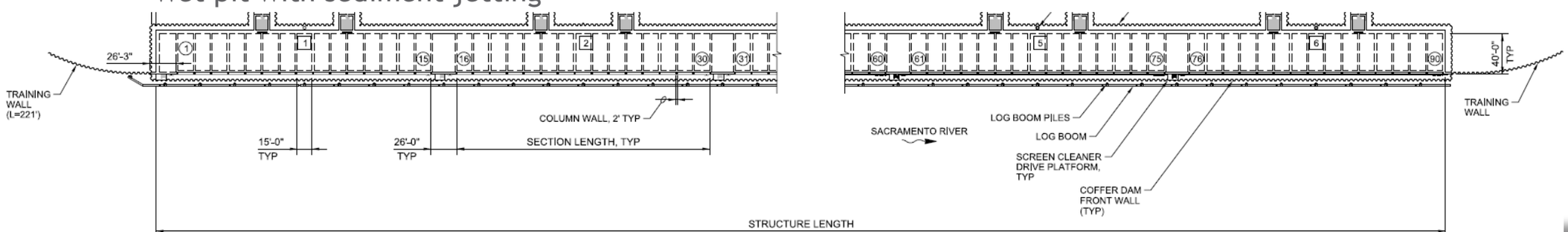


ANIMATION:
CYLINDRICAL TEE SCREEN CLEANING

File available at dcdca.org

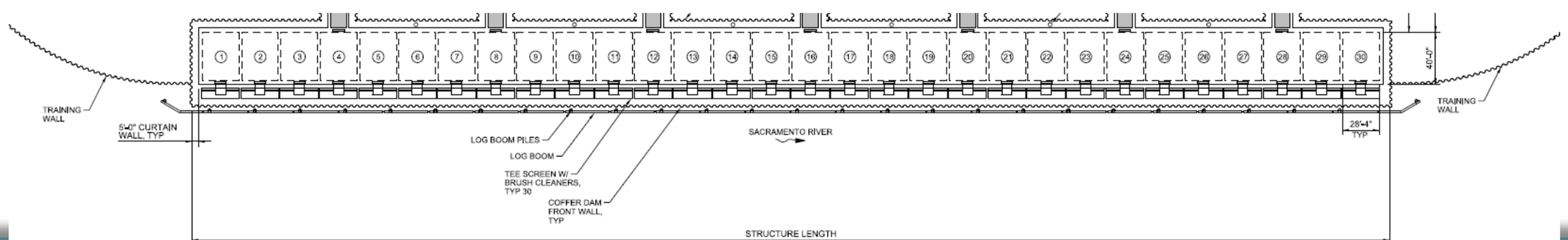
Vertical Flat Plate Screen – Conceptual Screen/Structure Sizing (3000 cfs)

- Screen panels 15 feet wide by 12 to 20 feet tall
  - Depends on river depth at intake site
  - Include 2 feet between screen panels
- Total intake structure length
  - 1175 to 1575 feet (overall concrete structure length)
  - Includes 6 sections at 500 cfs per section
  - 26 foot cleaner landing in each section
- Intake structure width—40 feet
  - Wet pit with sediment jetting

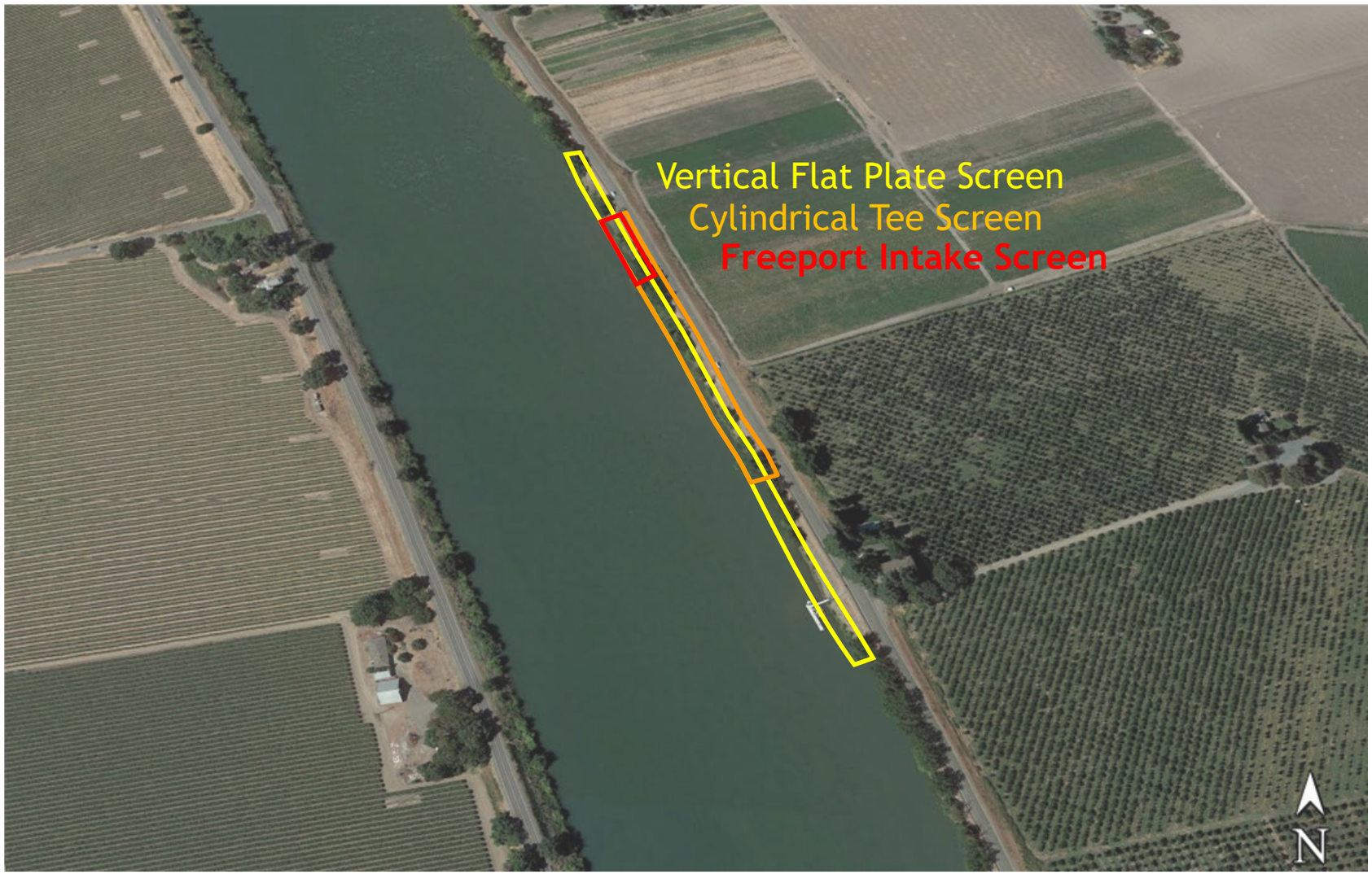


Cylindrical Tee Screen - Conceptual Screen/Structure Sizing (3000 cfs)

- Screen units 8-foot diameter by ~30 feet wide
  - Same for all intake sites
  - Include 1 foot between screens
- Total intake structure length
  - 965 feet (overall concrete structure length)
  - Includes 30 screen units at 100 cfs each
- Intake structure width—~65 feet (preliminary)
  - Dry pit housing valves and meters



Intake Type and Sizing - Comparison



Intake Type and Sizing - Comparison

Cylindrical Tee Screens

Substantially shorter structure

Better screen cleaning

Better flow control

More predator holding areas

Refugia possible along structure face, but does not add length

Possibly more debris collection

One supplier

Vertical Flat Plate Screens

Longer structure

Less effective screen cleaning

Effective flow control

Minimal predator holding areas

Refugia adds length (and cost)

Screen cleaner susceptible to debris damage

Known regulatory acceptance

ANIMATION:
TYPICAL COMPONENTS OF AN INTAKE FACILITY

File available at dcdca.org

ANIMATION:
TYPICAL FOOTPRINT OF A TEE SCREEN INTAKE FACILITY
File available at dcdca.org

ANIMATION:
INTAKE FACILITY CONSTRUCTION SEQUENCING

File available at dcdca.org


ANIMATION:
INTAKE FACILITY CROSS-SECTION
File available at dcdca.org

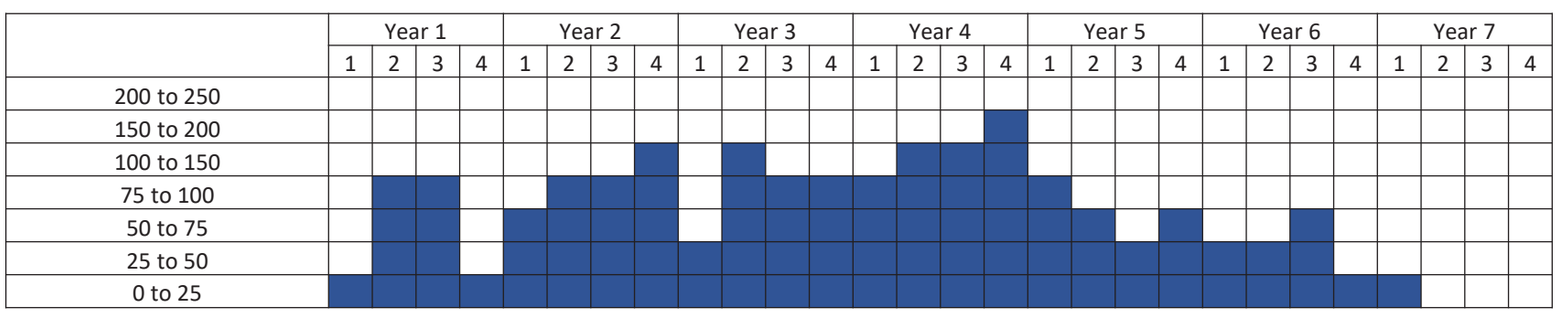
ANIMATION:
INTAKE FACILITY FLOW REGULATION
File available at dcdca.org

Site Access

- Rail
  - Existing line near I-5
  - No direct site access
  - Possible use of central material staging near rail line

Truck Traffic Control

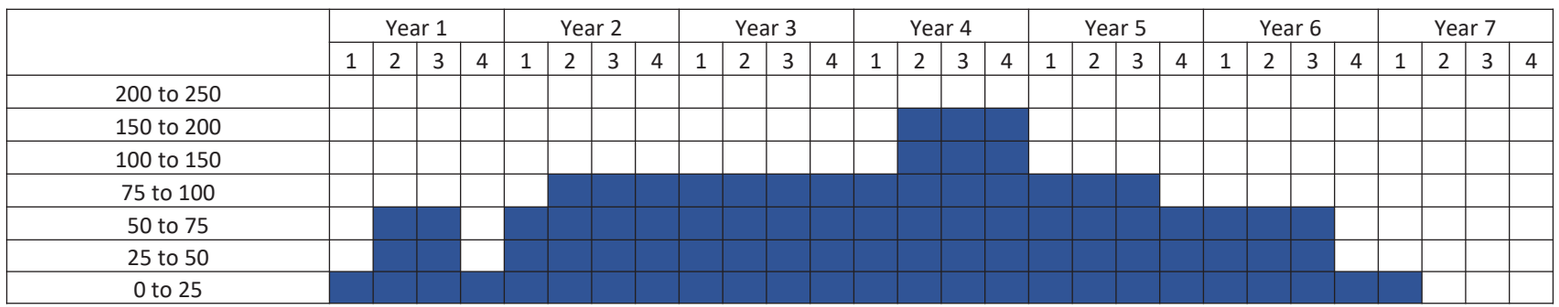
- Truck Traffic Effects from Construction
  - Truck traffic to each construction site on two-lane roads after freeway
  - Potential for disrupting local transportation of residents', workers', commercial, and visitors' vehicles
- Measures to Reduce Effects
  - Create new/parallel roads for construction traffic only
  - Improve existing road systems to accommodate additional traffic volumes and loads
  - Store construction vehicles onsite to minimize volume of large trucks
  - Batch plant onsite to reduce concrete truck traffic



Estimated Truck Trips/Day at an Intake without Reduction Measures

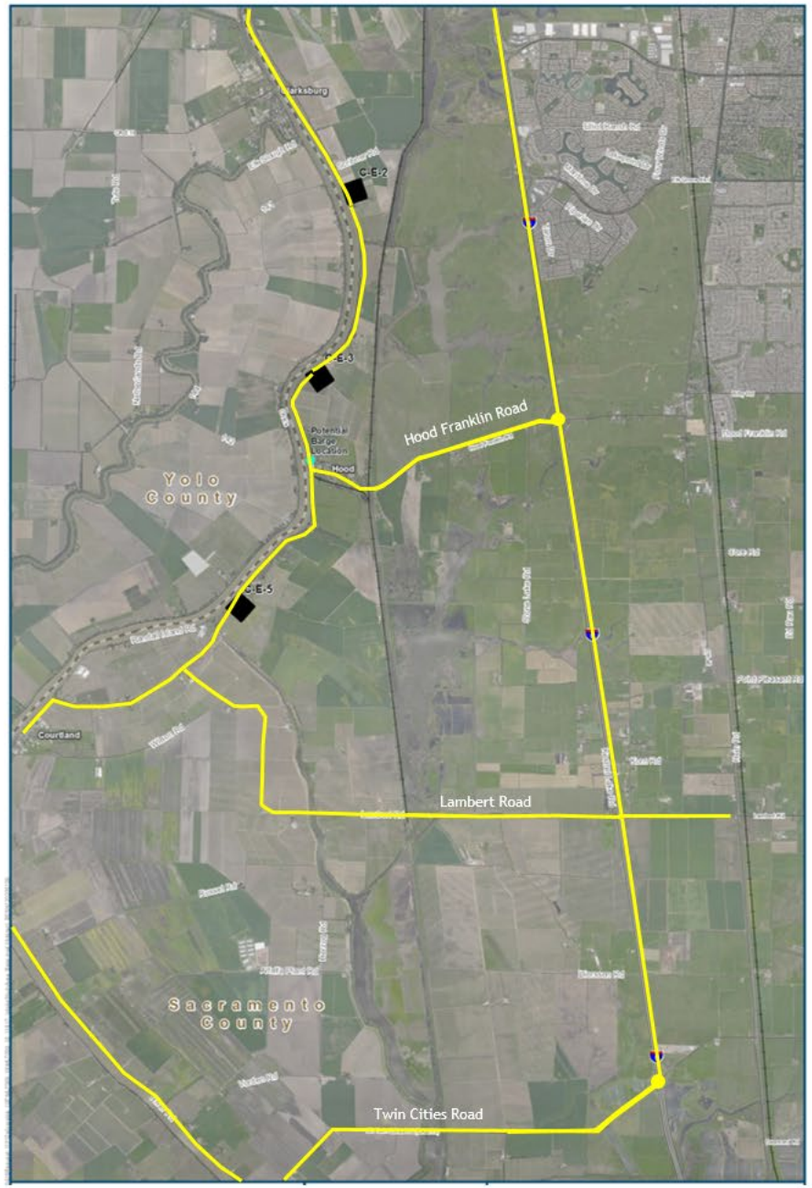
Worker Traffic Control

- Potential Measures to Reduce Worker Traffic
  - Park-and-Ride locations (Staging Centers)
    - Use electric buses/vans to drive to construction site
    - Place at locations with less effects
    - Could be converted for public use after construction
  - Stagger shifts at construction site
  - Use food trucks to minimize lunch traffic



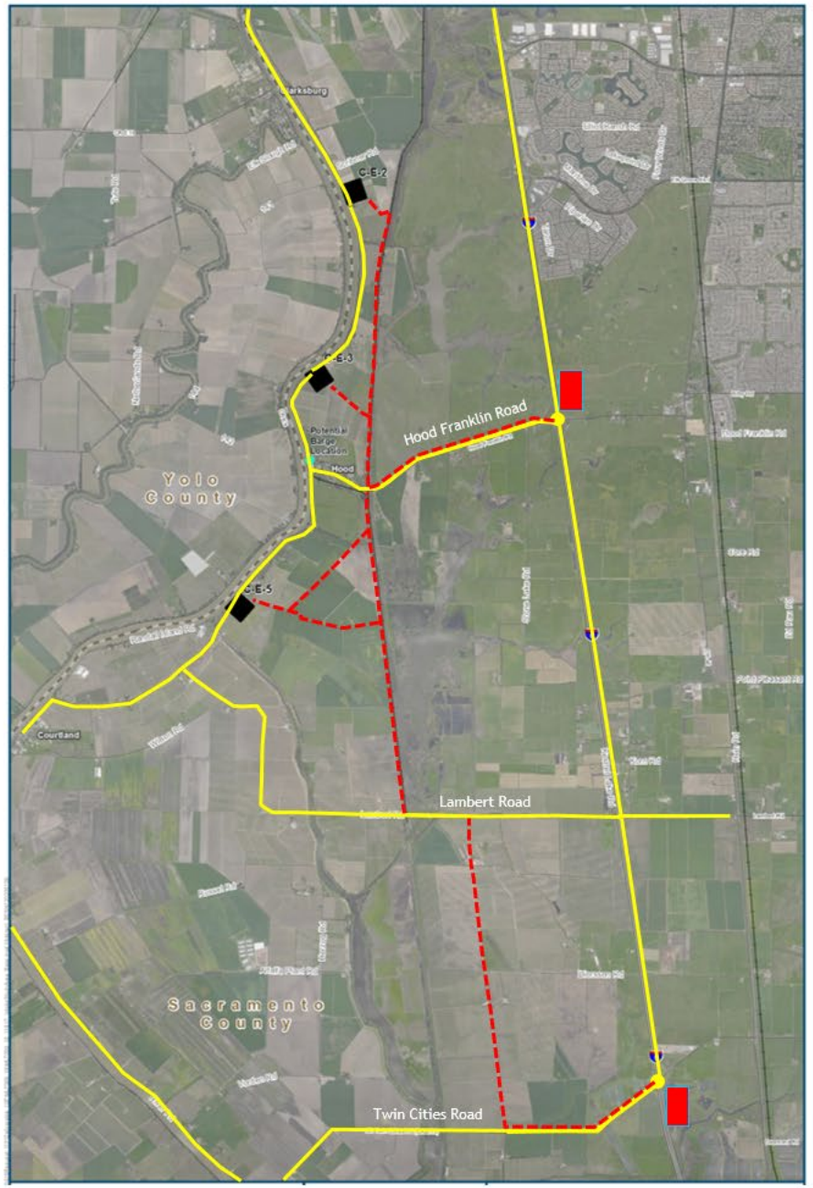
Estimated Worker Trips/Day at an Intake without Reduction Measures

Site Access
- Roads



Site Access

- Roads
  - Use of haul roads and staging centers will reduce dependence on portions of existing roads



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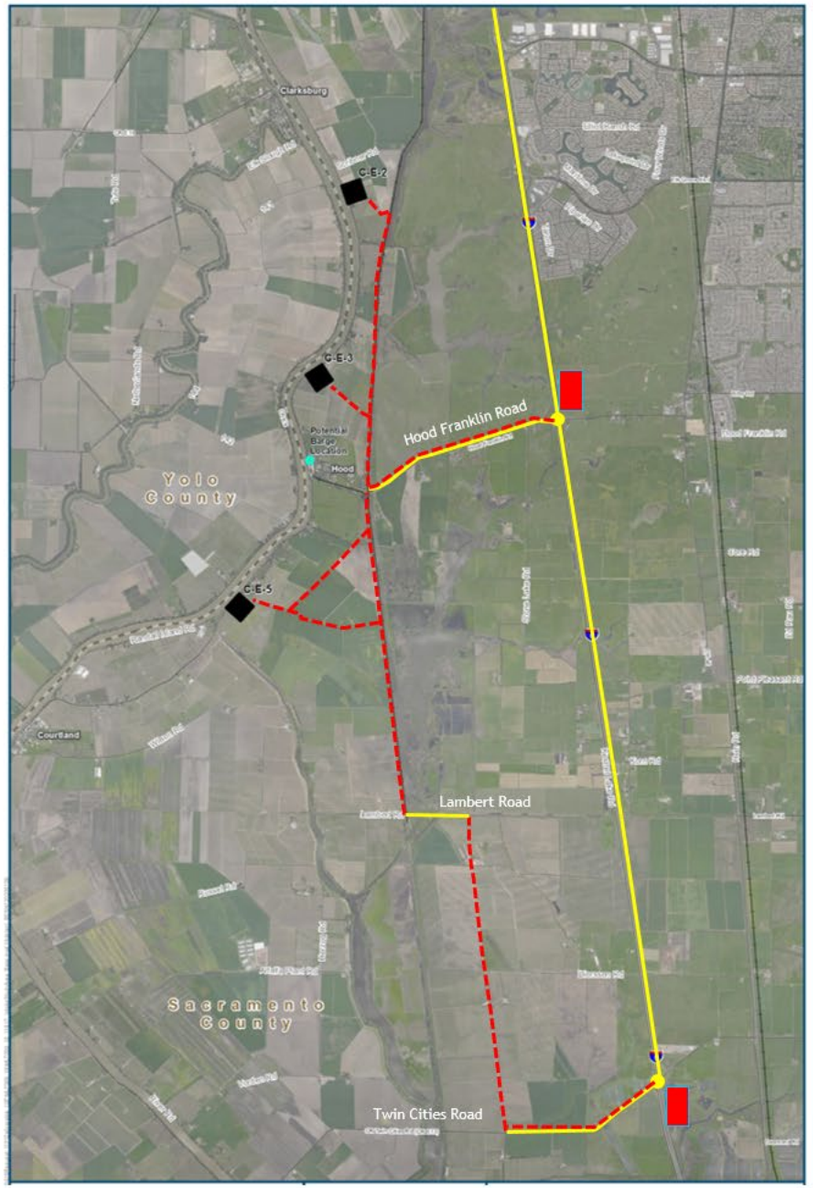
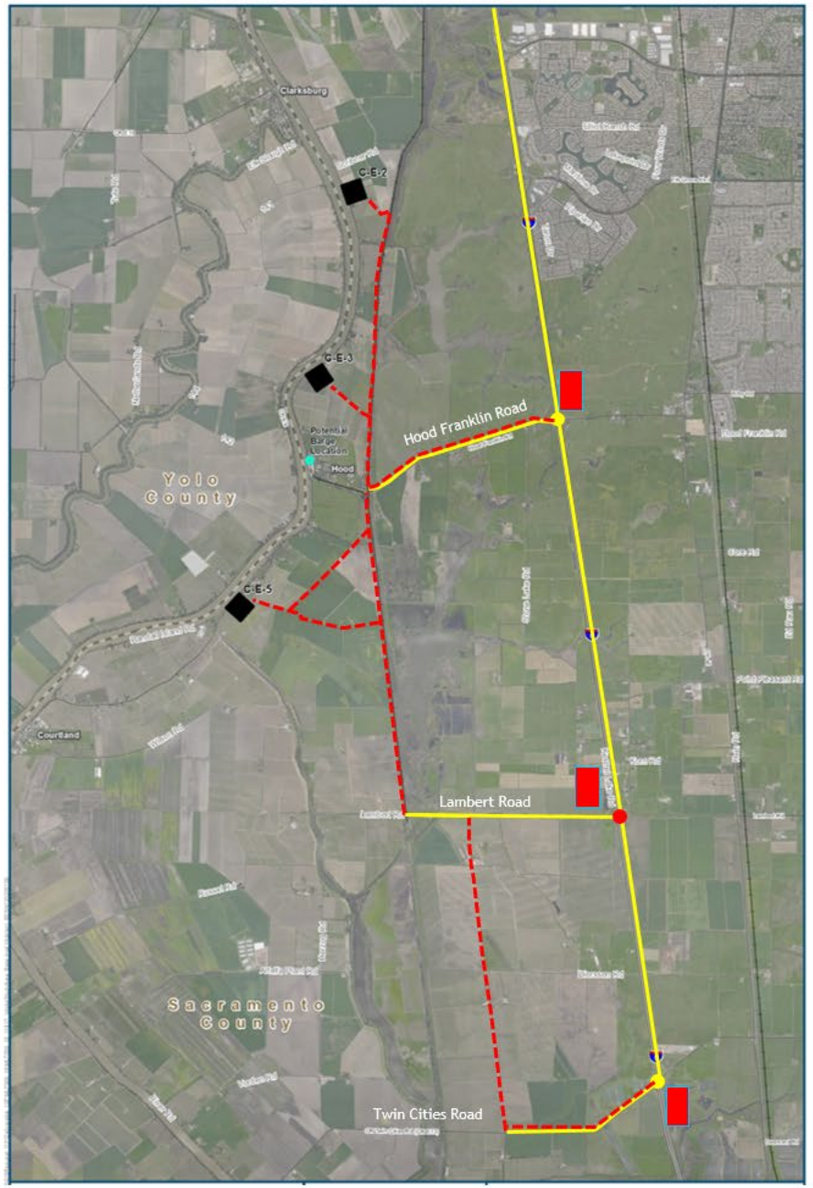


Site Access

- Roads
  - In addition to Twin Cities Road a new interchange near Lambert Rd may be beneficial



Site Access

- Barge
  - Existing barge landing at Hood
    - Requires use of Hwy 160
  - Can create barge landings at intake sites

Site Access

- Barge
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    - Requires use of Hwy 160
  - Can create barge landings at intake sites

Logistics Alternatives

- Modes of Transportation
  - Rail
  - Trucking/Roads
  - Barge

- Trucking/Roads
  - Force traffic to use I-5
  - Avoid 160 and the River Road using new Haul Roads.
  - Possible new Highway interchange near Lambert Rd.
  - Possible staging center for consolidation and/or employee parking

- Barge
  - Potential barge landings at Hood or at/near intake sites
- Rail
  - Possible rail staging area and consolidation center off tracks near I-5

Noise Control

Typical Pile Driving Noise Levels

Table 1. Typical A-Weighted Sound Levels

Common Outdoor Activities	Noise Level Scale (dBA)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	70	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60	
		Large business office
Quiet urban daytime	50	Dishwasher in next room
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime		
	30	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

Source: Caltrans 2009.

Pile Driver without Noise Reduction Equipment
Source: Carpenters Training Institute

Noise Reduction Equipment - Shroud

Noise Control

Typical Pile Driving Noise Without Noise Reduction Equipment

Noise Control

Typical Pile Driving with Noise Reduction Equipment

Site Runoff Control

Protecting Surface Waters at Construction Sites

Sources of Potential Water Discharges from Construction Sites

- Runoff from off-site and on-site (including dust control watering)
- Dewatering flows
- Construction-water flows

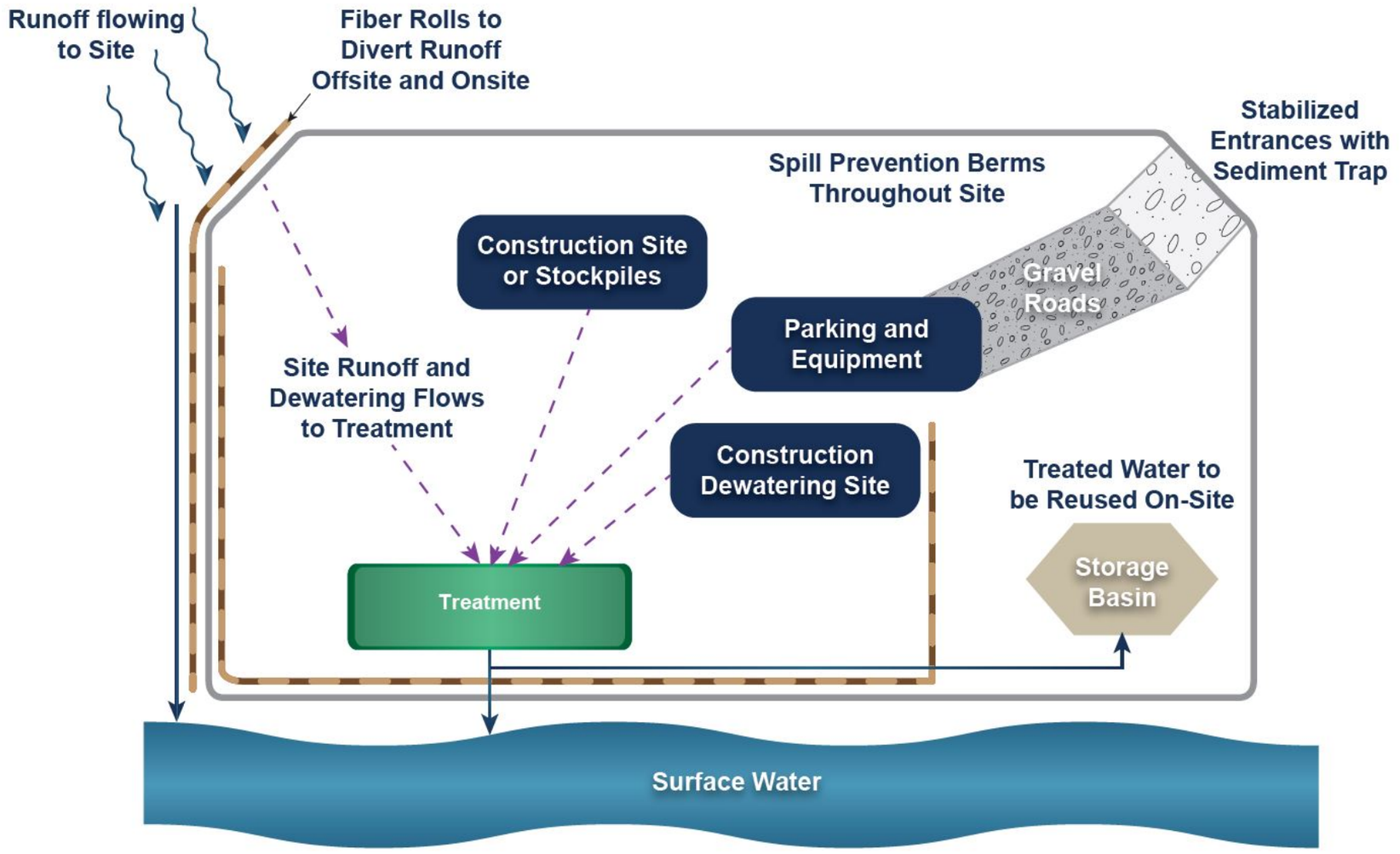
On-Site Monitoring and Treatment Facilities

- Treatment to remove sediment, oil and grease, metals, and/or organic material
- Must meet State Water Resources Control Board (SWRCB) Criteria
- Hazardous materials segregated and stored separately for subsequent removal

Criteria for Discharge of On-Site Water

- Discharge to surface water or drainage channels only if available capacity and suitable quality
- Must have SWRCB permit (NPDES)
- Cannot cause seepage or groundwater reduction on other properties
- Cannot degrade water quality

Protecting Surface Waters Near Construction Site



Air Quality & Greenhouse Gas Emissions

Reduction of Air Quality Emissions from Construction Activities

Typical Sources for Intake Construction

- Water trucks- operate 8-10 hrs./day
- Cranes - operate 8-10 hrs./day
- Dozers/tractors/scrapers/graders/compactors
- Concrete trucks
- Large portable diesel generators

Measures to Reduce Total Emissions

- Use “Tier 4” diesel engines
- Use equipment with hybrid or electrical engines
- Irrigation for dust control
- Provide surfacing
- Onsite batch plant
- Consolidation center

Example: Hybrid Dozer

Dust Control

- Typical Sources of Dust for Intake Construction Activities
  - Wind erosion of exposed soils, including unpaved roads and storage piles on construction site
  - Removing existing structures and vegetation
  - Graders
  - Finishing of concrete surfaces
  - Soil particles from construction vehicle tires fall onto surrounding roads. The wind and other vehicle tires move the soil into dust.
- Methods to Reduce Dust Related to Construction
  - Build gravel or paved roads on site
  - Use tackifiers (soil binder) or covers on soil piles

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Clarifications?