DELTA CONVEYANCE DESIGN & CONSTRUCTION AUTHORITY

JULY 22, 2020

Stakeholder Engagement Committee

Meeting Agenda

1	Welcome/Call to Order
2	Roll Call/Housekeeping
3	Minutes Review: June 24, 2020 Regular SEC Meeting
4a.	DWR General Updates and Alternatives Formulation
4b.	DCA Response to SEC Comments
4c.	SEC Questions or Comments on June 24th Presentation
4d.	Public Comment on Item 4
5a.	SEC Tour Updates
5b.	August 24th Meeting Topics
5c.	August 20th SEC Report to DCA Board
6	Non-Agendized SEC Questions or Comments
7	Public Comment on Non-Agendized Items

Item 3.

Minutes Review:

June 24, 2020 Regular SEC Meeting

Item 4a.

DWR General Updates and Alternatives Formulation

July
2020

Delta Conveyance Project: *Alternatives Selection Process and Status*

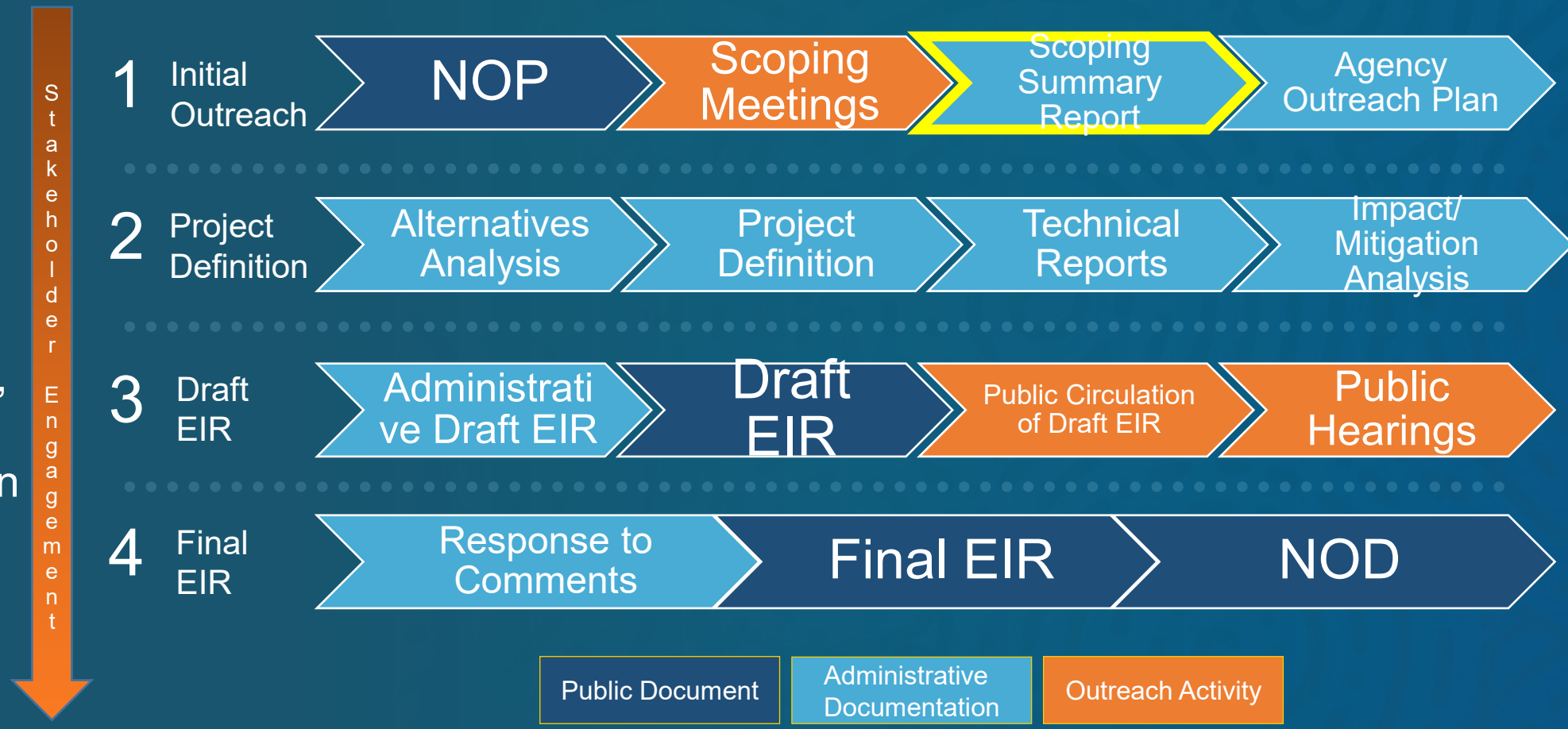
Carrie Buckman
Environmental Program Manager

Environmental Planning Update

- CEQA: Scoping Summary Report published; available online
- NEPA: USACE to prepare EIS; Notice of Intent and scoping expected late summer
- Soil Investigations: CEQA finalized; work will begin on publicly-owned sites this fall

Environmental Review Process

Identify, analyze and disclose the potential significant adverse environmental impacts of a proposed project, and provide feasible mitigation measures and alternatives to avoid or reduce such impacts.



Topics Today

Provide the SEC with:

- Information about CEQA requirements related to alternatives
- An overview of the in-progress alternatives screening purpose and process (specific to CEQA)
- A preview of preliminary screening results related to physical alternatives
- An opportunity to discuss and better understand the process and preliminary findings

Alternatives were suggested through scoping; new alternatives cannot be added today

Why Alternatives?

- Public agencies should not approve projects as proposed if there are feasible alternatives or mitigations that would meet project objectives but also substantially lessen significant environmental effects.
- As a part of the decision-making process, agencies are required to consider alternatives to the proposed project.

What Does CEQA Say?

- An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives.
- An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. Alternatives formulation is guided by the "rule of reason." An EIR is not required to consider alternatives which are infeasible.

Alternative Screening Filters

Filter One:
Meets most of the basic project objectives

PASS

Filter Two:
Avoids or substantially lessens an expected significant environmental effect of the proposed project

Filter One Details

Addresses fundamental project purpose?

Restore and protect the reliability of SWP water deliveries in a cost-effective manner consistent with the State's Water Resilience Portfolio.

Meets most project objectives?

Climate resiliency
Seismic resiliency
Water supply reliability
Operational resiliency

These alternatives may then pass through to Filter 2.

Project Objectives Defined

- CLIMATE RESILIENCY – Addresses climate change, extreme weather, and rising sea levels in the Delta for the SWP
- SEISMIC RESILIENCY – Minimizes health/safety risk to public from earthquake-caused reductions in water delivery quality and quantity from the SWP
- WATER SUPPLY RELIABILITY – Restores and protects ability to deliver SWP water in compliance with regulatory and contractual constraints
- OPERATIONAL RESILIENCY – Provides SWP operational flexibility to improve aquatic conditions and manage risks of additional future constraints

Filter Two

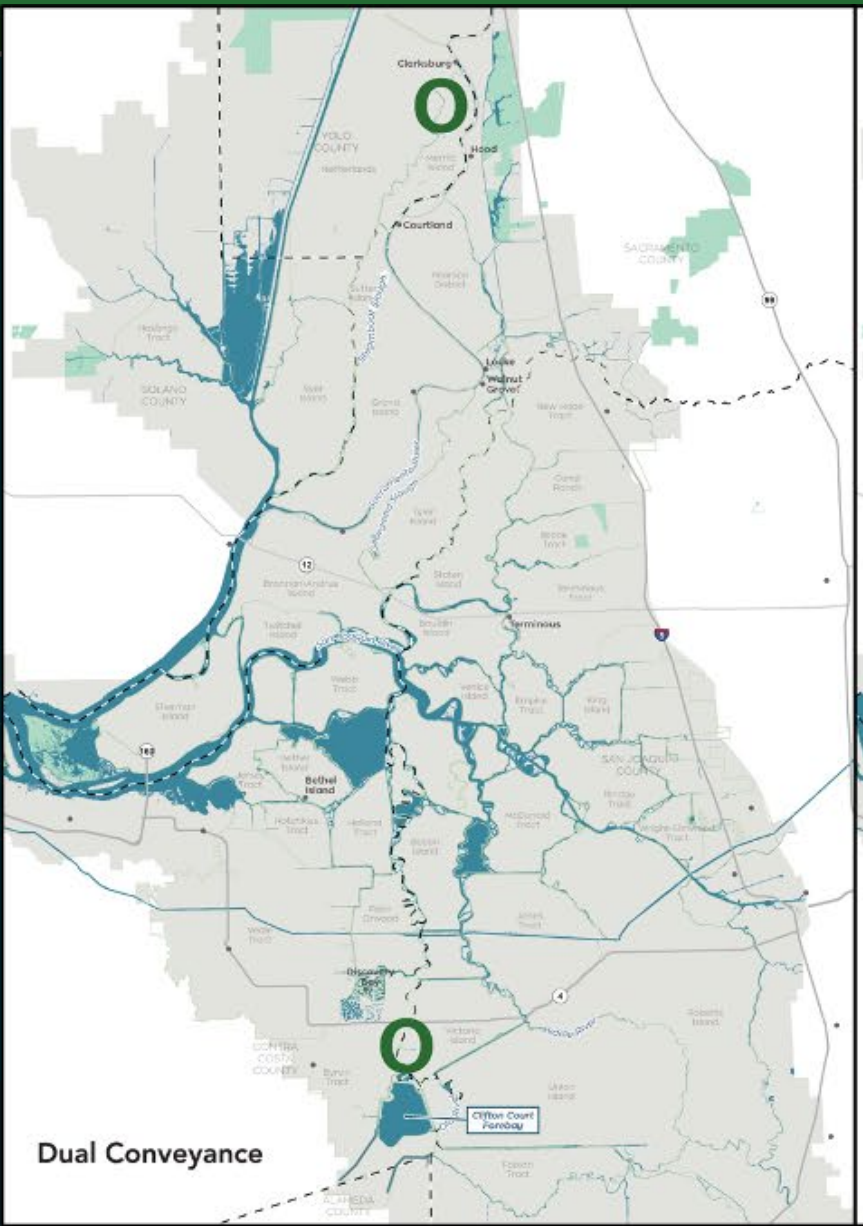
Filter 1 → Acceptable → **Filter 2**

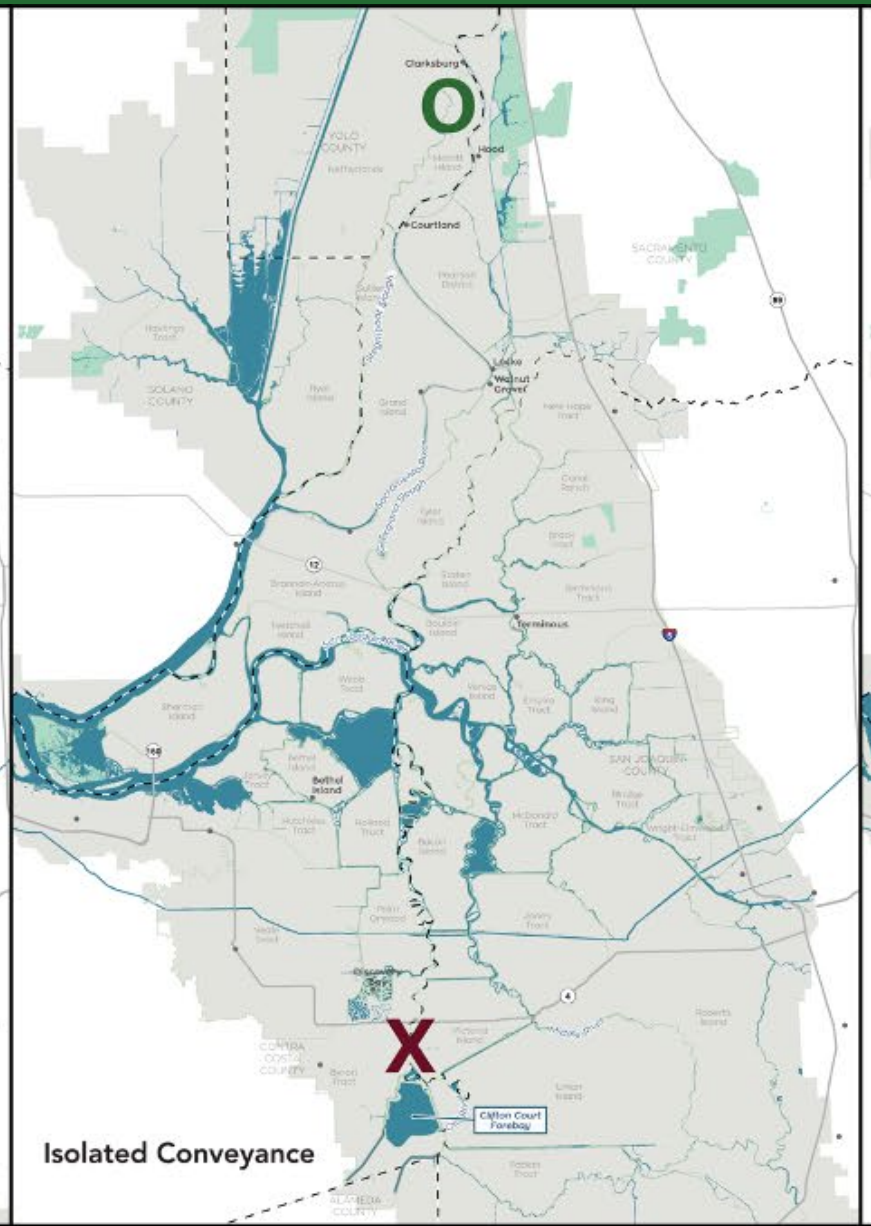
Does the alternative avoid or substantially lessen any of the expected significant environmental effects of, or potentially address one or more significant issues related to, the proposed project, without creating additional potentially significant environmental effects?

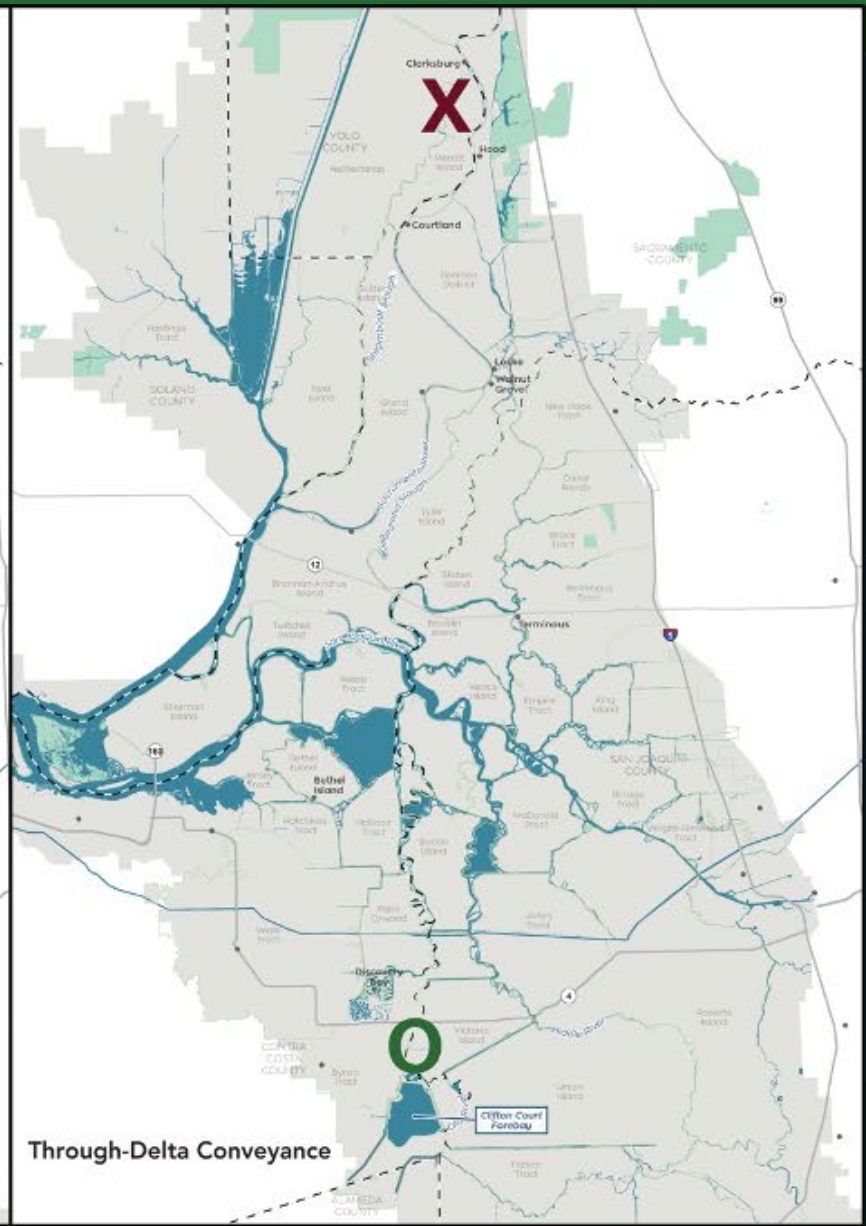
Categories of Alternatives

- **Dual conveyance** – Includes new points of diversion in the Delta and facilities to move water from those new points of diversion to the existing pumping facilities in the south Delta. Called “dual conveyance” because it would also continue use of existing diversions (intakes) in the south Delta—two ways of conveying water.
- **Isolated conveyance** – May include new points of diversion in the Delta but would not continue use of existing diversions in the south Delta.
- **Through-Delta conveyance** – No new intakes in the Delta but could include new infrastructure in the Delta to ensure continued/improved conveyance capacity through existing Delta waterways.

Categories of Alternatives







Alternatives Considered

Dual conveyance

- Central Tunnel
- East Tunnel
- East Canal
- West Canal
- West Tunnel
- New Sacramento Weir intakes
- New Fremont Weir intakes
- New Decker Island intakes
- Bethany Reservoir
- Alternative Points of Diversion

Isolated conveyance

- New Fremont Weir and Decker Island intakes
- Sacramento River intakes
- San Joaquin River intake

Through-Delta conveyance

- No tunnel
- No diversion facility
- Levee improvements and reduced reliance on exports

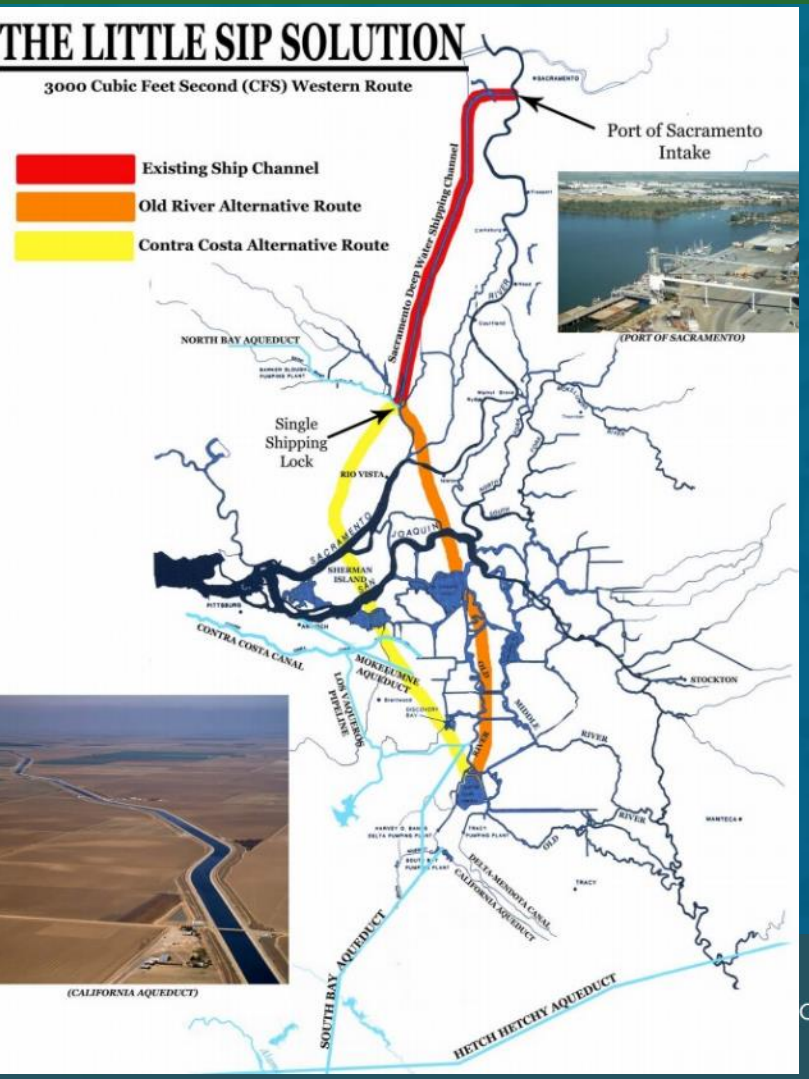
Other

- A Water Plan for All of California (Congressman Garamendi)
- Western Delta Intake Concept (Pyke proposal)
- SolAgra Water Solution
- Portfolio-based Conceptual Alternative
- Enclosure of existing California Aqueduct
- Novel technologies
- Alternate water supplies

Alternative Screening Results

- All alternatives suggested through the scoping process went through the screening filters
- Alternative formulation process will be documented in the Draft EIR
- The following slides describe example filtering process results for:
    1. Congressman Garamendi proposal
    2. Pyke proposal
    3. No-Tunnel and Through-Delta proposals
    4. Bethany Alternative

1. A Water Plan for All of California
(Congressman Garamendi plan)



Dual conveyance

- New 3,000 cfs north of Delta diversion structure on the Sacramento River near West Sacramento (including fish screen and low-head pump station)
- Use of the Sacramento Deep Water Ship Channel to convey water approximately 25 miles to a new intake near the southern end of the channel
- New boat lock near the southern end of the Deep Water Ship Channel to prevent water diverted from the Sacramento River from flowing into the Delta near Rio Vista
- New 12-mile pipeline to convey water through the western Delta and underneath the Sacramento and San Joaquin Rivers between the Deep Water Ship Channel and existing Delta channels leading to the existing SWP and CVP pumping plants in the south Delta.

A Water Plan for All California – Filter 1 Screening Discussion

Filter 1

Climate Resiliency	☑
Seismic Resiliency	☒
Water Supply Reliability	☑
Operational Resiliency	☒

Filter One – Meets Basic Project Objectives?

- Reliance on channels, canals, and levees provide limited seismic resilience
- Lower flow provides less operational flexibility between the existing and new facilities for the protection of species and capture of excess flows

A Water Plan for All California – Filter 2 Screening Discussion

Filter 1

Climate Resiliency	☑
Seismic Resiliency	☒
Water Supply Reliability	☑
Operational Resiliency	☒

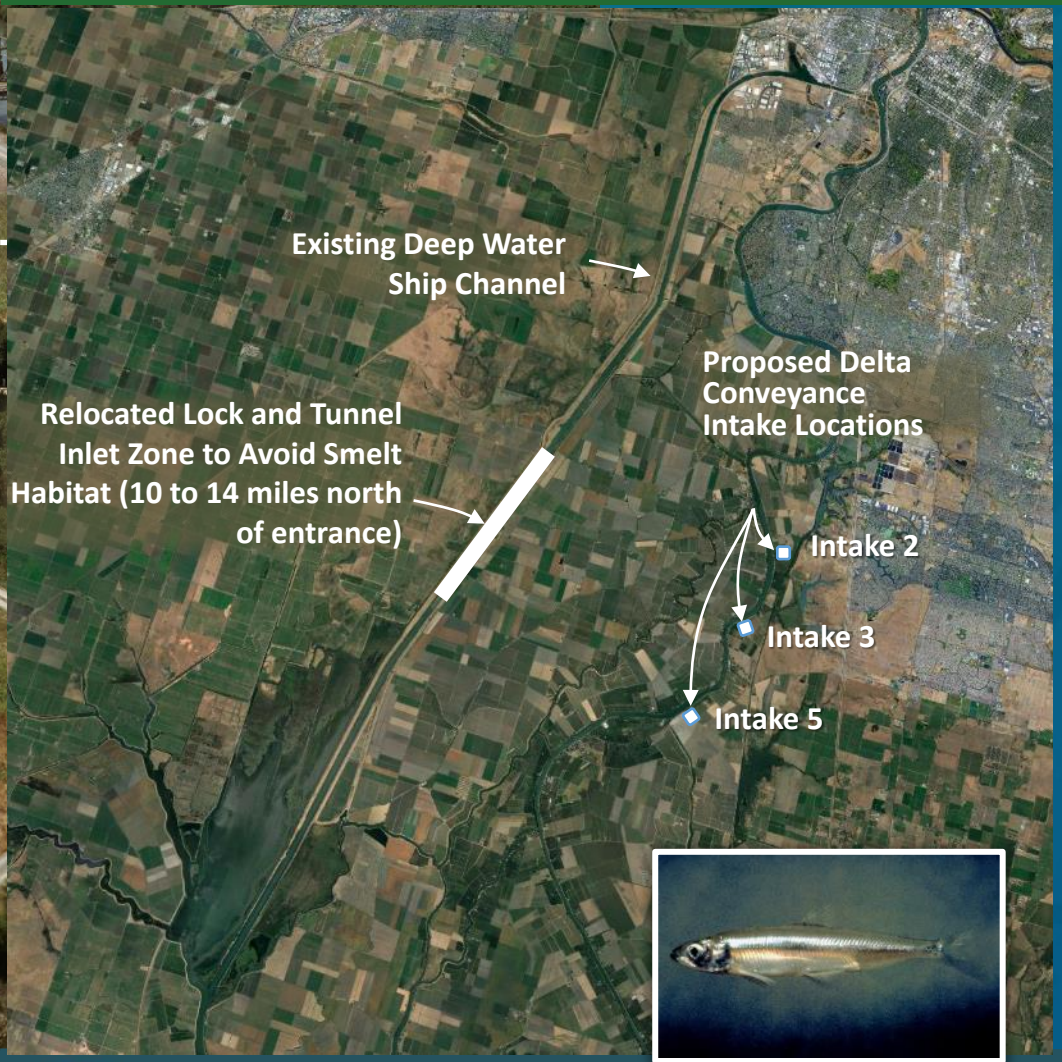
Filter 2

Avoids/lessens impacts	☒

Filter Two – Lessens Impacts?

- Substantial reconstruction of the Deep Water Ship Channel would be needed in order to use it.
- Significant construction impacts associated with working in West Sacramento to build a fish screen and low head pump station. Construction on the west bank of the Sacramento River would result in noise, transportation, visual, air quality, and other impacts related to construction activities through highly populated areas of West Sacramento.
- Fish screen protrudes into the Sacramento River and could be disruptive

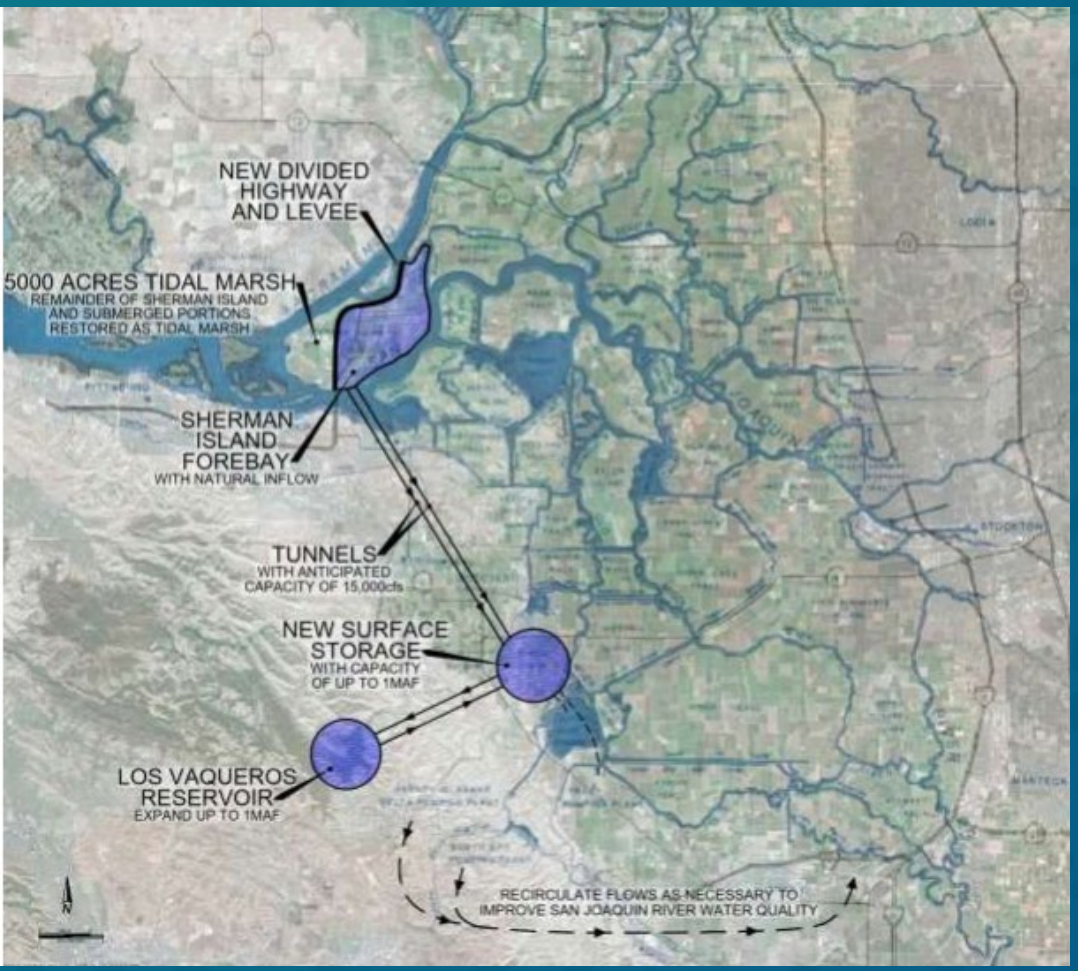
A Water Plan for All California – Filter 2 Screening Discussion



Filter Two – Lessens Impacts?

- Lower reach of DWSC is core spawning and rearing habitat for Delta Smelt and unique habitat within the Cache Slough Complex supports some of the highest occurrence of native fish species in the Delta.
- Lock and tunnel inlet shaft would need to be moved about 10 to 14 miles north along the DWSC to avoid habitat disturbance.
- If moved north, the tunnel inlet shaft is nearly lateral to the location of the proposed intakes in the proposed project. This minimizes the difference in tunnel length between the alternatives.

2. Western Delta Intake Concept (Pyke Proposal)



Dual conveyance

- Use of Sherman Island as an intake forebay, facilitated by removal of the peat soils and modification of the levees to allow for water to infiltrate up to 15,000 cfs into the island forebay (water inflow into Sherman Island would occur when water elevation in Sherman Island is lower than water elevation in the surrounding rivers and sloughs).
- A pumping plant and one or more tunnels to convey water from Sherman Island to a new reservoir near Clifton Court Forebay (Brushy Creek Reservoir) with connections to existing south Delta pumping plants and an enlarged Los Vaqueros Reservoir.
- Continued use of existing south Delta intakes with new fish screens and a boat lock at the Delta Cross Channel.

Western Delta Intake Concept
Filter 1 Screening Discussion

Filter 1

Climate Resiliency	☒
Seismic Resiliency	☒
Water Supply Reliability	☒
Operational Resiliency	☒

Filter 2

Avoids/lessens impacts	NA

Filter One – Meets Basic Project Objectives?

- Delta water quality may limit the use of the Sherman Island reservoir – this condition would worsen with sea level rise
- No SWP water supply reliability or operational resiliency
- Water quantities could be limited due to SWRCB water quality and water rights decisions, and other regulatory limitations imposed by USFWS and NMFS.

3. No Tunnel and Through-Delta Alternatives

Ideas proposed include some combination of:

- Increase water recycling and conservation efforts
- Desalination facilities
- Continued through-Delta conveyance (use of existing facilities) with improvement to Delta levees (Mokelumne, San Joaquin, and Middle rivers; along Snodgrass, Deadhorse Island, Beaver, Hog, Sycamore, Little Potato, White, Little Connection, Latham, and Trapper sloughs; Columbia and Empire cuts; Victoria Canal)

Through-Delta Screening Discussion

Filter 1

Climate Resiliency	☒
Seismic Resiliency	☒
Water Supply Reliability	☒
Operational Resiliency	☒

Filter 2

Avoids/lessens impacts	NA

Filter One – Meets Basic Project Objectives?

- Improving levees and through-Delta conveyance would not address the water quality component of the project objectives of climate change and sea level rise for the SWP
- Continued use of the existing system (even with upgrades) as a long-term plan does not address seismic resiliency and the associated water supply reliability concerns

No Tunnel Screening Discussion

Filter 1

Climate Resiliency	☒
Seismic Resiliency	☒
Water Supply Reliability	☒
Operational Resiliency	☒

Filter 2

Avoids/lessens impacts	NA

Filter One – Meets Basic Project Objectives?

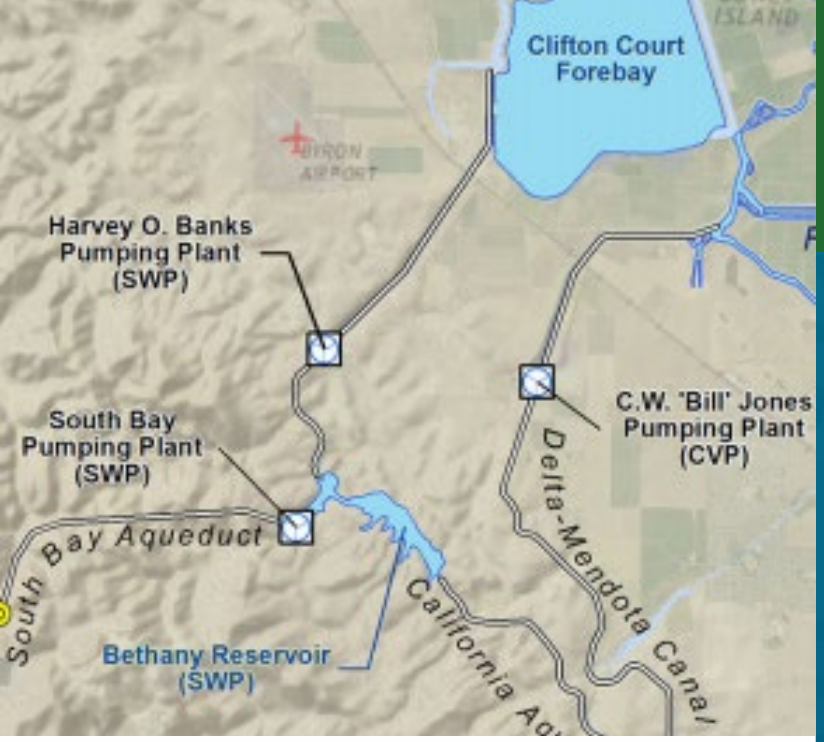
- Alternatives that rely on water agencies to implement additional projects (such as water recycling, conservation, or desalination) provide alternate supplies instead of the SWP
- Alternate supplies do not meet the fundamental project purpose of enabling the SWP to continue to function through challenges such as climate change, sea level rise, and earthquake risk

No Project Alternative

Some alternatives proposed in scoping comments do not meet the project objectives but may be considered in the No Project Alternative

- No Project Alternative (required under CEQA) describes likely conditions if the project is not implemented, including potential actions that may be taken absent a project
- Alternate water supply options may be incorporated to address water shortages

4. Bethany Reservoir Alternative



Filter 1

- Climate Resiliency ☑
- Seismic Resiliency ☑
- Water Supply Reliability ☑
- Operational Resiliency ☑

Filter 2

- Avoids/lessens impacts ☑

Worth Further Exploration Because…

- Fewer surface impacts because no construction of a new terminal forebay
- No additional south delta conveyance facilities needed

Screening and Intake 2

Intake 2 has been removed from further consideration for the Proposed Project but will still be considered for alternatives with capacity greater than 6,000 cfs.

- Preliminary screening indicates greatest potential for cultural and historic resources (based on known resources)
- Preliminary screening found increased potential for construction-related effects to sensitive receptors in Clarksburg
- Distance to Twin Cities requires an additional maintenance shaft, which would increase construction-related effects
- Shallower river depth results in longer fish screen and increased fish exposure

Item 4b.

Response to SEC Comments and Questions

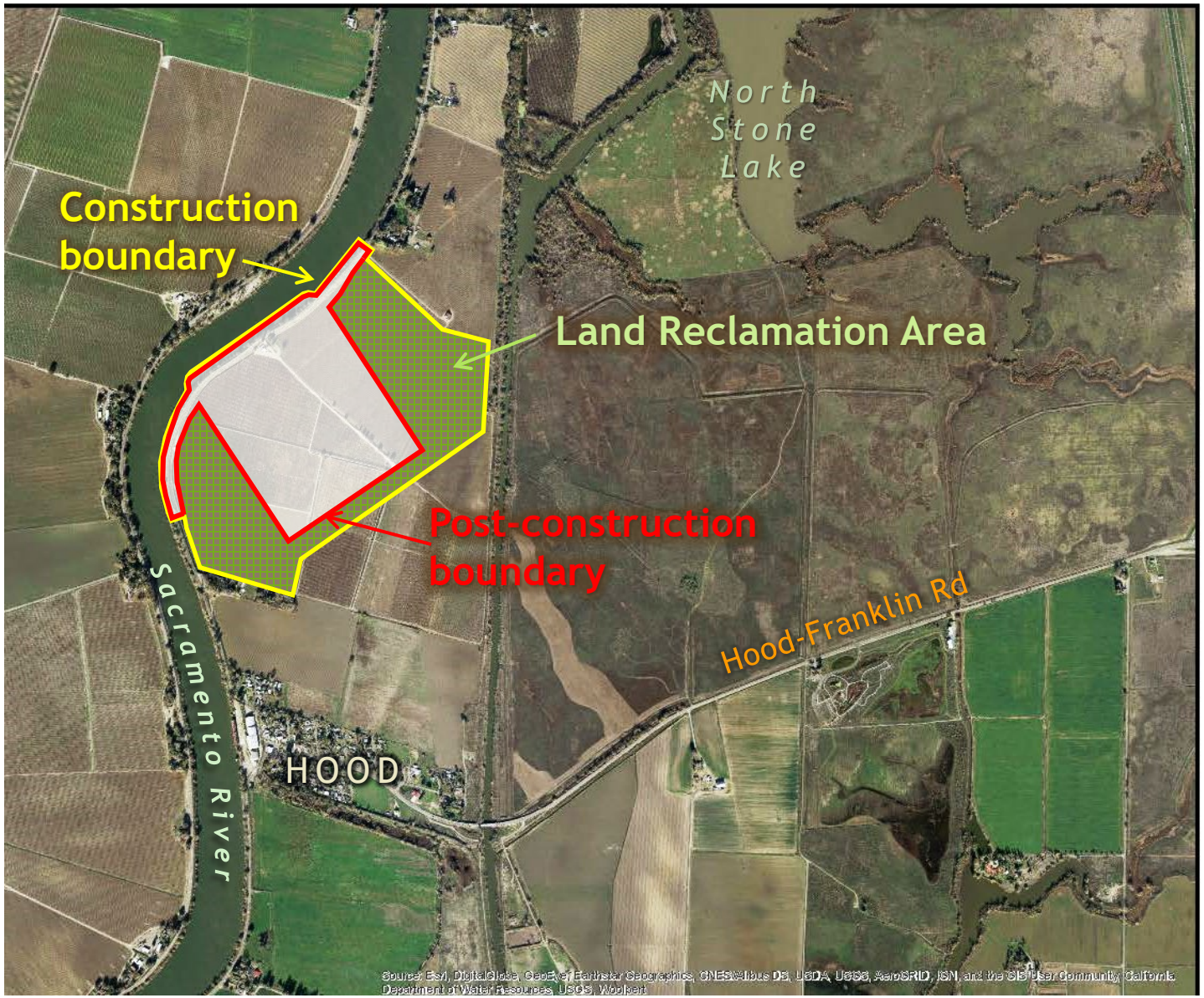
Items for Discussion

1.	Maximize restoration of agricultural land
2.	Reduce shaft diameter and shaft pad size (Reduce truck traffic)
3.	Minimize site footprints and optimize siting
4.	Minimize construction activity in and around Stone Lakes Refuge
5.	Tunnel Boring Machine Soil Conditioners

1. Maximize Agricultural Land Restoration

Land Reclamation

- **Up-front commitment to site rehabilitation**
- **Initial Assessment**
  - Understand current conditions
  - Consider potential construction impacts – primary impact will be from RTM storage
  - Include effort in Environmental Document
- **Site Reclamation**
  - Comprehensive approach
  - Includes pre-, during, and post-construction actions
  - Incorporate elements into construction documents



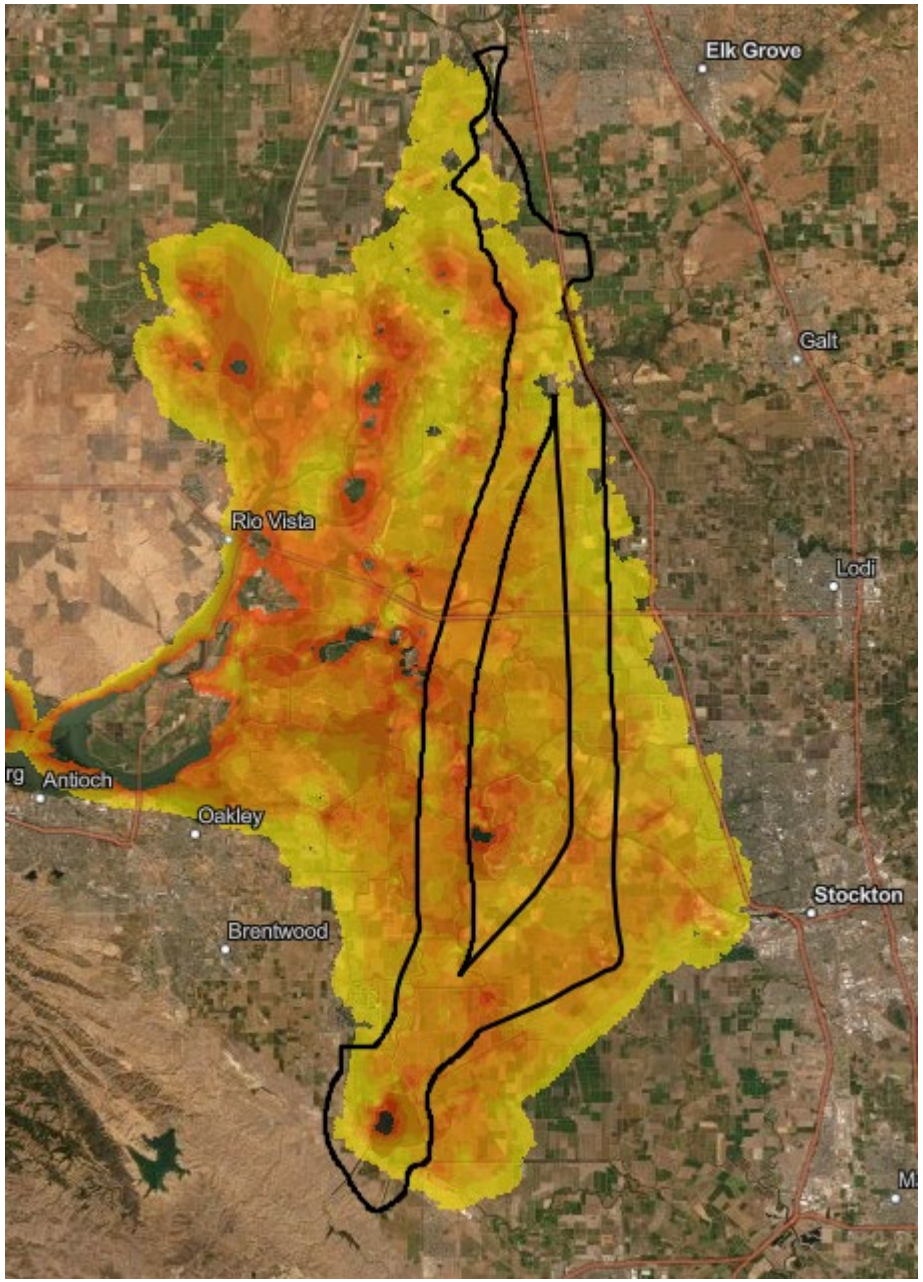
Types of Sites

- **All sites:** material/equipment laydown & staging, materials stockpiles, topsoil/peat stockpiles, retention ponds/desilting basins, access roads, construction trailers & parking
- **Intakes & Southern Complex:**
  Slurry batch plants
- **Launch shafts:**
  Segment storage, RTM processing & storage, some have railroad spurs

Level of impact will vary depending on the mix of temporary construction uses on the site

Anticipated Site Conditions

- **Size range** from maintenance/ reception shafts (<10 acres) to tunnel launch sites w/ materials depots (~450 acres)
- **Existing agricultural uses** range from irrigated pasture to vineyards and orchards
- **Ground conditions** vary from soft peat/organics to older consolidated deposits
- **Preliminary estimates of settlements** up to ~4 feet depending on ground conditions, loading, and duration
- **Some sites or elements require ground improvement** to support loads



Site Reclamation Activities

Pre-Construction Actions

- ✓ Soil Sampling and Analysis
- ✓ Save Topsoil
- ✓ Surface Treatments
- ✓ Water Infrastructure

During Construction Actions

- ✓ Soil Handling
- ✓ Reducing Compaction
- ✓ Spills Containment
- ✓ Water Infrastructure Maintenance

Post-Construction Actions

- ✓ Remove Construction Materials
- ✓ Soil Sampling and Analysis
- ✓ Refine Site Rehabilitation Strategy
  - ✓ Tillage
  - ✓ Topsoil
  - ✓ Amendments
  - ✓ Leveling/Grading

Post-Construction Conditions

- **Post-construction treatments**
  - Native soil base
  - RTM base
  - RTM stockpile
- **Long-term uses**
  - Agriculture
  - Natural/ habitat
  - RTM stockpile (not considered land reclamation)

General post-construction treatments will be based on site conditions and post-construction use

Post-Construction Treatments

Native Soil Base

- Conduct soil testing and analysis
- Rip up to 3-feet depth
- Add amendments to address compaction (e.g., gypsum)
- Incorporate amendments by cross-ripping
- Respread topsoil
- Cross-disc
- Grade/level
- Wind/water erosion cover (unless future land user is ready to plant)

RTM Base

- Conduct soil testing and analysis
- Rip up to 3-feet depth
- Add amendments to address compaction (e.g., gypsum)
- Incorporate amendments by cross-ripping
- Respread topsoil & add amendments to address soil fertility (e.g., compost, peat)
- Cross-disc
- Grade/level
- Wind/water erosion cover (unless future land user is ready to plant)

RTM Stockpiles

- Respread topsoil
- Cross-disc
- Wind/water erosion cover (likely hydroseed with native grasses)
- Establish access road to stockpile
- Implement SWPPP (erosion berm around perimeter, stabilized exit)

**For Agricultural or Natural/Habitat Uses*

**Stockpile for Future Borrow*

Long-Term Use (following Post-Construction Activities)

Agricultural Sites

- **The grower would prepare the field based on crop type:**
  - Laser-level the fields
  - Re-establish water supply and drainage
  - Add additional amendments
  - Plant cover crops to build soil fertility
- **Recognition that the site may initially have sub-optimal yields would be reflected in reduced land cost**

Natural Areas

- **The site would be prepared based on habitat use:**
  - Natural contouring
  - Mixture of plant materials

Long-term use would dictate final site preparations to be completed by end user

Initial Coordination with Agricultural Community

Reviewed draft approach
with Sacramento County Farm Bureau

Preliminary feedback on restoration approach

- Compaction is major concern, shallow groundwater exacerbates the issue
- Account for existing drainage and irrigation in the site layouts
- Consider deep stripping, if needed, to collect sufficient local, organic material for on-site restoration activities
- Consider adjacent land use when evaluating potential end use of reclaimed areas
- Grass for grazing is possible in many proposed locations, but permanent crops will be more difficult

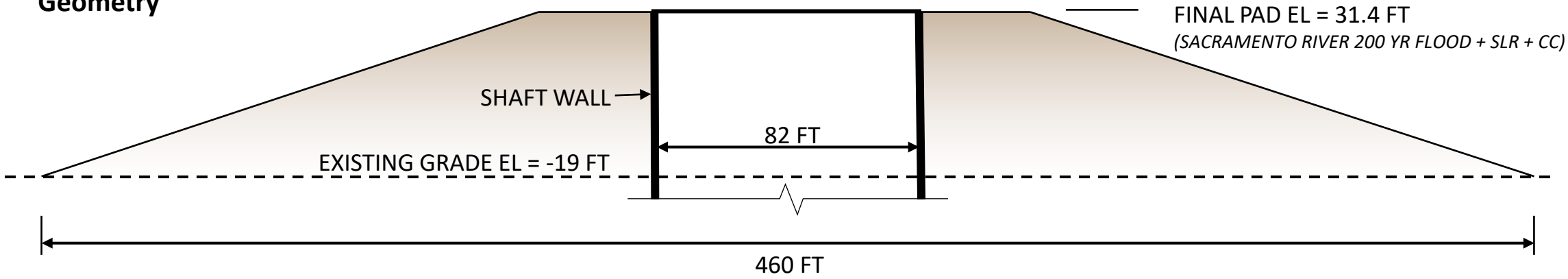
Other comments

- Traffic concerns that could affect agricultural business operations
- Effects of RTM processing and drying on surrounding land and groundwater conditions

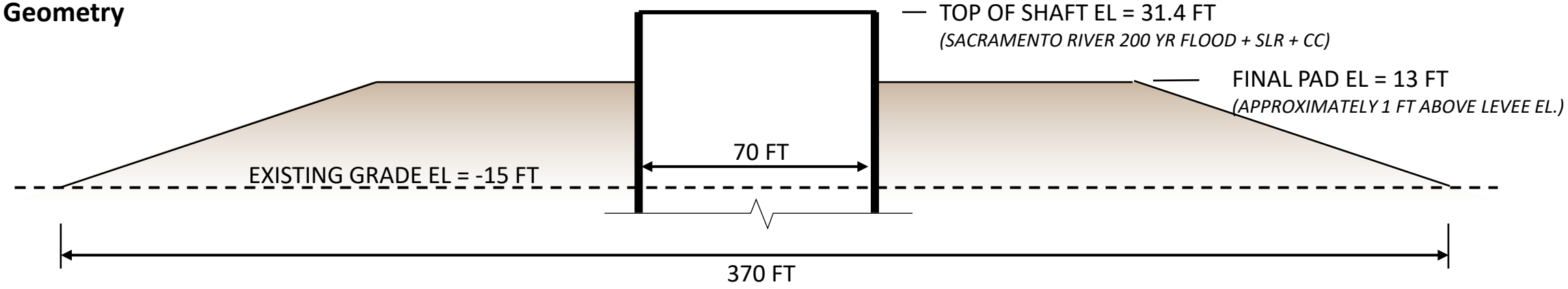
2. Reduce Shaft Diameter and Shaft Pad Size

Mandeville Island Maintenance Shaft (Example)

Previous Geometry



Updated Geometry



Mandeville Maintenance Shaft

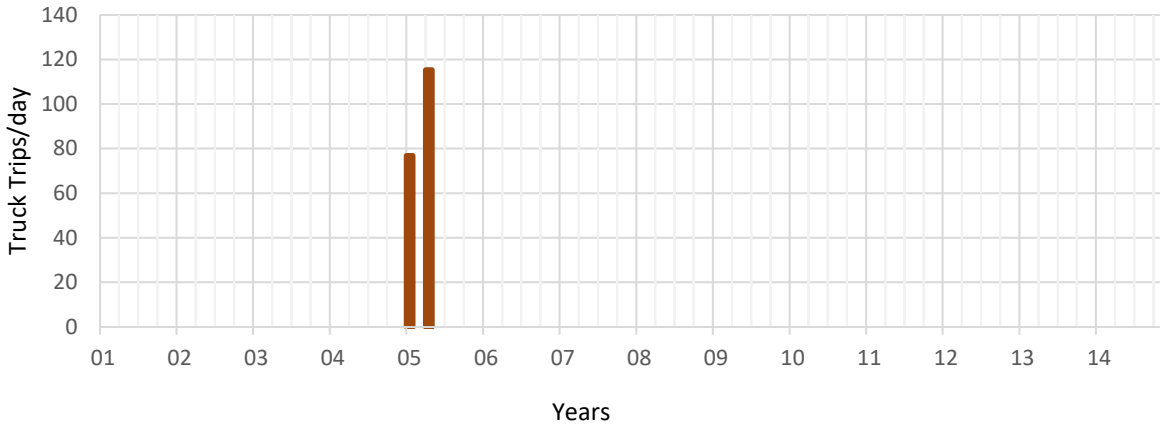
As Presented at June 2020 SEC

Description	Volume (CCY)	Source/Haul
NEEDED	**211,000**	
IMPORT	**200,000**	**TCC RTM**
ON-SITE	11,000	Mandeville Shaft Excavation
EXCESS	*23,000*	*To Southern Forebay*

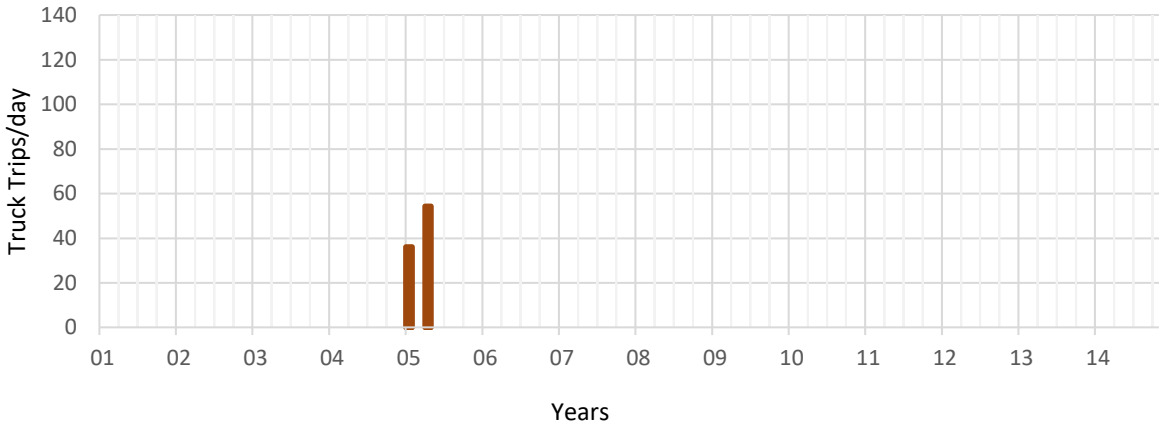
UPDATED July 2020

Description	Volume (CCY)	Source/Haul
NEEDED	**94,000**	
IMPORT	**94,000**	**TCC RTM/Borrow**
ON-SITE	0	
EXCESS	*24,000*	*Spread on-site (from Mandeville shaft excavation)*

Truck Hauling Schedule



Truck Hauling Schedule



3. Reduced Site Footprints

Summary of Site Acreages

	CONSTRUCTION FOOTPRINT *(Yellow)*			PERMANENT FOOTPRINT		
	Previous *5/4/2020*	**Current** *7/15/2020*	***Reduction***	**Previous** *5/4/2020*	**Current** *7/15/2020*	***Reduction***
NORTHERN SHARED SITES						
Intake 3 – Tee	245	244	1	131	124	7
Intake 5 – Tee	242	240	2	113	109	4
Lambert Shaft	5	0	5	5	0	5
Glanville now Twin Cities Launch Shaft	669	507	162	669	111	558
EASTERN ALIGNMENT OPTION						
New Hope Tract Maintenance Shaft	6	11	-5	6	11	-5
Brack, now Canal Ranch Tract Maintenance Shaft	11	11	0	11	11	0
Terminous Tract Reception Shaft	15	13	2	15	13	2
King Island Maintenance Shaft	11	12	-1	11	12	-1
Lower Roberts Island Launch/ Reception Shaft	472	438	34	337	406	-69
Lower Jones now Upper Jones Tract Maint. Shaft	16	13	3	16	13	3
Victoria Island Maintenance Shaft	12	0	12	12	0	12
CENTRAL ALIGNMENT OPTION						
New Hope Tract Maintenance Shaft	7	11	-4	7	11	-4
Staten Island Maintenance Shaft	15	12	3	15	12	3
Bouldin Island Launch Shaft	424	592	-168	423	577	-154
Mandeville Island Maintenance Shaft	16	14	2	16	14	2
Bacon Island Reception Shaft	27	16	11	27	16	11
SOUTHERN COMPLEX						
Southern Forebay and Launch Shaft	1705	1666	39	1327	1293	34
South Delta Conveyance Control Facilities	180	168	12	125	105	20

Twin Cities Launch Shaft Site *(Formerly Glanville Tract)*

CHANGES

- **Emphasis on mechanical drying**
- **More robust assessment of soil borrow, backfill, and storage logistics needs**

ACREAGE

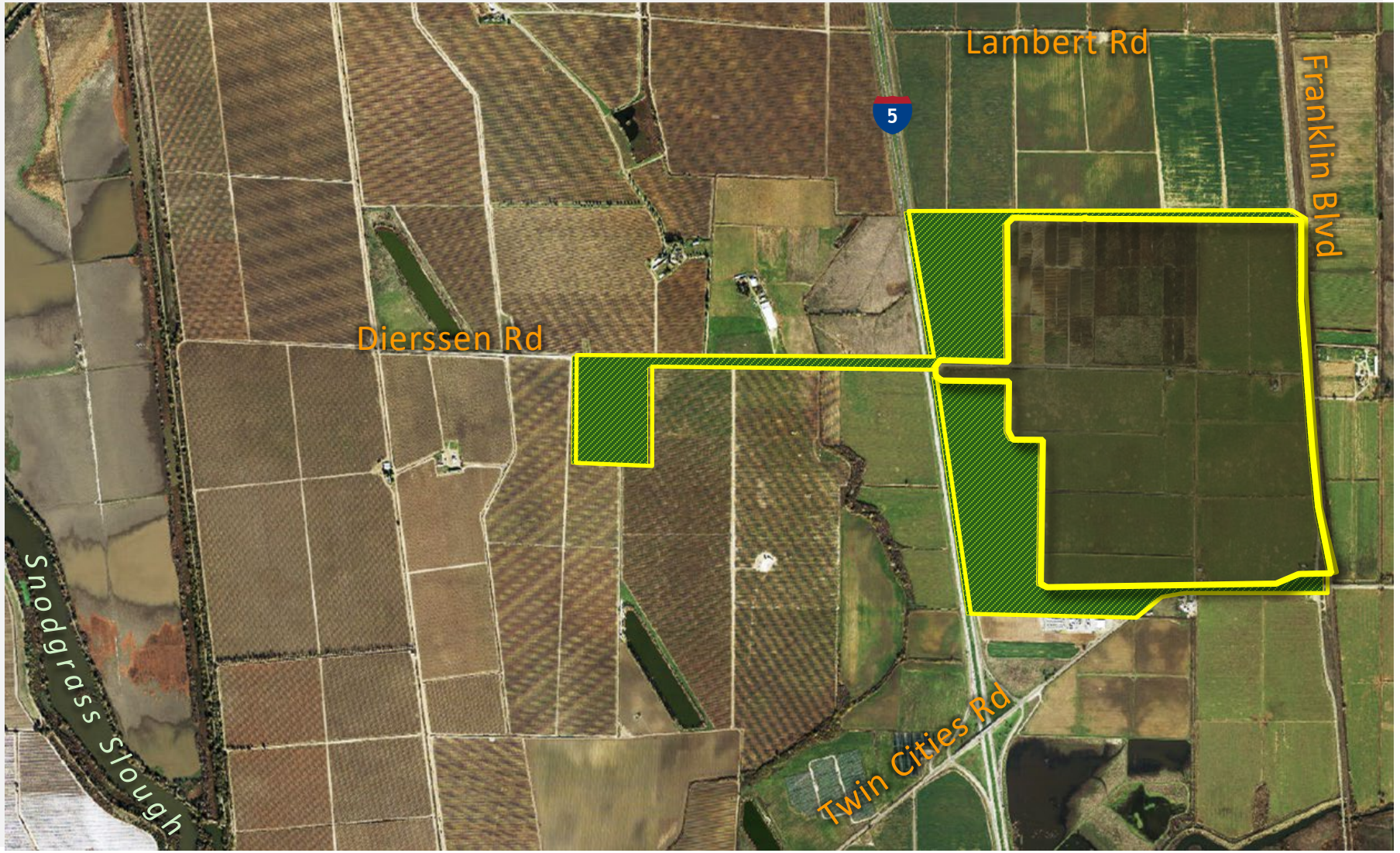
Previous 5/4/2020	Current 7/15/2020	*Difference*
CONSTRUCTION FOOTPRINT		
669	507	162
PERMANENT FOOTPRINT		
669	111	558

LEGEND

Initial and Revised Construction Footprint

Reduction

Addition



Staten Island Maintenance Shaft Site

CHANGES

- **Reduced peat excavation and stockpile**
- **Decreased pad dimensions and adjusted layout**

ACREAGE

Previous 5/4/2020	Current 7/15/2020	*Difference*
CONSTRUCTION FOOTPRINT		
15	12	3
PERMANENT FOOTPRINT		
15	12	3

LEGEND

Initial and Revised Construction Footprint

Reduction

Addition

Bouldin Island Launch Shaft Site

CHANGES

- **Removed barge landing**
- **Increased on-site RTM storage area for simplified natural drying *(permanent RTM storage)***

ACREAGE

Previous 5/4/2020	Current 7/15/2020	*Difference*
CONSTRUCTION FOOTPRINT		
424	592	-168
PERMANENT FOOTPRINT		
423	577	-154

CONSTRUCTION FOOTPRINT KEY

Initial and Revised Construction Footprint

Reduction

Addition

Mandeville Island Maintenance Shaft Site

CHANGES

- Moved to higher El. site
- Reduced peat excavation and stockpile
- Decreased pad dimensions and adjusted layout

ACREAGE

Previous 5/4/2020	Current 7/15/2020	*Difference*
CONSTRUCTION FOOTPRINT		
16	14	2
PERMANENT FOOTPRINT		
16	14	2

CONSTRUCTION FOOTPRINT KEY

Initial and Revised Construction Footprint

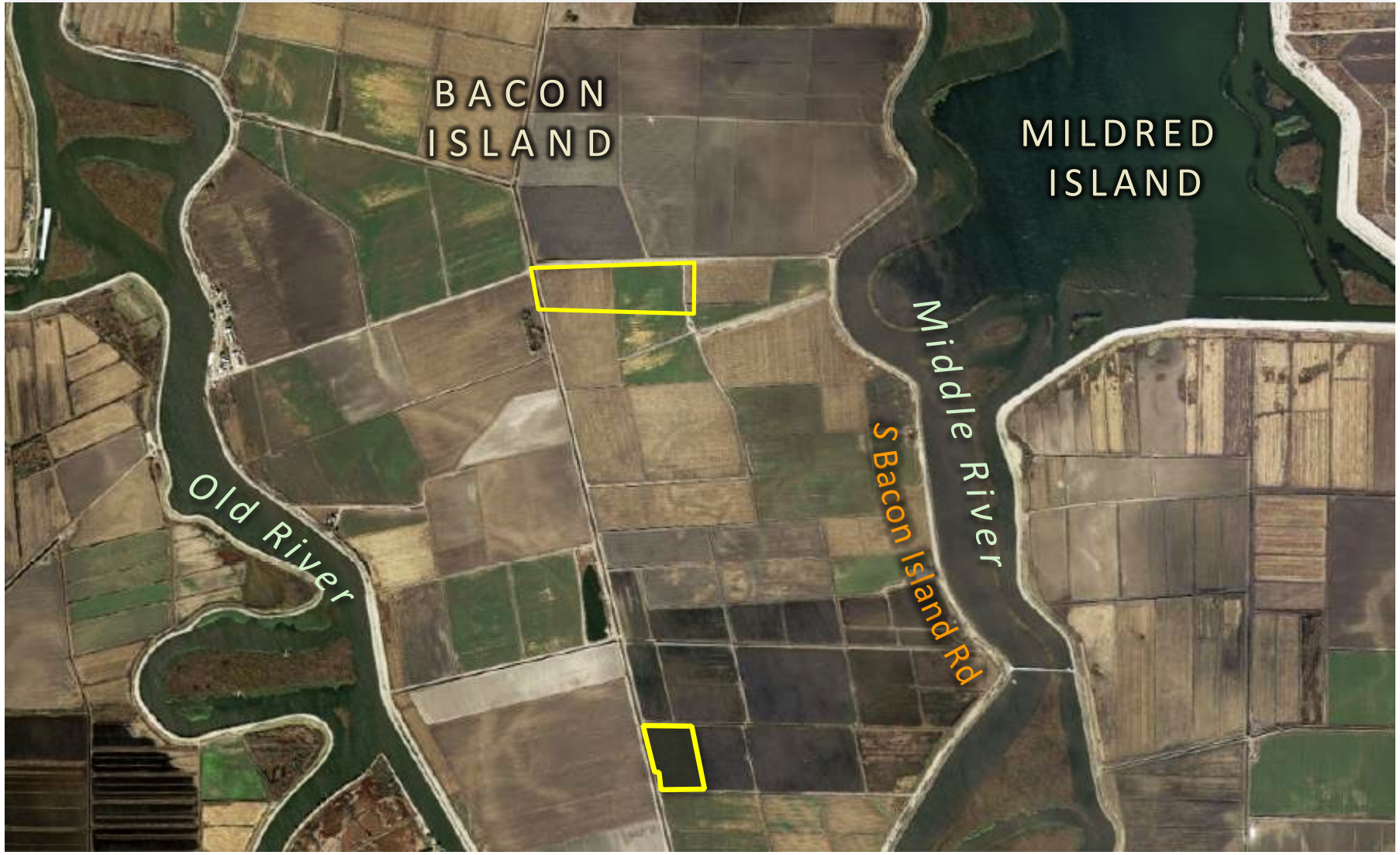
Reduction

Addition

Bacon Island Reception Shaft Site

CHANGES

- **Reduced peat excavation and stockpile**
- **Decreased pad dimensions and adjusted layout**



ACREAGE

Previous 5/4/2020	Current 7/15/2020	*Difference*
CONSTRUCTION FOOTPRINT		
27	16	11
PERMANENT FOOTPRINT		
27	16	11

CONSTRUCTION FOOTPRINT KEY

Initial and Revised Construction Footprint

Reduction

Addition

Canal Ranch Maintenance Shaft Site *(formerly Brack Tract Shaft)*

CHANGES

- **Moved to avoid Woodbridge Preserve Units and improve access**
- **Decreased pad dimensions and adjusted layout**

ACREAGE

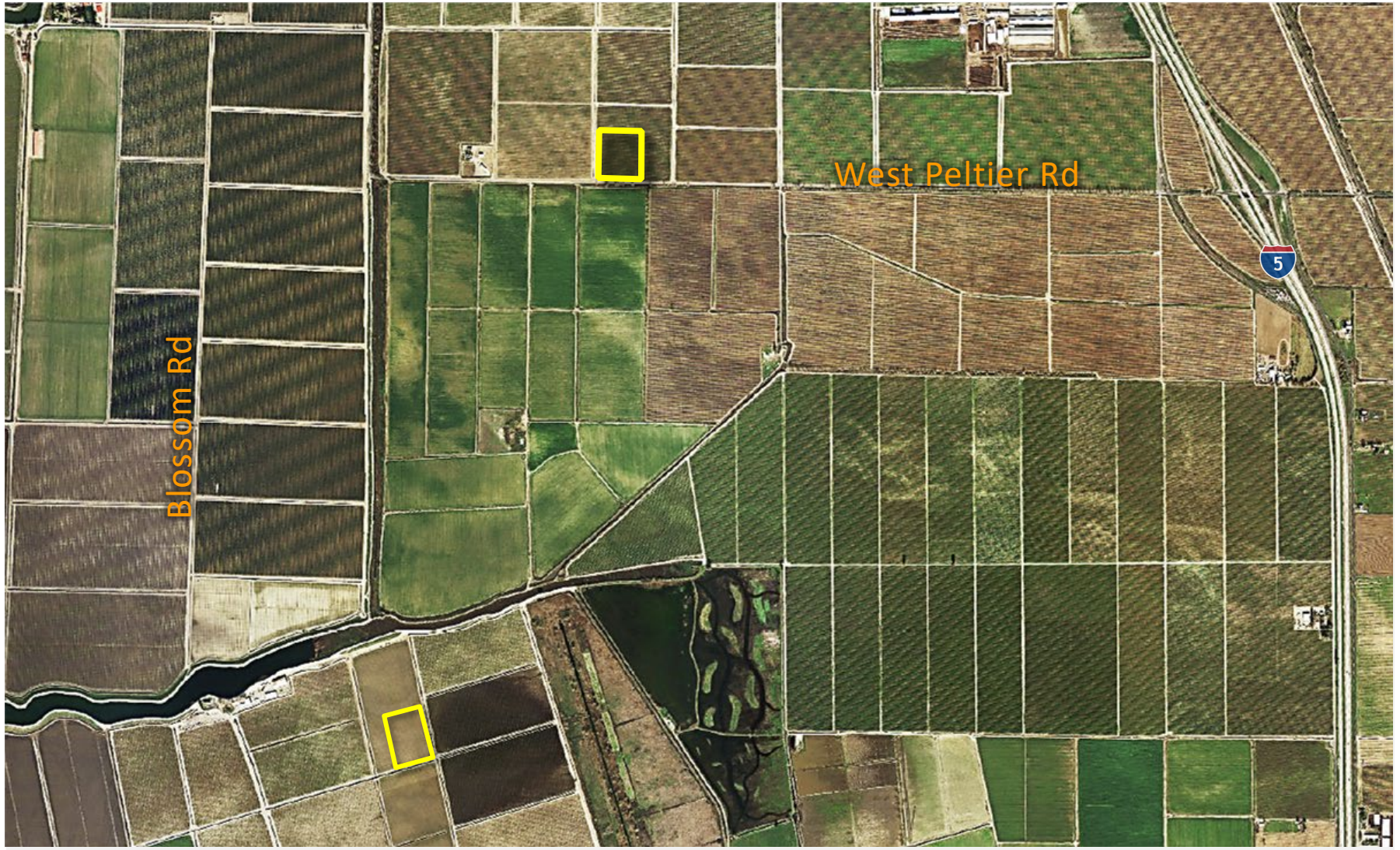
Previous 5/4/2020	Current 7/15/2020	*Difference*
CONSTRUCTION FOOTPRINT		
11	11	0
PERMANENT FOOTPRINT		
11	11	0

CONSTRUCTION FOOTPRINT KEY

Initial and Revised Construction Footprint

Reduction

Addition



Lower Roberts Island Launch Shaft Site

CHANGES

- Removed barge landing
- Reduced peat excavation and stockpile
- Increased RTM storage area
- Avoid wetland areas

ACREAGE

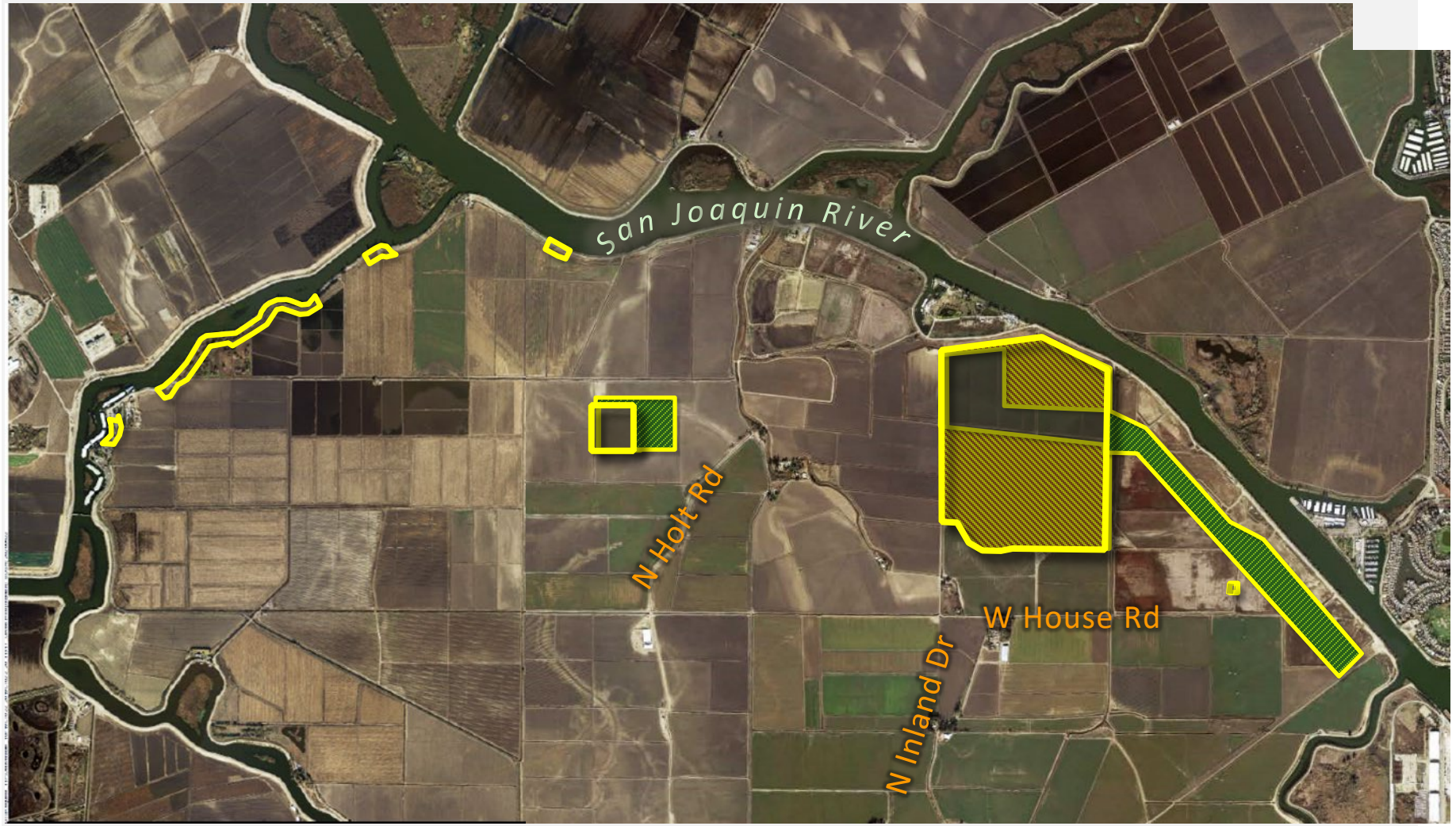
Previous 5/4/2020	Current 7/15/2020	*Difference*
CONSTRUCTION FOOTPRINT		
472	438	34
PERMANENT FOOTPRINT		
337	406	-69

CONSTRUCTION FOOTPRINT KEY

Initial and Revised Construction Footprint

Reduction

Addition



Upper Jones Island Maintenance Shaft Site *(formerly Lower Jones Island Shaft)*

CHANGES

- **Reduced peat excavation and stockpile**
- **Decreased pad dimensions and adjusted layout**

ACREAGE

Previous 5/4/2020	Current 7/15/2020	*Difference*
CONSTRUCTION FOOTPRINT		
16	13	3
PERMANENT FOOTPRINT		
16	13	3

CONSTRUCTION FOOTPRINT KEY

Initial and Revised Construction Footprint

Reduction

Addition

4. Minimize Construction Activity in and Around Stone Lakes Refuge

Prioritize Intakes 3 and 5 for < 6,000 CFS Alternatives

Original Plan Considered

Option A: Intakes 3 and 5 (6,000 cfs; 3,000 cfs ea)

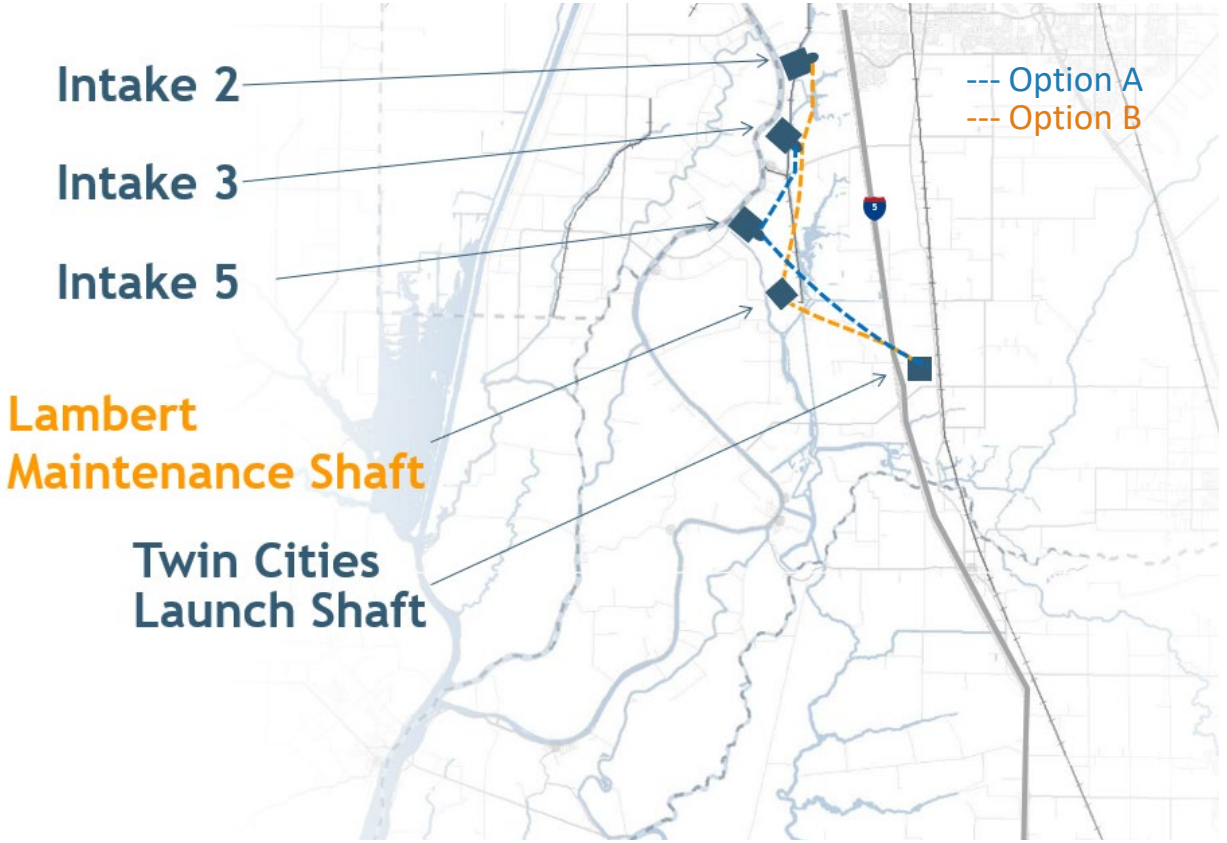
Option B: Intakes 2 and 3 (6,000 cfs; 3,000 cfs ea)

Current Plan

Eliminate Option B

Benefits

- Shorter logistics travel route from I-5 to intakes sites
- Increases separation of construction activities to sensitive receptors in Courtland and Elk Grove
- Shorter tunnel length
- Eliminates need for Lambert Shaft
- Intake 2 site had shallowest river depth and thus the longest intake structure



Eliminate Lambert Maintenance Shaft

Current Plan

Lambert Maintenance Shaft required to span tunnel drive from Glanville Shaft to Intake 3 (Option B)

Updated Plan

Lambert shaft not needed to drive from Glanville Shaft to Intake 5

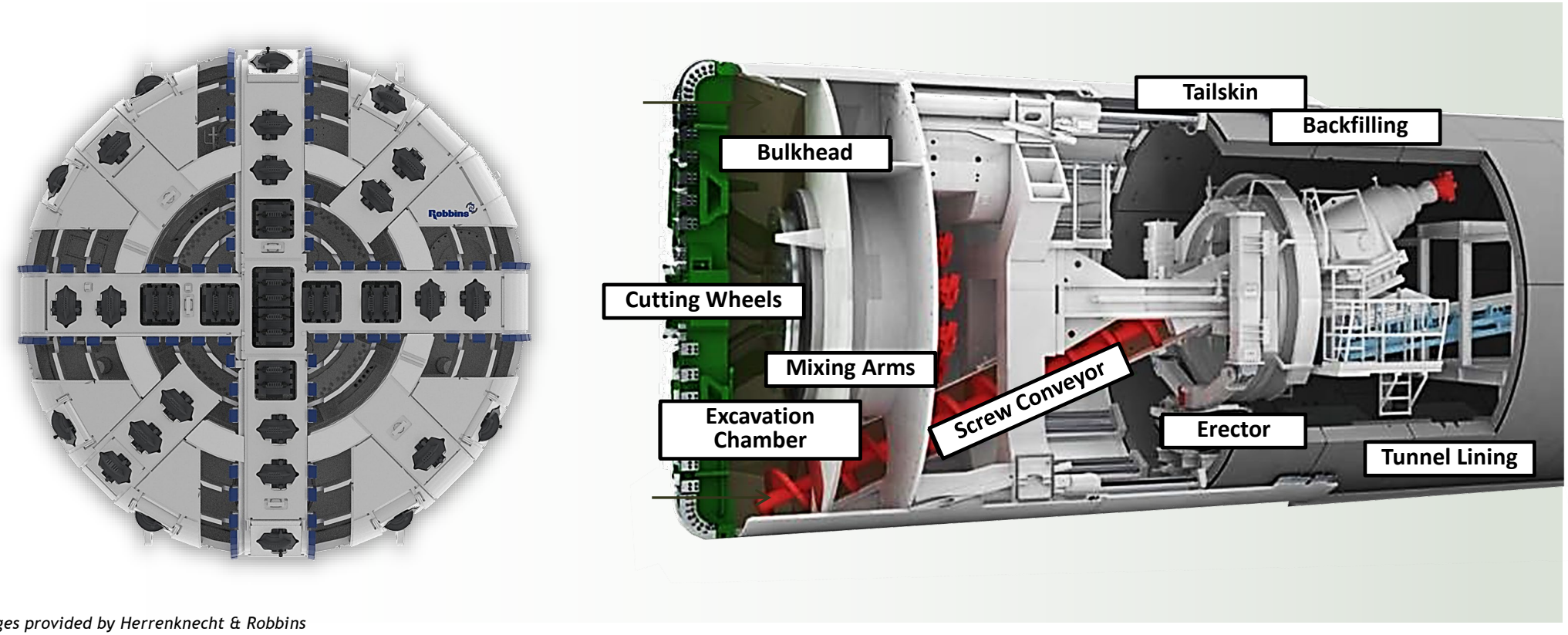
Benefits

- Eliminates construction site adjacent to Stone Lakes National Wildlife Refuge
- Reduced truck traffic

5. TBM Conditioners

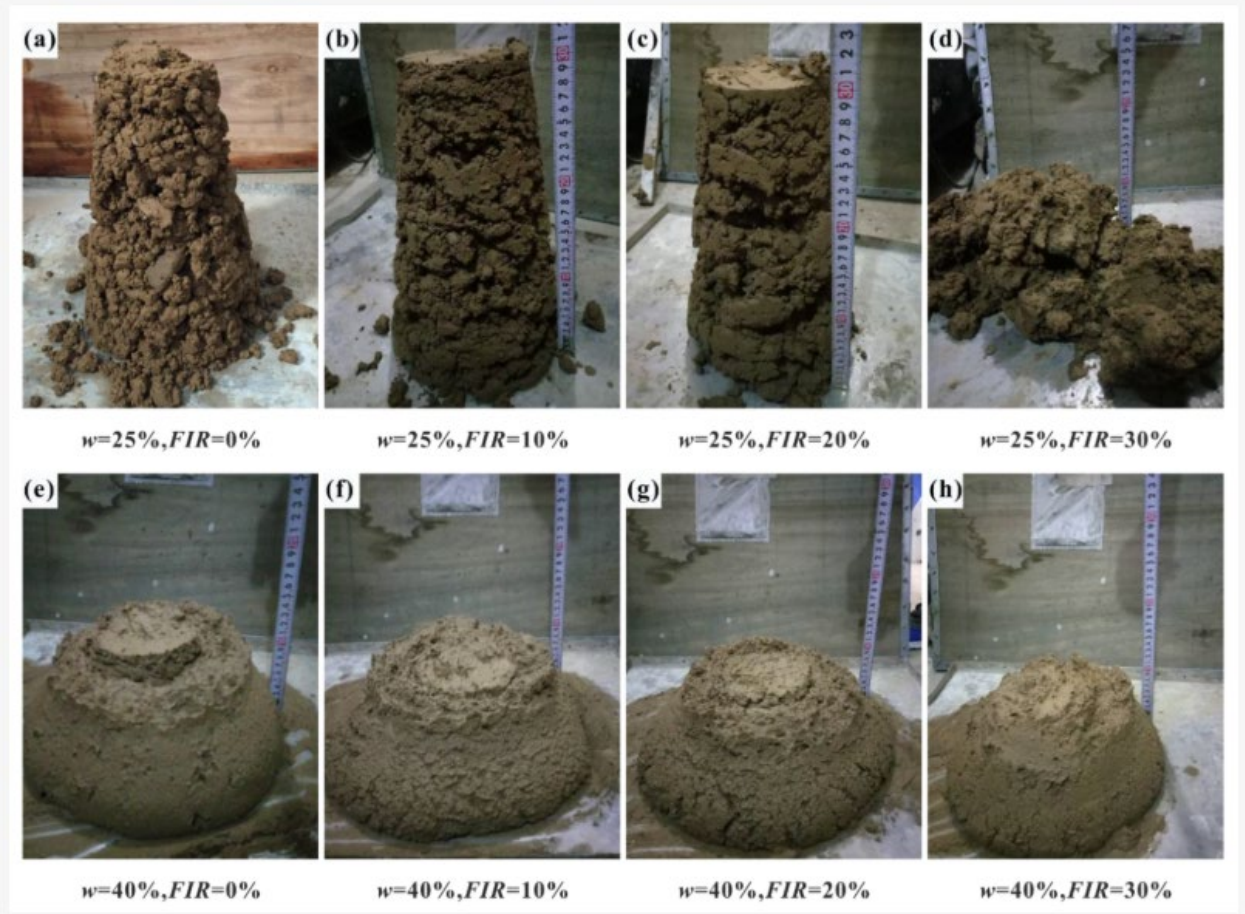
Earth Pressure Balance TBM (EPB)

"Earth pressure balance (EPB) tunneling machines are commonly used for the construction of tunnels in soft soils. These machines use the excavated soil in a pressurized head chamber to apply a support pressure to the tunnel face during excavation. ***Conditioning the excavated material is one of the most important components in the operation of an EPB TBM.***"



Modified from images provided by Herrenknecht & Robbins

Why is Soil Conditioning Important?



Photos showing the effect of water content and foam injection rate (FIR) on soil properties.

- Improves the workability of the soil to help balance the pressure against the face
- Reduces the “clumping” and abrasiveness of the soil to reduce energy, reduce maintenance, and improve speed
- Easier to transport soil through the face and convey out of the tunnel
- Better control of groundwater inflow by reducing permeability and increasing sealing of the face
- Improves safety of personnel during maintenance of the cutterhead

Conditioning Agent = Water & Foam

Soil

Addition of water

Soil with foam

Conditioner added at the point of "cut" to achieve maximum benefit.

Conditioning agent is injected into the mixing chamber and along the screw conveyor during tunnel excavation

Foam addition rate adjusted based on soil conditions to achieve optimal affect

Characteristics and Selection of Soil Conditioners to be Used

Conditioners have improved over the years migrating toward more eco-friendly constitutions

Latest conditioners are rapidly biodegradable and nonhazardous formulations.

During biodedgradation, conditioner is converted into water, CO2, and biomass through the action of existing, naturally occurring microbes.

Natural or vegetable polymers used; no glycols, alcohols, or other low biodegradable solvents used

Conditioner Manufacturers:

- *CONDAT (USA)*
- *NORMET (Finland)*
- *BASF (Germany)*
- *MAPEI (Italy)*

Selection of Conditioner:

DCA contract specifications will require use of:

- **highly biodegradable**
- **minimum toxicity and persistence**
- **natural-based polymers only**
- **no glycols or other low biodegradable solvents**

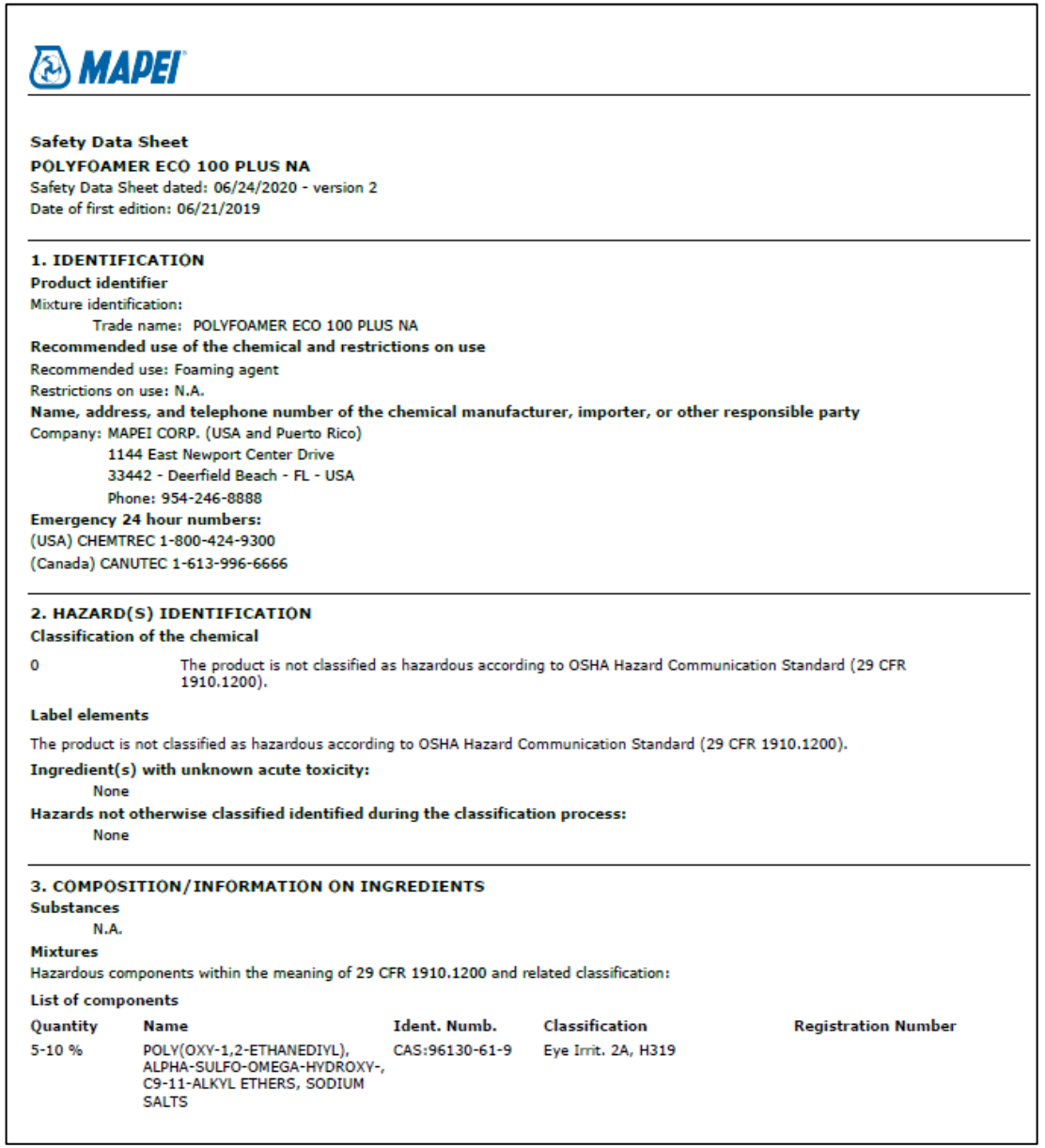
Conditioner will be submitted for testing and approval prior to use.

DCA will conduct studies prior to finalizing specifications to validate requirements

Material Safety Data Sheet (MSDS)

*A **Material Safety Data Sheet** (**MSDS**) is a document that contains information on the potential hazards and how to work safely with a chemical product.*

- All TBM conditioners must have an MSDS Sheet
- The MSDS identifies:
  - Hazards
  - Composition *(Note: Excludes trade secrets)*
  - Toxicology information
  - Disposal considerations
  - Transport information
  - Other information
- MSDS sheets along with independent testing will be used to verify product meets DCA Specifications



MAPEI

Safety Data Sheet
POLYFOAMER ECO 100 PLUS NA
Safety Data Sheet dated: 06/24/2020 - version 2
Date of first edition: 06/21/2019

1. IDENTIFICATION
Product identifier
Mixture identification:
Trade name: POLYFOAMER ECO 100 PLUS NA
Recommended use of the chemical and restrictions on use
Recommended use: Foaming agent
Restrictions on use: N.A.
Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party
Company: MAPEI CORP. (USA and Puerto Rico)
1144 East Newport Center Drive
33442 - Deerfield Beach - FL - USA
Phone: 954-246-8888
Emergency 24 hour numbers:
(USA) CHEMTREC 1-800-424-9300
(Canada) CANUTEC 1-613-996-6666

2. HAZARD(S) IDENTIFICATION
Classification of the chemical
0 The product is not classified as hazardous according to OSHA Hazard Communication Standard (29 CFR 1910.1200).
Label elements
The product is not classified as hazardous according to OSHA Hazard Communication Standard (29 CFR 1910.1200).
Ingredient(s) with unknown acute toxicity:
None
Hazards not otherwise classified identified during the classification process:
None

3. COMPOSITION/INFORMATION ON INGREDIENTS
Substances
N.A.
Mixtures
Hazardous components within the meaning of 29 CFR 1910.1200 and related classification:
List of components

Quantity	Name	Ident. Numb.	Classification	Registration Number
5-10 %	POLY(OXY-1,2-ETHANEDIYL), ALPHA-SULFO-OMEGA-HYDROXY-, C9-11-ALKYL ETHERS, SODIUM SALTS	CAS:96130-61-9	Eye Irrit. 2A, H319	

Example Safety Sheet from Mapei for Polyfoamer Eco 100 Plus.

Thank You

Item 4c.

SEC Questions or Comments on June 24th Presentation

Item 4d.

Public Comment on Item 4

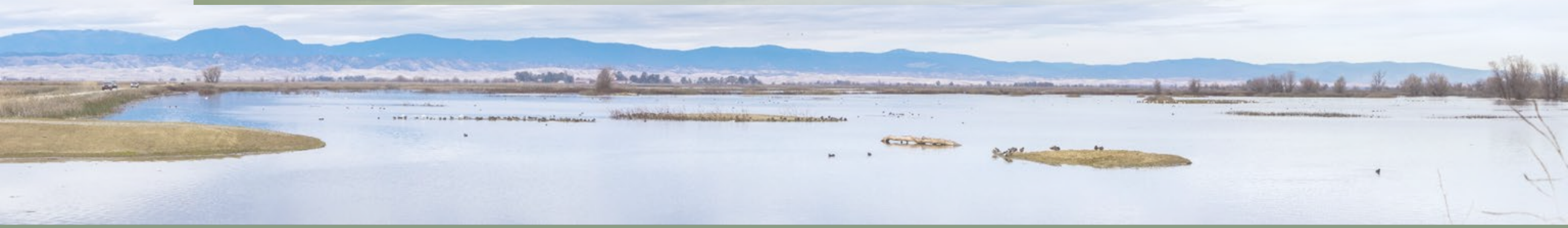
Item 5a.

SEC Tour Updates

Item 5b.

August 26th SEC Meeting Topics

- *Updated Traffic Histograms*
- *Update on Intakes Design*
- *Briefing on New Alternative*



Item 5c.

August 20th
SEC Report to DCA Board

Item 6.

Non-Agendized SEC Questions or Comments

Item 7.

Public Comment

Non-Agendized Items

Next SEC Meeting

- *Date: August 26, 2020*
- *Time: 3-6 PM*
- *Topics**
  - *Updated Traffic Histograms*
  - *Update on Intakes Design*
  - *Briefing on New Alternative*

**(subject to change)*