



STAKEHOLDER ENGAGEMENT
COMMITTEE (SEC)

Stakeholder Engagement Committee (SEC) Abridged Presentation: Tunnel Launch Shafts Presented at the February 12, 2020 Meeting

Today's Agenda



A. Basics of a Launch Shaft Site

- Components of a Tunnel Drive
- Construction Site Layout
- RTM Management
- Tunnel Liner Deliveries

B. Logistics

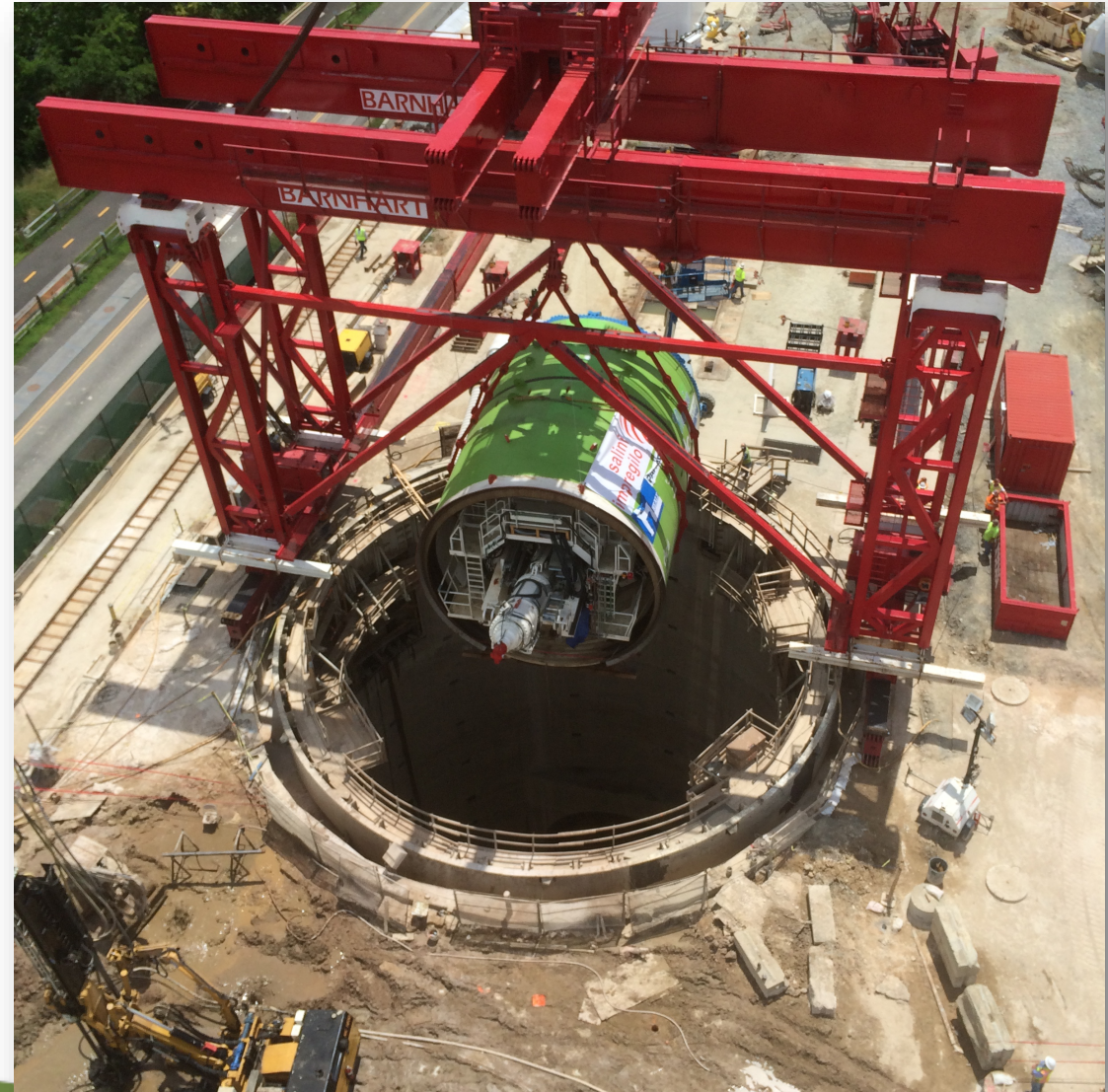
- Rail, Truck, and Barge Counts
- Logistics Maps

C. Siting Analyses

- Siting Methodology
- Site Rankings
 - Central Corridor
 - East Corridor
- Discussion

Next Meeting - Feb 26

1. SEC Input on Launch Shaft Locations
2. Basics of Retrieval Shafts and Maintenance Shafts
3. Siting Analysis of Retrieval and Maintenance Shafts
 - Central Corridor
 - Eastern Corridor
4. Discussion on Potential Beneficial Reuse opportunities for RTM in Delta





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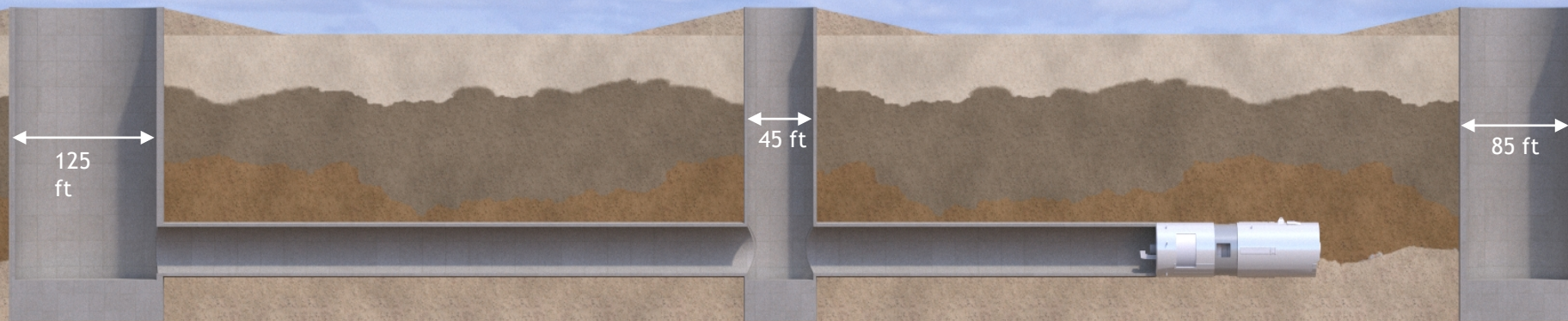
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Tunnel Launch Shaft Basics

Key Components of a Tunnel Drive

10 to 15 mile tunnel drive lengths acceptable based on Delta soil conditions



Tunnel Launch Shaft

Where the tunnel boring machine (TBM) is lowered into the tunnel. Where the concrete liners are transported into the tunnel. Where the excavated material (RTM) is removed.

Maintenance Shaft

Provides direct access to the TBM for routine maintenance work. Needed approximately every 4 to 5 miles.

Tunnel Retrieval Shaft

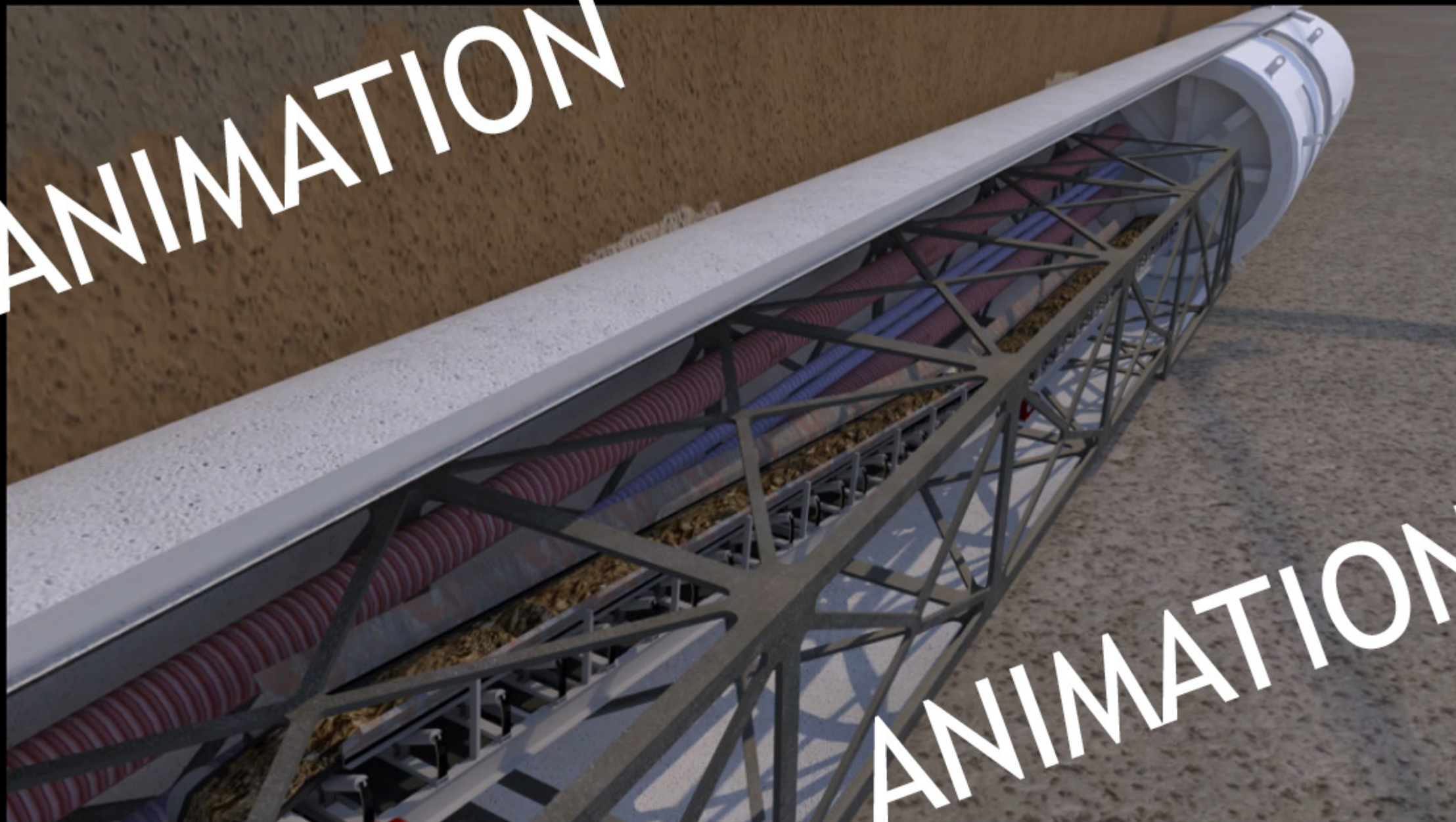
Termination point of tunnel drive. Where TBM is disassembled and lifted out of the tunnel.

Main Activities at Launch Site

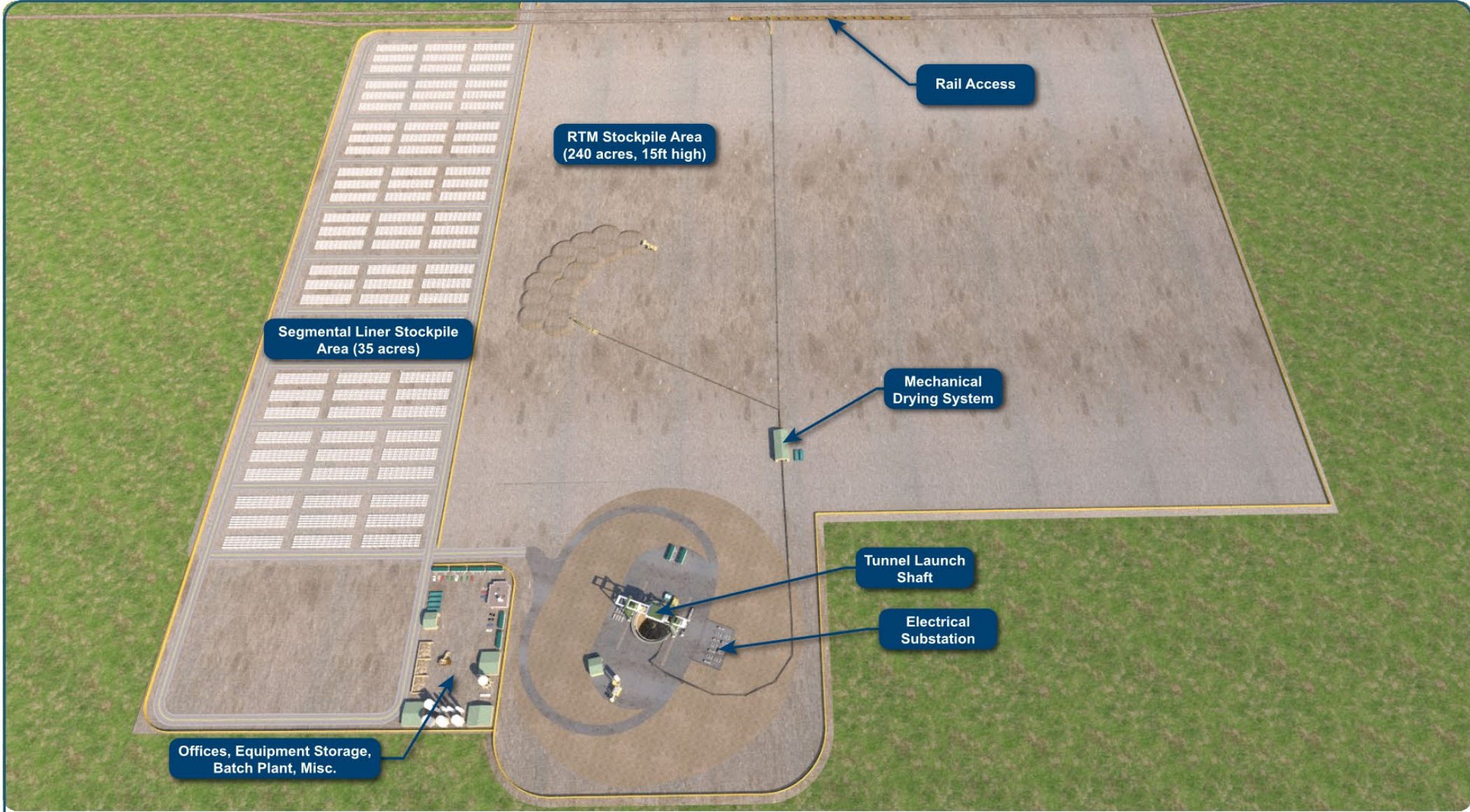
- Launch tunnel boring machine
- Tunnel boring operations
- Segment liner deliveries, stockpiling and transport into the tunnel for placement
- Reusable Tunnel Material (RTM) production, dewatering, and stockpiling
- Power supply systems
- Tunnel ventilation systems
- Site runoff management
- Tunnel boring machine worker access
- Emergency access



ANIMATION



ANIMATION



290 total acres
Single 15 mile drive
6,000 cfs capacity

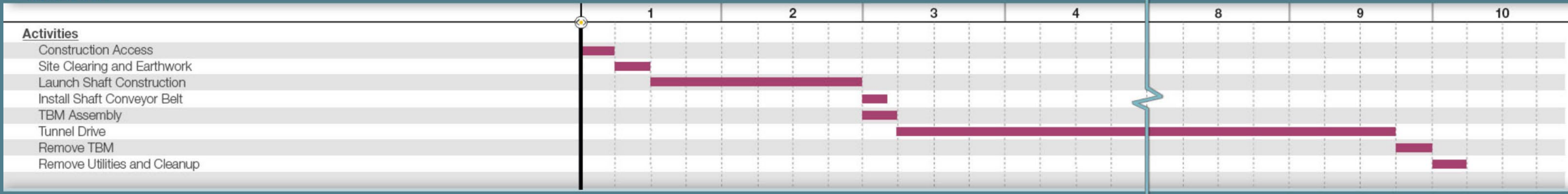
Tunnel Launch Shaft Site Plan



Tunnel Launch Shaft Construction



SCHEDULE

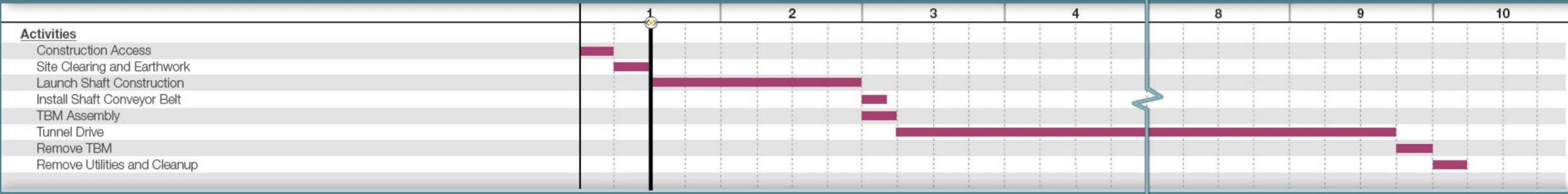




Tunnel Launch Shaft Construction



SCHEDULE





Tunnel Launch Shaft Construction



SCHEDULE

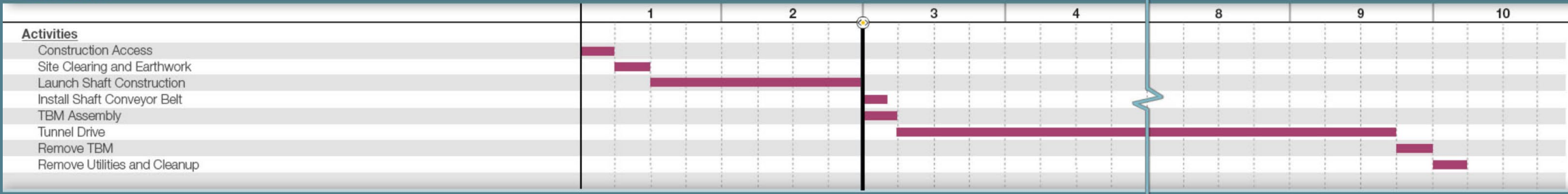




Tunnel Launch Shaft Construction



SCHEDULE

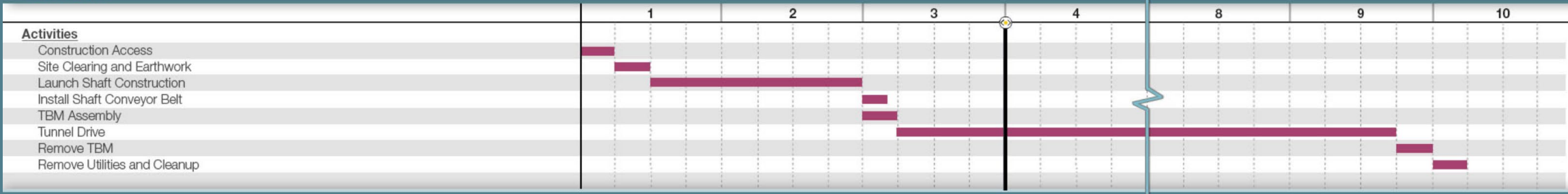




Tunnel Launch Shaft Construction



SCHEDULE



Reusable Tunnel Material (RTM)

- Extracted material from the tunneling process
- Comprised of clays, sands, and silts
- Consistency of toothpaste
- Soil conditioners used for boring operation are also present in low quantities
- Wet material would be dried prior to stockpiling
- Continuous soil and water testing program would be implemented to confirm quality of material for reuse or disposal
- Material suitable for beneficial reuse



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RTM Drying Options



Centrifuge dewatering equipment

Land Application - Air Drying

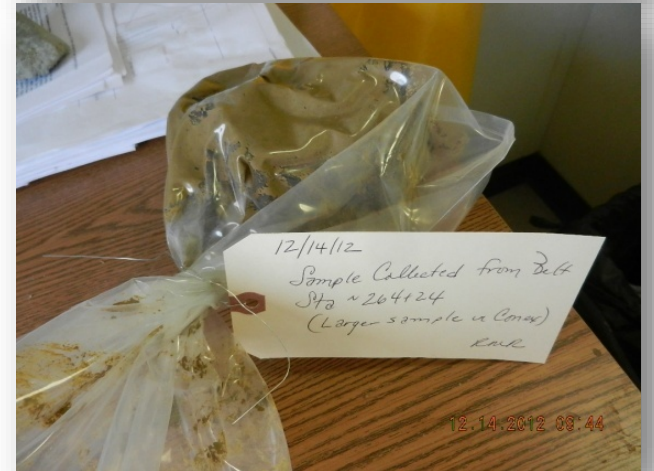
- Spread in approximately 12 to 18-inch lifts
- Would disc (turn) several times daily
- ~14 days to dry (weather dependent)
- Land intensive
- Would capture and treat drained water
- Additional truck emissions and noise (spreader, excavator, etc.)
- Would implement dust management
- Would implement stormwater runoff management

Mechanical Dewatering

- Centrifuges and plate presses have been used
- Could be housed indoors to capture dust and reduce noise
- Could be managed with electric powered conveyors, hoppers, and machines

Typical RTM Testing Plan

- RTM is loaded onto a continuous conveyor belt that transports material to a Classification Holding Area
- Samples are taken daily from the conveyor belt
- The samples are logged, profiled, and stored on site for further screening if necessary
- RTM and decant water is held in designated zones awaiting sample results
 - Acceptable quality - material slated for beneficial reuse
 - Unacceptable quality - additional stored samples tested; material sent for landfill disposal



RTM and Environmental Test Results

- Reviewed available environmental soil laboratory results
- Initial observations:
 - Metals generally resemble background levels. Cadmium appears slightly elevated in all samples compared with published background, but doesn't appear to represent a human health or ecological risk.
 - Pesticides and total petroleum hydrocarbons (TPH): few detects (no pesticides, TPH in one water sample)
- Additional sampling as part of future soil investigation program
- Developing exposure scenarios to evaluate human health and ecological risks
- Evaluating alternatives to control airborne RTM particulate matter

Possible Local Beneficial Reuse Opportunities (further discussion Feb 26)

- Delta Conveyance Southern Forebay embankment
- Delta Conveyance mitigation projects in Delta
- Delta Reclamation Districts levee maintenance
- Other Delta restoration projects
- Land subsidence
- Road improvements
- Commercial sale



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Pre-Cast Liners

- Liners typically provided by tunnel contractor
- Fabricated at existing or new purpose-built pre-cast facility
- Continuous operations at pre-cast facility with on-site stockpiling and batch shipments to tunnel launch sites
- Stockpiled on launch shaft site



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Potential Pre-Cast Liner Fabrication Sites

- Approximately 50 segments per day needed for 6,000 cfs capacity (per tunnel drive)
- Delivery options
 - 25 trucks per day
 - One - 20 car rail delivery every 3 to 5 days
 - One barge delivery every 3 to 5 days
- Sites selected by contractor or pre-selected by the Project
- Prefer to identify acceptable locations as part of engineering planning process rather than leaving to contractor selection which allows for assessment of transportation effects
- Prefer pre-cast fabrication sites near rail or barge access to reduce trucking

