



DCA

## A CLOSER LOOK: REUSABLE TUNNEL MATERIAL

The soil excavated by the Tunnel Boring Machines (TBMs) in the construction of the Delta Conveyance Project will consist of mostly sand, silt, and clay, and could be suitably reused for a variety of purposes, such as levee improvements and environmental restoration projects. Rather than hauling the Reusable Tunnel Material (RTM) away, the Delta Conveyance Design and Construction Authority (DCA), working at the direction of the Department of Water Resources (DWR), has designed a program for testing, drying and stockpiling the material for potential reuse as part of DCA's commitment to sustainability and minimizing community effects.



*Rendering of 15ft high RTM stockpile at Twin Cities Launch Shaft*

### Reusing Tunnel Material—A History

The practice of reusing tunnel material is quite common in tunneling projects, with its most recent applications observed in these specific projects:

- The San Francisco Public Utilities Commission Bay Tunnel Project, with similar soils to those found in the Delta, reused their tunnel material in the Bair Island Tidal Marsh Restoration Project.
- London Underground's Elizabeth Line Project used excavated soil to cover up four landfills near London, build a golf course, and create a 1,500-acre wildlife reserve.

Soil tests conducted suggest that the mostly sand, silt and clay that make up the soil along the Delta Conveyance Project alignment at depths of 130-170 feet are suitable for reuse for engineering fill and wildland restoration. While the DCA and DWR are continuing soil investigations, none of the samples to date have indicated that there is a likely contamination problem. Therefore, it is anticipated that the vast majority of the approximately 9.3 million cubic yards (Mcy) of tunnel material will be reusable as engineering fill.

## Excavating RTM: From TBM Face to Launch Shaft Surface

Tunneling contractors typically use “soil conditioners” introduced directly in front of the cutterhead and in the screw conveyor maintaining face stability, reducing wear and tear on the TBM cutterhead, and improving the consistency of the soil for better material handling. Contractors determine the type of soil conditioners needed based on information from the soil investigations and would be required to use commercially available eco-friendly biodegradable conditioners that do not negatively impact the environmental or engineering properties of the soil. This helps to ensure the highest potential for RTM reuse.

## Testing to Meet Federal and State Requirements

Once on the surface, the RTM would be temporarily stored in concrete-lined holding bays for profiling and testing. All excavated materials would be tested for composition and environmental properties to ensure suitability for reuse. All tests would comply with the requirements of the Central Valley Regional Water Quality Control Board and California Department of Toxic Substances Control. If testing indicates the presence of contaminants or hazardous materials, the RTM would be taken to the appropriate qualified hazardous disposal facility.

## Drying Materials for Reuse

Once testing is complete, the RTM is moved to designated on-site drying areas to naturally dry. The soil would be distributed throughout the drying area by conveyors and periodically graded flat in lifts of about 18 inches. During dry weather, the saturated soil is estimated to need about 3 weeks to reach a condition suitable for stockpiling and compaction. In wet weather, the soil is conveyed to the drying area but left as small stacks until dry weather returns and piles can be graded flat. Once dry, the soil is compacted in place and another layer is added until the pile reaches a maximum height of 15 feet. The drying process would not cause odors since the RTM comes from depths in excess of 100 feet below the ground surface and does not contain organic matter, which emit odors as it dries and oxidizes.

## Utilizing RTM

RTM will be placed in long-term stockpiles at the tunnel launch sites and managed by DWR, or a third party site manager. To control dust and runoff, an erosion-control seed mix will be sown in the stockpiles. With no expiration date, RTM will be made publicly available to projects needing fill material. There will be large quantities of RTM available. It is anticipated the Bethany Alignment will have 4.9 Mcy at Twin Cities launch shaft and 4.4 Mcy at Lower Roberts launch shaft.



Given the timing of when RTM will become available, future uses remain unknown. However, as projects requiring significant soil fill, such as levee restoration projects, are routinely pursued in the Delta region it is anticipated that demand will exist for RTM once it becomes available.

## Reusing RTM to Support Sustainability and Minimize Community Impacts

DCA is committed to sustainability and minimizing community impacts where possible. In light of these efforts, RTM will be stored on site for potential future local uses rather than trucked away. This greatly reduces truck trips throughout the Delta, minimizing impacts to local traffic and reducing vehicle emissions.

## Engineering a Reliable Water Supply for California

The DCA's mission is to plan, permit, design and build a modernized state-of-the-art sustainable, resilient, environmentally responsive, and cost-effective Delta Conveyance Project that resolves the long-standing need to assure affordable State Water Project reliability serving future generations of Californians in a way that respects the uniqueness of the Delta as a place and its communities.