

San Francisco Bay Area Rapid Transit District

2150 Webster Street, P. O. Box 12688, Oakland, CA 94604-2688



COMMITTEE MEETING AGENDA

Wednesday, January 19, 2022

4:30 PM

via Teleconference Only.

**Citizens' Oversight Committee - Earthquake Safety
Program**

Citizens' Oversight Committee
Meeting Agenda

Wednesday, January 19, 2022 at 4:30 pm

Please note, pursuant to all necessary findings having been made by the Board of Directors of the San Francisco Bay Area Rapid Transit District (for itself as well as all subordinate legislative bodies) to continue remote public meetings in the manner contemplated under urgency legislation Assembly Bill No. 361, public participation for this meeting will be via teleconference only.

You may join the Earthquake Safety Programs Citizens' Oversight Committee Meeting via Teams by calling 1-628-225-1207 and entering Conference ID 287-377-725# or type the following link into your web browser

https://teams.microsoft.com/l/meetup-join/19%3ameeting_NTY0MWI5MTQtZWI5Ni00OWZhLTlhYWmtMWMwYjExNDM4MGQw%40thread.v2/0?context=%7b%22Tid%22%3a%2259f6c9f3-d814-4192-ab9c-bd8a5553b25a%22%2c%22Oid%22%3a%227eac0a5b-874c-4a36-875d-760e996702ae%22%7d

A. Welcome, Roll Call, and Introductions

1. Roll Call and introduction of BART Citizens' Oversight Committee Members/Alternates present and BART Representatives.
2. Introduction of BART Earthquake Safety Program staff and supporting representatives.

B. Review of Administrative Matters (For Action)

1. Review and Approval of the following meeting minutes
 - a. January 13, 2021 Meeting Minutes
 - b. July 21, 2021 Meeting Minutes

Attachments: [January 13, 2021 Meeting Minutes](#)
[July 21, 2021 Meeting Minutes](#)

C. Project Update (For Information Only)

1. Completed Activities
2. Current Activities
3. Upcoming Activities
4. Financial Report
5. Findings of the TBT seismic re-evaluation

Attachments: [Project Update - Presentation 1](#)
[Project Update - Presentation 2](#)

D. Next Meeting

1. Date and time
2. Agenda items

Finalize the date and time of the next meeting. Committee Members may request to add items to the next meeting's agenda.

E. Public Comment

Members of the public may make comments.

F. Adjournment

Attendees with Special Needs: Please refrain from wearing scented products (i.e., perfume, cologne, after-shave, etc.) to these meetings, as there may be people in attendance susceptible to environmental illnesses. BART provides services/accommodations upon request to persons with disabilities and individuals who are limited English proficient who wish to address the Committee. A request must be made within one and five days in advance of the Committee meetings, depending on the service requested. Please contact the Citizens' Oversight Committee Information Line at (510) 874-7478 for more information or to request services.



San Francisco Bay Area Rapid Transit District (BART)
Earthquake Safety Program

Citizens' Oversight Committee Meeting Minutes

Wednesday, January 13, 2021, 4:30 pm

**Conference Room 1700, Kaiser Center Tower, 17th Floor
300 Lakeside Drive, Oakland CA 94612**

Virtual Meeting

Meeting Number Term 7, Meeting 7	Meeting Date January 13, 2021	Meeting Time 4:33 pm – 5:45 pm
Attendees	<i>Current Members</i> Derek Schaible, Chair Eric Tandy Clint Loftman	<i>BART Representatives</i> Zecharias “Zach” Amare Chuck Bernardo Carl Holmes Tracy Johnson Jose “Ramiro” Salazar Director McPartland Bianca Mallory Mark Salmon
	<i>Alternate Members</i> Tom Horton Ken Mark Monica Tell Louise Engel	
Agenda Item	Action Taken	
A. Welcome, Introductions, and Roll Call	Meeting called to order by Chair D. Schaible at 4:35 pm on Jan. 13, 2021. B. Mallory went over housekeeping items relating to the new format of conducting the meeting virtually. B. Mallory took roll call, noted members in attendance, and confirmed there was a quorum of three members in attendance and four alternates.	
B. Project Update	Z. Amare, Capital Projects Group Manager, introduced the agenda items, including the project update and work progress, update on the re-analysis of the TBT, and financial report and schedule. As part of the Project Update, C. Bernardo provided an overview of the program’s progress since the last meeting, noting the completed, current, and upcoming activities, with photos representing construction activity. Below is a summary of the report: <ul style="list-style-type: none">• There is one contract remaining:<ul style="list-style-type: none">– TBT Retrofit <u>TBT Retrofit</u>	



San Francisco Bay Area Rapid Transit District (BART) Earthquake Safety Program

	<ul style="list-style-type: none">• Due to the Security Sensitive Information (SSI) nature of the project, details are limited and omitted per BART Attorney from COC Meeting Minutes <p>C. Bernardo gave a visual presentation on the work that is being done in the TBT and the status of completion on each element of work. C. Bernardo provided updates on the status of the structural plating in the upper and lower galleries as well as mechanical (pump systems) and related electrical upgrades in those areas. Testing of those systems are underway. C. Bernardo also reviewed the status of trackwork. Z. Amare and C. Bernardo showed photos of demolition, welding, installation and plating, and explained the invert work, including hardware and software used. Also gave the status of the installation of lighting. C. Bernardo described work sequencing, and details about the pilot cuts, invert construction, demolition and other elements of the work. There was a video that was shared to show the amount of people vs. a very small work area to complete complicated work. Working in an operating environment and train disruption and risk issues are continuously examined and coordinated.</p> <p>A brief discussion followed regarding the status of the engineering reanalysis by Fugro. M. Salmon gave an overview of the reanalysis. There are three areas of concern zone 1, zone 2/3, zone 5/6. He discussed the process for the analysis, looking at the fault motions, bedrock motions, soils motions, and TBT Deformation. He discussed the Original Analysis and compared that information to the updated data the is available today for the re-analysis. The re-analysis was done in two parts in 2020 there was an Intermediate reanalysis that was completed that supported the descoping of zone 1, and 3. The team is currently working on a full reanalysis that should be complete in the latter part of 2021.</p> <p>K. Mark asked M. Salmon “Do you meet the same operability criteria as the original analysis?” M. Salmon let him know that the criteria is life safety.</p> <p>E. Tandy asked if there where any issues with Covid-19. Z. Amare shared that during the holidays the contractor suspended work for two and half weeks to reduce the spread of covid-19. They had a mobile testing company to come and administer rapid test. There were only two people.</p>
D. Schedule and Financial Report	<p>Z. Amare provided an overview of the Program’s schedule and finances, noting the following:</p> <ul style="list-style-type: none">• The final tranche was issued and sold by BART to complete all \$980 million in 2004 Measure AA bond funds (estimate to be used through 2021). COC mission & duration linked to \$980M.



San Francisco Bay Area Rapid Transit District (BART) Earthquake Safety Program

	<ul style="list-style-type: none">• The ESP Program has spent \$920,3000,000 from inception through August 2020.• August 2020 Cash Expended (4-month average): \$6,133,052.
E. Review of Administrative Matters	D. Schaible reviewed the following administrative matter: <ul style="list-style-type: none">• The October 21, 2020 meeting minutes were approved.• Determined the date for the second meeting of 2021.• R. Salazar announced that he will be retiring
F. Next Meeting	After review of COC member calendars, committee members voted to hold the next COC meeting on Wednesday, May 19, 2021. The Committee requested that the following agenda item be included in the next meeting: <ul style="list-style-type: none">• Follow up once the Fugro engineering analysis is complete
G. Public Comments	No members of the public were present.
H. Adjournment	5:45 p.m.; seconded by E. Tandy; passed unanimously.



San Francisco Bay Area Rapid Transit District (BART)
Earthquake Safety Program

Citizens' Oversight Committee Meeting Minutes

Wednesday, July 21, 2021, 4:30 pm

2150 Webster Street, Oakland, CA 94612

Virtual Meeting

Meeting Number Term 7, Meeting 8	Meeting Date July 21, 2021	Meeting Time 4:30 pm – 5:15 pm
Attendees	<i>Current Members</i> Derek Schaible, Chair Eric Tandy Karen Varnado	<i>BART Representatives</i> Zecharias “Zach” Amare Chuck Bernardo Raymond Pascual Bianca Mallory Hanna Horning Director Raburn
	<i>Alternate Members</i> Ken Mark Monica Tell Louise Engel	
Agenda Item	Action Taken	
A. Welcome, Introductions, and Roll Call	Meeting called to order by Chair D. Schaible at 4:30 pm on July 21, 2021. B. Mallory went over housekeeping items relating to conducting the meeting virtually. B. Mallory took roll call, noted members in attendance, and confirmed there was a quorum of three members in attendance and three alternates.	
B. Project Update	Z. Amare, Capital Projects Group Manager, introduced the agenda items, including the project update and work progress, and financial report and schedule. Z. Amare, mentioned that the committee would be extended till the competition of the project for another two years. C. Bernardo introduced Raymond Pascual from BART’s general council. As part of the Project Update, C. Bernardo provided an overview of the program’s progress since the last meeting, noting the completed, current, and upcoming activities, with photos representing construction activity. Below is a summary of the report: <ul style="list-style-type: none">• There is one contract remaining:<ul style="list-style-type: none">– TBT Retrofit <u>TBT Retrofit</u>	



San Francisco Bay Area Rapid Transit District (BART) Earthquake Safety Program

	<ul style="list-style-type: none">• Due to the Security Sensitive Information (SSI) nature of the project, details are limited and omitted per BART Attorney from COC Meeting Minutes <p>C. Bernardo gave a visual presentation on the work that is being done in the TBT and the status of completion on each element of work. C. Bernardo provided updates on the status of work using the Maintenance Vehicle Consist (MVC) train and restoring trackway.</p> <p>Z. Amare and C. Bernardo showed photos of the before and after work that has been taking place in the tube and how they have been working with the MVC train. C. Bernardo described work sequencing, and details about the process of doing the retrofitting. Completing work each day for trains to start running on time they run testing to make sure there is the correct clearances. C. Bernardo gave the status of the installation of lighting. Gave a status update in the upper and lower galleries as well as mechanical (pump systems) and related electrical upgrades in those areas. Testing of those systems are underway. C. Bernardo also reviewed the status of trackwork. Working in an operating environment and train disruption and risk issues are continuously examined and coordinated.</p> <p>C. Bernardo reviewed the status of the Contract Change Orders issued, in progress, and protested.</p>
D. Schedule and Financial Report	<p>Z. Amare provided an overview of the Program's schedule and finances, noting the following:</p> <ul style="list-style-type: none">• The final tranche was issued and sold by BART to complete all \$980 million in 2004 Measure AA bond funds (estimate to be used through 2021). COC mission & duration linked to \$980M.
E. Review of Administrative Matters	<p>D. Schaible reviewed the following administrative matter:</p> <ul style="list-style-type: none">• The January 13, 2021 meeting minutes were distributed, and it was agreed that they would be approved at the next meeting.• Determined the date for the third meeting of 2021.
F. Next Meeting	<p>After review of COC member calendars, committee members voted to hold the next COC meeting on Wednesday, Oct 20, 2021.</p> <p>The Committee requested that the following agenda item be included in the next meeting:</p> <ul style="list-style-type: none">• Follow up once the Fugro engineering full reanalysis is complete
G. Public Comments	<p>No members of the public were present.</p>
H. Adjournment	<p>5:15 p.m.; seconded by K. Varnado; passed unanimously.</p>



BART EARTHQUAKE SAFETY PROGRAM

CITIZENS' OVERSIGHT COMMITTEE MEETING

Wednesday, January 19, 2022 – 4:30 pm

6



**EARTHQUAKE
SAFETY PROGRAM**
BUILDING A STRONGER SYSTEM

- **Welcome and Roll Call**
 - ✓ **2019-2021 Citizens' Oversight Committee (COC) Members and Alternates**
 - **Derek Schaible** – Seismic Retrofitting (Alternate – Tom Horton)
 - **Clint Loftman** – Auditing (Alternate – Kathy Buckley)
 - **Karen Varnado** – Community-at-Large (Alternate – Monica Tell)
 - **Eric Tandy** – Engineering (Alternate – Ken Mark)
 - **Sang Bak Lee** – Public Finance/Project Mgt. (Alternate – Louise Engel)
 - ✓ **Acknowledgement of attending Members of the BART Board, Staff and Public**
 - **Zach Amare** – BART Representative – Group Manager, Capital Projects
 - **Chuck Bernardo** – BART Representative – Project Manager, Capital Projects
 - **Raymond Pascual** – BART General Council – Attorney
 - **Bianca Mallory** – ESP COC Support – The Allen Group, LLC



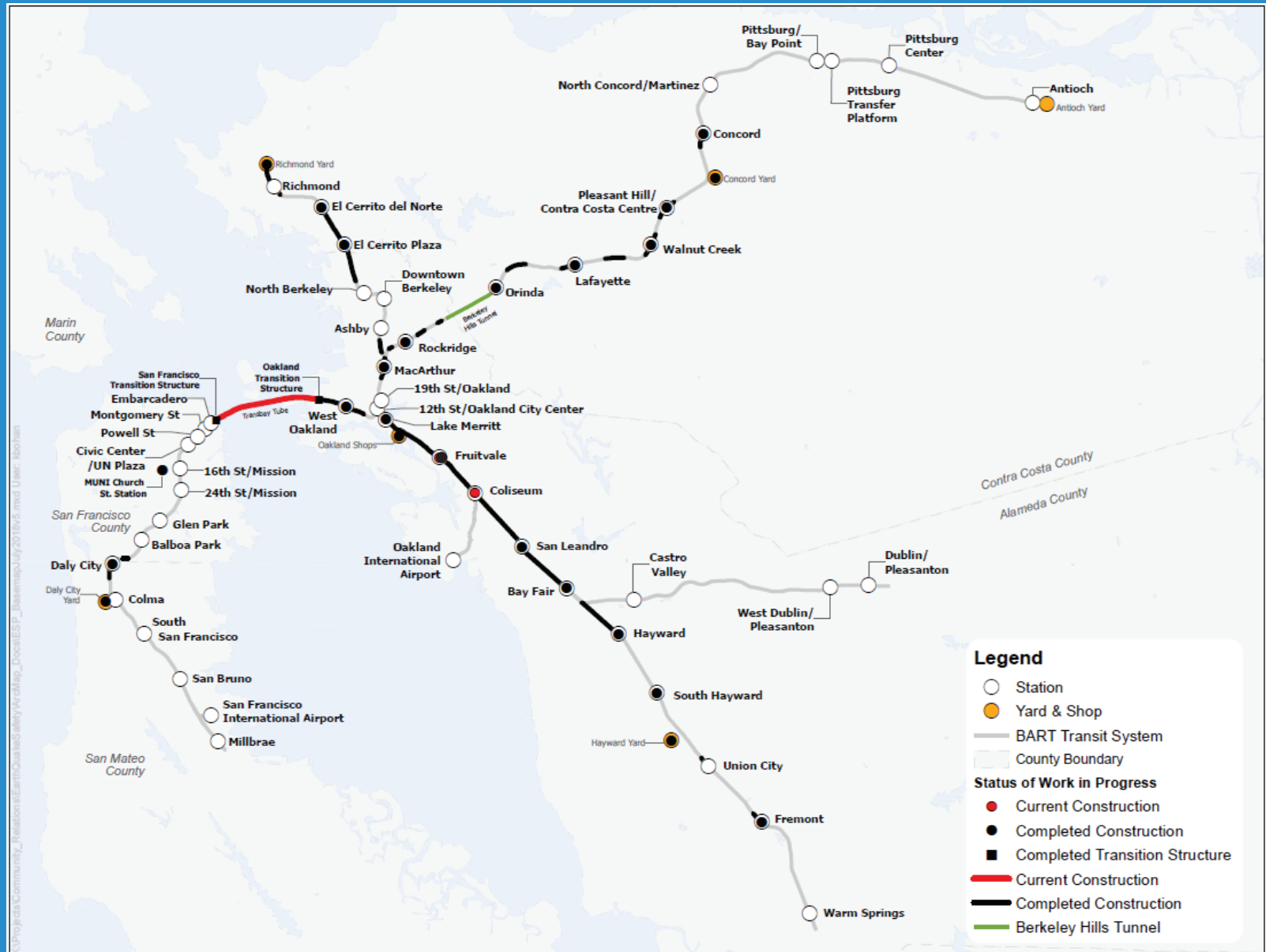
Agenda

- **Project Update**
- **Financial Report and Project Schedules**
- **Review of Administrative Matters**
 - ✓ Review and Approval of Meeting Minutes: July 21, 2021
- **Next Meeting**
 - ✓ Date and Agenda Items
- **Public Comment**
- **Adjournment**



Project Update: Status of Earthquake Safety Work

As of July 2021





Change Order Summary

- Change Orders To Date = 233
 - Change Orders Issued = 227
 - Change Orders In Progress = 6
- Change Orders in Protest = 79
- 2 Change Orders Issued since last COC meeting





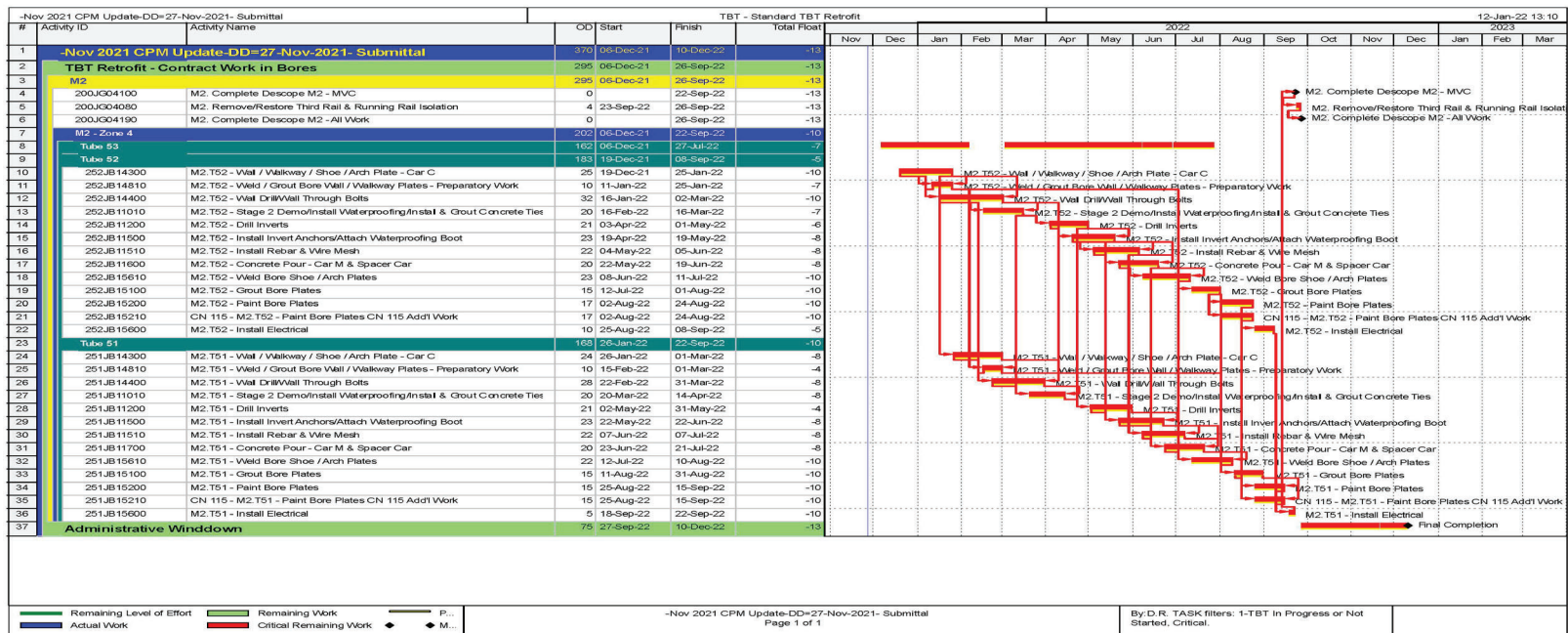
Schedule Summary

November 2021 Update (Submittal 885.0)

- 1st Working Day = 2/2/2017
- Contract Time = 1950 CD
 - TIE 1 (CN 27) = 99 CD
 - TIE 2 (CN 37) = 60 CD
 - TIE 6 (CN 208) = 16 CD (Extension for Covid delay)
- Total Contract = 2125 CD
- Approved Completion 11/27/2022
- Forecast Completion 12/10/2022

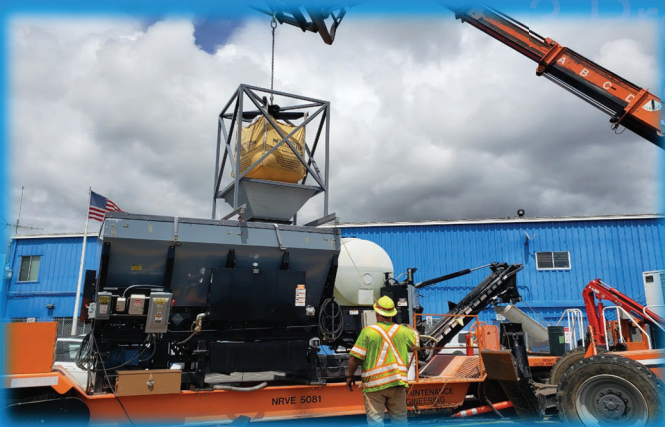
As of 01/19/2022
Elapsed Time = 1812 days
Time Remaining = 312 days

- 85% Time Spent
- Slight Delay in Completion





MVC Production Work



COC 19-22 Meeting 7.10
Presentation

16 Slide 8

Security Sensitive Information



M1 Bore Invert Restoration

M1 Invert Restoration (Concrete Placed) = 100% overall

- T53 – Completed on 4/25/21
- T52 - Completed on 5/18/21
- T51 – Completed on 6/11/21



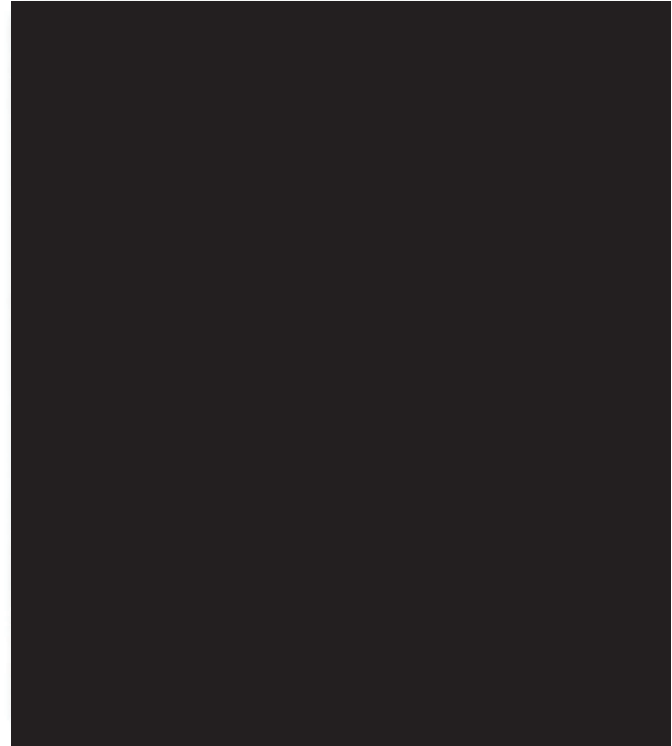


Completed Invert Concrete M1 T53

Before Concrete Placement



After Concrete Placement





M1 Bore Plating

Security Sensitive Information

- M1 Bore Installation Complete



COC 19-22 Meeting 7.10
Presentation
Slide 11



P2 & P3 Arch Plate Installation



52-M2 Arch Plate P2 Installation

52-M2 Arch Plate P3 Installation





PCCE Verification and Damper Plate Installation



M2-T53 Damper PL Installation



M2-T52 PCCE Verification





10" Drainage Pipe Installation



COC 19-22 Meeting 7.10
Presentation
Slide 14

Security Sensitive Information



**EARTHQUAKE
SAFETY PROGRAM**
BUILDING A STRONGER SYSTEM



SF Ventilation Discharge Piping



COC 19-22 Meeting 7.10
Presentation
Slide 15

Security Sensitive Information



**EARTHQUAKE
SAFETY PROGRAM**
BUILDING A STRONGER SYSTEM



Financial Forecast

Description*	Baseline Budget	Funded Budget	Expended ITD	Cost to Complete (Incl. Contingency)	Forecast at Completion	% of Construction	% of Total
BART Costs	\$93,790,000	\$156,260,352	\$124,233,325	\$29,252,257	\$153,485,582	20%	11%
Engineering	\$171,010,000	\$237,024,952	\$237,024,952	\$0	\$237,024,952	32%	16%
DSDC	\$28,110,000	\$51,322,431	\$42,031,328	\$9,369,155	\$51,400,483	7%	4%
CM	\$56,210,000	\$134,962,292	\$117,073,923	\$23,284,774	\$140,358,697	19%	10%
Construction	\$855,240,000	\$754,530,528	\$673,086,585	\$77,200,367	\$750,286,952		52%
Insurance	\$40,590,000	\$76,494,075	\$70,701,539	\$3,402,143	\$74,103,681	10%	5%
ROW	\$12,600,000	\$18,405,369	\$16,891,014	\$1,448,638	\$18,339,652	2%	1%
Bond Issuance & Elec	\$21,000,000	\$21,000,000		\$21,000,000	\$21,000,000	3%	1%
Total	\$1,278,550,000	\$1,450,000,000	\$1,281,042,666	\$164,957,333	\$1,446,000,000		100%



Financial Report

- **Measure AA Bond Total: \$980,000,000**
 - **Inception-to-Date Expensed: \$968,344,700**
 - **Remaining GOB Funding: \$11,655,300**
- **General Obligation Bond Interest: \$62,550,300**
 - **Inception-to-Date Expensed: \$13,423,500**
 - **Remaining GOB Interest: \$49,126,800**
- **Measure RR Bond Total: \$194,000,000**
 - **Inception-to-Date Expensed: \$70,955,600**
 - **Remaining Measure RR Funding: \$123,044,400**
- **FHWA, RM2, STIP, Prop 1B, FEMA & Other Funds: \$213,450,000**
 - **Inception-to-Date Expensed: \$213,450,000**
 - **Remaining Funding: \$0**



Public Comment



COC 19-22 Meeting 7.10
Presentation
Slide 18



**EARTHQUAKE
SAFETY PROGRAM**
BUILDING A STRONGER SYSTEM

Contacting the Committee

Information about the Citizens' Oversight Committee is included on the Earthquake Safety page of the BART website.

- **Visit the Website:** www.bart.gov/earthquakesafety
- **Email the Committee:** eqcommittee@bart.gov
- **Call the Committee:** (510) 874-7478

Voicemail and email inboxes are checked regularly for messages and coordinated response.

Adjournment



COC 19-20 Meeting 7.10
Presentation
Slide 20



**EARTHQUAKE
SAFETY PROGRAM**
BUILDING A STRONGER SYSTEM



BART TBT Seismic Retrofit TBT Reanalysis COC Briefing

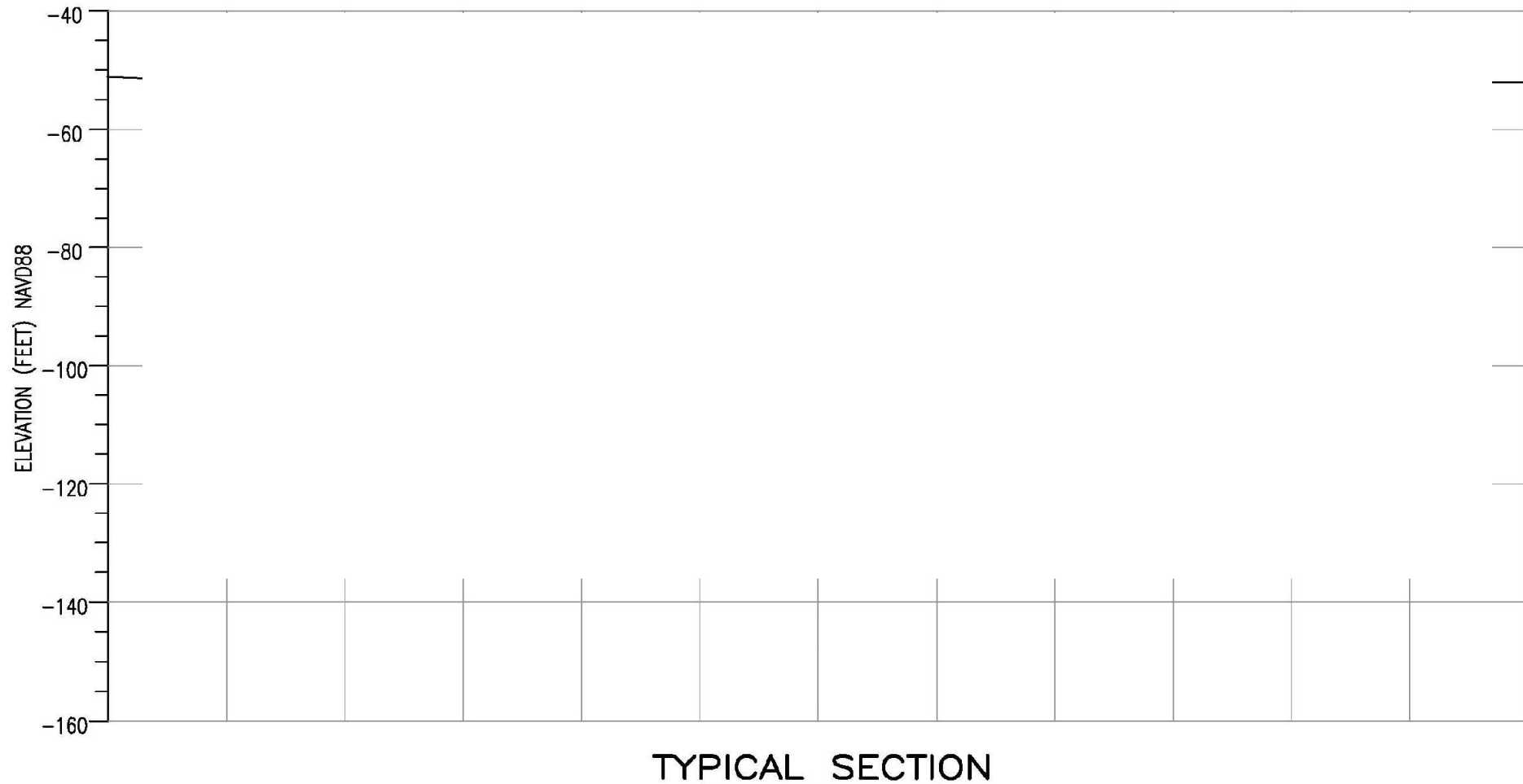
January 19, 2022

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“For Official Use Only”, requiring protection against unauthorized disclosure.
These materials may be distributed only on a “need-to-know” basis by prior written
permission from BART; and when unattended, shall be stored in
a secured location, not accessible to unauthorized persons.*





Typical Section

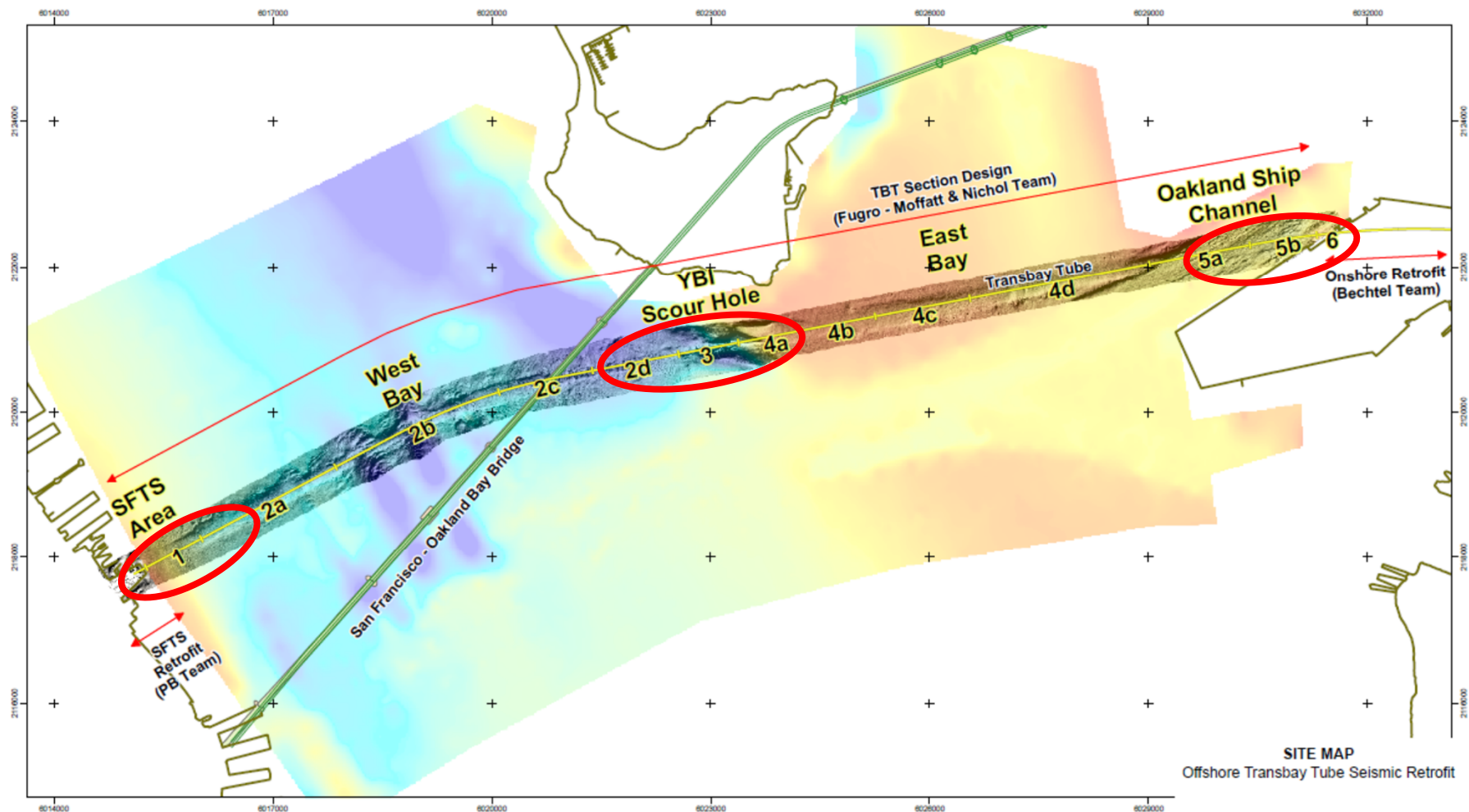




Primary Seismic Vulnerabilities

- Discovered panel weld defects
 - May crack and leak, in areas with large soil movements
- Water intrusion issue only
- Structural integrity is preserved
 - Circumferential cracking of outer shell does not cause collapse

MODULE SIXTH WEEK





2016 Retrofit Solution





Purpose of TBT Reanalysis

Objectives:

- Remove conservatisms in ground motions
- Use latest science and engineering – peer reviewed
- Confirm descoping
- ❖ Quantify uncertainty and risk

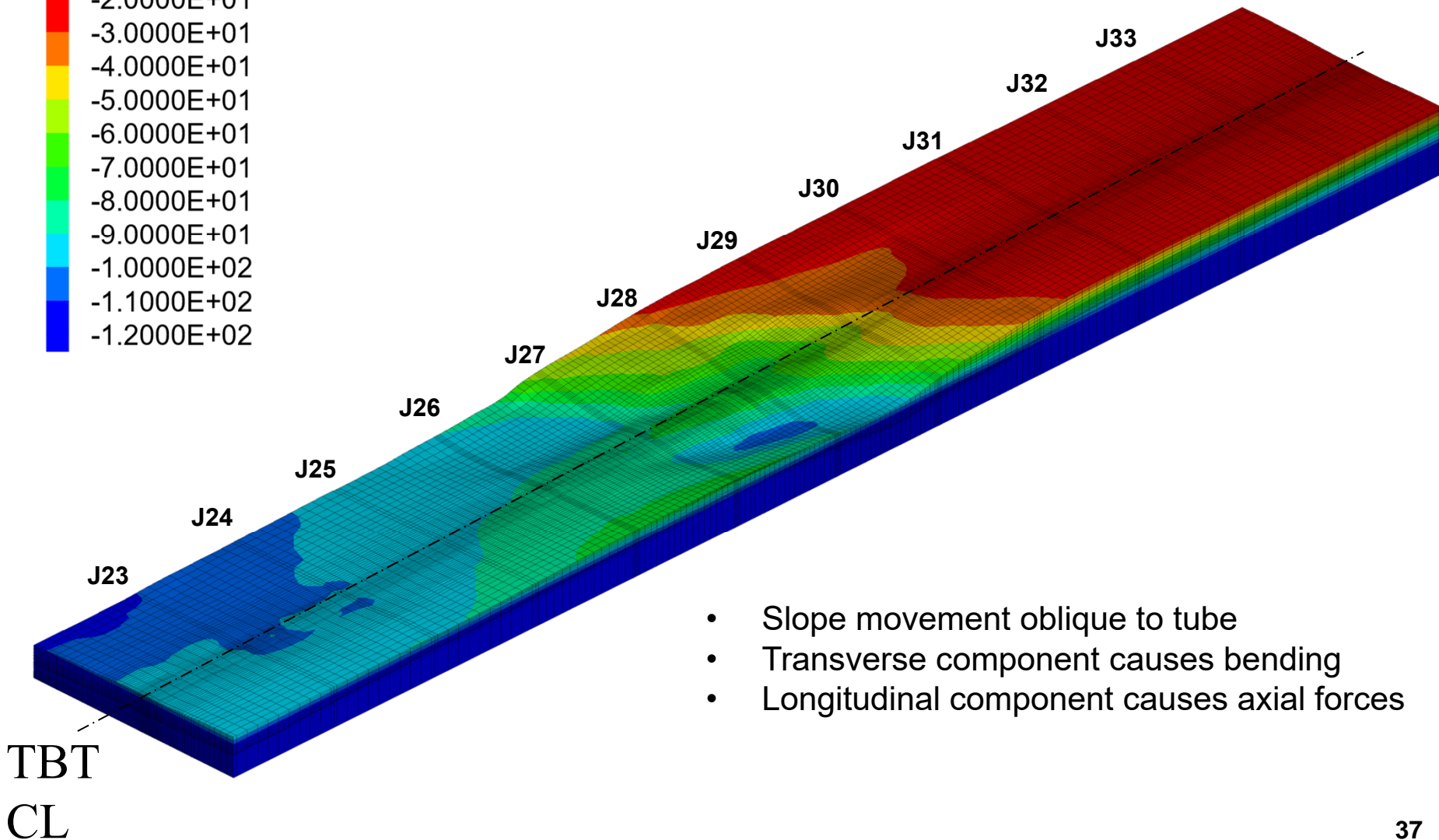
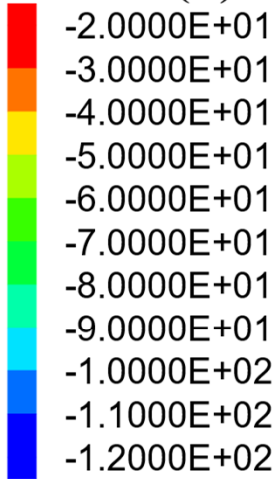


Status as of January 2021

Tentative findings as of January 2021:

- Leakage in west/middle portion of TBT is small
- Retrofit of Tubes 51 to 53 is necessary
- Reanalysis so far supported the descoped retrofit
- Slope movement checks were in progress

Elevation (ft)



- Slope movement oblique to tube
- Transverse component causes bending
- Longitudinal component causes axial forces



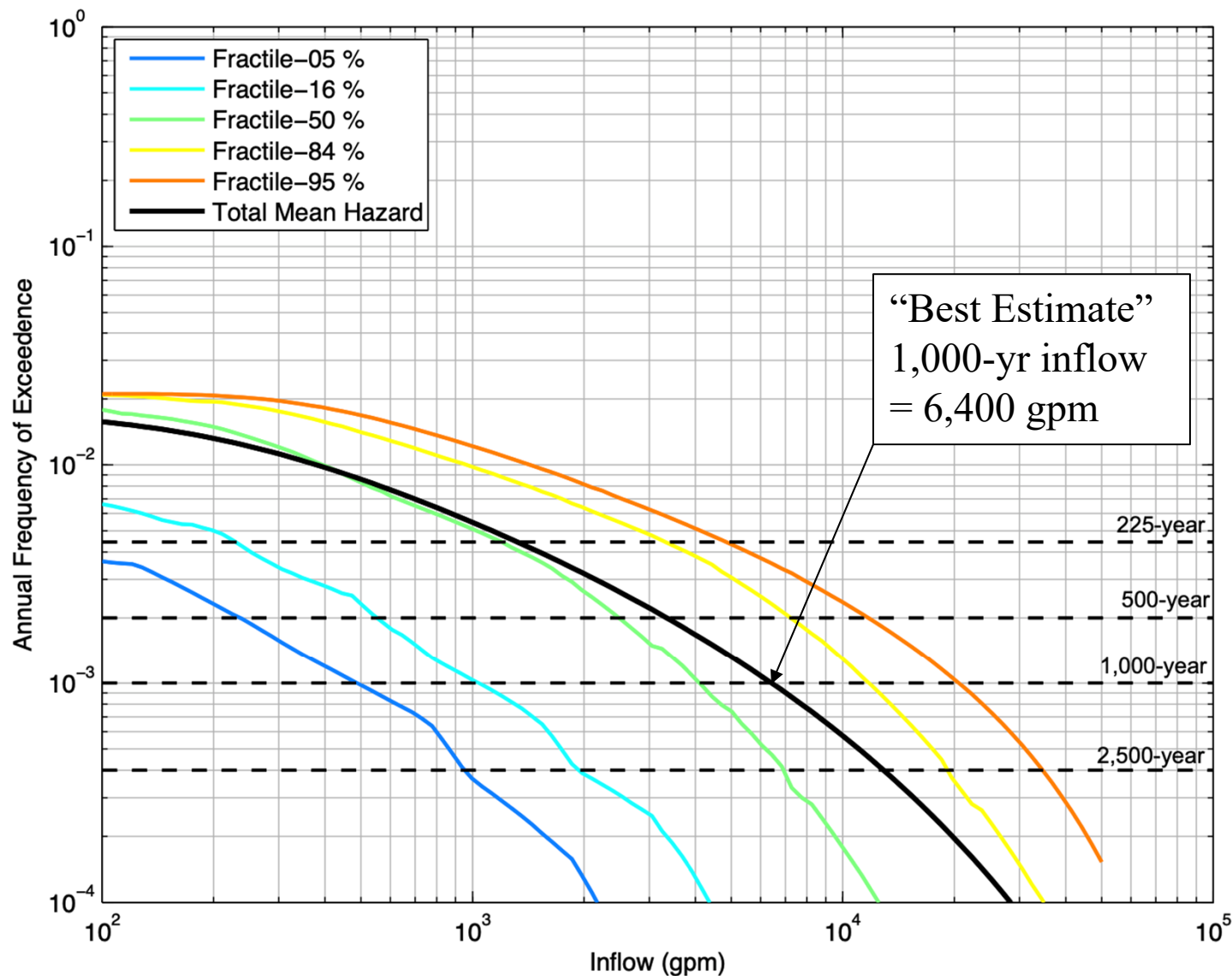
Discovered Zone 3 Issues

- Additional potential vulnerability not previously identified: Longitudinal slope movement in Zone 3
- High axial strains in previously low-strained tube segments
- Majority of inflow is now in Zone 3
- High uncertainty due to limited critical soil data

- Probabilistic Leakage Hazard Analysis
 - Useful to quantify high uncertainties
- Considers *ranges* of key parameters and their probabilities:
 - Earthquake intensities
 - Soil conditions
 - Size and distribution of flawed welds
 - Crack leakage rates
- Informs *risk* of different leakage inflow levels
 - Hazard curves
 - Confidence levels

Zone 3 Leakage Hazard Analysis

- Hazard Curves – Zone 3 Inflow

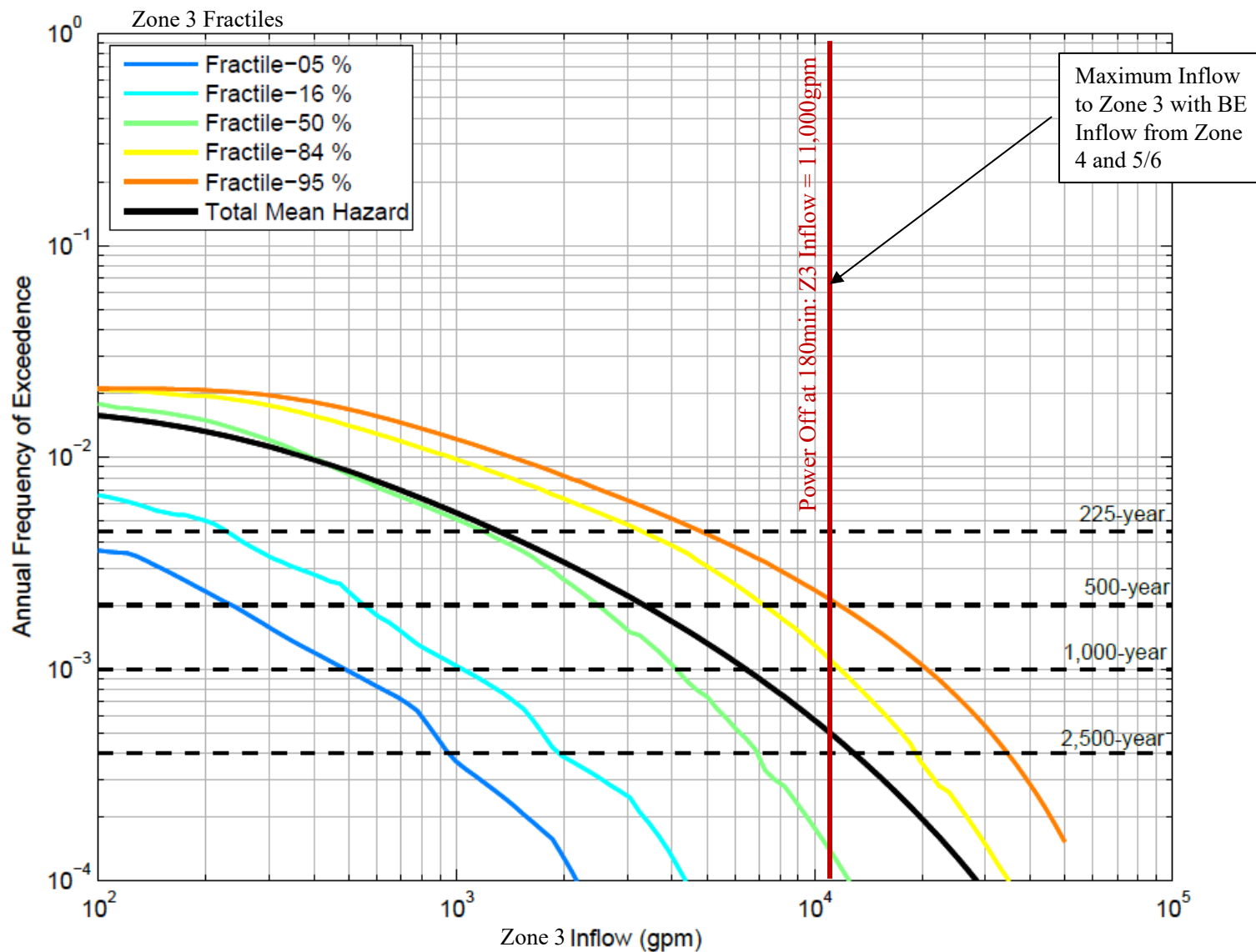




Egress Scenario

1. it DCA NTS

Hazard Analysis Observations





Conclusions from Reanalysis

Key Findings

- Reduced inflow in Zone 1
- Increased inflow in Zone 3 due to longitudinal slope
- ✓ Current retrofit addresses most vulnerable area (Zone 5/6)
- Wide range of predicted inflows due to high uncertainties
- “Best Estimate” 1000-yr inflow:
 - ✓ gives more than twice the time needed for egress
 - ✓ consistent with original ESP retrofit performance goals for egress
- Higher fractiles (> 84%) or longer return periods:
 - Egress goals will not be met without additional retrofit



Recommendations and Considerations

Control and mitigate the risk by:

- Alternative or supplemental lighting
- Advance planning, drills, signage for egress
 - Estimated egress times already assume efficient egress
- Continued maintenance and testing of emergency systems
 - Pumping, lighting, communications

Benefits of obtaining additional data:

- ✓ Improve confidence in Zone 3 soils data
- ✓ Improve confidence in condition of panel welds
- ✓ Reduce uncertainty, provide more robust information
- ✓ Possibly reduce best estimate inflows