



# Casa Loma Siphon Barrel No. 1 Seismic Upgrade

Engineering & Operations Committee

Item 6b

November 4, 2019

# Seismic Resilience Strategy

## Planning

*Goal: Provide system flexibility, diversified supply portfolio, & emergency storage*

## Engineering

*Goal: Mitigate seismic risks of infrastructure & water system as a whole*

## Operations

*Goal: Maintain effective emergency planning & response capabilities*

## Reporting

*Goal: Provide accountability & transparency*

## Seismic Resilience Water Supply Task Force

*Goal: Enhance the seismic resilience of imported water supplies through multi-agency collaboration*

# Distribution System



# Location Map



# Background

- 148-in concrete pipe constructed in 1935
- Ground subsidence due to groundwater withdrawal
- Multiple repairs to address leaks
  - 300 ft of concrete pipe replaced with steel pipe & external sleeve type couplings in 1968
  - Internal seals installed in 1996 & 2017



# Mitigation Strategy

- Earthquake Resistant Ductile Iron Pipe (ERDIP)
  - Developed by Kubota Corp.
  - Absorbs large displacements & allows pipeline to remain intact
  - Over 40 years of experience in Japan



# Mitigation Strategy

- May 2018 authorization for design to replace Casa Loma Siphon Barrel No. 1
  - Kubota Sole Source Supplier
    - Widely used in Japan since 1970's
    - Used in US & Canada since 2013
      - Valley Water, SFPUC, EBMUD, LADWP & MWD



# Project Plan

- ✓ Geotechnical Investigation
- ✓ Fault Hazard Evaluation
- ✓ Design Criteria Development
- ✓ Structural Modeling
- ✓ Verification Performance Testing
- Final Design
- Material Procurement Recommendation
  - Welded Steel Pipe (Competitively Bid)
  - ERDIP (Negotiated sole-source contract)
- Construction



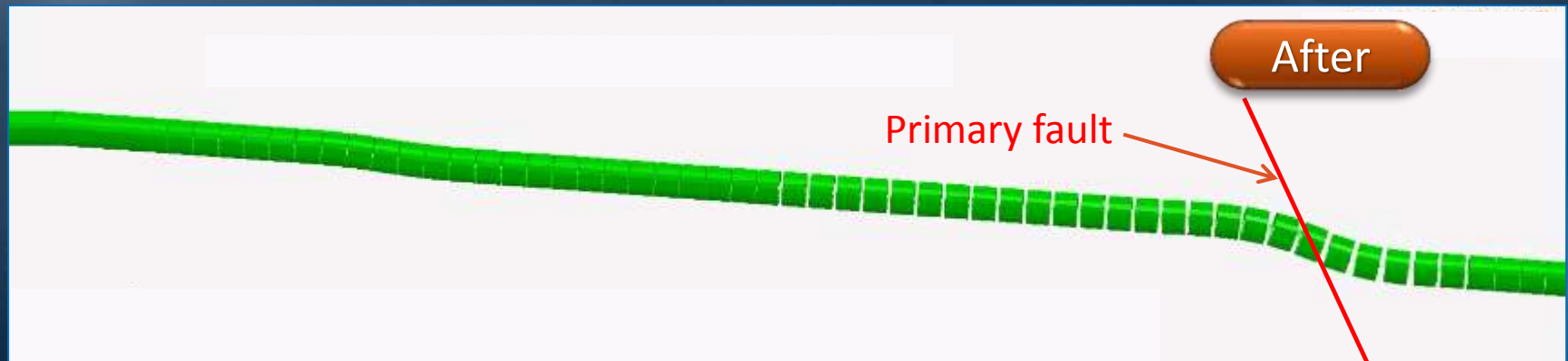
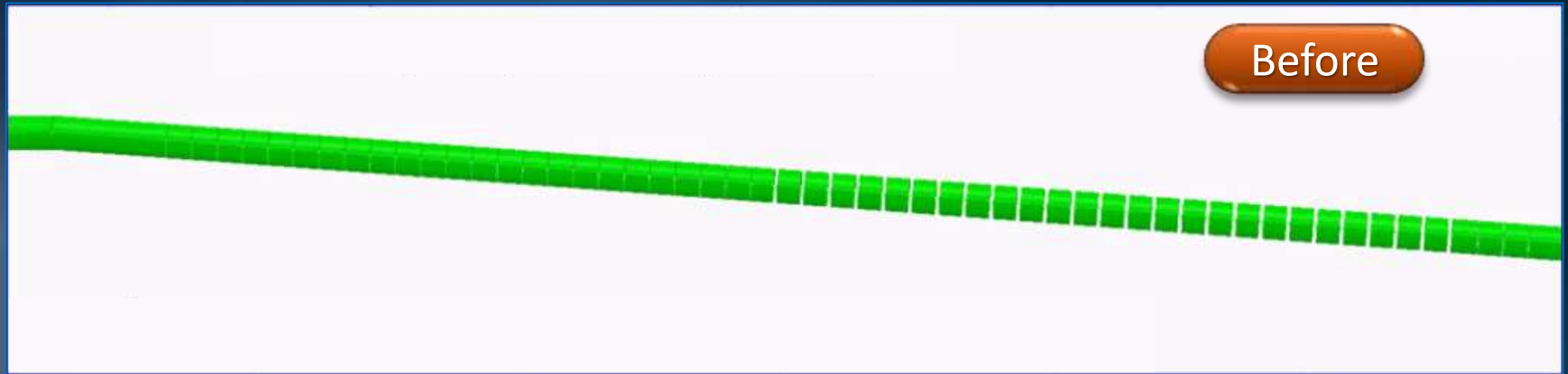
# Investigations

- Geotechnical Investigation
- Fault Hazard Evaluation
  - Potential fault displacement of 13 ft. horizontal, 3 ft. vert.
  - Potential subsidence of 5 ft.

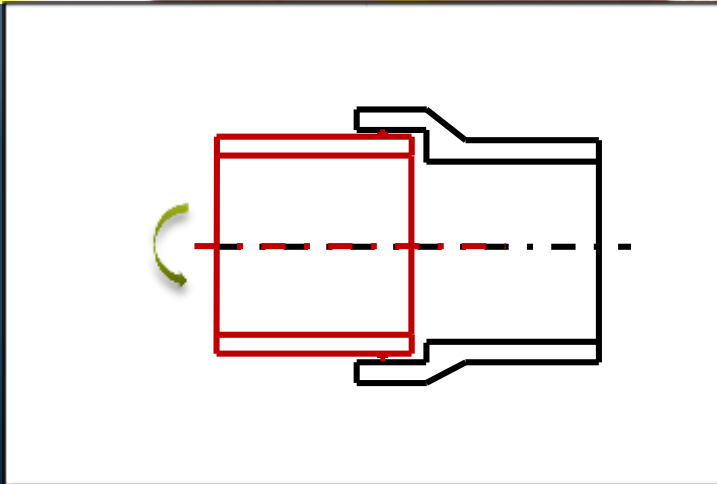
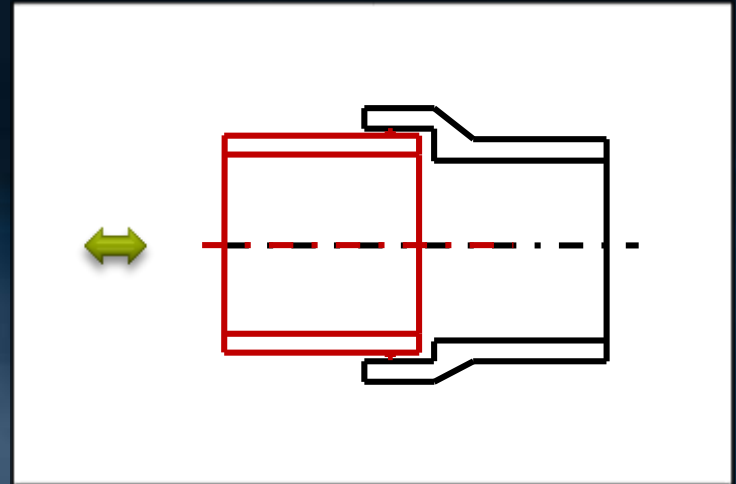


# Structural Modeling

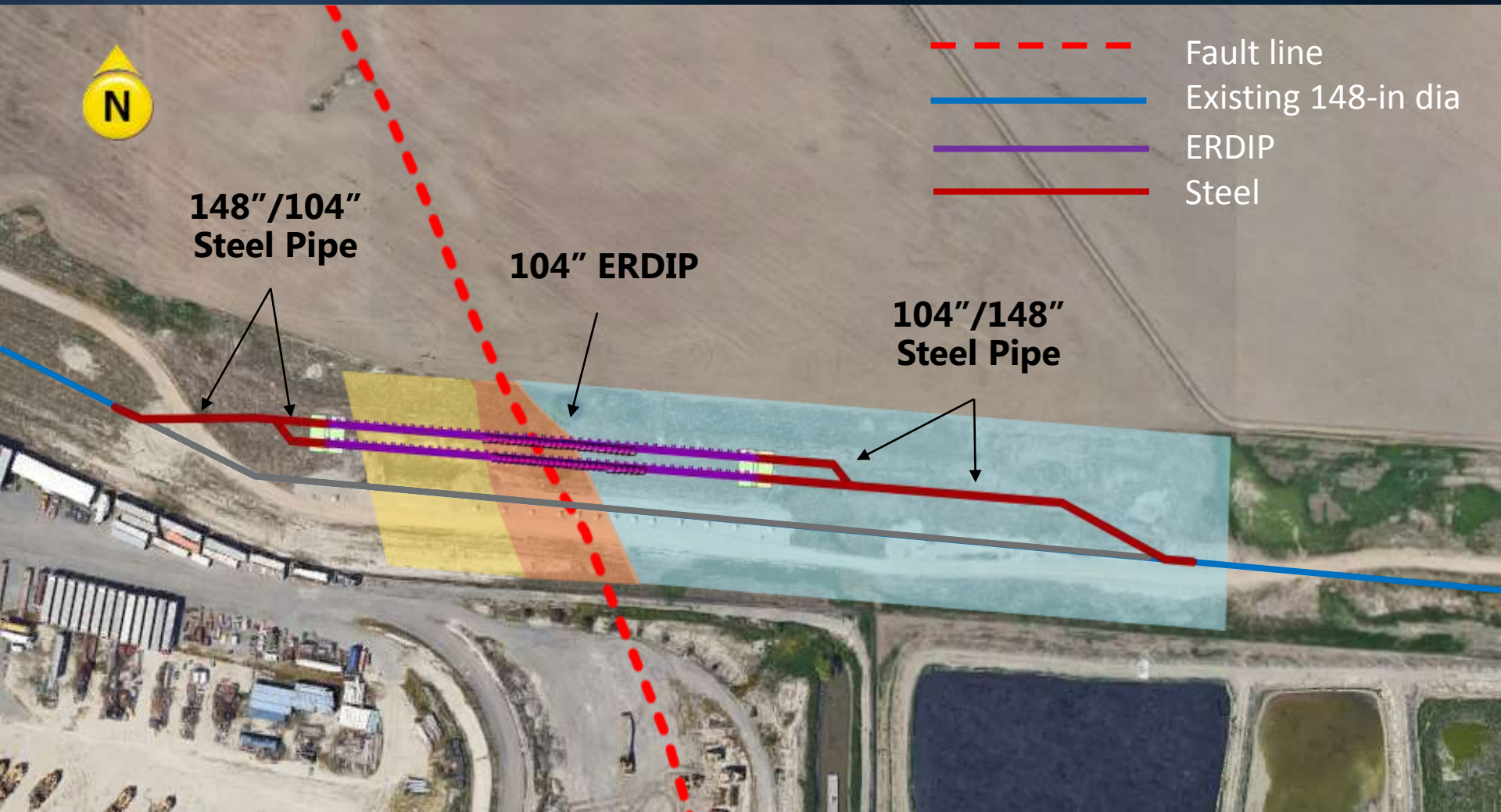
- Fault Interaction Model
- ERDIP Joint Model



# Full Scale ERDIP Performance Testing



# Project Overview



# Next Steps

- December 2019: Award Procurement Contracts
  - ERDIP: sole source agreement with Kubota
  - Welded steel pipe competitively bid
- June 2020: Board Award Installation
  - Final tie-in during February 2021 shutdown

