



MEETING MINUTES

March 8, 2022

Virtual Meeting

Attendees:

Name of Attendee(s)	Company / Agency Name	Email Address
Bill Brick	CDM Smith	brickwd@cdmsmith.com
Brad Conder	Aegion	bconder@aegion.com
Brandon Sjulín	Zefiro	bsjulín@zefiro.info
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Announcements:

- **PUG**
 - **PUG Membership Renewal**

Please renew your membership. The PUG new year has started in June 2021. Please double-check that your organization has renewed.

Future Presentations for Monthly Meetings

For future meetings, PUG is open to presentations for future topics. Available dates are July 12, August 9, November 8, and December 13 of 2022.

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Future Presentations for Monthly Meetings

For future meetings, PUG is open to presentations for future topics. We are booked through June. We have August, November, and December open.

Board Elections

Consider becoming a PUG Board Member. Nominations will be requested in May and elections will be held in June. Each term is two years, and generally requested that you continue on the Board through each of the positions. Per PUG bylaws positions are open only to public agency employees and consultants. Benefits of being a Board Member:

- Building relationships within the industry
- Enhancing your leadership skills
- Using your talents to support an information sharing organization
- Attending one or more conferences during your term

In-Person Meetings

We are looking into resuming LIVE monthly meetings and are working out the details. If you have any suggestions, please send an email to pugnorcal@gmail.com.

PUG/Alliance for PE Pipe

April 12, 2022, LIVE 7:30 am to 2:30 pm

HDPE Pipe Advance Total Solutions Roadshow

The schedule includes Continental Breakfast, HDPE Demos, Lunch in the morning and Engineer's View Lessons Learned and a choice of nine Classes in the afternoon.

Share Roadshow Flyer and video clip on the PUG website.

- **NASTT 2022**
 - **NASTT 2022 - April 10 to 14, 2022** – No-Dig Show, Minneapolis, MN - Live
- **AWWA ACE 2022 - June 12-15, 2022** – San Antonio, TX – Live
- **ASCE'S March 14-18, 2022, 5-day workshop.** Thursday (March 17) has been designated to the field training, Arlington, TX.
 - Utility Engineering and Surveying Institute (UESI) has teamed up with the Buried Asset Management Institute – International (BAMI-I) & the Center for Underground Infrastructure Research & Education (CUIRE) at the University of Texas at Arlington - 12th Utility Investigation School (UIS).
- **UESI Pipelines 2022 Conference**
 - Registration Opens January 26, 2022
 - July 31-August 3 – Live - Indianapolis, Indiana
- **WEFTEC 2022 October 8-12 WEFTEC 2022 Conference** - LIVE New Orleans Memorial Convention Center, New Orleans, LA.

General:

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January 2022 Meeting Minutes: An overview of the December meeting minutes presented

Financial Update: The current total in the organization account as of February is \$90,641 (Dustin La Vallee).

PUG 2022 Sharing Technology Annual Seminar:

Thank you for making the seminar a success! There were over 91 attendees with a great interaction with the speakers and vendors in the breakout rooms.

For those who attended, please complete our anonymous feedback form that was sent out by email February 23rd.

Preparing for an in-person event for the future June meetings, PUG will be providing lunch and will be paying for the space.

Project Discussions:

Solano Irrigation Water District (Nancy McWilliams)

District has two projects under construction:

1. The 48-inch HDPE installed, 2800 feet long irrigation line, buried pipe
2. The district is concern with the plastic pipes prices since they are tied to petroleum prices which had skyrocketed in the last month. District anticipates price for HDPE pipe will double this year.
3. Slip line project 54-inch CMP to be lined with 48-inch Snap-Tite HDPE liner specifically for culverts. Twin pipes that go under Hay Road. Annular space filled with cellular grout. District is using two different grout manufacture products.

Lesson learned: Plug the holes before adding cellular grout to prevent the grout migration to the outside areas.

EBMUD (Gus Cicala)

EBMUD Advertised the Oakland Inner Harbor Crossing project:

1. 3,000 ft Horizontal Directional Drilling "HDD" Pipe size 32-inch HDPE, HDD under the channel between Alameda and Oakland
2. 3 prequalified contractors for HDD
3. 24-inch steel additional 2-mile approach pipelines: 1 mile in Oakland and 1-mile in Alameda
4. Contract is 3-years the HDD there are temporary easements and that shall be finished next summer.

Presentation: "San Lorenzo Valley Water District Cross Country Pipeline Constructability Study," by Jeff Tarantino, Freyer & Laureta, Inc.

Overview:

The presentation was on the constructability study being performed to restore over 7 miles of raw water pipelines that were destroyed during the August 2020 CZU wildfire.

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Highlights from the presentation include:

Background:

- San Lorenzo Valley Water District established in 1941 but some surface water supplies are pre 1914 water rights
- Customers in Boulder Creek Brookdale, Ben Lomond, Lompico, Zayante, Scotts Valley, Manana Woods, and Felton.
- Over 7,900 connections
- Surface and well water supply
- Service area is rural with significant elevation

Project Team:

- Freyer & Laureta, Inc Lead
- WRA, Environmental Consultants (Permitting/CEQA)
- CE&G Geotechnical
- Alpine Summit Development, LLC Constructability and Cost Estimating
- Advanced Hydro Engineering, Hydraulics

Project Status

- Constructability study presented to Board, February 17 meeting to receive comments.
- Update study to be presented to Engineering Committee, March 14 ,2022.
- Anticipate Board approval of recommended alternative, March 17, 2022, meeting

Historical Operations:

- Diversion Constructed Pre-1914
- 1914 Original pipeline was wooden conveyance system
- 1930 stove pipe replaces wood flume length 7 miles (a lot of leaks in the 1980 with the stove pipe)
- 1994-1995 Reconstructed Clear Creek, Sweetwater, and Harmon Intake
- 1994-1995 Install 8-inch polyethylene pipe (above ground HDPE pipe, laid on benches ranging manually grading on the slopes from 2-feet to 10-feet, pipe flown by helicopter, pipe operated for 30 years until the 2020 CZU fire)
- August 2020 CZU Fire

2020 CZU Fire: (San Mateo Santa Cruz Complex Fire)

- Irreparable damage to the HDPE
- Substantial vegetation and forest loss
- Long term erosion and debris flow risk

Project Goals:

- Restore Conveyance
- Improve Operability and Resiliency
- Develop permits and constructable solutions

- Include green energy
- 1000-ft Elevation change is significant in the five miles segment

Team walked the entire alignment in 3 days

Existing Condition Peavine Pipeline Alignment (2-mile segment):

- Wider pipe benches
- Mild debris on bench
- Moderate loss of vegetation and forest

Existing Conditions -Five Mile Pipeline Segment:

- Steep Hillside
- Irreparable pipe damage (melted with the fire)
- Narrow pipe bench
- Extremely steep grades
- Hillside sloughs

Team considering the challenges for the contractor and the operations in the long and accessible for the future.

How to build it and make it accessible in the future?

Jurisdictional Assessment (A lot of permits required and Impact to sensitive species, biological survey still needs completion)

Permits and interaction with agencies listed below

- U.S. Army Corps of Engineers, San Francisco District (USACE)
- U.S. Fish and Wildlife Service (USFWS)
- California Department of Fish and Wildlife (CDFW)
- Central Coast Regional Water Quality Control Board (RWQCB)
- State Historic Preservation Officer (SHPO)
- California Environmental Quality Act (CEQA)

Key Environmental Factors before implementation of the project

- **Schedule Constraints**
 - Time required for environmental clearance
 - Breeding birds and other seasonal work restrictions (7 miles of potential nesting birds)
 - Risk shall be minimized during breeding season.
- **Stream Crossings**
 - Mitigation risk (above ground or below ground pipe crossing)
 - Potential operational impacts of permit requirements
- **Potential redwood forest impacts**
 - Community concerns (reach out to the community so they understand the project impacts is critical)

Alternative Development and Evaluation:

Factors: Constructability, construction cost main engineer factors, however, other items are important into

Non engineer factors such as Operational and management, biological impacts

Develop a risk evaluation criteria

Develop alternatives

Perform evaluations

Select preferred alternative

- Help us understand the value and risks for an alternative
- Documents decision making process
- Supports alternatives analysis for environment

Evaluate and rate base on the highest rank

Technical team and district staff collaborated to evaluate

- *Goals statements*
- *Success factors*
- *Risk factors*
- *Evaluate alternatives*

Risk base solution development

- *Risk: Permits, safety & phasing*
- *Success: FEMA, methods, Alignment, materials*

Goal Statement:

- **Safety:** construction safety and maintenance and repairs and the changing environmental conditions
- **Constructability:** Develop a project that considers current construction practices and technology anticipated regulatory requirements in a cost-efficient manner.
- **Operations & Maintenance:** Build a project that optimizes the ease and accessibility for long-term operations and maintenance, while meeting established performance levels.
- **Stakeholder Impact:** Account for the project's potential benefits and impact to the community and environment, and the influence of the stakeholders on project feasibility.

Success Factors (ranking from 1 to 10) to select the best solution (ranking 1 to 10: 1 minimum, 10 great success)

- Safety:
 - Emergency medical access
 - Natural disaster Hardening
- Constructability:
 - Buried vs. above ground
 - Schedule construction phasing
 - Reduce construction cost

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- Pipe sections and material
- O&M:
 - Accessibility
 - Schedule
 - Performance levels
 - Hydroelectric operations
- Stakeholders: Public acceptance, environmental, and easements and land rights

Risk Factor: scale rating 1 to 5 (1 minimal impact, 5-higher impact)

- Safety: Operational disruption, conditions assessment, and potential disruption
- Constructability: Soil erosion, FEMA funding, Pipe displacement slope failure
- O&M: Public access, natural disaster, and increasing coasts
- Stakeholders impact: Board approval, cultural resources, CEQA, Habitat mitigation, and property ownership

Evaluate Pipe Materials

- PVC
 - Pros: Lightweight, Ability to connect to mechanical fittings
 - Cons: Multiple fittings, less flexible, susceptible to melting when above ground, potential for leaking
- HDPE:
 - pros: flexible, lightweight, and fused fittings
 - Cons: Susceptible to melting when above ground
- Ductile iron
 - Resistant to fire damage, strong compared to plastics
 - Cons Heavy, multiple fittings, and gaskets melted when above ground.
- Welded Steel
 - Pros: resistant to fire, strong compared to plastics, welded joints
 - Cons: Heavy, installation is weather dependent

Evaluate Construction Methods

- Standard Methods Open trench or above ground installation (prefer solutions)
- Trenchless Methods: HDD, Bore & Jack, or Microtunnelling (trenchless not an option for this project) since it takes large spaces for the insertion and receiving pit and not feasible in the topography

Evaluate Installation Methods

- Buried -HDPE (excavator and hand digging equipment, more resilient to the natural disasters)
- Above Grade HDPE (excavator and hand digging equipment less resilient to natural disasters)
- Above Grade Welded Steel (provide fire resistance above ground and it is considered)

Evaluate Minimum Pipe Depth for HDPE

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Estimated soil temperature at varying depths

- Proposed 18-inch of cover (2.5 safety factor for potential to release gases at 400 degrees Fahrenheit to almost 3 safety factor for potential for melting 500 degrees Fahrenheit)

Evaluate Alignment

Utilizing owned District property/easements

- Existing alignment

Reduce Length of the pipe alignment

- Second treatment plant (requires land acquisition as well as pump station)
- New Pump stations
- Alternative routing to Highway 9

Alternative 1 – Above Ground HDPE

Challenge in elevation changes and accessibility, using standard construction equipment and safety construction standards,

- Retaining wall system where needed,
- Typical bench width (8' to 12')
- Narrowed bench width (4' to 6')
- Creek crossing will be above ground 8" HDPE.
- Disadvantages: Potential for pipe to be damage during fire events.

Alternative 2 – Above Ground Welded Steel (same installation as Alternative -1 but with steel pipe)

- Creek crossing will be above ground steel pipe

Alternative 3A – Below Ground HDPE (creek crossing above ground using 8" steel pipe)

same as alternative 1 but below ground

- Minimum pipe cover 18-inch
- Narrowed bench (4' to 6') used topsoil from spoils from the area to cover the pipe minimum pipe cover 18-inch. (May require hand digging).
- Creek crossing will be above ground 8" steel pipe

Alternative 3-B – Below Ground HDPE (same as Alternative 3A but creek crossing will be 8" HDPE at creek crossing)

Using standard construction equipment and safety construction standards

- Minimum pipe cover 18-inch (may require hand digging).
- Creek crossing will be below ground 8" HDPE (minimum 4-ft from creek bed to top of pipe)

Alternative 4A – Clear Creek and Sweetwater Pipelines with Pump Stations

Using standard construction equipment and safety construction standards and like 3A alignment but looking for pathways to reduce the pump station.

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A lot of complications losing gravity head and introduces the need for pumps station construction along Caltrans ROW (HWY 9).

Construct near HWY 9

- Minimum pipe cover 18-inch
- Creek crossing will be below ground 8" HDPE (minimum 4-ft from creek bed to top of pipe)

Alternative 4B – Clear Creek and Sweetwater Common Pipelines with Pump Stations

Used slight variation where there will be the use of a common pipeline for Clear Creek and Sweetwater, also using the existing alignment and will allow to reduce to one pump station.

Alternative 5 – Clear Creek and Sweetwater Common Pipelines with Treatment Facility

Potential package treatment plant.

How do the alternatives compare?

Success Score vs Risk Score

Alternative 3B was the prefer alternative and the recommended to the Board. Below grade HDPE installation.

All the alternatives 3B to 5 meet all the resilience goal stablished by the district for the project

Implementation Strategies – Phasing

Project is divided into 3 phases

Phase 1 (north portion of alignment) construction starts 2023 (Peavine Intake to Lyon Water Treatment Plant) (5 Mile segment)

Phase 2 (Southern portion of alignment)

Phase 3 (middle portion of alignment)

1. Sequence of three removal prior to nesting season February 1st to October 31)
2. Restoring Peavine Pipeline as soon as possible 2023
3. Complete 5-Mile pipeline over two seasons
4. Three seasons to rebuild entire system.

Green Energy: Investigated into the Micro-Hydro Station (expensive component for not a lot of power generation)

Cost:

<u>Segment</u>	<u>CEQA/Permitting/ design/CM/Inspection</u>	<u>Construction</u>	<u>Total</u>
Peavine	\$2.6 M to \$3.1 M	\$8.2 M to 9.5 M	\$10.8 M to \$12.6 M
(Peavine restores approximately 40% of surface water)			
5-Mile	\$10.2 M to \$11.9 M	\$31.9 M to 37.2 M	\$42.1 M to \$49.1 M
Hydro Power	\$0.2 M to \$0.3 million	\$0.7 M to 0.8 M	\$0.9 M to \$1.1 M

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Total \$13 M to \$15.3 M \$40.8 M to \$47.5 M \$53.8 M to \$62.8 M

- Cost is in 2022 US dollars
- Considers Phase approach
- Access limitations influence production rates
- Engaged Suppliers and contractors to validate pricing
- Identifies permitting, engineering, and construction tasks

Next Steps:

- Issue final constructability study for Board acceptance
- Advance CEQA and permitting
- Proceed with Design
- Collaborate with FEMA

Thank you to Jeff Tarantino, Freyer & Laureta, Inc. for a great presentation and contribution to PUG monthly meeting.

Next Meeting:

The next general meeting is scheduled for Tuesday, April 12, 2022. The topic is “**HDPE Pipe Total Advanced Solutions Roadshow**” by PE Pipe 7:30 AM – 2:30 PM Core & Main and PUG. Live event located in Concord at the Concord Police Association Event Hall.

Please call Alexandra Watson at 925-332-5221 or email pugnorcal@gmail.com for additional information on this month’s meeting minutes.