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**Subject:** Project Emergency Response Plan – Bethany Reservoir Alternative (Final Draft)

**Project feature:** Site Development / Logistics

**Prepared for:** California Department of Water Resources (DWR) / Delta Conveyance Office (DCO)

**Prepared by:** Delta Conveyance Design and Construction Authority (DCA)

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## 1. Summary

The construction phase of the Bethany Reservoir Alternative for the Delta Conveyance Project (project) would extend over many years and would involve a broad range of activities, including:

- Completing significant lengths of tunneling
- Constructing major intake structures, pumping plants, hydraulic control structures, aqueducts, and other features
- Upgrading transport infrastructure
- Completing other general civil construction activities

The project would require sustained incident management operations and support activities throughout the construction period. This technical memorandum (TM) identifies the basis of the emergency response plan (ERP) for project construction and operations based on regulatory requirements and considering the capabilities of emergency services in the Sacramento-San Joaquin Delta (Delta).

### 1.1 Organization

This TM contains the following sections:

- Purpose
- Approach
- Fire Protection Agencies
- Medical Facilities
- Law Enforcement
- Methods to Provide Emergency Services to the Project
- Conclusions and Recommendations
- References
- Document History and Quality Assurance

## 1.2 Types of Incidents

Consistent with the varied nature of planned activities, the types of potential incidents that could occur during construction or operations covers a broad range of situations. Some examples include:

- Vehicle accident
- Fall from height
- Electrocution
- Struck by accidents
- Falling objects
- Fire
- Heat related illness
- Trench collapse
- Working over or under water

### 1.2.1 Construction Phase

The greatest challenge of the ERP would be to meet the tunneling rescue needs during construction. As stipulated by the California Division of Occupational Safety and Health of California (Cal OSHA), response time by a qualified primary rescue team to a tunneling incident must be within a half-hour travel time from the entry point. A secondary rescue team will be required where the number of people underground totals 25 or more. It is assumed that the incident scene could be at any one of the intake structures, tunnel shafts, or pump station locations. This TM examines the current capability, capacity, and proximity of emergency services agencies in the Delta that could be called upon to respond to an incident during construction of the project.

There is an opportunity for the project to provide project-specific fire and emergency medical resources at the major construction sites, including, but not limited to, the intakes, tunnel launch shaft sites, and the pumping plant and aqueducts. However, it could also be advantageous to provide these facilities at an existing emergency provider location to take advantage of existing trained personnel who know the geographic area. In addition, some of these project emergency resources could be delivered to the local agencies to be used following construction.

Fire Department (FD) personnel or project staff would need tunnel and shaft rescue training, heavy rescue equipment and vehicles, confined space training, and confined space rescue equipment, as a minimum.

### 1.2.2 Operational Phase

The operational phase commences after completion of all construction activities and commissioning of the system. During this phase, ERPs would be in place for each facility, so personnel are aware of immediate actions to be taken, including:

- Protect health, life, and property.
- Notify emergency services.
- Safely evacuate the facility, if necessary.
- Guide emergency services on arrival.

Responsibility for emergency response during project operations would be anticipated to be through DWR and the local FDs.

By implementing these actions, the project would meet mandated safety requirements for construction activities by the appropriate agency having jurisdiction and as specified in the contract documents for a particular contract, provide essential protection to the construction workforce, and reduce project risk.

## 2. Purpose

The project is a major water infrastructure project currently being planned through the Delta. Both the construction and operational phases of the project would require coordination with emergency response agencies throughout the region to provide for the safety of those working on the project and nearby land uses, and to comply with government regulations.

The project's ERP focuses on Eastern and Central corridors was described in the *Project Emergency Response Plan Technical Memorandum* (DCA 2021a). The Bethany Reservoir Alternative would extend from the intakes along the Eastern corridor to Lower Roberts Island; and then, continue along a tunnel alignment to a new Bethany Reservoir Pumping Plant to be located south of the Clifton Court Forebay and the Byron Highway. The new pumping plant and associated aqueducts would convey the water to a Bethany Reservoir Discharge Structure along the rim of the existing State Water Plan Bethany Reservoir. The BRPP, associated surge basin, Bethany Reservoir Aqueduct, and Bethany Reservoir Discharge Structure are referred to as the Bethany Complex.

The Bethany Reservoir Alternative is therefore a variation to the Eastern corridor where facilities south of, and including, the Lower Roberts Island Tunnel Launch Shaft site were extended along a new path, ultimately with an outfall to Bethany Reservoir. The Bethany Reservoir Alternative does not include the Southern Forebay and the associated facilities connection to the State Water Project downstream of Clifton Court Forebay as were included in the Central and Eastern Corridor project options. This supplemental TM examines the Bethany Reservoir Alternative from an emergency response perspective.

Recommendations contained in this TM would need to be considered during the project design phase.

## 3. Approach

The Bethany Reservoir Alternative uses the same facilities as the Eastern corridor from the intake structures to the Lower Roberts Island tunnel launch site, so emergency response for those sites is not considered in this TM. Refer to *Project Emergency Response Plan Technical Memorandum* (DCA 2021a) for information on those facility sites.

## 4. Fire Protection Agencies

### 4.1 Outreach Process

During the preparation of the TM for the Eastern and Central corridor options, agencies were initially contacted by Mr. Tony Meyers, Executive Director, DCO, to establish lines of communication at an agency-to-agency level, introduce the project, and notify the agency of the process for follow-up contact by a member of the DCA consultant team. Subsequent calls by the DCA project representative were guided by a series of questions designed to elicit details of the capabilities and capacity of each individual agency relevant to project construction and operations. For a summary of information obtained from the outreach process, refer to *Project Emergency Response Plan Technical Memorandum* (DCA 2021a).

## 4.2 Information Obtained

Emergency services information obtained during preparation of the TM for the Eastern Corridor is also applicable for the tunnel maintenance shaft sites on Upper Jones Tract and Union Island for the Bethany Reservoir Alternative.

Additional information relating to the Bethany Reservoir Alternative was obtained using web-based research. The Bethany Complex facilities are located within Alameda County, and fire stations servicing this area were investigated. The outcome of this research is summarized here.

### 4.2.1 Livermore Fire Department

Information obtained from the Alameda County Fire Department website (Alameda County Fire Department 2020) relating to Livermore fire station is summarized as follows:

- Fire station 20 located at the Lawrence Livermore National Laboratory, approximately 16 miles from the site
- Station offers specialized hazardous materials team
- Station houses two crews composed of 8 firefighters
- Station has one Type III engine, two Type IV apparatus (patrols), a hazardous materials unit, and an ambulance
- Station was expanded in 1990 and a renovation was completed in November of 1993

### 4.2.2 Mountain House Community Services District Fire Department

The Mountain House Community Services District (CSD) FD is the closest responder to the work area and is located approximately 6 miles from the Bethany Complex. It services a 7.5-square-mile area and is based in the Mountain House residential development within San Joaquin County, east of the work area. The station has the following equipment and capabilities based on information obtained from their website (Mountain House Fire 2020):

- Crew of 5 personnel on duty daily
- Wildland fire truck
- Ladder truck, carrying rope rescue equipment, ground ladders, and 75' aerial ladder
- Two Type I engines
- Water rescue capability
- Emergency medical service capability

## 5. Medical Facilities

Details of medical facilities located relatively near the Bethany Reservoir Alternative alignment are the same as those described for the Central and Eastern corridors - refer to *Project Emergency Response Plan Technical Memorandum* (DCA 2021a).

## 6. Law Enforcement

Details of law enforcement agencies located relatively near the Bethany Reservoir Alternative alignment are the same as those described for the Central and Eastern corridors - refer to *Project Emergency Response Plan Technical Memorandum* (DCA 2021a).

The Bethany Complex facilities are located within Alameda County. According to their website (Alameda County Sheriff's Office 2020), Alameda County Sheriff's Office is a full-service law enforcement agency providing patrol and investigative services to the unincorporated areas of Alameda County. The closest Sheriff's office to the Bethany Complex is located in Dublin, which is approximately 27 minutes away from these potential construction sites, without traffic congestion.

## 7. Methods to Provide Emergency Services to the Project

This section compares the stated capacity of emergency response agencies in the region and the needs of the project considering travel times. It further makes a preliminary recommendation on how to provide emergency services to each main work site.

### 7.1 Background

Figure 1 shows the tunnel alignments and locations of the intake, launch, reception, and maintenance shafts and the FDs in the area.

Refer to the *Project Emergency Response Plan Technical Memorandum* (DCA 2021a) for options considered to provide emergency response services to the project work sites. The only FD that meets the tunneling rescue response time requirements needed to support the Bethany Complex portion of the project is the Livermore FD (Table 1). Coordination with the FDs would be needed in the next phase of project development to confirm additional resources and equipment necessary to meet the tunnel rescue requirements, and to identify the actions to address disparities.



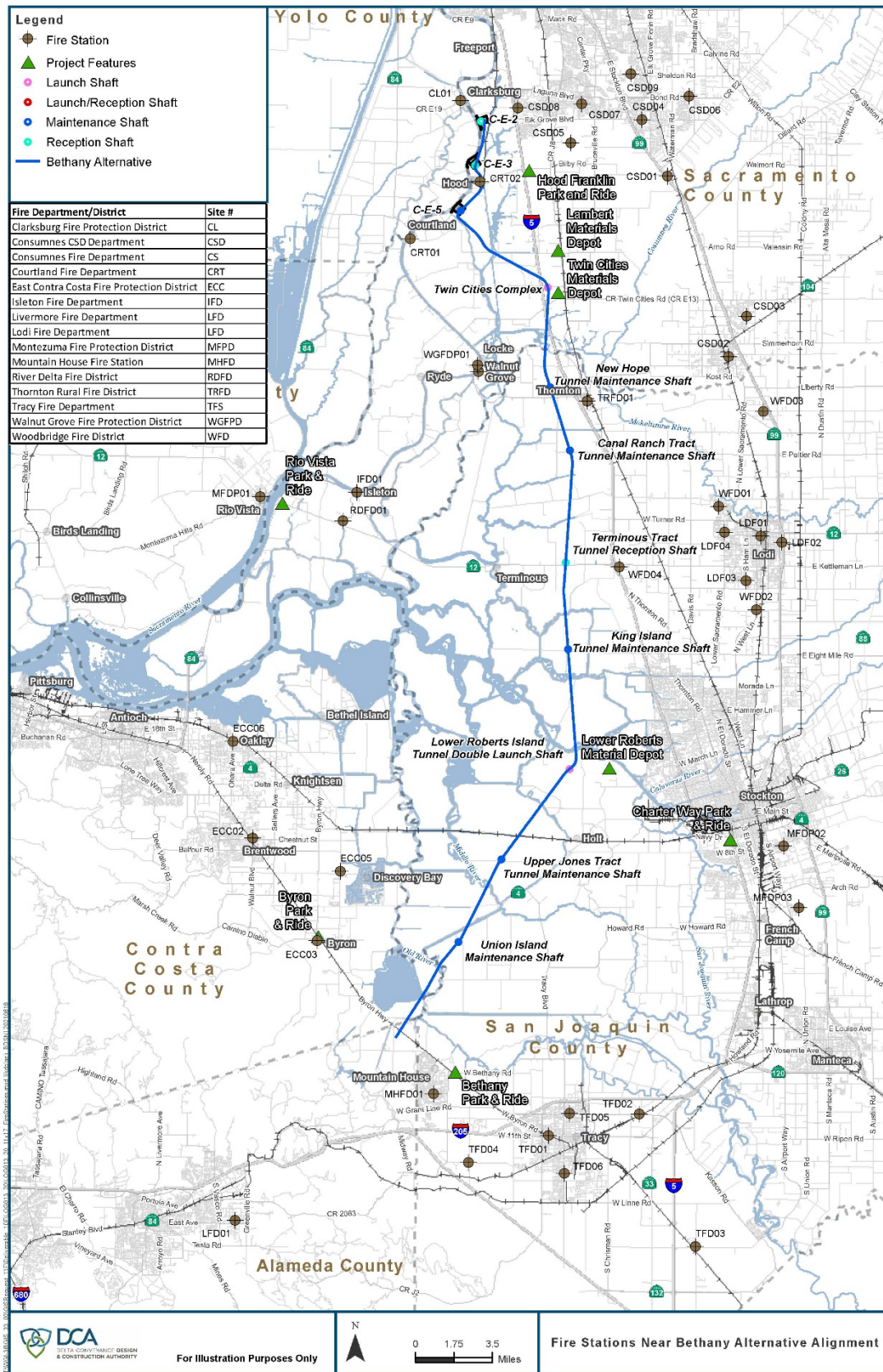


Figure 1. Fire Station Locations

**Table 1. Fire Department Services**

FD or FPD	Site No. (Figure 1)	Number of Operating Stations	Medical Emergency Service	Confined Space Rescue	HazMat Response	Excavation or General Rescue	Low- or High-angle Rescue	Equipment for Tunnel Rescue
Clarksburg FPD	CL	No response to inquiries						
Cosumnes CSD FD	CSD	4	Yes	Yes	Yes	Yes	Yes	No
Courtland FD	CRT	2	Yes	No	Yes	Yes	No	No
ECCFPD	ECC	3	Unknown	No	No	No	No	No
Isleton FD	IFD	Unknown	Unknown	Yes	Unknown	Unknown	Yes	No
Livermore FD	LFD	1	Yes	Yes	Yes	No	No	No
Lodi FD	LFD	4	Unknown	Yes	Unknown	Yes	Unknown	Some
Montezuma FPD	MFPD	2	Unknown	No	Unknown	No	No	No
Mountain House CSD Fire Department	MHCSD	1	Yes	Unknown	Unknown	Yes	No	No
River Delta Fire District	RDFD	Unknown	Yes	Unknown	Yes	Unknown	Unknown	Unknown
Thornton RFD	TRFD	Unknown	Unknown	No	Unknown	No	No	No
Tracy Fire Station 98	TFS	No response to inquiries						
Walnut Grove FPD	WGFPD	No response to inquiries						
Woodbridge Fire District	WFD	No response to inquiries						

Notes:

FPD = Fire Protection District

HazMat = hazardous material(s)

### 7.1.1 Bethany Reservoir Alternative Key Facilities

Proposed project key facilities are common between the Eastern corridor and Bethany Reservoir Alternative from the intake structures south to the Lower Roberts Island Shaft site. For details relating to the following features, refer to *Project Emergency Response Plan Technical Memorandum* (DCA 2021a):

- Intakes C-E-3 and C-E-5
- Twin Cities Complex
- New Hope Tract and Canal Ranch Tract Maintenance Shafts
- Terminous Island Reception Shaft and King Island Maintenance Shaft
- Lower Roberts Island Launch Shaft

The following subsections present preliminary recommendations on providing emergency response services to each of the project's work sites south of Lower Roberts Island.

#### 7.1.1.1 Upper Jones Tract Maintenance Shaft and Union Island Maintenance Shaft

Upper Jones Tract and Union Island are located in a portion of San Joaquin County that is not included in any fire protection district. The closest fire station to these shaft work sites is operated by Montezuma FPD. However, these sites are located in San Joaquin County, and Montezuma FPD is located in Solano County. Table 2 lists approximate travel times. Having a rescue team at this location would meet the half-hour response requirement for one team.

**Table 2. Estimated Travel Times without Traffic Congestion to the Upper Jones Maintenance Shaft and Union Island Maintenance Shaft**

Shaft Location	FDs or FPDs	Site No.	Distance (miles)	Travel Time (minutes)
Upper Jones Tract	Montezuma FPD	MFPD02	14	25
Union Island	Montezuma FPD	MFPD02	22	35

The proposed emergency response services strategy for the Upper Jones Tract and Union Island work sites are as follows:

- Primary – since these sites would be part of the tunnel drive originating at the Lower Roberts Island launch shaft, provide emergency response services to this shaft site from the temporary emergency response facilities constructed for the project at the Lower Roberts Island work site [refer to *Project Emergency Response Plan Technical Memorandum* (DCA 2021a)].
- Secondary – make arrangements with the Montezuma FPD to provide backup emergency response services to both these work site, including support for additional equipment and training as deemed necessary to perform this backup role.

#### 7.1.1.2 Bethany Complex

The closest FD or FPD to the Bethany Complex that is also within Alameda County is Livermore FD Station No 20. Table 3 lists the approximate travel times. Having a rescue team at this location would meet the half-hour response requirement for one team.



**Table 3. Estimated Travel Times without Traffic Congestion to the Bethany Complex**

Shaft Location	FDs or FPDs	Site No.	Distance (miles)	Travel Time (minutes)
Bethany Reservoir Pumping Plant and Surge Basin	Livermore FD	LFD01	14	20
Bethany Reservoir Discharge Structure	Livermore FD	LFD01	13	15

Note, Mountain House Fire Station 98 is located closer to the project site. However, the Mountain House Fire Station 98 is located within San Joaquin County, and the Bethany Complex is located in Alameda County, so it is not an appropriate first responder site option. However, with an agreement and when appropriate the Mountain House Fire Station can be considered to be a backup for Livermore FD for smaller incidents.

The proposed emergency response services strategy for the Bethany Complex is as follows:

- Primary – construct temporary facilities emergency response facilities at the Bethany Complex work site, which would include fire, rescue and medical equipment and personnel along with a helipad (refer to *Engineering Project Report | Bethany Reservoir Option, Volume 2 of 3 – Engineering Concept Drawings* (DCA 2021b), which would be shared by all contractors working from this major work site. The assigned contractor would provide qualified and trained personnel for both primary and backup response.
- Secondary – make arrangements with the Livermore FPD to provide backup emergency response services, including support for additional equipment and training as deemed necessary to perform this backup role.

## 8. Conclusions

The construction phase of the project would extend over many years and would involve a broad range of activities, including:

- Construction of significant lengths of tunneling
- Construction of major intake structures, pumping plants, hydraulic control structures, aqueducts and other features
- Upgrades to transport infrastructure
- Other general civil construction activities

Most of the tunnel construction sites for the Bethany Reservoir Alternative would be within a half-hour travel time to an existing fire station. However, none of the FDs are currently capable of responding to a tunneling incident with suitably trained and equipped resources to meet Cal OSHA regulatory requirements for safe construction operations. Therefore, the primary approach to providing emergency response services for the majority of the work sites is for the Project to provide its own temporary facilities, equipment and personnel, which is customary practice in the tunneling industry. Where a work site is selected to include temporary emergency response services facilities and this site is used by multiple contractors, the contract documents would assign the primary contractor at the site the responsibility for furnishing the equipment and personnel to provide these services. This is customary practice where multiple large contractors work from a single site. The contract documents would also clearly delineate the scope and coverage of these services in order to cover all contracts being worked on from that work

site. The existing emergency response providers, for the most part, would provide support and backup to the contractor supplied emergency response services if/when needed, which will require project support for additional equipment and training as deemed necessary to perform this backup role.

The project has identified emergency resources to be included at the main work sites. These facilities would be located at each main work site during construction, which would also provide services to reception and maintenance shafts. Each main work site would also be supported by nearby existing emergency service providers as backup.

Overall, additional training would be required for the following:

- Tunnel and shaft rescue training
- Appropriate heavy rescue equipment and vehicles
- Confined space training
- Confined space rescue equipment

Future development of the ERP would need to consider the best means of supporting construction activities, working in close consultation with emergency response agencies throughout the Delta. Future development of the ERP would need to consider a range of factors, including the following:

- Risk profile for each major construction activity
- Relative construction schedules
- Capacity and participation of local emergency service providers at the time of construction
- Changes in road networks or traffic congestion over time
- Other factors

DWR's existing operational ERPs would be expanded to include each new facility and would provide detailed procedures for responding to a range of incidents.

## 9. References

Alameda County Fire Department. 2020. *Alameda County Fire Department*. Accessed October 27, 2020. <https://www.acgov.org/fire/about/station20.htm>

Alameda County. 2020. *Alameda County Sheriff's Office*. Accessed October 28, 2020. <https://www.alamedacountysheriff.org>

Delta Conveyance Design and Construction Authority (DCA). 2021a. Project Emergency Response Plan Technical Memorandum. Final Draft.

Mountain House Community Services District Fire Department (Mountain House Fire). 2020. *Mountain House CSD Fire Department*. Accessed November 4, 2020. <http://mountainhousefire.com/>

Delta Conveyance Design and Construction Authority (DCA). 2021b. Engineering Project Report | Bethany Reservoir Alternative, Volume 2 of 3 – Engineering Concept Drawings. Final Draft.

## 10. Document History and Quality Assurance

Reviewers listed have completed an internal quality review check and approval process for deliverable documents that is consistent with procedures and directives identified by the Engineering Design Manager (EDM) and the DCA.

Approval Names and Roles			
Prepared by	Internal Quality Control review by	Consistency review by	Approved for submission by
Terry Krause / EDM Project Manager	Bob Cermak / EDM QC Reviewer	Gwen Buchholz / DCA Environmental Consultant Phil Ryan / EDM Design Manager	Graham Bradner / DCA Executive Director

This interim document is considered preliminary and was prepared under the responsible charge of Bob Cermak, California Professional Engineering License C31524.