

## N. PUBLIC HEALTH AND SAFETY

### 1. Introduction

This section describes the public health and safety setting and existing conditions as they relate to the BART to Livermore Extension Project, discusses applicable regulations, and assesses the potential impacts to public health and safety from construction and operation of the Proposed Project and Alternatives.

The study area for public health and safety varies in this section as follows:

- An area within a 0.5-mile radius of the collective footprint—the combined footprints of the Proposed Project, DMU Alternative, and Express Bus/BRT Alternative was used to identify hazardous materials sites in the vicinity. The 0.5-mile radius is a conservative search for nearby hazardous material sites.
- An area within a 0.25-mile radius of the collective footprint was used to assess potential impacts related to hazardous materials, substances, or waste to schools, consistent with CEQA Guidelines Appendix G.
- An area within a 2-mile radius of the collective footprint was used to assess potential impacts related to public and private airports, consistent with CEQA Guidelines Appendix G;
- The direct collective footprint was used to assess potential impacts related to wildfire, as any potential fires generated at BART-related facilities would occur within the direct footprint;
- An area within 1,000 feet of the collective footprint was used to assess potential impacts from electromagnetic fields (EMFs). An 1,000-foot radius is a conservative study area for EMF impacts related to electrified railways.<sup>1, 2</sup>

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<sup>1</sup> The California High Speed Rail (CHSR) uses a study area of 200 feet from the right-of-way (ROW) for health impacts from EMF and 500 feet from the ROW for electromagnetic interference impacts. A 1,000-foot study area is thus conservative as it captures a greater distance from the ROW than that employed in the CHSR Environmental Impact Report, which is for a train system running on much higher voltage.

<sup>2</sup> California High-Speed Rail Authority, 2014. California High-Speed Train Project Environmental Impact Report/Environmental Impact Statement, Fresno to Bakersfield Section. Chapter 3.5 Electromagnetic Fields and Electromagnetic Interference. April. Available at: [http://www.hsr.ca.gov/docs/programs/fresno-baker-eir/final\\_ERIS\\_FresBaker\\_Vol\\_I\\_CH3\\_5\\_EMI\\_and\\_EMF.pdf](http://www.hsr.ca.gov/docs/programs/fresno-baker-eir/final_ERIS_FresBaker_Vol_I_CH3_5_EMI_and_EMF.pdf), accessed May 2017.

This section describes the potential hazards within the study areas for the following topics:

- **Hazardous Materials and Public Health** – Hazardous materials have previously been released into the soil and groundwater at sites near the study area. The potential for exposure to hazardous materials from these past releases during construction and operation could pose a public health and safety risk. In addition, the accidental release of hazardous materials during construction and operation could pose a potential health and safety risk. Both impacts are analyzed in this section. This section also addresses potential historical releases of hazardous materials and current handling of hazardous materials near existing or proposed schools within 0.25-mile of the collective footprint of the Proposed Project, DMU Alternative, and Express Bus/BRT Alternative.
- **Airport Safety** – Interference with operational safety of the Livermore Municipal Airport
- **Wildland Fires** – Exposure of people or structures to wildland fire
- **Electromagnetic Fields** – Exposure of people or sensitive equipment to EMFs from train operations
- **BART System Safety** – System safety refers to the prevention of harmful incidents to riders, employees, or other members of the public near proposed operations, structures, or facilities. Potential incidents analyzed in this section include: (1) interference with existing evacuation routes/plans or routes/plans that would be established under the Proposed Project and Build Alternatives; and (2) terrorist activities.

The public health impacts related to air quality are discussed in Section 3.K, Air Quality. An analysis of traffic (automobile, bicycle, and pedestrian) safety can be found in Section 3.B, Transportation.

No comments pertaining to public health and safety were received in response to the Notice of Preparation for this EIR or during the public scoping meeting held for this EIR.

## 2. Existing Conditions

This subsection describes the existing conditions for public health and safety, including hazardous materials and public health, airport safety, wildland fires, EMF, and BART system safety.

### a. Hazardous Materials and Public Health

A hazardous material is any substance that, because of its quantity, concentration, or physical or chemical properties, may pose a hazard to human health and the environment. The California Health and Safety Code (HSC) sets forth some of the California regulations related to hazardous materials management and disposal and defines hazardous materials as follows:

...a material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment. (HSC, Division 20, Chapter 6.95, Section 25501(n)).

Under Title 22 of the California Code of Regulations (CCR), the term "hazardous substance" refers to both hazardous materials and hazardous wastes. Hazardous wastes are classified according to the properties of (1) toxicity; (2) ignitability; (3) corrosiveness; and (4) reactivity (CCR Title 22, Chapter 11, and Article 3). Title 22 Sections 66261.1 through 66261.126 identify regulatory requirements for the classification of hazardous wastes. A hazardous material is defined in CCR, Title 22 as:

A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed (CCR, Title 22, Section 66260.10).

California regulations and the HSC define hazardous waste as a waste with properties that make it potentially dangerous or harmful to human health or the environment. They can be the by-products of manufacturing processes, discarded used materials, or discarded unused commercial products, such as cleaning fluids (solvents) or pesticides. Materials can be hazardous waste even if they are not specifically listed or do not exhibit any of the four characteristic of a hazardous waste. For example, "used oil," products and contaminated soil generated from a "clean up" can be hazardous wastes. Common hazardous materials include petroleum hydrocarbons, pesticides, volatile organic compounds, semi-volatile organic compounds, and metals.

The Proposed Project and Build Alternatives would be located adjacent to industrial, commercial, residential, and agricultural areas within Alameda County, and the cities of Dublin, Pleasanton, and Livermore. Industrial facilities, research laboratories, medical centers, dry cleaners, and agricultural uses are located within the study area, and are among the uses that may have resulted in potential soil and groundwater contamination in the vicinity of the collective footprint due to past accidental spills or leaks, intentional dumping, and use of pesticides.

The only hazardous material currently transported for BART within the collective footprint is diesel fuel, which is associated with a diesel-powered emergency generator located at the Dublin/Pleasanton Station. The emergency generator is run periodically for testing and as a backup power supply, and thus, the use of diesel fuel is limited. BART does not currently operate any other hazardous material handling or hazardous waste generating equipment/activities within the collective footprint.

However, the routine transport of hazardous materials and hazardous wastes by other public and private entities occurs along Interstate (I-) 580 and other public and private roadways within the collective footprint.

### **(1) Environmental Database Search**

Searches of various environmental databases were conducted in August 2016, February 2017, and May 2017, pursuant to CEQA Guidelines Appendix G and Government Code Section 65962.5. To be conservative in the impact assessment, these searches also included environmental databases that are not required by law to be included in such searches, but are indicative of known or potential contamination concerns, hazardous material handling and transport, and hazardous waste management. The purpose of the searches was to identify sites within a 0.5-mile radius of the collective footprint (more conservative than solely searching for the collective footprint only) with potential contaminated soil or groundwater or which have been identified in federal, state, or local databases for environmental regulatory compliance (see Table 3.N-1 for a description of the databases).

These database searches included federal, state, and local regulatory databases for sites with potential or known contamination, hazardous materials storage, and hazardous waste generation, including: (1) the National Priorities List (NPL), also known as Superfund sites; (2) the Superfund Enterprise Management System (SEMS) database, formerly known as the Comprehensive Environmental Response, Compensation, and Liability Information System; and (3) lists maintained by the Department of Toxic Substance Control (DTSC), the California Department of Health Services, the State Water Resources Control Board, and the California Department of Resources Recycling and Recovery.

**TABLE 3.N-1 ENVIRONMENTAL DATABASE SITES WITHIN THE STUDY AREA**

Database <sup>a, b</sup>	Number of Sites		
	Conventional BART Project	DMU	Express Bus/BRT Alternative
		Alternative (with EMU Option)	
<b>Listings With Known or Potential Contamination</b>			
Superfund Enterprise Management System (SEMS) <sup>c</sup>	0	0	0
Superfund Enterprise Management System-Archive (SEMS-Archive) <sup>d</sup>	0	0	1
National Priorities List (NPL) <sup>e</sup>	0	0	0
Corrective Action Report (CORRACTS) <sup>f</sup>	0	0	0
Department of Defense (DOD) Sites <sup>g</sup>	1	1	1
Formerly Used Defense Sites (FUDS) Properties <sup>h</sup>	2	2	1
Emergency Response Notification System (ERNS) <sup>i</sup>	23	23	15
Hazardous Materials Incident Reporting System (HMIRS) <sup>j</sup>	1	1	1
Unexploded Ordnance (UXO) <sup>k</sup>	1	1	1
HIST Cal-Sites (Calsites) <sup>l</sup>	1	1	1
Cortese Hazardous Waste and Substances Sites List (CORTESE) <sup>m</sup>	2	2	2
Hazardous Waste and Substance Site List (HIST CORTESE) <sup>m</sup>	30	32	19
Leaking Underground Storage Tank (LUST) <sup>n</sup>	42	44	23
Spills, Leaks, Investigations and Cleanup (SLIC) <sup>o</sup>	18	21	13
CHMIRS <sup>p</sup>	45	51	21
Military Cleanup Sites Listing (MCS) <sup>q</sup>	1	1	1
Proposition 65 Records (Notify 65) <sup>r</sup>	4	4	2
Deed Restriction Listing (DEED) <sup>s</sup>	1	1	1
State Response Sites (RESPONSE) <sup>t</sup>	2	2	2
EnviroStor Database (ENVIROSTOR) <sup>u</sup>	3	5	6
<b>Listings With Hazardous Material Use and/or Hazardous Waste Generation or Treatment</b>			
Resource Conservation and Recovery Act (RCRA)-Treatment Storage and Disposal Facility (RCRA-TSDF) <sup>v</sup>	0	0	0
RCRA-Large Quantity Generator (RCRA-LQG) <sup>y</sup>	10	10	5
RCRA-Small Quantity Generator (RCRA-SQG) <sup>w</sup>	71	74	39
RCRA-No Longer Regulated (RCRA-NLR) <sup>x</sup>	13	17	14
Toxic Chemical Release Inventory System (TRIS) <sup>y</sup>	1	1	0
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) / Toxic Substances Control Act (TSCA) Tracking System (FTTS) <sup>z</sup>	5	6	3
FIFRA / TSCA Tracking System Administrative Case Listing (HIST FTTS) <sup>z</sup>	3	3	1
Section 7 of FIFRA (SSTS) <sup>aa</sup>	3	5	2
Integrated Compliance Information System (ICIS) <sup>ab</sup>	2	2	2
Polychlorinated Biphenyl Activity Database (PADS) <sup>ac</sup>	1	1	0

**TABLE 3.N-1 ENVIRONMENTAL DATABASE SITES WITHIN THE STUDY AREA**

Database <sup>a, b</sup>	Number of Sites		
	Conventional BART Project	DMU	Express Bus/BRT Alternative
		Alternative (with EMU Option)	
Material Licensing Tracking System (MLTS) <sup>ad</sup>	1	1	2
Risk Management Plans (RMP) <sup>ae</sup>	2	2	0
Aerometric Information Retrieval System (US AIRS) <sup>af</sup>	1	1	1
Solid Waste Facilities/Landfill Sites (SWF/LS) <sup>ag</sup>	1	1	0
National Pollutant Discharge Elimination System (NPDES) <sup>ah</sup>	55	57	26
Waste Discharge System (WDS) <sup>ai</sup>	10	10	5
Facility Inventory Database (FID UST) <sup>aj</sup>	18	18	6
Active UST Facilities (UST) <sup>aj</sup>	15	15	9
Hazardous Substance Storage Container Database (HIST UST) <sup>aj</sup>	25	26	15
Statewide Environmental Evaluation and Planning System UST Listing (SWEEPS UST) <sup>aj</sup>	35	35	21
Aboveground Petroleum Storage Tank Facilities (AST) <sup>ak</sup>	15	15	8
Drycleaner Facilities (DRYCLEANERS) <sup>al</sup>	5	7	1
Clandestine Drug Labs (CDL) <sup>am</sup>	7	7	4
Facility and Manifest Data (HAZNET) <sup>an</sup>	501	540	311
Emissions Inventory Data (EMI) <sup>ao</sup>	94	101	66
Mines Site Location Listing (MINES) <sup>ap</sup>	1	1	0

Notes:

<sup>a</sup> This table summarizes the results of a database search for facilities located on and within a 0.5-mile radius of the collective footprint; only listings on databases indicative of potential contamination concern, hazardous material use, and hazardous waste generation are included here. This EIR describes and analyzes the bus routes and bus infrastructure improvements, including the Enhanced Bus Alternative, at a programmatic level as described in Chapter 2, Project Description. Bus infrastructure improvements are anticipated to be constructed within existing street rights-of-way (ROW) and a search for listings for the Enhanced Bus Alternative was not conducted.

<sup>b</sup> Listings on databases indicative of certain regulatory compliance matters (e.g., compliance information, manifest records, pesticide application licensing), pointer databases, and Environmental Data Resources proprietary records are not summarized herein.

<sup>c</sup> Known and potentially hazardous waste sites, including those under consideration for inclusion in the NPL.

<sup>d</sup> SEMS-Archive was formerly known as CERCLIS No Further Remedial Action Planned. Archived status indicates the site assessment was completed and the EPA determined the site is not a potential NPL site.

<sup>e</sup> Sites with known or potential releases of hazardous materials and prioritized by the EPA as warranting investigation and/or remediation.

<sup>f</sup> Sites subject to corrective action due to mismanagement of Resource Conservation and Recovery Act (RCRA) hazardous waste.

<sup>g</sup> Federally owned or administered lands administered by the United States Department of Defense that are 640 acres or larger.

<sup>h</sup> Sites where the United States Army Corps of Engineers has conducted or plans to conduct clean up actions.

<sup>i</sup> Releases of oil and other hazardous materials reported to the National Response Center.

<sup>j</sup> Spills of hazardous materials reported to the United States Department of Transportation.

<sup>k</sup> Sites containing unexploded ordnance.

<sup>l</sup> Sites in California with known or potential contamination. ENVIROSTOR replaced the Calsites database.

ENVIROSTOR also identifies sites where contamination was identified, but a deed restriction was recorded, allowing the site to be authorized for reuse.

<sup>m</sup> Pointers to sites in California included on the LUST, SWF/LS, and Calsites lists. HIST CORTESE is not updated;

**TABLE 3.N-1 ENVIRONMENTAL DATABASE SITES WITHIN THE STUDY AREA**

<b>Database<sup>a,b</sup></b>	<b>Number of Sites</b>		
	<b>Conventional BART Project</b>	<b>DMU Alternative (with EMU Option)</b>	<b>Express Bus/BRT Alternative</b>
current listings are included in the CORTESE database.			
<sup>a</sup> Reported releases from underground storage tanks in California.			
<sup>b</sup> Sites in California with known or potential contamination due to unauthorized releases.			
<sup>c</sup> Spills of hazardous materials reported to the California Governor's Office of Emergency Services.			
<sup>d</sup> Military facilities in California where investigation and cleanup is overseen by the State Water Resources Control Board and the United States Department of Defense.			
<sup>e</sup> Reported releases in California that could impact drinking water.			
<sup>f</sup> Sites in California where a recorded land use restriction was placed to protect the public from unsafe exposure to hazardous materials and waste.			
<sup>g</sup> Sites in California with confirmed contamination. Remediation of the listed sites is under DTSC oversight.			
<sup>h</sup> Sites authorized to treat, store, or dispose of hazardous waste.			
<sup>i</sup> Sites registered for the generation of over 1,000 kilograms of hazardous waste or over 1 kilogram of acutely hazardous waste per month.			
<sup>j</sup> Sites registered for the generation of 100 to 1,000 kilograms of hazardous waste per month			
<sup>k</sup> Sites formerly registered as RCRA hazardous waste generators, but that do not currently generate RCRA hazardous waste in quantities requiring registration as either a small- or large-quantity generator.			
<sup>l</sup> Facilities in certain industry sectors that report releases of toxic chemicals in reportable quantities (where "release" means the chemical is emitted to air, discharged to water, or managed through recycling, energy recovery, and/or treatment).			
<sup>m</sup> FTTS and HIST FTTS track administrative cases and enforcement actions related to FIFRA, TSCA, and EPCRA. FTTS includes the past 5 years of records; the HIST FTTS is no longer updated and its records are not generally included in the FTTS.			
<sup>n</sup> Pesticide-producing establishments that submit compliance reports to the EPA.			
<sup>o</sup> Facilities that have been subject to regulatory compliance enforcement and facilities that maintain a National Pollutant Discharge Elimination System permit.			
<sup>p</sup> Registered generators, transporters, commercial stores, and/or brokers and disposers of polychlorinated biphenyls.			
<sup>q</sup> Nuclear Regulatory Commission-licensed sites that maintain or use radioactive materials.			
<sup>r</sup> Facilities that maintain a Risk Management Plan pursuant to federal requirements due to the storage of listed toxic or flammable substances above threshold quantities.			
<sup>s</sup> Air emissions compliance data for certain point sources.			
<sup>t</sup> Solid waste disposal facilities and/or landfills in California.			
<sup>u</sup> Sites issued National Pollutant Discharge Elimination System permits for process wastewater and/or stormwater discharges.			
<sup>v</sup> Sites in California authorized to discharge wastes/wastewater to land or surface water (e.g., domestic/municipal wastewater, animal waste solids, industrial process wastewater, stormwater).			
<sup>w</sup> FID UST, UST, HIST UST, and SWEEPS UST list active and/or inactive underground storage tank locations in California. Only the UST database continues to be updated with new information.			
<sup>x</sup> Sites in California registered with aboveground petroleum storage exceeding 1,320 gallons.			
<sup>y</sup> Sites registered with the EPA as hazardous waste generators with standard industrial classification codes corresponding to activities that could involve dry cleaning (e.g., power laundries, garment pressing and cleaner's agents, linen supply, industrial launderers).			
<sup>z</sup> Illegal drug lab locations in California.			
<sup>aa</sup> Sites currently or formerly generated hazardous waste in California. Information is extracted from hazardous waste manifests submitted to the DTSC, and thus includes hazardous waste generators that are registered with both the EPA (e.g., RCRA-LQG, RCRA-SQG) and the State of California.			
<sup>ab</sup> Sites that report air emissions data to the California Air Resources Board and/or local air pollution control districts.			
<sup>ac</sup> Mining locations in California.			
Sources: Environmental Data Resources, 2016; Environmental Data Resources, 2017a; Environmental Data Resources, 2017b.			

Table 3.N-1 lists the sites identified on environmental databases (both those required pursuant to CEQA Appendix G and others). Table 3.N-1 also distinguishes between those databases related to known or potential contamination (Listings Indicative of Known or Potential Contamination Concerns), such as known contamination as a result of the operation of hazardous waste treatment or solid waste management operations, and those databases related to regulatory compliance (Listings Indicative of Hazardous Material Use and/or Hazardous Waste Generation or Treatment), such as sites registered with the United States Environmental Protection Agency or DTSC for hazardous waste generation or treatment or sites that maintain underground storage tanks. These sites are also shown on Figure 3.N-1.

Only six of the sites listed in Table 3.N-1 are located within the footprints of the Proposed Project or DMU Alternative and five sites are within the Express Bus/BRT Alternative. These sites are summarized in Table 3.N-2 and described below.

**TABLE 3.N-2 ENVIRONMENTAL DATABASE SITES WITHIN THE COLLECTIVE FOOTPRINT**

Database <sup>a, b</sup>	Number of Sites		
	Conventional BART Project	DMU Alternative (with EMU Option)	Express Bus/BRT Alternative
<b>Listings With Potential or Known Contamination</b>			
Hazardous Materials Incident Reporting System (HMIRS) <sup>c</sup>	5	5	5
<b>Listings With Hazardous Material Use and/or Hazardous Waste Generation or Treatment</b>			
Facility and Manifest Data (HAZNET) <sup>d</sup>	1	1	0

Notes:

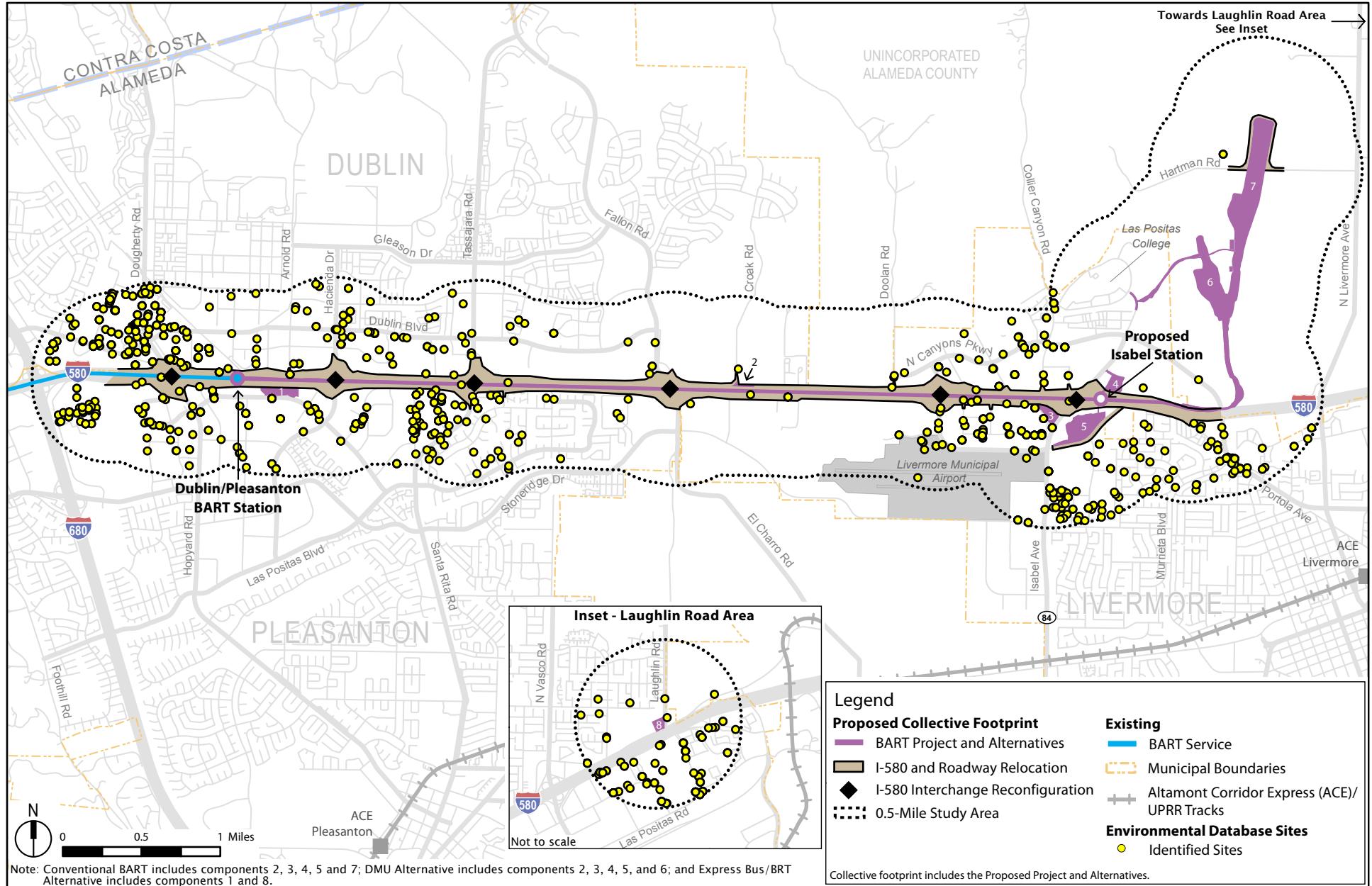
<sup>a</sup> This table summarizes the results of a database search for facilities located on and within a 0.5-mile radius of the collective footprint; only listings on databases indicative of potential contamination concern, hazardous material use, and hazardous waste generation are included here. This EIR describes and analyzes the bus routes and bus infrastructure improvements, including the Enhanced Bus Alternative, at a programmatic level as described in Chapter 2, Project Description. Bus infrastructure improvements are anticipated to be constructed within existing street rights-of-way (ROW) and a search for listings for the Enhanced Bus Alternative was not conducted.

<sup>b</sup> Listings on databases indicative of certain regulatory compliance matters (e.g., compliance information, manifest records, pesticide application licensing), pointer databases, and Environmental Data Resources proprietary records are not summarized herein.

<sup>c</sup> Spills of hazardous materials reported to the United States Department of Transportation.

<sup>d</sup> Sites currently or formerly generated hazardous waste in California. Information is extracted from hazardous waste manifests submitted to the DTSC, and thus includes hazardous waste generators that are registered with both the EPA (e.g., RCRA-LQG, RCRA-SQG) and the State of California.

Sources: Environmental Data Resources, 2016. Environmental Data Resources, 2017a. Environmental Data Resources, 2017b.



Source: Arup, 2017; Environmental Data Resources, Inc., 2016, 2017a,b.

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Figure 3.N-1  
Public Health and Safety  
Sites Identified in Environmental Databases in the Study Area

- Four of the six sites within the collective footprint are listed on the California Hazardous Material Incident Reporting System (CHMIRS) for incidents involving freight vehicles. No additional details are available in the CHMIRS listings regarding the type or volume of material released, but each incident is marked with a completed status, indicating that the incident was cleaned up to the satisfaction of the regulatory authority at that time. Therefore, these four CHMIRS listings are unlikely to present a current contamination concern to the Proposed Project and Build Alternatives. The location of these incidents are as follows:
  - (1) October 13, 1988 – two incidents at westbound I-580 at Hopyard Road, Pleasanton, CA
  - (2) October 13, 1988 – eastbound I-580, 0.25 miles east of Santa Rita Road, Pleasanton, CA
  - (3) September 25, 1990 – westbound I-580 at Hopyard Road, Pleasanton, CA
  - (4) October 14, 1991 – eastbound I-580, 0.5 miles East Airway Boulevard, Livermore, CA.
- A fifth site within the collective footprint is listed on the CHMIRS due to a 30-gallon diesel spill on January 19, 2012 from a damaged fuel line on a vehicle (located at I-580 at Santa Rita Road). A date of incident completion is not identified in the CHMIRS. However, because the listing indicates that the spill was contained and cleaned up by a contractor, this spill is unlikely to present a current contamination concern.
- A sixth site is a listing for past hazardous waste generation activity at the BART Park & Ride Lot at 200 East Airway Boulevard in Livermore, within the Isabel South Area (within the Proposed Project and DMU Alternative footprints). A temporary hazardous waste identification number was obtained for off-site management of asbestos containing waste (one shipment each in 1995 and 1996).
- No sites within the collective footprint are identified on databases indicative of current hazardous material use (e.g., underground storage tank registration, wastewater discharges) or hazardous waste generation.

## **(2) Aerially Deposited Lead**

Aerially deposited lead exists along many highways due to emissions from vehicles powered by leaded gasoline. The California Department of Transportation (Caltrans) has identified lead within 30 feet of pavement and within 6 inches to 3 feet below the ground surface. Caltrans reports that aerially deposited lead is generally present in soils above an unrestricted use level (unspecified) and is in the process of entering into an agreement with the DTSC for reuse of soil with total lead concentrations up to 3,200 milligrams per kilogram under certain conditions. Based on the presence of I-580 highway and roads

within and adjacent to the Proposed Project and Build Alternatives, it is possible that aerially deposited lead is present.<sup>3</sup>

### **(3) Sensitive Receptors for Hazardous Materials**

For the purposes of the hazardous materials analysis, sensitive receptors are individuals such as children, who are especially vulnerable to exposure to hazardous emissions or handling of hazardous or acutely hazardous materials, substances, or wastes (e.g., in the event of a hazardous material release). One school was identified within 0.25-mile of the collective footprint, as listed in Table 3.N-3. In addition to the school, other sensitive receptors (e.g., residences, daycare facilities, hospitals, recreation areas) are present within 0.25-mile of the collective footprint. For more information about land uses near the project corridor, see Section 3.C, Land Use and Agricultural Resources.

**TABLE 3.N-3 SCHOOLS WITHIN 0.25-MILE OF THE COLLECTIVE FOOTPRINT**

School Name	Address	Project Component within 0.25-Mile
Livermore Valley Charter (Public School)	3142 Constitution Drive, Livermore, CA 94551	<ul style="list-style-type: none"> <li>▪ North Canyons Parkway Staging Area (south of the intersection of Airway Boulevard) approximately 460 feet southwest at its nearest point to the school</li> <li>▪ I-580 relocation at Airway Boulevard (portions of the westbound on-ramps)</li> </ul>

**Notes:**

This table summarizes the results of a database search for schools within 0.25-mile of the collective footprint. This EIR describes and analyzes the bus routes and bus infrastructure improvements, including the Enhanced Bus Alternative, at a programmatic level as described in Chapter 2, Project Description. Bus infrastructure improvements are anticipated to be constructed within existing street rights-of-way (ROW) and a search for listings for the Enhanced Bus Alternative was not conducted.

The information in the table is based on the EDR Offsite Receptor Report which includes a search of information from the National Center for Education Statistics, specifically for public elementary and secondary schools and private schools.

Sources: Environmental Data Resources, 2017c; Environmental Data Resources, 2017d.

### **b. Airport Safety**

The Livermore Municipal Airport is located within approximately 0.35-mile south of I-580 and the collective footprint. The airport is between the Las Positas Golf Course and the Water Reclamation Plant on the west and Isabel Avenue on the east. It is at an elevation of 397 feet above mean sea level.

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<sup>3</sup> California Department of Toxic Substances Control, 2016. California Environmental Quality Act Initial Study, Agreement with Caltrans for reuse of aerially deposited lead-contaminated soils. March 21.

The airport has 392 hangars and over 200 tie-down spots that house approximately 505 based aircraft. The airport's tenants consist of 33 percent Livermore residents and 18 percent Pleasanton residents. In 2015, the airport was the 20th busiest airport in California with 117,698 operations. The airport sold 662,262 gallons of fuel in 2015, of which 330,543 gallons were jet fuel. Livermore Municipal Airport serves a large number of corporate clients, including Costco, Safeway, Coca Cola, Chevron, Home Depot, Target, Les Schwab, Dollar General, and Verizon.<sup>4</sup>

The airport is available to pilots 365 days a year and 24 hours a day. However, aircraft operators, especially those operating jet aircraft, are requested by the city of Livermore to adhere to the Livermore Airport Voluntary Restraint from Night Flying Time Period, and refrain from flying between the hours of 10:00 p.m. and 6:00 a.m. to preserve quiet time for its neighbors. A total of 594 noise complaints were registered in 2015 (75.6 percent of which originated from Pleasanton households, 23.7 percent from Livermore households, and less than 1 percent by Dublin, San Ramon, or Danville residents).<sup>5</sup>

The Livermore Municipal Airport Land Use Compatibility Plan (ALUCP) identifies a number of different zones around the Livermore Municipal Airport that are defined to ensure that surrounding land uses are compatible with airport activities. The zones include, but are not limited to, the Airport Safety Zone, which encompasses an airport clear zone; an approach zone; and the Airport Protection Area (APA), wherein increased residential development is prohibited. The Livermore Municipal Airport is also currently designated an APA by the city of Livermore to encourage noise-compatible land uses around the airport. As shown in Figure 3.N-2, the APA is rectangular in shape and extends from the airport runways 5,000 feet to the north, south, and east towards Livermore and 7,100 feet to the west towards Pleasanton. The APA policy prohibits new residential uses within the APA boundary.<sup>6</sup> The ALUCP, the Airport Safety Zone, and APA of the Livermore Municipal Airport are described in more detail under Regulatory Framework below.

### **c. Wildland Fires**

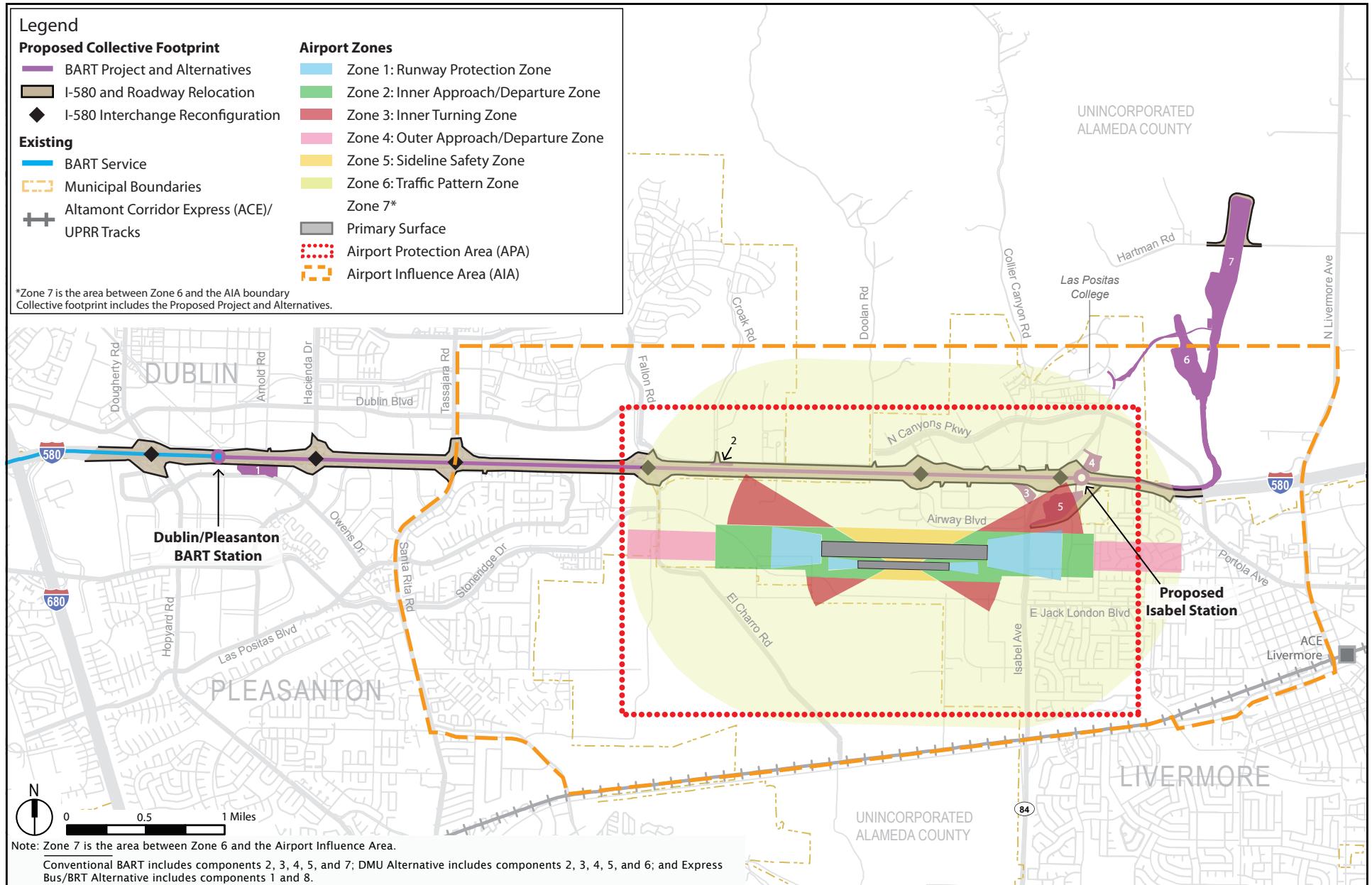
The San Francisco Bay Area experiences extended, dry summers with high wildland fire hazards. The risk of wildfire hazard depends on a combination of factors including winds, temperatures, humidity levels, rainfall quantity, and fuel moisture content. Steep slopes also contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult.

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<sup>4</sup> City of Livermore, 2015. Livermore Airport Synopsis. Available at: <http://www.cityoflivermore.net/civicax/filebank/documents/14368>.

<sup>5</sup> Ibid.

<sup>6</sup> City of Livermore. 2004. City of Livermore General Plan: 2003–2025.



Source: Arup, 2017; Alameda County Airport Land Use Commission, 2012.

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**Figure 3.N-2**  
**Public Health and Safety**  
**Livermore Municipal Airport Zones**

To quantify this potential risk, the California Department of Forestry and Fire Protection (CAL FIRE) has developed a fire hazard severity scale that uses three criteria to evaluate and designate potential fire hazards in wildland areas. These criteria include the following: 1) fuel loading from vegetation; 2) fire weather from winds, temperatures, humidity levels and fuel moisture contents; and 3) topography. The designations for fire hazard severity are moderate, high, and very high. CAL FIRE's designations are limited to areas of state or federal responsibility. Within the study area, the state responsibility areas are generally located in unincorporated Alameda County.

Areas of local responsibility are not designated by CAL FIRE. These areas within the local responsibility area have been analyzed for fire hazard by the United States Forest Service (USFS), which has also developed a wildland fire map.<sup>7</sup> The USFS designations range from water, non-burnable, very low, low, moderate, high, and very high. Areas designated as non-burnable are those areas that are heavily urbanized and do not pose a wildland fire potential. Areas with higher fire severity have fuels, such as continuous brush, downed vegetation or small trees, with high probability of experiencing torching, crowning, and other forms of extreme fire behavior under conductive weather conditions.<sup>8</sup>

Areas along the project corridor that are within CAL FIRE's state responsibility area are as follows and shown in Figure 3.N-3:

- I-580 Corridor Area – the northern portion of I-580 from Fallon Road/El Charro Road to Doolan Road is designated moderate fire severity
- Cayetano Creek Area – primarily located within a moderate designation with some areas of high severity

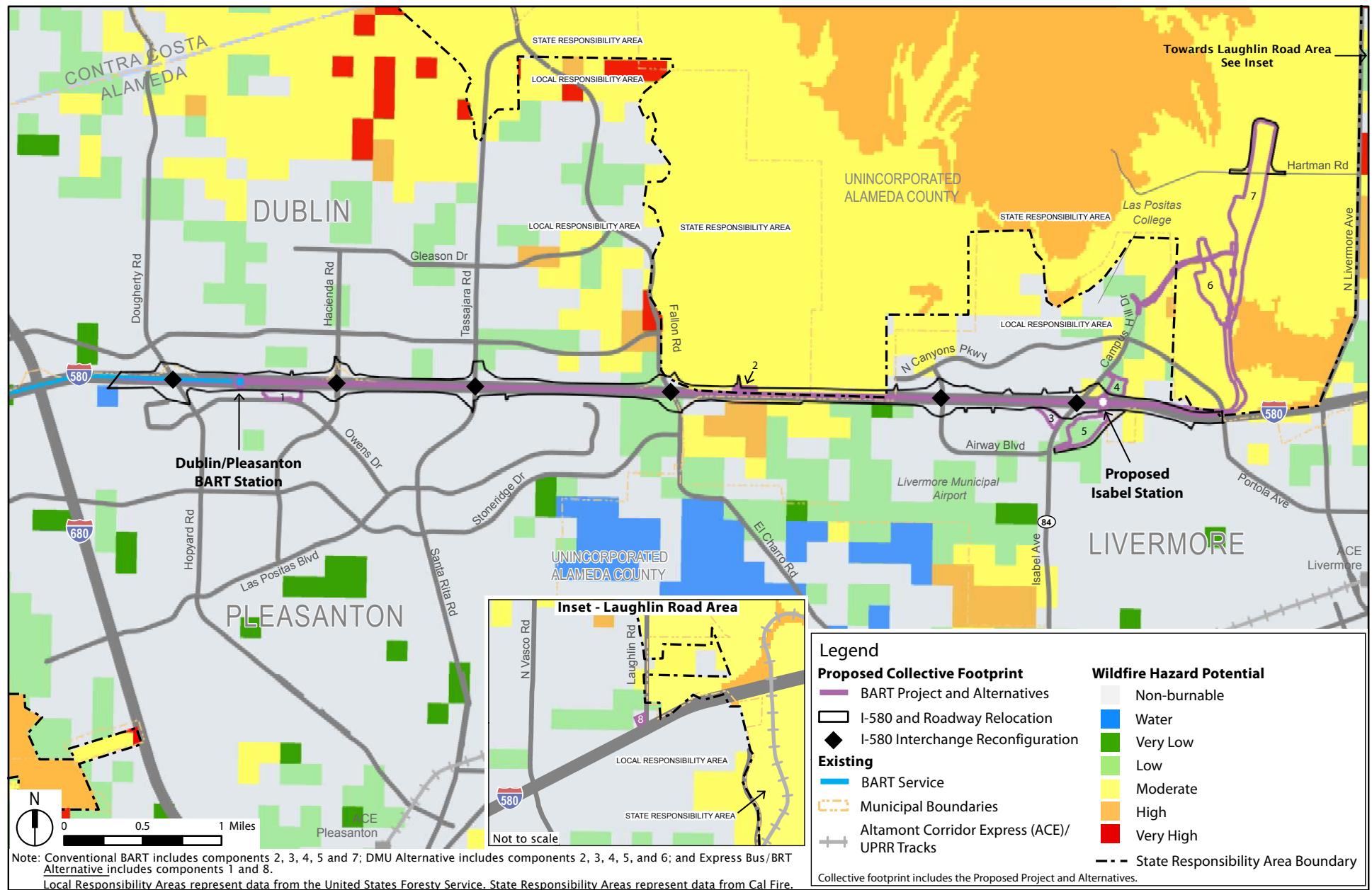
The majority of the collective footprint is not within CAL FIRE's designated state responsibility zone. These areas are designated with wildfire hazard potential as follows:

- Dublin/Pleasanton Station Area – generally designated as non-burnable with a few areas of low wildfire hazard potential
- I-580 Corridor Area – the western portion of the corridor is generally designated as non-burnable, while areas along the eastern portion are designated as low, moderate, and high wildfire hazard potential

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<sup>7</sup> United States Forest Service, 2014. Wildfire Hazard Potential. December, Available at: <https://www.arcgis.com/home/item.html?id=fc0ccb504be142b59eb16a7ef44669a3>, accessed January 30, 2017.

<sup>8</sup> Crowning consists of fires which burn through the top layer of foliage on a tree, known as the canopy or crown fires. Conductive weather conditions are those conditions that could potentially start wildfire, such as warm and dry weather.



Source: Arup, 2017; USFS, 2014; CAL FIRE, 2008.

Figure 3.N-3

Public Health and Safety  
Wildfire Hazard Potential

- Isabel North Area – primarily designated as low and moderate potential
- Isabel South Area – primarily designated as low potential
- Laughlin Road Area – primarily non-burnable with areas of low wildfire hazard potential

**d. Electromagnetic Radiation and Electromagnetic Fields**

This subsection defines electromagnetic radiation (EMR) and EMF and identifies typical sources for it, and describes the characteristics of EMF, sources of background EMF, and types of sensitive receptors.

**(1) Definition and Sources of EMF**

EMR is the electric and magnetic field that results from the motion of an electric charge (i.e., electricity). EMF is the electric and magnetic field that is measured as the sum of all EMR contributed from different sources at a specific frequency at a particular location. The terms EMF and EMR are often used interchangeably. If there is only one EMR source, then the EMF is equal to the EMR.

In general, anything that generates, transports, or uses electricity will emit EMF. The higher the voltage and power, the more powerful the electric and magnetic fields that are created. The largest contributor to static magnetic field is the Earth itself, and this magnetic field is what is used by compasses to detect direction. The second largest contributor of EMF is the electric and magnetic fields from power lines. Other major contributors to EMF are radio and television stations, cell phone towers, and radar stations.

The values for magnetic fields are typically expressed in tesla (T) or Gauss (G) and electric fields are expressed in volts per meter (V/m). For both values, the prefixes milli (m), or 1 thousandth, and micro ( $\mu$ ), or 1 millionth, are typically used. Example magnetic field strengths for everyday electrical appliances and other environmental sources are shown in Table 3.N-4.

EMF can be categorized into two groups, non-ionizing and ionizing frequencies. As shown in Figure 3.N-4, ionizing frequencies (i.e., shorter wavelengths) include x-rays and gamma rays and are considered harmful because the radiation is so powerful that it can change (i.e., ionize) living cell structure. Non-ionizing frequencies are considered relatively harmless within certain power limits. If the power limits are exceeded, living cells can be heated and eventually change structure. The frequencies emitted by electric trains are extremely low frequency, and are therefore considered non-ionizing.

**TABLE 3.N-4 EXAMPLE MAGNETIC FIELD STRENGTHS**

<b>Electrical Appliance</b>	<b>Magnetic Field Strength</b>	
	<b>(mG)</b>	<b>(µT)</b>
Copy Machines	40	4
Hair Dryers	70	7
Electric Shavers	100	10
Can Openers	300	30
Coffee Makers	1	0.1
Food Processors	20	2
Microwave Ovens	200	20
Mixers	100	10
Refrigerators	20	2
Washing Machines	30	3
Vacuum Cleaners	200	20

Notes: mG = milligauss; µT = microtesla. Magnetic field strength is provided at a distance of 1 foot from the source.

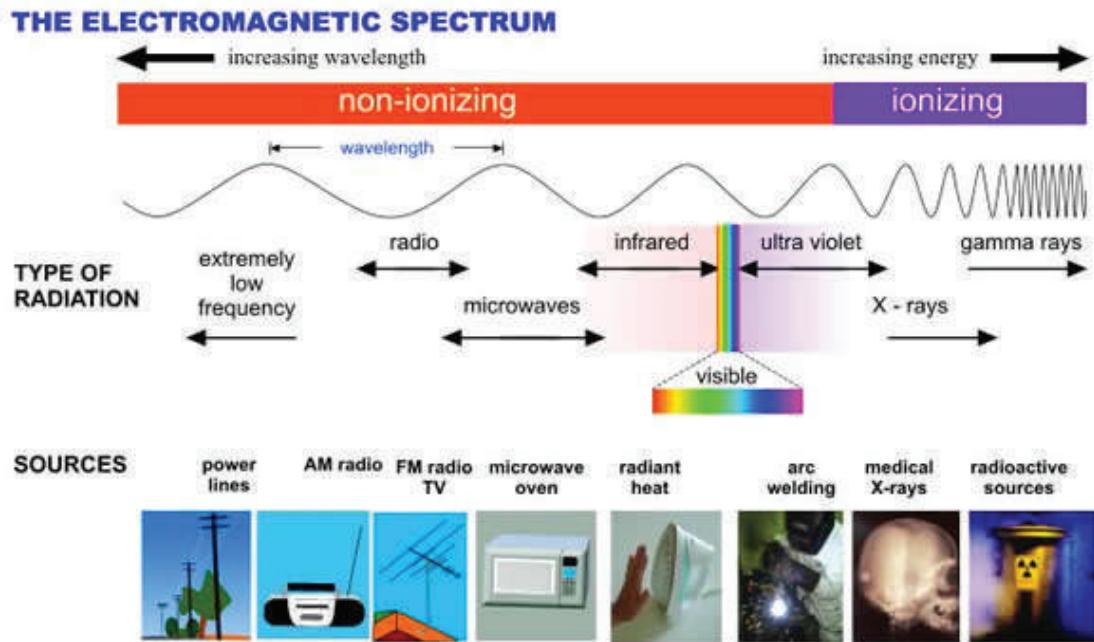
Source: National Institute of Environmental Health Sciences. National Institutes of Health, 2002.

## **(2) Characteristics of EMF**

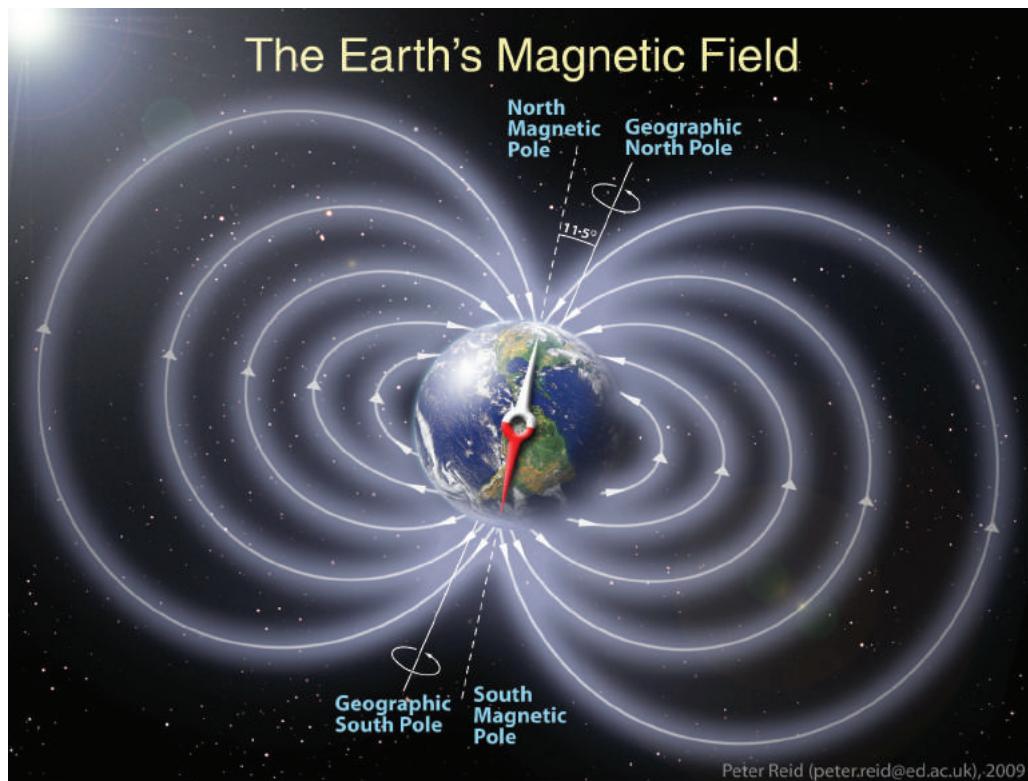
Electric current can either be direct current (DC) or alternating current (AC). In DC electricity, electrons flow in one direction. A common example of a source of DC electricity is a battery. BART trains receive their power through DC electricity. DC electricity emits EMF with magnetic and electric poles in a constant position.

In AC electricity, the flow of electrons reverses direction at a regular frequency. A common example of a source of AC electricity is electricity delivered to businesses and residences. In the U.S., electricity is delivered at 60 hertz (Hz) (i.e., the direction of the current switches back and forth 60 times per second). The traction motors on BART operate on AC power. AC also emits EMF; however, under AC, the magnetic or electric poles swap position according to the frequency.

## Electromagnetic Spectrum



## The Earth's Magnetic Field



Source: Peter Reid/NASA, 2009; ARPANSA, 2017.

In measuring any source's magnetic field, it is important to consider the Earth's static magnetic field. Figure 3.N-4 shows the Earth's static magnetic field, including the Magnetic North Pole and the Magnetic South Pole. Between the two magnetic poles are lines representing the Earth's magnetic fields. The magnetic field emitted by a source of EMF can be in any direction, compared to the Earth's magnetic direction and this direction affects the total EMF attributable to a source. For example, if a source's magnetic north pole aligns with the Earth's Magnetic North Pole, the strength of the magnetic fields will be additive. However, if the source's magnetic north pole matches the direction of the Earth's Magnetic South Pole, the source's magnetic field will be subtracted from the Earth's magnetic field. Because the strength of the Earth's magnetic field is relatively constant at a particular location, the relevant measurable EMF from a source for impact analysis is the change in magnetic field.

### (3) Background EMF

Within the project corridor, the only source of background EMF at 0 Hz is the Earth itself. The magnetic field associated with Earth is approximately 50 microtesla ( $\mu\text{T}$ ) in the San Francisco Bay Area.<sup>9</sup> The traction motors on the BART cars operate at frequencies between 35 to 700 Hz, depending on car type, and can potentially emit EMF from all frequencies in this span. Background sources of EMF in this frequency range can include power transmission lines and electrical appliances, both operating at 60 Hz. Other background sources of EMF include antennas associated with cellular telephone towers and broadcast towers for radio and television. However, these sources of EMF operate at higher frequencies than 700 Hz and are therefore not considered in this study.

### (4) Sensitive Receptors for EMF

For the purposes of the EMF analysis, sensitive receptors are populations that may be exposed to EMF, including passengers waiting at the platform, passengers riding in BART or EMU cars, and the general population near the BART third rail or EMU catenary line. Individuals with cardiac pacemakers and similar electronic medical devices may be more sensitive to exposure to EMF. In addition to the potential impacts on people, certain sensitive equipment can be impacted by EMF. Sensitive equipment typically can be found at hospitals (e.g., MRI-scanners) and research universities (e.g., electron microscopes).

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<sup>9</sup> A magnetic field of 50  $\mu\text{T}$  was measured in the San Jose area for the Silicon Valley Rapid Transit Corridor report. Given the relative proximity between the study areas for the Silicon Valley Rapid Transit Corridor and the BART to Livermore Extension Project, the magnetic field is assumed to have roughly equal values in both areas.

Valley Transportation Authority, 2004. Silicon Valley Rapid Transit Corridor Draft EIS/EIR. Available at: <http://www.vta.org/sfc/servlet.shepherd/document/download/069A0000001EL1vIAG>, accessed May 2017.

Within the study area for EMF (within 1,000 feet of the collective footprint) there is one medical facility—the John Muir Health Urgent Care Center (5860 Owens Drive, Pleasanton).<sup>10</sup> This facility is approximately 800 feet south of the proposed rail line for the Proposed Project and DMU Alternative. Although not within the study area, the Sutter Health Palo Alto Medical Foundation (4000 and 4050 Dublin Boulevard, Dublin) is approximately 1,100 feet north of the collective footprint.

#### e. BART System Safety

System safety refers to the prevention of harmful incidents to riders, employees, or other members of the public near proposed operations, structures, or facilities associated with the Proposed Project and Build Alternatives. BART is responsible for ensuring that emergency plans, described in the Regulatory Framework subsection below, are in place to respond to a terrorist event within the BART system and is responsible for law-enforcement within its system, as well as coordination with other law enforcement agencies. Emergency plans outline procedures to ensure coordination with local jurisdictions in evacuating areas and notifying BART and emergency response personnel.

### 3. Regulatory Framework

The following section describes the federal, state, and local environmental laws and policies relevant to public health and safety, organized by topic below.

#### a. Hazardous Materials and Public Health

Various federal, state, and local agencies exercise regulatory authority over the safe use, generation, transport, and disposal of hazardous substances. The primary federal regulatory agency is the United States Environmental Protection Agency (EPA). The primary state agency with similar authority and responsibility is the California Environmental Protection Agency (Cal EPA), which may delegate enforcement authority to other local agencies with which it has agreements. Construction activities are also subject to the regulations noted below for soil and groundwater contamination.

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<sup>10</sup> The EMF Study Area is defined as 1,000 feet from the collective footprint. The California High Speed Rail (CHSR) uses a study area of 200 feet from the right-of-way (ROW) for health impacts from EMF and 500 feet from the ROW for electromagnetic interference impacts. A 1,000-foot study area is thus conservative as it captures a greater distance from the ROW than that employed in the CHSR Environmental Impact Report.

Source: California High-Speed Rail Authority, 2014. California High-Speed Train Project Environmental Impact Report/Environmental Impact Statement, Fresno to Bakersfield Section. Chapter 3.5 Electromagnetic Fields and Electromagnetic Interference. April. Available at: [http://www.hsr.ca.gov/docs/programs/fresno-baker-eir/final\\_ERIS\\_FresBaker\\_Vol\\_I\\_CH3\\_5\\_EMI\\_and\\_EMF.pdf](http://www.hsr.ca.gov/docs/programs/fresno-baker-eir/final_ERIS_FresBaker_Vol_I_CH3_5_EMI_and_EMF.pdf), accessed May 2017.

**(1) Federal Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act**

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also called the Superfund Act (42 United States Code Section 9601 et seq.), is intended to protect human health and the environment from sites contaminated with hazardous materials. Under CERCLA, the EPA has the authority to do the following: respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment; establish requirements concerning closed and abandoned hazardous waste sites; seek the parties responsible for hazardous materials releases; and ensure their cooperation in site remediation. CERCLA also provides federal funding (the Superfund) for the remediation of contaminated sites. The Superfund Amendments and Reauthorization Act of 1986 (SARA) amends some provisions of CERCLA and provides for a Community Right-to-Know Program, which is regulated in California under the more stringent Hazardous Materials Business Plan (HMBP) regulations.

Pursuant to CERCLA, the EPA maintains the NPL, which prioritizes sites warranting further investigation; such sites are identified for listing based on the EPA's hazard ranking system. As shown in Table 3.N-1, there are no active SEMS (formerly known as CERCLIS) or NPL sites within 0.5-mile of the Proposed Project and DMU Alternative footprints. However, there is a SEMS-Archive (formerly known as CERCLIS-No Further Remedial Action Planned) site located within 0.5-mile of the Express Bus/BRT Alternative footprint (Nuclepore Corp, located at 7035 Commerce Circle in Pleasanton) with no further remedial action planned status. A listing of an off-site location on the SEMS-Archive does not present a current contamination concern to the BART to Livermore Extension Project.

**(2) Federal Resource Conservation and Recovery Act and California's Hazardous Waste Regulations**

The Federal Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act (RCRA) of 1976 (40 Code of Federal Regulations [CFR] Parts 239 through 282) are the federal regulatory framework governing the generation, transportation, treatment, storage, and disposal of hazardous waste to ensure waste handling is controlled from the point of generation to its ultimate disposal. The EPA authorized the state to implement its more stringent hazardous waste regulations in lieu of RCRA. RCRA was amended in 1984 by the Hazardous and Solid Waste Amendments (40 CFR Part 260), which affirmed and extended the "cradle to grave" system of regulating hazardous wastes. A RCRA hazardous waste is a waste that appears on one of the four hazardous wastes lists (F-list, K-list, P-list, or U-list), or exhibits at least one of four characteristics—ignitability, corrosivity, reactivity, or toxicity.

Under RCRA, states may implement their own hazardous waste programs so long as they are at least as stringent as the federal RCRA requirements. California's DTSC administers and enforces the state's more stringent hazardous waste regulations under the Hazardous Waste Control Act of 1972 (HSC Division 20, Chapter 6.5). This law defines hazardous wastes and the procedures for the handling, transportation, and disposal of hazardous waste. The implementing regulations prescribe management practices for hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills. Hazardous waste is tracked from the point of generation to the point of disposal or treatment using hazardous waste manifests. The hazardous waste control program is administered by DTSC and by local Certified Unified Program Agencies (CUPAs). California's Hazardous Waste Regulations (22 CCR Sections 66260.1 et seq.) provide the regulatory requirements for the implementation of the law. Numerous federally registered hazardous waste generators were identified within 0.5-mile of the collective footprint (see RCRA-LQG and RCRA-SQ database listings in Table 3.N-1). Additionally, the HAZNET database identified hundreds of facilities that have generated and shipped hazardous waste under manifest (includes facilities that currently or formerly maintained state hazardous waste identification numbers) within 0.5-mile of the collective footprint. Of the listings related to registered hazardous waste generators, only one site was identified within the collective footprint—at the BART Park & Ride Lot (200 East Airway Boulevard, Livermore).

Operations of the Proposed Project and Build Alternatives that would entail use of hazardous waste (e.g., oily debris, equipment wash water, spent solvents) would be required to obtain a hazardous waste identification number and meet hazardous waste generator requirements.

**(3) Federal Accidental Release Prevention Program and California Accidental Release Prevention Program**

The Federal Risk Management Program (Clean Air Act Section 112(r)), the Federal Accidental Release Prevention Program (40 CFR 68) and the more stringent California Accidental Release Prevention Program (CalARP, 19 CCR Sections 2735 et seq.) require development of a Risk Management Plan if listed toxic or flammable substances (e.g., anhydrous ammonia, chlorine, ethane, formaldehyde, hydrogen, nitric acid, vinyl chloride) are stored in excess of substance-specific threshold quantities. The purpose of these programs is to prevent accidental releases of substances that could cause serious harm to the public and the environment and to minimize impacts from an accidental release. The EPA implements the federal Accidental Release Prevention program while local CUPAs, discussed below, implement the CalARP. Any business where the maximum quantity of a regulated substance exceeds the specified threshold must register with the county health department as a manager of regulated substances. Operations of the Proposed Project

and Build Alternatives that would entail use of hazardous materials (e.g., cleaners, solvents) that are listed regulated substances under the federal or state regulations would be subject to these requirements.

**(4) Federal Spill Prevention, Control, and Countermeasure Regulations and California's Aboveground Petroleum Storage Act**

The Oil Pollution Act of 1990 (33 United States Code [U.S.C.] section 2701-2761) amended the Clean Water Act and established a single uniform federal system of liability and compensation for damages caused by oil spills in navigable waters, defined as waters of the United States. The Federal Spill Prevention, Control, and Countermeasure (40 CFR 112) (SPCC) regulations were first published in 1973 and were amended in 1990, 2002, and 2009. These regulations require that a SPCC plan must be prepared for facilities with a total aboveground oil storage capacity greater than 1,320 gallons (applies to containers that are 55-gallon and larger) or a total underground oil storage capacity greater than 42,000 gallons and if, due to its location, the facility could reasonably be expected to discharge oil into or upon the "navigable waters" of the United States. The purpose of an SPCC plan is to prevent release of oil and contain discharges.

The California Aboveground Petroleum Storage Act (APSA) (19 CCR section 2620-2734) regulates aboveground storage tanks (defined as containers that have a capacity to store 55 gallons or more of petroleum product and that are substantially or totally above the surface of the ground). The APSA requires reporting of any spill or leak in excess of one barrel. The state implements this program through the Unified Program administered by the CUPAs, discussed further below. BART would be required to prepare and implement a SPCC plan and meet APSA notification filing requirements to comply with the regulatory requirements for any operational activities that entail use of oils (e.g., diesel fuel) stored in aboveground containers in quantities exceeding the SPCC and APSA filing thresholds (each 1,320 gallons).

**(5) Hazardous Materials Release Response Plans and Inventory Act of 1985/Business Plan Act**

The Hazardous Material Release Response Plans and Inventory Act, also known as the Business Plan Act, (HSC Division 20, Chapter 6.95, Sections 25500 et seq. and 19 CCR Sections 2729, et seq.) requires any business that handles a hazardous material or mixture containing a hazardous material in reportable quantities to establish and implement a HMBP that describes their facilities, inventories, emergency response plans, and training programs. Specifically, the regulations require facilities that store hazardous materials in excess of 500 pounds for a solid, 55 gallons for a liquid, or 200 cubic feet for a gas at standard temperature and pressure to submit HMBPs to the CUPA. The HMBP

includes general business information, a hazardous materials inventory, a training plan, and emergency/contingency response procedures.

BART would be required to establish and implement a HMBP for any operations that would entail use of hazardous materials (e.g., diesel fuel, cleaners, solvents) above reportable quantities.

**(6) Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)**

Senate Bill 1082 of 1993 (HSC Chapter 6.11) required the Secretary of the Cal EPA to establish a “unified hazardous waste and hazardous materials management” regulatory program (Unified Program) by January 1, 1996. Currently, there are 83 Certified Unified Program Agencies in California. All counties have been certified by the Secretary.

The following Unified Programs are administered within each CUPA’s geographic jurisdictional boundary: the Hazardous Materials Release Response Plan and Inventory Program (Business Plan), the CalARP, the hazardous waste generator and onsite hazardous waste treatment program (tiered permitting system), the Aboveground Storage Tank program (and its SPCCs), the underground storage tank program and the California Uniform Fire Code (UFC), and Hazardous Material Inventory Statement (HMIS). The Alameda County Department of Environmental Health coordinates and enforces the Unified Program within its jurisdiction, which includes the city of Dublin and unincorporated areas of Livermore and Pleasanton. In the cities of Livermore and Pleasanton, the Livermore-Pleasanton Fire Department is the CUPA, enforcing the Unified Program within its geographic boundary.

**(7) Alameda County Water District**

At sites where groundwater quality is threatened, the Alameda County Water District (ACWD) works with the San Francisco Bay Regional Water Quality Control Board (RWQCB) to oversee and provide guidelines for the investigation and cleanup of contaminated sites within the ACWD’s jurisdiction. The ACWD provides technical oversight of cleanup sites within their jurisdiction, and submits closure recommendations to the RWQCB when regulatory closure is anticipated. The RWQCB and the ACWD sign off on regulatory closure.

**(8) Federal Occupational Safety and Health Act and California Occupational Safety and Health Administration Standards**

Under the authority of the Occupational Safety and Health Act of 1970 (29 U.S.C. 651-678), the Occupational Safety and Health Administration (OSHA), a division of the Department of Labor, established health and safety standards for the workplace, including

the accidents and occupational injuries reporting requirements. Relevant regulations include those related to hazardous materials handling, communication of hazards to employers and employees, employee protection requirements, first aid, and fire protection, as well as material handling and storage.

The California Occupational Safety and Health Administration (Cal/OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal/OSHA standards are generally more stringent than federal regulations. Worker exposure to hazardous materials as well as contaminated soils, vapors, and groundwater may be subject to medical monitoring and personal protective equipment requirements that are established in Title 8 of the CCR. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). Workers must be provided with employee training and hazardous material exposure warnings, including safety data sheets for hazardous materials handled by the worker. The primary intent of these regulations is to protect workers, but compliance with some of these regulations also would reduce potential hazards to non-workers because required site monitoring, reporting, and other controls would be in place. Workers who are in direct contact with soil or groundwater containing hazardous levels of constituents are required to perform all activities in accordance with a site-specific health and safety plan.

### b. Airport Safety

Portions of the Proposed Project and Build Alternatives would be located in the vicinity of the Livermore Municipal Airport, which is depicted in Figure 3.N-2. Applicable airport policies and regulations are described below.

#### (1) Federal Aviation Administration Regulations Part 77 – Safe, Efficient Use, and Preservation of the Navigable Airspace

The Federal Aviation Administration (FAA) regulates aviation at regional, public, private, and military airports. The FAA has established baseline standards for determining what projects are subject to review and what constitutes an obstruction for navigable airspace in 14 CFR Part 77 (Part 77).<sup>11</sup> Part 77 establishes the following:

- Requirements to provide notice to the FAA of certain proposed construction, or the alteration of existing structures
- The standards used to determine obstructions to air navigation, and navigational and communication facilities

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<sup>11</sup> United States Government Publishing Office, 2016. Code of Federal Regulations: Part 77 - Safe, Efficient Use, and Preservation of the Navigable Airspace. December.

- The process for completing aeronautical studies of obstructions to air navigation or navigational facilities to determine the effect on the safe and efficient use of navigable airspace, air navigation facilities or equipment
- The process to petition the FAA for discretionary review of determinations, revisions, and extensions of determinations

Under Section 77.9 of Part 77, the FAA requires notice of construction or alteration for any of the following types of construction or alteration: (1) if a building is more than 200 feet above ground level; (2) any building penetrating an imaginary surface extending (a) outward and upward at 1 foot elevation for every 100 horizontal feet, over a horizontal distance of 20,000 feet, (b) at 1 foot of elevation for every 50 horizontal feet, over a horizontal distance of 10,000 feet, or (c) at 1 foot of elevation for every 25 horizontal feet, over a horizontal distance of 5,000 feet from the nearest point of a runway; or (3) vehicle clearances of roads (17 feet) and railroads (23 feet). Notification requirements under Section 77.9 include submittal of FAA Form 7460-1 (Notice of Proposed Construction or Alteration) to the FAA.

Based on the Form 7460-1 review, the FAA makes a determination whether or not a project would be an obstruction to navigation or navigational aids or facilities. Under Section 77.17 of Part 77, an object would be considered an obstruction or hazard to air navigation if: (1) it is greater than 499 above ground level; (2) it is 200 feet above ground level or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport; (3) a height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance; (4) a height within an en route obstacle clearance area, including turn and termination areas, of a Federal Airway or approved off-airway route, that would increase the minimum obstacle clearance altitude; or (5) the surface of a takeoff and landing area of an airport or any imaginary surface established under Section 77.19, 77.21, or 77.23 of Part 77.

Section 77.19 of Part 77 establishes thresholds for obstruction to air navigation—referred to as airport imaginary surfaces. Of these imaginary surfaces, Section 77.19(e), transitional surfaces are most relevant. Transitional surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 1 foot of elevation for every 7 feet horizontally from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline, which roughly corresponds to the Airport Protection Area (APA) boundaries established by the Alameda County Airport Land Use Commission (ALUC) and explained below.

Through the Form 7460-1 review process, the FAA makes one of three determinations as follows:

- Determination of Hazard to Air Navigation, which concludes that the proposed construction or alteration will exceed an obstruction standard and would have a substantial aeronautical impact.
- Determination of No Hazard to Air Navigation, which is issued when the aeronautical study concludes that the proposed construction or alteration will exceed an obstruction standard, but would not have a substantial aeronautical impact to air navigation. A Determination of No Hazard of Air Navigation may include a project to include conditional provisions of a determination, limitations necessary to minimize potential problems, such as the use of temporary construction equipment, supplemental notice requirements, and/or marking and lighting recommendations.
- Determination of No Hazard to Air Navigation when a project does not exceed any of the construction standards and would not be a hazard to air navigation.

## (2) Caltrans Airport Land Use Planning Handbook

The Caltrans Division of Aeronautics publishes the California Airport Land Use Planning Handbook (handbook) to provide compatibility planning guidance to ALUCs, their staffs and consultants, the counties and cities having jurisdiction over airport area land uses, and airport proprietors. The handbook includes guidance for ALUCs on establishing airport safety compatibility policies. The handbook is not binding, except as it may be adopted or incorporated by local governments. The handbook was most recently revised in October 2011. The Livermore ALUCP reflects the land use compatibility planning guidance set forth in the previous (2002) version of the Caltrans handbook.

The handbook provides examples of safety zones for different types of general aviation runways. As many as six safety zones are identified, depending on the size and activity level of the airport. The guidelines in the handbook are not intended to cover every type of scenario. Rather, they provide guidance for ALUCs as they adopt their own standards for the airports within their jurisdictions. The handbook quantifies the level of aviation risk within the zones ranging from a low likelihood of an accident in regular traffic patterns (Zone 6), to very high risk in the immediate runway protection area (Zone 1).<sup>12</sup>

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<sup>12</sup> California Department of Transportation, Division of Aeronautics, 2011. California Airport Land Use Planning Handbook. October. Available at: <http://dot.ca.gov/hq/planning/aeronaut/documents/alucp/AirportLandUsePlanningHandbook.pdf>.

**(3) Alameda County Airport Land Use Commission**

The State Aeronautics Act, Public Utilities Code Section 21670 et seq., provides for the establishment of airport land use commissions in counties with airports and requires that each ALUC develop a comprehensive ALUCP. The Livermore Municipal Airport ALUCP, adopted in August 2012 and discussed further below, contains policies that guide ALUC review of proposed local agency actions.

Once an ALUC has adopted an ALUCP, the authority and responsibility for enforcing its compatibility policies lie fully with the affected jurisdictions. For example, the city of Livermore is required to revise its general plan to be consistent with the Livermore Municipal Airport ALUCP (or adopt findings to override its requirements); the general plan is then subject to ALUC review (as are the other goals and policies established in the general plan). The ALUC also requests that project proponents for certain types of actions apply for review by the ALUC if action is planned within certain Airport Zones, as discussed further below.

Airspace protection policies rely upon regulation enacted by FAA and the state of California; ALUC policies are intended to help implement the federal and state regulations. The FAA has well-defined standards by which potential hazards to flight, especially airspace obstructions, can be assessed. However, the FAA has no authority to prevent the creation of such hazards; that authority rests with state and local officials. In addition, California airspace protection standards mostly mirror those of the FAA; the primary difference being that state law gives the California Department of Transportation, Division of Aeronautics and local agencies the authority to enforce the standards.

**(4) Livermore Municipal Airport Land Use Compatibility Plan**

**(a) Airport Zones**

The Livermore Municipal Airport ALUCP identifies a number of different zones around the Airport. These zones are identified to ensure that surrounding land uses are compatible with airport activities. The following zones are defined and described further below: Airport Influence Area, Airport Protection Area, and Airport Safety Zones. See Section 3.J, Noise and Vibration for a discussion of the noise impacts associated with the Livermore Municipal Airport.<sup>13</sup>

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<sup>13</sup> Alameda County Airport Land Use Commission, 2012. Livermore Executive Airport: Airport Land Use Compatibility Plan. August.

### Airport Influence Area

The Airport Influence Area (AIA) is the area in which current or future airport-related noise, overflight, safety, and/or airspace protection factors may significantly affect land uses or necessitate restrictions on those uses. In the AIA, the Alameda County ALUC is authorized to review local land use actions affecting the area, including adoption or amendments of general plans, specific plans, zoning ordinances, and building regulations. In addition, the ALUC asks project proponents for proposed residential developments (with five or more units), non-residential developments (of at least 20,000 square feet), utilities, and other uses to apply for review by the ALUC. To inform people about the potential for overflight annoyance the ALUCP also requires overflight notification or avigation easement and Buyer's Awareness Measures (i.e., sellers of land must disclose information regarding the property's proximity to the airport) to all residences within the AIA. For newly created residential properties within the AIA, the city of Livermore requires real estate disclosures to notify residents of the airport owner's right to use airspace (i.e., overflight notification), pursuant to the ALUCP and California law. The AIA for the Livermore Municipal Airport extends east from Tassajara Road/Santa Rita Road to North Livermore Avenue, and extends from Stanley Boulevard north past I-580. The AIA includes a large portion of the collective footprint (the majority of the I-580 Corridor Area, Isabel North Area, Isabel South Area, and much of the Cayetano Creek Area), as shown in Figure 3.N-2. The Dublin/Pleasanton Station Area and the Laughlin Road Area are not located within any airport zones.

State law provides that ALUCs, while required to be guided by the handbook, may develop height restrictions on buildings, specify use of land, and determine building standards, including soundproofing adjacent to airports within the AIA. The ALUC will also take into consideration the type of and location of proposed land uses apart from aircraft accident distribution patterns within the AIA, in order to minimize exposure to excessive noise and safety hazards within areas around the Livermore Municipal Airport to the extent that the areas are not already devoted to incompatible uses, and to safeguard against safety problems related to airport use.

### Airport Protection Area

The city of Livermore established the Airport Protection Area (APA) in 1991 to prevent the encroachment of incompatible land uses near the airport. The APA extends 5,000 feet beyond the runways to the north, south, and east, and 7,000 feet to the west (typically the takeoff direction). As shown in Figure 3.N-2, the APA includes the I-580 corridor from just west of Fallon Road/El Charro Road to east of Isabel Avenue, which includes portions of the collective footprint (a portion of I-580 Corridor Area, Isabel North Area, and Isabel South Area).

New residential land use designations, or the intensification of existing residential land uses, are prohibited within the APA. Nonresidential land uses may be allowed as long as they are consistent with ALUCP criteria. The ALUC determines whether plans or proposed projects within the APA are consistent with the compatibility criteria set forth in the ALUCP.

### Airport Safety Zones

The Airport Safety Zones, as established in the ALUCP, include seven safety zones identified by runway length and flight patterns, as shown in Figure 3.N-2. Where the risks associated with a particular land use are considered significant but tolerable, restrictions may be established to reduce the risk to an acceptable level. The zones represent the imaginary surfaces defined for the Airport in accordance with Federal Aviation Regulation (FAR) Part 77. Acceptable land uses generally require no limitations. Each of the zones also has acceptable open land requirements<sup>14</sup>.

- Zone 1, Runway Protection, and Zone 2, Inner Approach/Departure, represent the higher risk areas immediately surrounding the runways. The collective footprint would not be located in Zone 1 or 2.
- Zone 3, Inner Turning Zone, extends northeast from the runways to acknowledge potential risk associated with turn movements on landing or departure. A portion of the I-580 Corridor Area and the Isabel South Area are located within Zone 3. The ALUCP recommends that 30 percent of the land area within Zone 3 be open land. Transit-oriented uses (train stations, bus stations, etc.), roads, automobile parking areas, and open parking garages are permitted uses in this Zone.
- Zones 4 through 6 are lower risk zones. Zone 6, Traffic Pattern Zone, roughly corresponds to the APA boundaries. As shown in Figure 3.N-2, the collective footprint is not located in Zone 4 or Zone 5; however, the I-580 Corridor Area from west of Fallon Road/El Charro Road to east of Isabel Avenue, Isabel North Area, and Isabel South Area are within Zone 6. Transit-oriented uses, roads, automobile parking areas, open parking garages, storage of hazardous materials, and repair garages are permitted uses in these zones and are recommended to have at least 20 percent open land for zones 4 and 5, with no minimum recommended percentage of open land in Zone 6.
- Zone 7, Other Airport Enviro/Horizontal Surface/Outer Conical Surface, is the area between Zone 6 and the AIA boundaries, and prohibits hazards to flight, but allows residential uses, transit-oriented uses, roads, automobile parking areas, open parking garages, storage of hazardous materials, and repair garages are permitted uses in this Zone. There is no recommended minimum percent of open land in Zone 7.

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<sup>14</sup> Roads and automobile parking areas are considered acceptable as open land areas.

Where the risks of a particular land use are considered significant but tolerable, establishment of restrictions may reduce the risk to an acceptable level. Uses which are basically acceptable generally require no limitations. In addition, land uses within safety zones 2 through 5 should be clustered, to the greatest extent practical, to preserve open space.

### (b) ALUC Evaluation

A project must be evaluated for consistency with the ALUCP by the ALUC if it meets one of the following standards:

- Proposed redevelopment of a property which introduces a new land use within an AIA
- Increases the intensity or density of, or permitted by, an existing land use which the existing use is consistent with the local general plan and/or specific plan, but does not conform to the compatibility criteria set forth in this ALUCP
- Any obstruction reviewed by the FAA in accordance with FAR Part 77 that receives a finding other than "not a hazard to air navigation"
- Any other proposed land use action, as determined by the local planning agency, involving a question of compatibility with airport activities

FAA notification does not automatically trigger an airport compatibility review of a project by the ALUC, unless the general plan of the jurisdiction in which the project is located has not been deemed compatible with the ALUCP. Under most circumstances, when reviewing proposed structures that exceed the height criteria, the ALUC is expected to abide by the FAA's conclusions regarding marking and lighting requirements. However, situations may arise in which the ALUC, because of its particular knowledge of local airports and airspace, may reach a different conclusion than that of the FAA.

If a project meets one of these standards, the ALUC would conduct a consistency review. This process primarily considers the land use associated with a proposed project, in relation to its location within one of the respective safety zones listed above.

Upon determination that a consistency review must be completed, project sponsors are required to provide a number of items regarding including, but not limited to, the project's land use, relation to airport safety zones, component heights, general project description, and a copy of any environmental documents.

This consistency review examines if the proposed project does not contain characteristics likely to result in inconsistencies with the compatibility criteria set forth in the ALUCP, including airport safety zone compatibility. The ALUC Administrative Officer is authorized to make a finding of consistency, in writing, for such projects on behalf of the ALUC. However, if it is found that the proposed project may be inconsistent with the ALUCP, the ALUC Administrative Officer shall forward any such project to the ALUC for a consistency determination hearing.

The ALUC will make one of three determinations when reviewing a major land use project proposal:

- Find the project consistent with the ALUCP.
- Find the project consistent with the ALUCP, subject to compliance with such conditions as the ALUC may require. Any such conditions should be limited in scope and be described in a manner which allows compliance to be clearly assessed (e.g., the height of a structure).
- Find the project inconsistent with the ALUCP. In making a finding of inconsistency, the ALUC shall note the specific conflicts upon which its determination is based.

Once a project has been found consistent with the ALUCP, it need not be referred for review at subsequent stages of the planning process.

**(c) City of Livermore**

Local municipalities and the FAA work together to ensure that new structures do not degrade the safety and utility of navigable airspace surrounding airports. The local building department with jurisdictional authority to issue building permits is ultimately responsible for this task, but must coordinate with the FAA and Caltrans' aeronautical divisions as appropriate on aeronautical review and technical details.

The City of Livermore has a building height restriction of 40 feet, plus 15 feet for light poles for structures within the Livermore Municipal Airport APA and Zone 6, according to the Livermore Development Code 4.02.040 C.<sup>15</sup> This is independent of FAA evaluations for determining what constitutes an obstruction of navigable airspace in 14 CFR Part 77. To the extent that this restriction is applicable to BART through its incorporation in the APA, BART anticipates that it will be modified by the City of Livermore. While Livermore's height restriction is a relatively conservative restriction, depending on terrain differences and alignment with runway centerlines, it is possible that a proposed structure of 55 feet above ground level would constitute an obstruction and/or a hazard as defined by the FAA. Proposed construction that is lower than the civil airport imaginary surfaces shown in the ALUCP will likely not constitute an obstruction or hazard, but may constitute an obstruction or hazard depending on terrain differences and other factors. Deviation from the FAA's Part 77 standards does not necessarily mean that a safety hazard exists, only that encroaching objects must be evaluated by the FAA and that mitigation, such as marking or lighting, may be required if appropriate.

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<sup>15</sup> City of Livermore Development Code, Section 4.02.040 C.

### c. Wildland Fires

CCR Title 24, Part 9 (California Fire Code) sets forth building standards created by the California Building Standards Commission. These standards include fire service features, fire and smoke protection features, means of egress, and construction requirements that projects across the state must follow.

Within the California Fire Code, the Wildland-Urban Interface Code regulates the geographical areas identified by the State of California as fire hazard severity zones in accordance with the Public Resources Code, Sections 4201 through 4204, and the Government Code, Sections 51175 through 51189, or other areas designated by the enforcing agency to be at a significant risk from wildfires. The purpose of the code is to provide minimum standards to increase the ability of a building to resist the intrusion of flame or burning embers being projected by a vegetation fire and to contribute to a systematic reduction in conflagration losses through the use of performance and prescriptive requirements. Any BART facilities located within CAL FIRE's state or federal responsibility areas, and designated as moderate, high, or very high fire hazard severity zones would be subject to this code.

### d. Electromagnetic Radiation and Electromagnetic Fields

The field of EMR and EMF is developing and thus standards for exposure tend to be guidelines promulgated by individual agencies relating to specific EMF sources (such as electric transmission lines) and/or specific receptors (such as schools). At present, the only available EMF guidelines that apply to the Proposed Project and Build Alternatives are the 1998 International Commission of Non-Ionizing Radiation Protection (ICNIRP) Guidelines discussed below. However, other EMF guidelines are discussed in this section for background purposes only.

#### (1) International Commission of Non-Ionizing Radiation Protection

The ICNIRP developed a guideline in 1998 (ICNIRP 1998) for limiting exposure to time-varying electric, magnetic, and EMFs, up to 300 GHz.<sup>16</sup> The ICNIRP 1998 recommendations were the result of years of research.<sup>17, 18</sup> The guideline contains limit values for workers and for the general public. Because impacts of EMF are evaluated in

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<sup>16</sup> International Commission of Non-Ionizing Radiation Protection (ICNIRP), 1998. ICNIRP Guidelines For Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). Published in Health Physics 74 (4): 494-522, 1998. Available at: <http://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf>, accessed February 2017.

<sup>17</sup> References to studies that lead to the ICNIRP 1998 recommendation are embedded in the ICNIRP (1998) document.

<sup>18</sup> <http://www.who.int/peh-emf/en/>.

areas accessible to the public, or at distances from the train accessible to the general public, the ICNIRP 1998 limit values for the general public are used in this chapter.

For DC, there is only a reference value for magnetic fields and not for electric fields. This is because the only risk from an electric field at DC is electric shock, which is prevented by established electrical safety procedures. ICNIRP 1998 reference levels for magnetic fields and electric fields are shown in Figure 3.N-5, respectively. These reference levels are not to be exceeded at any time.

The reference levels for the general public are lower than the reference levels for workers as the limits account for special sensitivities of children, pregnant women, and people with medical implants.

## **(2) Federal Communications Commission**

The Federal Communications Commission provides guidelines for exposure to EMF at frequencies in the range of 300 kHz to 100 GHz.<sup>19</sup> However, because BART trains run on DC, and the frequency emitted from the traction motor regulation is significantly below 300 kHz, the Federal Communications Commission guidelines are not applicable to the Proposed Project or Alternatives.

## **(3) California Energy Commission**

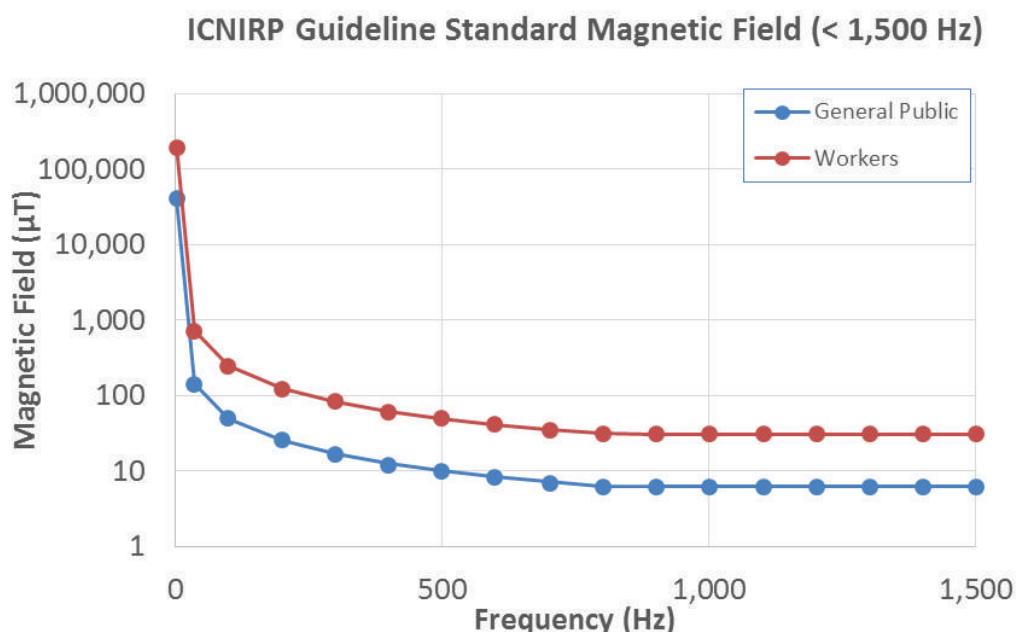
The California Energy Commission makes recommendations for limiting the electric fields for electric transmission lines at the edge of ROW.<sup>20</sup> However, they do not make a recommendation for limiting magnetic fields. These recommendations are not applicable to the Proposed Project or Alternatives because they do not involve electric transmission lines.

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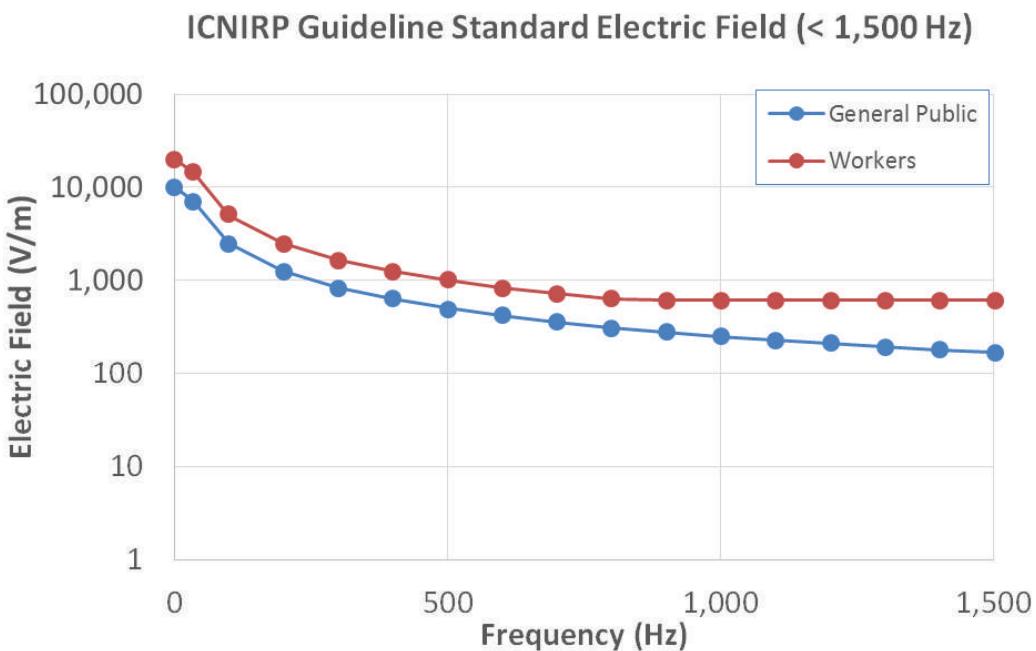
<sup>19</sup> Federal Communications Commission (FCC), 2017. Radio Frequency Safety. Available at: <https://www.fcc.gov/general/radio-frequency-safety-0>, accessed June 2017

<sup>20</sup> Peninsula Corridor Joint Powers Board, 2014. Peninsula Corridor Electrification Project EIR. Chapter 3.5: Electromagnetic Fields and Electromagnetic Interference. December. Available at: <http://www.caltrain.com/Assets/Caltrain+Modernization+Program/FEIR/3.5+EMF+EMI.pdf>, accessed: May 2017.

## Reference Levels for Magnetic Fields Below 3 kHz



## Reference Levels for Electric Fields



Source: International Commission of Non-Ionizing Radiation Protection (ICNIRP), 1998.

#### (4) American Conference of Governmental Industrial Hygienists

The American Conference of Governmental Industrial Hygienists (ACGIH) provides guidelines for worker exposure to EMF.<sup>21</sup> For normal healthy workers without special training the ceiling Threshold Limit Value (TLV-C) is 2 T (or 2,000,000 µT) for static magnetic fields.<sup>22</sup> For workers wearing medical devices the TLV-C is 0.5 mT (or 500 µT) for static magnetic fields. For magnetic fields in the range of 1 to 300 Hz, the TLV is 60,000/f µT, where f is the frequency expressed in hertz. For magnetic fields from 300 Hz to 30,000 Hz, the TLV is 200 µT. For workers wearing cardiac pacemakers at these low frequencies (1 to 30,000 Hz), it is recommended that exposure be maintained at or below 100 µT.

ACGIH also provides electric field TLVs for normal health workers. Up to 220 Hz, the TLV is 25,000 V/m. Between 220 Hz and 3,000 Hz, the TLV is given by  $5.525 \times 10^6/f$ , where f is the frequency expressed in hertz. For workers wearing cardiac pacemakers, it is recommended that exposure be maintained at or below 1,000 V/m. The TLVs for workers not wearing medical devices are higher than the ICNIRP reference levels. The recommended thresholds for workers wearing medical devices is more stringent than the ICNIRP reference levels and are considered in this analysis.

#### e. BART System Safety

##### (1) California Public Utilities Commission Regulations

The California Public Utilities Commission (PUC) has several regulations regarding rail transit. Most notable are 1) General Order (GO) 143-B Safety Rules Regulations Governing Light-Rail Transit, 2) GO 164-D Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems, and 3) GO 175-A Rules and Regulations Governing Roadway Worker Protection Provided by Rail Transit Agencies and Rail Fixed Guideway Systems. These regulations are summarized below.

California PUC GO 143-B establishes requirements regarding equipment on light-rail vehicles, brakes, lighting, construction, operating speeds, ROW standards, traction power, fire protection, operating rules, inspections, maintenance, and reporting and investigating hazardous conditions.<sup>23</sup>

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<sup>21</sup> American Conference of Governmental Industrial Hygienists (ACGIH), 2017. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. Electromagnetic Fields 0-300 GHz. Pages 139-141.

<sup>22</sup> The Threshold Limit Value - Ceiling (TLV-C) indicates an exposure limit that should not be exceeded even instantaneously.

<sup>23</sup> California Public Utilities Commission (CPUC), 1991. General Order 143-B: Safety Rules and Regulations Governing Light Rail Transit. May, Amended 1991.

California PUC GO 164 establishes a number of safety regulations required by BART, including requirements for System Safety Program Plans (SSPP), System Security Plans, Internal Safety and Security Audits, Hazard Management Processes, reporting accidents, investigating accidents, corrective action plans, at grade rail crossings, Safety Certification Plans, and Safety Certification Verification Reports.<sup>24</sup>

California PUC GO 175-A establishes minimum controls and limitations for employees performing work on and off tracks, protections for emergency response personnel, roadway worker protections, and near-miss reporting programs.<sup>25</sup>

## (2) Local Emergency Plans

Both Livermore and Pleasanton have local emergency plans adopted in 2005, titled Comprehensive Emergency Management Plans. These address the cities' respective responsibilities during emergencies associated with natural disasters, human-caused emergencies, and technological incidents. The plans provide a framework for coordination of response and recovery efforts within the cities in coordination with federal, state, and local agencies. In addition, the plans establish an emergency organization to direct and control operations during a period of emergency by assigning responsibilities to specific personnel. BART coordinates with these local jurisdictions in carrying out the plans and procedures outlined in their emergency plans.

## (3) BART's Emergency Plan

BART responds to accidents based on procedures set forth in the BART Emergency Plan. This plan establishes standard operating policies and procedures that would be implemented by BART and other public safety agencies during an emergency that may occur within the BART system. The BART System Safety Department is responsible for managing accidents and hazardous materials cleanup, and ensuring that emergency plans are in place to respond appropriately. The plan applies to all BART personnel and is also used by outside public agencies such as local police and fire departments. The plan addresses specific response procedures for a full range of foreseeable types of emergencies, including procedures for train fires; derailments; injuries or deaths on the ROW; ROW intrusions; earthquakes; high winds; flooding; gas leaks and toxic spills; bomb threats; explosions; and hostage situations. When an emergency occurs, the plan is implemented through BART's Operations Control Center, and supersedes all other plans, rules, and procedures that conflict with the plan.

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<sup>24</sup> California Public Utilities Commission (CPUC), 1996. Rules and Regulations Governing State Safety Oversight of Rail Fixed Guideway Systems. September, Amended 2007.

<sup>25</sup> California Public Utilities Commission (CPUC), 2016. Rules and Regulations Governing Roadway Worker Protection Provided By Rail Transit Agencies and Rail Fixed Guideway Systems. April.

BART also has a Terrorism Response Plan, which is maintained by the BART Police Department.

#### **(4) BART System Safety Regulations**

The BART System Safety Department is in charge of BART's safety program and ensures that safety procedures are implemented throughout the entire BART District. The BART System Safety Department developed the BART SSPP, which outlines safety goals and objectives and describes the procedures that BART follows to identify, reduce, and control hazards throughout the system. Potential hazards in the system can be caused by fires, broken equipment, and damaged software that could result in accidents to riders, employees, or other members of the public using or within the vicinity of the Proposed Project and Build Alternatives. BART's SSPP states that, "safety is the major consideration in all [BART] operations including planning, design, construction, testing, and maintenance of the rail transit system." The SSPP complies with the requirements of the California PUC General Order 164. The BART System Safety Department also evaluates the performance of the program and takes corrective measures to improve program implementation. In 2010 the PUC conducted a triennial review and confirmed that BART was in compliance with its SSPP.<sup>26</sup>

#### **(5) BART Facilities Standards**

The BART Facilities Standards set the standard specifications for construction of BART facilities. These specifications are the basic requirements governing the materials, equipment, and methods used in construction contracts administered by BART. These standards include 34 requirements ranging from building material requirements to required utilities for facilities. Of these standards, Division 21 – Fire Suppression and Division 28 – Electronic Safety and Security are the most relevant to BART system safety regulations. Division 21 sets forth requirements regarding the types of fire suppression devices and techniques that are required for the various BART facilities. Division 28 sets forth requirements for access-controlled doors and fire detection and alarm systems.

### **4. Impacts and Mitigation Measures**

This subsection lists the standards of significance used to assess impacts, discusses the methodology used in the analysis, summarizes the impacts, and then provides an in-depth analysis of the impacts with mitigation measures identified as appropriate.

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<sup>26</sup> California Public Utilities Commission (CPUC), 2010. Triennial Review of the San Francisco Bay Area Rapid Transit District (BART). August 19.

**a. Standards of Significance**

For the purposes of this EIR, impacts on public health and safety are considered significant if the Proposed Project or one of the Alternatives would result in any of the following:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and as a result, would create a significant hazard to the public or the environment
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25-mile of an existing or proposed school
- Impair implementation of or physically interfere with an adopted emergency response or emergency evacuation plan
- Be located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, and would result in a significant safety hazard for people residing or working in the project area
- Be located within the vicinity of a private airstrip, and result in a significant safety hazard for people residing or working in the project area
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands
- Result in EMF that exceeds significance levels for human health
- Result in EMF that causes interference with other electromagnetic systems
- Create a potential public or environmental health hazard; an undue potential risk for health-related accidents; or result in a safety hazard for people residing or working in the project area
- Physically interfere with an adopted emergency response or evacuation

**b. Impact Methodology**

The methodology used to evaluate the significance of public health and safety impacts is described below. The EMU Option would result in the same impacts as the DMU Alternative, and therefore the analysis and conclusions for the DMU Alternative also apply.

to the EMU Option, except where specifically noted in the analysis below. In these cases, the impacts associated with the EMU Option are described independently.

The analysis of the Enhanced Bus Alternative, which addresses the potential impacts of construction of the bus infrastructure improvements and operation of the bus routes at a programmatic level, would also apply to the bus improvements and feeder bus service under the Proposed Project and other Build Alternatives. Therefore, the analyses and conclusions for the Enhanced Bus Alternative also apply to the Proposed Project, DMU Alternative, and Express Bus/BRT Alternative, and are not repeated in the analysis of the Proposed Project and other Build Alternatives.

### **(1) Hazardous Materials and Public Health**

The hazardous materials and public health analysis focuses on a qualitative comparison of potential impacts to the public from hazardous materials or wastes. This analysis was based on searches of environmental databases on August 19, 2016; February 16, 2017; and May 2, 2017 for sites within a 0.5-mile radius of the collective footprint; general aerially deposited lead information obtained from website searches; sensitive receptor searches dated August 24 and 29, 2016 for sites within 1,000 feet of the collective footprint; and a field survey for sensitive receptors on August 25, 2016.

Property-specific environmental site assessments (e.g., Phase I environmental site assessment [ESA], Phase II ESA, site-specific historical review, targeted evaluation of migration of contamination from potential off-site sources) were not completed. Thus, the hazardous materials and public health analysis does not include other potential impacts (e.g., historical industrial site use, historical agricultural site use, migration of contamination from off-site sources).

### **(2) Electromagnetic Fields**

Unlike the Proposed Project and the EMU Option, which use electricity to power the train, the DMU Alternative would use self-propelled rail cars that use a diesel engine to generate their own power. Therefore, they would have no impacts to EMF. The Express Bus/BRT Alternative and the Enhanced Bus Alternative would not extend the BART rail system and therefore, would have no impacts. Therefore, the EMF analysis focuses on the Proposed Project and EMU Option.

BART cars run on 1,000 volts (V) on a third rail and the EMUs are assumed to run on a 600-V catenary system. Both use DC creating DC electric and magnetic fields. Traction motors used to move the BART cars and EMUs operate on AC power, thus also creating AC electric and magnetic fields. By 2025 (opening year for the Proposed Project or Alternatives), two types of BART cars are expected to be in operation: (1) Type-A cars (existing BART cars); and (2) the new Bombardier cars anticipated to be put into service by

2017. Type-A train traction motors operate in the range of 35 to 450 Hz while Bombardier train traction motors operate in the range of 450 to 700 Hz.<sup>27</sup>

The 1998 ICNIRP Guidelines are used as the thresholds for EMF impacts for human health, as shown in Table 3.N-5. Threshold values generally decline with an increase in frequency. For DC electricity (i.e., frequency less than 1 Hz), the threshold for magnetic fields is 40,000  $\mu\text{T}$  for the general public. Unlike other frequency ranges, for the frequency less than 1 Hz, there is no quantitative threshold value for the electric field for DC electricity. For AC electricity, the electric and magnetic field thresholds are functions of frequency as shown in Table 3.N-5.<sup>28</sup>

**TABLE 3.N-5 ICNIRP ELECTRIC AND MAGNETIC FIELD THRESHOLDS FOR GENERAL PUBLIC EXPOSURE**

Frequency Range	Electric Field Strength (V/m)	Magnetic Field Strength ( $\mu\text{T}$ )
Up to 1 Hz <sup>a</sup>	-	40,000
1 to 8 Hz	10,000	40,000/ $f^b$
8 to 25 Hz	10,000	5,000/ $f^b$
25 to 800 Hz	250,000/ $f^b$	5,000/ $f^b$
800 to 3,000 Hz	250,000/ $f^b$	6.25

Notes: Hz = hertz; V/m = volts per meter;  $\mu\text{T}$  = microtesla.

The thresholds shown here are for general public exposure. Adapted from Table 7 of ICNIRP 1998. Frequencies greater than 3,000 Hz are not shown here as they are not applicable to the BART to Livermore Extension Project.

<sup>a</sup> DC electricity corresponds to 0 Hz.

<sup>b</sup> f = frequency in Hz.

Source: ICNIRP, 1998.

The ACGIH recommendations for workers wearing medical devices are also used as thresholds, as shown in Table 3-N-6. ACGIH TLVs for workers not wearing medical devices are less stringent than ICNIRP reference levels, so the thresholds in Table 3.N-6 are conservative.

<sup>27</sup> Simply speaking, the DC electricity providing power to the train is converted to AC electricity for use by the traction motors.

<sup>28</sup> The ICNIRP Guidelines state that for electric fields for frequencies less than 1 Hz, spark discharges causing stress or annoyance should be avoided. This is not expected to occur at electric field strengths less than 25 kilovolt per meter.

**TABLE 3.N-6 ACGIH ELECTRIC AND MAGNETIC FIELD THRESHOLDS FOR WORKERS WEARING MEDICAL DEVICES**

Frequency Range	Electric Field Strength (V/m)	Magnetic Field Strength ( $\mu$ T)
Up to 1 Hz <sup>a</sup>	-	500
1 to 30 kHz	1,000 <sup>b</sup>	100

Notes: Hz = hertz; V/m = volts per meter;  $\mu$ T = microtesla.

The thresholds shown here are for exposure to workers wearing medical devices. Adapted from ACGIH (2017). Frequencies greater than 30 kHz are not shown here as they are not applicable to the BART to Livermore Extension Project.

<sup>a</sup> DC electricity and magnetic field corresponds to 0 Hz.

<sup>b</sup> Above 250 Hz, the ICNIRP limit values for the general public are more health protective compared to the ACGIH recommended value.

Source: ACGIH, 2017.

Measurements were made for both types of cars up to 1,500 Hz to cover these frequencies. The greatest EMF is expected when the cars are accelerating. Measurements on Type-A cars were conducted while the train was in service and loaded with passengers. Measurements on Bombardier cars were conducted while the train was fully loaded with sand bags to simulate a full passenger load. AC and DC electric and magnetic fields were measured at the locations described in Table 3.N-7 using an Aaronia NF-5035 spectrum analyzer (calibrated September 2016).

**TABLE 3.N-7 BART TRAIN MEASUREMENT LOCATIONS**

Location	Type-A Train	Bombardier Train
Adjacent to Moving Train	At MacArthur Station Platform	At Hayward Yard
Inside Train	On moving train between El Cerrito Plaza Station and MacArthur Station	At Hayward Yard
Under Moving Train	Under MacArthur Station Platform on 40 <sup>th</sup> Street	Not performed <sup>a</sup>

Note:

<sup>a</sup>The Bombardier trains are not in service currently, and thus a measurement from under a moving train was not possible.

Measurements were made where the public could be reasonably expected to be exposed to EMF from trains. These are conservative estimates as measurements were taken at publically accessible locations closest to sources of EMF. Measurements were also made inside the cars in motion. These measurements were taken from directly above the car's traction motors where EMF strength is the greatest. Traction motors control the

acceleration and speed of the car as it regulates the amount of power taken on from the direct current from the third rail. Measurements were also taken below a BART overpass for the Type-A Trains only as the Bombardier Trains are not currently in service. Based on measurements at the platform and inside train (Table 3.N-10), it is expected that the electric and magnetic field for the Bombardier Trains would be less than that measured for the Type-A Trains below the BART overpass.

EMF occurs at specific frequencies and therefore measurements of EMF need to be at those same frequencies. Because the frequencies used by some common sources of EMF such as cellular telephone towers and broadcast towers are much higher than those used on electric train systems, they do not impact the measurements taken and are not further discussed in this report. Also, while electric power lines emit EMF at 60 Hz (within the span for the traction motors on BART trains), interference with the measurements is not expected as measurements were not made directly under or adjacent to 60-Hz power lines.

All magnetic fields at DC are measured as relative values, not including the magnetic field from Earth itself. The measured value is the change in the magnetic field, in either negative or positive direction, created by the train. For example, if the magnetic field of the Earth is 50 µT and a change in the magnetic field of 9 µT is measured outside a train, the total magnetic field strength can be somewhere between a minimum of 41 µT (50 µT minus 9 µT) and a maximum of 59 µT (50 µT plus 9 µT), depending on the polarity (i.e., direction) of the magnetic field from the train at any particular location.

For the EMU Option, San Francisco Muni Metro N-Judah trains at Duboce Park were measured. While the exact type of EMU to be employed in the EMU Option has not been selected, the San Francisco Muni Metro train is a reasonable proxy as it is likely to be in a similar weight class as the EMU. Measurement locations are described in Table 3.N-8.

**TABLE 3.N-8 EMU TRAIN MEASUREMENT LOCATIONS**

<b>Location</b>	<b>EMU Train</b>
Adjacent to Moving Train	At station platform
Public Space Near Moving Train	33 feet from moving train at a public space
Inside Train	Not performed
Under Moving Train	Not performed

The EMU cars measured in this study run on a 600 V DC catenary system. Two EMU units were coupled together. The measurements were made on a platform (adjacent to the train, at ground level) and in a public space approximately 33 feet from the EMU ROW.

Measurements were not made inside the EMU, as measurement values would be strongly dependent on the exact type of EMU in service (i.e., low-floor, mid-floor or high-floor EMU). It is anticipated that EMF inside the EMU would be lower than that measured inside conventional BART trains due to the lighter weight of the EMU trains as lighter cars require less power to move the trains.

Electromagnetic interference can occur to sensitive equipment, such as magnetic resonance imaging systems typically used in hospitals. Thus, the threshold for electromagnetic interference used in this assessment is a magnetic field of 2 mG. A recent study of worst-case magnetic fields for the California High Speed Rail uses 2 mG as significance threshold.<sup>29, 30</sup> Electric fields are not expected to result in electromagnetic interference to sensitive equipment and this impact is not discussed further.

### **c. Summary of Impacts**

Table 3.N-9 summarizes the impacts of the Proposed Project and Alternatives described in the analysis below.

**TABLE 3.N-9 SUMMARY OF PUBLIC HEALTH AND SAFETY IMPACTS**

Impacts	Significance Determinations <sup>a</sup>				
	No Project Alternative	Conventional BART Project <sup>b</sup>	DMU Alternative (with EMU Option) <sup>b,c</sup>	Express Bus/BRT Alternative <sup>b</sup>	Enhanced Bus Alternative
<b>Construction</b>					
<b>Project Analysis</b>					
Impact PHS-1: Create a potential public or environmental health hazard; an undue potential risk for health-related accidents; or result in a safety hazard for people residing or working in the project area during construction	NI	LSM	LSM	LSM	LSM

<sup>29</sup> The basis for setting the significance threshold at 2 mG is roughly equivalent to the susceptibility level of an unshielded magnetic resonance imaging (MRI) machine. 2 mG is also a typical level emitted from household appliances.

<sup>30</sup> Turner Engineering Corporation, 2012. California High-Speed Train Project. EIR/EIS Assessment of CHST Alignment EMF Footprint. Prepared for California High-Speed Rail Authority. Available at: [www.hsr.ca.gov/docs/programs/eir\\_memos/Proj\\_Guidelines\\_TM300\\_07R00.pdf](http://www.hsr.ca.gov/docs/programs/eir_memos/Proj_Guidelines_TM300_07R00.pdf), accessed May 2017.

**TABLE 3.N-9 SUMMARY OF PUBLIC HEALTH AND SAFETY IMPACTS**

Impacts	Significance Determinations <sup>a</sup>				
	No Project Alternative	Conventional BART Project <sup>b</sup>	DMU Alternative (with EMU Option) <sup>b,c</sup>	Express Bus/BRT Alternative <sup>b</sup>	Enhanced Bus Alternative <sup>b</sup>
Impact PHS-2: Physically interfere with an adopted emergency response or evacuation plan during construction	NI	LSM	LSM	LSM	LS
<b>Cumulative Analysis</b>					
Impact PHS-3(CU): Create a potential public or environmental health hazard; an undue potential risk for health-related accidents; or result in a safety hazard for people residing or working in the project area during construction under Cumulative Conditions	NI	LS	LS	LS	LS
Impact PHS-4(CU): Physically interfere with an adopted emergency response or evacuation plan during construction under Cumulative Conditions	NI	LS	LS	LS	LS
<b>Operational</b>					
<b>Project Analysis</b>					
Impact PHS-5: Significant hazard created by routine transport, use, or disposal of hazardous materials or accidental release of hazardous materials	NI	LS	LS	LS	LS
Impact PHS-6: Located on a hazardous materials site pursuant to Government Code Section 35962.5	NI	LS	LS	LS	LS
Impact PHS-7: Emit hazardous emissions or handle hazardous materials within 0.25 miles of a school	NI	NI	NI	NI	NI

**TABLE 3.N-9 SUMMARY OF PUBLIC HEALTH AND SAFETY IMPACTS**

Impacts	Significance Determinations <sup>a</sup>				
	No Project Alternative	Conventional BART Project <sup>b</sup>	DMU Alternative (with EMU Option) <sup>b,c</sup>	Express Bus/BRT Alternative <sup>b</sup>	Enhanced Bus Alternative <sup>b</sup>
Impact PHS-8: Interfere with adopted emergency response and evacuation plans during operations	NI	LS	LS	LS	NI
Impact PHS-9: Located within an airport land use plan and result in a significant safety hazard	NI	LS	LS	NI	NI
Impact PHS-10: Located near a private airstrip and result in a significant safety hazard	NI	NI	NI	NI	NI
Impact PHS-11: Expose people or structures to wildland fires	NI	LS	LS	NI	NI
Impact PHS-12: Result in EMF that exceeds significant levels for human health	NI	LS	NI (LS)	NI	NI
Impact PHS-13: Result in EMF that can cause interference with existing electromagnetic systems	NI	LS	NI (LS)	NI	NI
<b>Cumulative Analysis</b>					
Impact PHS-14(CU): Significant hazard created by routine transport, use, or disposal of hazardous materials or accidental release of hazardous materials or be located on a hazardous materials site pursuant to Government Code Section 35962.5 under Cumulative Conditions	NI	LS	LS	LS	LS
Impact PHS-15(CU): Interfere with adopted emergency response and evacuation plans under Cumulative Conditions	NI	LS	LS	LS	LS

**TABLE 3.N-9 SUMMARY OF PUBLIC HEALTH AND SAFETY IMPACTS**

Impacts	Significance Determinations <sup>a</sup>				
	No Project Alternative	Conventional BART Project <sup>b</sup>	DMU Alternative (with EMU Option) <sup>b,c</sup>	Express Bus/BRT Alternative <sup>b</sup>	Enhanced Bus Alternative <sup>b</sup>
Impact PHS-16(CU): Located within an airport land use plan and result in a significant safety hazard under Cumulative Conditions	NI	LS	LS	NI	NI
Impact PHS-17(CU): Expose people or structures to wildland fires under Cumulative Conditions	NI	LS	LS	NI	NI
Impact PHS-18(CU): Result in EMF that exceeds significant levels for human health or causes interference with existing electromagnetic systems	NI	LS	NI (LS)	NI	NI

Notes: NI=No impact; LS=Less-than-Significant impact, no mitigation required; LSM=Less-than-Significant impact with mitigation.

DMU = diesel multiple unit; EMU = electrical multiple unit; BRT = bus rapid transit.

<sup>a</sup> All significance determinations listed in the table assume incorporation of applicable mitigation measures.

<sup>b</sup> The analysis of the Enhanced Bus Alternative also applies to the feeder bus service and bus improvements under the Proposed Project, DMU Alternative, and Express Bus/BRT Alternative, as described in the Impact Methodology subsection above.

<sup>c</sup> If EMU Option impacts differ from those of the DMU Alternative, they are indicated in parentheses.

#### d. Environmental Analysis

Impacts related to project construction are described below, followed by operations-related impacts.

##### (1) Construction Impacts

Potential impacts pertaining to project construction are described below, followed by cumulative construction impacts.

**(a) Construction – Project Analysis**

***Impact PHS-1: Create a potential public or environmental health hazard; an undue potential risk for health-related accidents; or result in a safety hazard for people residing or working in the project area during construction.***

**(No Project Alternative: NI; Conventional BART Project: LSM; DMU Alternative: LSM; Express Bus/BRT Alternative: LSM; Enhanced Bus Alternative: LSM)**

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with construction of the Proposed Project or any of the Build Alternatives. However, planned and programmed transportation improvements for segments of I-580, local roadways and intersections, and core transit service improvements for BART, Altamont Corridor Express, and the Livermore Amador Valley Transit Authority would be constructed. In addition, population and employment increases throughout Alameda County would result in continued land use development, including both residential and commercial. Construction of these improvements and development projects could create a potential health hazard during construction. However, the effects of the other projects associated with the No Project Alternative have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Director's decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impacts related to public or environmental health hazards, health-related accidents, or safety hazards. (NI)

**Conventional BART Project and Build Alternatives.** During construction of the Proposed Project or an alternative, there would be a potential for exposure to the public and workers from hazardous materials due to pre-existing site contamination and accidental spills/releases.

**Pre-existing Site Contamination.** As noted in the Environmental Database Search subsection above, based on a search of environmental databases, there are no known contamination concerns in the footprints of the Proposed Project, DMU Alternative, or Express Bus/BRT Alternative. However, there are potential and known areas of contamination within the broader study area. In addition, the bus infrastructure improvements for the Enhanced Bus Alternative, as well as for the Proposed Project and other Build Alternatives, are anticipated be located within existing street ROWs (e.g., excavation limited in depth and extent) and the presence of contamination at these locations is unknown at this time; however, the likelihood of encountering hazardous materials is expected to be low given their general locations and limited area of each excavation.

Also, aerially deposited lead may present a concern along areas of the footprints of the Proposed Project and Build Alternatives that are within or adjacent to highways. Soil excavation and dewatering may result in identification of contaminated soil and/or groundwater requiring hazardous waste management. If contamination within the project area is identified (e.g., impacts from past operations, migration of contamination from off-site sources), investigation and remedial activities could be required to minimize hazards to construction workers and residents in the project area, the public, and the environment. Therefore, exposure of the public or workers to pre-existing site contamination could be a significant impact.

**Accidental Spills or Releases during Construction.** Construction activities for the Proposed Project and Build Alternatives would involve the use of hazardous materials (e.g., diesel fuel, oils, hydraulic fluid, vehicle maintenance fluids) associated with vehicles and heavy equipment. These materials would be typical of those used during construction for similar types of construction projects. The public health impacts related to air contamination are discussed in Section 3.K, Air Quality.

Construction activities could create a potential public health or environmental hazard, or result in a safety hazard for workers and residents in the project area if hazardous materials are not appropriately handled, stored, transported, or disposed. While there are regulatory requirements in place to minimize potential releases of hazardous materials and wastes from accidental spills/releases, described in **Impact PHS-5** below, construction operations may not be regulated under certain requirements (e.g., HMBP, SPCC) that would otherwise reduce potential impacts because activities would be transient and lacking a fixed location. Therefore, the Proposed Project and Build Alternatives could result in potentially significant impacts to the public, environment, and construction workers and residents during construction from accidental spills/releases.

These potential impacts related to pre-existing site contamination and accidental spills/releases during construction would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measure PHS-1.A**, which requires preparation of a Phase I ESA and Phase II ESA (if necessary) to identify site-specific contamination; **Mitigation Measure PHS-1.B**, which requires preparation of a Soil Management Plan; **Mitigation Measure PHS-1.C**, which requires preparation of a hazardous materials and hazardous waste management plan; **Mitigation Measure PHS-1.D**, which provides procedures for construction equipment and vehicle fueling; and **Mitigation Measure PHS-1.E**, which requires an emergency response/contingency plan. (**LSM**)

**Mitigation Measures.** As described above, the Proposed Project and Build Alternatives would have potentially significant impacts to the public, the environment, and construction workers and residents in the project area. However, implementation of the

**Mitigation Measures PHS-1.A and PHS-1.B**, which address potential impacts due to pre-existing site contamination, and **Mitigation Measures PHS-1.C, PHS-1.D, and PHS-1.E**, which address accidental spills/releases, would reduce impacts to a less-than-significant level. Specifically, **Mitigation Measure PHS-1.A**, requires preparation of a Phase I ESA and Phase II ESA (if necessary) to identify site-specific contamination; **Mitigation Measure PHS-1.B**, requires preparation of a Soil Management Plan; **Mitigation Measure PHS-1.C**, requires preparation of a hazardous materials and hazardous waste management plan; **Mitigation Measure PHS-1.D**, provides procedures for construction equipment and vehicle fueling; and **Mitigation Measure PHS-1.E**, requires an emergency response/contingency plan.

**Mitigation Measure PHS-1.A: Prepare Phase I ESA and Phase II ESA, as Necessary (Conventional BART Project and Build Alternatives).**

BART shall prepare a site-specific Phase I ESA for the footprint of the adopted project. The Phase I ESA shall be prepared pursuant to the ASTM International's Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process E1527-13 (or the most current ASTM standard at the time the Phase I ESA is performed). Based on the results of the Phase I ESA, BART shall evaluate whether a Phase II ESA is necessary (i.e., subsurface investigation). As needed, BART shall prepare a Phase II ESA.

**Mitigation Measure PHS-1.B: Soil Management Plan (Conventional BART Project and Build Alternatives).**

Following implementation of **Mitigation Measure PHS-1.A** (preparation of a Phase I ESA and Phase II ESA, if necessary), and prior to construction, BART or its construction contractor shall develop a site-specific soil management plan based on the recommendations of the ESA(s). This plan shall include procedures for identification, investigation, excavation, characterization, and disposal of contaminated soil. The soil management plan shall outline handling, accumulation, and off-site disposal of contaminated soil that may be encountered during construction activities. The plan shall outline activities where appropriately trained workers are present (e.g., site preparation, grading, excavation) to monitor soil conditions. The soil management plan shall outline the professional qualifications of the appropriately trained workers to monitor and implement the plan.

During construction, BART or its contractor shall update the soil management plan, the documentation of locations where contaminated soil was encountered, sampling results, the extent of excavation and confirmatory sampling, and off-site disposal records. The soil management plan shall identify notification procedures to regulatory authorities for further assessment.

**Mitigation Measure PHS-1.C: Hazardous Materials and Hazardous Waste Management Plan (Conventional BART Project and Build Alternatives).**

BART or its construction contractor shall prepare and implement a hazardous materials and hazardous waste management plan prior to construction. Hazardous materials used and stored at staging areas and other construction areas shall be inventoried. Proper handling, storage, and disposal of the hazardous materials shall be documented, either through the maintenance of Safety Data Sheets or summaries of such information. Best management practices to prevent a release during storage shall be described (e.g., spill kits, secondary containment). This plan shall identify the types of hazardous wastes expected to be generated during routine construction activities and container management requirements. Workers shall receive training to implement this plan, including hazardous materials handling and waste management. Workers generating hazardous waste, their supervisors, and workers responsible for management of hazardous waste shall receive training appropriate for their role for hazardous waste container management (e.g., accumulation, labeling), spill prevention, and spill response. This plan shall include a procedure for off-site management of hazardous waste. BART shall be responsible for ensuring compliance with the above-described plan.

**Mitigation Measure PHS-1.D: Fueling Procedures during Construction (Conventional BART Project and Build Alternatives).**

BART or its construction contractor shall document procedures for fueling construction equipment and vehicles and ensure that BART employees and contractors are trained to implement these procedures. Procedures may require equipment to be refueled at a staging area, use of portable containers, fixed containers, or tanker trucks. The procedures shall require the use of fixed containment, where possible, and active containment (e.g., spill pans beneath fuel loading connections). Workers and their supervisors shall receive training to ensure that written procedures are understood and followed. A copy of the fueling procedure shall be affixed to portable and fixed fueling containers. BART shall be responsible for ensuring compliance with the above-described procedures.

**Mitigation Measure PHS-1.E: Emergency Response Plan during Construction (Conventional BART Project and Build Alternatives).**

BART or its construction contractor shall prepare an emergency response/contingency plan prior to construction. The plan shall be implemented by the construction contractor during construction and shall describe procedures to respond to releases of hazardous materials and waste. Similar to the hazardous materials and waste management plan, the emergency response/contingency plan shall describe

hazardous materials and waste handling procedures to minimize spills. At a minimum, this plan shall include procedures to safely respond to a release, emergency contact information, identification of and directions to the nearest medical facility with emergency care, and notification procedures to regulatory authorities in the event of a spill or release. Workers and their supervisors shall receive emergency response training. Copies of the emergency response/contingency plan shall be maintained in hard copy at specified locations for use in the event of an emergency. BART shall be responsible for ensuring compliance with the above-described plan.

***Impact PHS-2: Physically interfere with an adopted emergency response or evacuation plan during construction.***

**(No Project Alternative: NI; Conventional BART Project: LSM; DMU Alternative: LSM; Express Bus/BRT Alternative: LSM; Enhanced Bus Alternative: LS)**

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with construction of the Proposed Project or any of the Build Alternatives. However, construction of the planned and programmed transportation improvements and continued land use development, including construction of residential and commercial uses under the No Project Alternative could interfere with adopted emergency response or evacuation plan during construction. The effects of the other projects associated with the No Project Alternative have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impacts related to emergency response or evacuation plans. (NI)

**Conventional BART Project, DMU Alternative, and Express Bus/BRT Alternative.** Potential public safety impacts could result from construction traffic and activities along local roads if these activities impede the movement of emergency response vehicles and/or the evacuation routes of emergency and evacuation plans. The Proposed Project, DMU Alternative, and Express Bus/BRT Alternative would include construction along portions of I-580, relocating the westbound lanes to the north and eastbound lanes to the south. The Proposed Project and these alternatives would also require relocating some surface roads adjacent to I-580, as well as constructing BART and bus facilities. These construction operations would intermittently require lane and roadway closures, which could interrupt emergency response and affect evacuation routes. In addition, construction haul trips for moving excavated soils and construction materials could result in congestion to roadways, further affecting emergency vehicle response times.

Construction of the Proposed Project and these alternatives would be temporary and is anticipated to occur over approximately 5 years, in phases along the project corridor, as described in Chapter 2, Project Description.

Therefore, the Proposed Project, DMU Alternative, and Express Bus/BRT Alternative would have potentially significant impacts on adopted emergency response and evacuation plans during construction. This impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure TRAN-1** (see Section 3.B, Transportation), which requires the preparation and implementation of a construction phasing and traffic management plan. (LSM)

**Enhanced Bus Alternative.** Construction of the Enhanced Bus Alternative would occur within the existing street ROW, and would be coordinated and reviewed by the applicable city agencies. These activities would entail limited construction to install bus infrastructure including bus bulbs, bus shelters, and signage. This construction would occur at various locations along the bus routes and would not be anticipated to significantly impact emergency response or evacuation plans. In addition, construction of this alternative is temporary in nature and anticipated to occur over approximately 2 months. Therefore, the Enhanced Bus Alternative would result in less-than-significant impacts to local emergency response and evacuation plans during construction. (LS)

**Mitigation Measures.** As described above, the Proposed Project, DMU Alternative, and Express Bus/BRT Alternative would have potentially significant impacts to emergency response and evacuation plans. With implementation of **Mitigation Measure TRAN-1** (see Section 3.B, Transportation), potential impacts would be reduced to a less-than-significant level. This measure requires BART or its contractor to prepare and implement a construction phasing and traffic management plan, which will identify traffic operations and circulation procedures for each phase of construction. The plan would provide information on road closures and detours and would be coordinated with the cities of Dublin, Pleasanton, and Livermore, and Caltrans. The plan would also specify measures to allow access and alternate transportation routes for maintenance and emergency response vehicles in the event of roadway closures.

The Enhanced Bus Alternative would not have significant impacts; therefore, no mitigation measures are required for this alternative.

#### (b) Construction – Cumulative Analysis

The geographic study area for the cumulative construction impacts related to public health and safety is defined as a 1-mile radius around the footprints of the Proposed Project, DMU Alternative, and Express Bus/BRT Alternative. Further, cumulative projects described in Section 3.A, Introduction to Environmental Analysis and Appendix E, that

would have concurrent construction with the Proposed Project and Build Alternatives are considered in the analysis below.

***Impact PHS-3(CU): Create a potential public or environmental health hazard; an undue potential risk for health-related accidents; or result in a safety hazard for people residing or working in the project area during construction under Cumulative Conditions.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: LS)**

**No Project Alternative.** As described in **Impact PHS-1** above, the No Project Alternative would have no impacts related to health hazards, health-related accidents, or safety hazards during construction. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**

**Conventional BART Project and Build Alternatives.** Use of hazardous materials and wastes during construction activities associated with cumulative projects in combination with the Proposed Project and Build Alternatives could create a hazard to the public and the environment and a safety hazard for workers and residents in the project area if materials are not appropriately handled, stored, transported, or disposed.

However, as described in **Impact PHS-1** above, the Proposed Project and Build Alternatives would be required to implement **Mitigation Measures PHS-1.A** through **PHS-1.E**, which would require preparation of a Phase I ESA and Phase II ESA (as needed), a hazardous materials and hazardous waste management plan, require procedures for construction equipment and vehicle fueling, require an emergency response/contingency plan, and require the preparation of a soil management plan. With implementation of these measures and compliance with applicable federal, state, and local regulations, potential impacts of the Proposed Project and Build Alternatives due to hazardous materials would be minimized and/or avoided. Similarly, other cumulative projects would also be subject to compliance with federal, state, and local regulations and would prepare and implement plans to address risks. Therefore, the Proposed Project and Build Alternatives, in combination with past, present, and probable future projects, would have a less-than-significant impact related to health hazards, health-related accidents, or safety hazards during construction. **(LS)**

**Mitigation Measures.** As described above, the construction of the Proposed Project and Alternatives in combination with past, present, or probable future projects would not result in significant cumulative impacts related to health hazards, health-related accidents, or safety hazards during construction, and no additional mitigation measures, beyond those identified for the project impacts (Proposed Project and Build Alternatives) are required.

***Impact PHS-4(CU): Physically interfere with an adopted emergency response or evacuation plan during construction under Cumulative Conditions.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: LS)**

**No Project Alternative.** As described in **Impact PHS-2** above, the No Project Alternative would have no impacts related to adopted emergency response or evacuation plans during construction. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**

**Conventional BART Project and Build Alternatives.** Several of the cumulative projects could have concurrent construction schedules with the Proposed Project or alternatives including, the Dublin/Pleasanton Station BART Parking Expansion, Dublin Crossing Specific Plan, Kaiser Dublin Medical Center, Johnson Drive Economic Development Zone, Residences at California Center, ACEforward Program, Las Positas College, and the Recreation, and Trails Draft Master Plan. Specifically, under the Proposed Project and DMU Alternative, a portion of the Isabel Neighborhood Plan (INP) would be constructed concurrently.

Cumulative public safety impacts may result from construction traffic and activities of the Proposed Project or alternatives, and concurrent cumulative development along local roads. These impacts could impede the movement of emergency response vehicles and affect emergency and evacuation plans, routes, and access.

However, as described in **Impact PHS-2** above, the Proposed Project, DMU Alternative, and Express Bus Alternative would implement **Mitigation Measure TRAN-1**, which would require a construction phasing and traffic management plan that would reduce the potential for impacts by informing cities and emergency responders of road closures and detours. With the implementation of this mitigation measure, potential impacts to emergency response and evacuation plans from the Proposed Project and these alternatives would be minimized and/or avoided. On the other hand, the Enhanced Bus Alternative would have a very limited potential for interfering with emergency response and evacuation plans due to the minor amount of construction required and construction would be coordinated with local cities to ensure all local emergency response and evacuation plans are not impeded. In addition, it is anticipated that cumulative construction projects would be required to undergo their own environmental review and mitigate potential impacts to adopted emergency response or evacuation plans, if needed. Therefore, the Proposed Project and Build Alternatives, in combination with past, present, and probable future projects, would have a less-than-significant impact on adopted emergency response or evacuation plans during construction. **(LS)**

**Mitigation Measures.** As described above, the construction of the Proposed Project and Alternatives in combination with past, present, or probable future projects would not result in significant cumulative impacts related adopted emergency response and evacuation plans during construction, and no additional mitigation measures, beyond those identified for the project impacts (Proposed Project, DMU Alternative, and Express Bus/BRT Alternative) are required.

## (2) Operational Impacts

Potential impacts pertaining to project operations are described below, followed by cumulative operations impacts.

### (a) Operations – Project Analysis

*Impact PHS-5: Create a significant hazard to the public or the environment through routine transport, use, or disposal of hazardous materials; or reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.*

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: LS)**

This section describes hazardous materials and wastes that may be handled or generated during operations.

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, construction of the planned and programmed transportation improvements and continued land use development, including construction of residential and commercial uses under the No Project Alternative could involve the transport, use, or disposal of hazardous materials. The effects of the other projects associated with the No Project Alternative have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project is considered to have no impacts related to routine transport, use, disposal, or release of hazardous materials into the environment.  
**(NI)**

**Conventional BART Project and DMU Alternative.** Both the Conventional BART Project and DMU Alternative would result in an approximately 5.5-mile extension of rail service within the I-580 median, construct a new station near Isabel Avenue, and construct support facilities along the alignment and a storage and maintenance facility north of

I-580 in the Cayetano Creek Area. In addition, the DMU Alternative would also entail additional improvements at the Dublin/Pleasanton Station, including a DMU transfer platform.

For the majority of the operations-related activities such as maintenance and cleaning, small quantities of common hazardous materials (e.g., cleaning supplies and paint) would be routinely used. These materials would not be used in sufficient volumes to create risk to human or environmental health. However, some project components, such as the emergency generator at the proposed Isabel Station and at the storage and maintenance facility, as well as maintenance activities at the storage and maintenance facility would use hazardous materials and generate hazardous waste, typical of maintenance shops.

Hazardous material storage and use and generation of hazardous waste at the proposed storage and maintenance facility would be similar to existing BART maintenance shops. Typical hazardous materials that are anticipated to be used at the storage and maintenance facility are described below, for the various activities associated with the buildings in which they would occur. The type of container (e.g., UST, AST, drum, pail) and approximate maximum container size are listed in parentheses following each hazardous material and waste. The types of materials required for the operation of the Proposed Project and DMU Alternative would generally be similar; however, the Proposed Project would require greater volumes of materials due to the larger storage capacity at the storage and maintenance facility under the Proposed Project (172 BART cars) compared to the DMU Alternative (12 DMU cars).

- **Maintenance Building.** A variety of maintenance-related materials would be stored in or near the maintenance building, including hydraulic oils and lube/gear oils (55-gallon drums), propane (500 to 1,100-gallon cylinders or ASTs), and compressed welding gases (300-cubic foot cylinders) such as nitrogen, argon, acetylene, and oxygen. Minor quantities of solvents such as brake cleaners would be used (less than 20 gallons per year). Hazardous wastes routinely generated during maintenance activities include used oil, which would be collected in either an UST or an AST (approximately 1,000 to 2,200-gallon capacity), and oily rags/absorbent materials (collected in 55-gallon drums or smaller containers).
- **Train Operator Building/Yard Tower.** Lead-acid batteries (approximately three-gallon electrolyte volume in each battery) are stored in this area in association with backup power supply. Spent lead acid batteries may be occasionally generated.
- **Train Car Cleaning Building.** Washing activities would include the storage and use of a variety of hazardous materials: concentrated aluminum brightener (1,500 to 3,300-gallon AST), 20 percent sodium hydroxide solution (250 to 550-gallon AST), 40 percent sulfuric acid solution (200 to 440-gallon AST), carpet shampoo (55-gallon drum), aluminum sulfate (55-gallon drum), and heavy duty stripper (5-gallon pails).

- **Blowdown Building.** Heavy duty cleaner would be stored in 5-gallon or smaller containers in or near the blowdown build and blowdown sludge would be generated. The blowdown sludge would be pumped from the blowdown area for off-site management as hazardous waste. In addition, vehicle/equipment fueling would be conducted using two 12,000-gallon diesel fuel ASTs and additional lead acid batteries are associated with two electric-powered forklifts operated at the storage and maintenance facility.

Hazardous materials and wastes transported to and from the storage and maintenance facility would occur on public roads (Isabel Avenue and Campus Hill Drive, which pass through a residential area and Las Positas College) and on a new private access road from Campus Hill Drive to the facility.

BART will obtain required environmental permits and prepare and implement environmental plans, consistent with federal, state, and local requirements. At a minimum, the following will be obtained and implemented based on anticipated hazardous material storage and hazardous waste generation: 1) a Unified Program permit covering hazardous material handling, hazardous waste generation, APSA, and UST operation (if a UST is installed for used oil collection); 2) hazardous waste registration as either a small or large quantity generator to ensure cradle-to-grave tracking of hazardous waste shipments of hazardous waste generated at the storage and maintenance facility; 3) a HMBP, which includes a hazardous material inventory for all materials and wastes stored above regulatory thresholds, an employee training program, and an emergency/contingency plan to respond to incidental spills and accidental releases; 4) a SPCC plan and APSA filing (latter typically performed through completion of the HMBP) for safe handling and storage of oils and petroleum products (including equipping SPCC-subject containers with appropriate secondary containment to contain potential spills and releases) and responses to releases; and 5) if a UST is installed/operated, a UST Monitoring Plan to ensure that the UST system, including associated monitoring equipment, are routinely checked and serviced to prevent leaks.

BART's compliance with existing regulatory requirements would ensure that no significant hazard to the public or the environment would result from storage and handling of hazardous materials or management of waste. Thus, the operation of the Conventional BART Project and DMU Alternative would not create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials. Furthermore, a hazardous materials release resulting in a significant hazard to the public or the environment is not reasonably foreseeable. Therefore, the Conventional BART Project and DMU Alternative would have less-than-significant impacts related to the routine transport, use, disposal, or release of hazardous materials into the environment, and no mitigation measures are required. (LS)

**Express Bus/BRT Alternative and Enhanced Bus Alternative.** The Express Bus/BRT Alternative would construct new bus transfer platforms at the existing Dublin/Pleasanton Station within the I-580 median and new direct bus ramps from the I-580 express lanes to the platforms, parking at Dublin/Pleasanton Station and Laughlin Road, as well as some limited new bus infrastructure along new and proposed bus routes. The Enhanced Bus Alternative would only construct limited new bus infrastructure—such as bus bulbs, bus shelters, and signage—along new and proposed bus routes. Under these alternatives, large quantities of hazardous materials would not be permanently stored or used. While small quantities of common hazardous materials (e.g., paint and maintenance supplies) would be routinely used for maintenance and cleaning within the new facilities constructed under these alternatives, these materials would not be used in sufficient volumes to create a substantial risk of fire or explosion, or otherwise pose a substantial risk to human or environmental health. Thus, the operation of the Express Bus/BRT Alternative and Enhanced Bus Alternative would not create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials. Furthermore, a hazardous materials release resulting in a significant hazard to the public or the environment is not reasonably foreseeable. Therefore, the Express Bus/BRT Alternative and the Enhanced Bus Alternative would have less-than-significant impacts related to the routine transport, use, disposal, or release of hazardous materials into the environment, and no mitigation measures are required. (LS)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to the routine transport, use, disposal, or release of hazardous materials into the environment, and no mitigation measures are required.

***Impact PHS-6: Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: LS)**

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. The potential impacts of the planned and programmed transportation improvements and continued land use development that would occur under the No Project Alternative has been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as consequence of the BART Board of Directors decisions not to adopt a project. Therefore, the No Project Alternative is considered to have no impacts related to creating a significant hazard to the public or the environment. (NI)

**Conventional BART Project and Build Alternatives.** As described in the Hazardous Materials and Public Health subsection above, the database search did not identify any open case listings indicative of a contamination concern within the footprints of the Proposed Project, DMU Alternative, and Express Bus/BRT Alternative. In addition, the bus improvements under the Enhanced Bus Alternative, as well as for the Proposed Project and other Build Alternatives, are anticipated to be located within existing street ROWs and the likelihood of encountering hazardous materials is expected to be low. However, once the locations of the bus infrastructure improvements are determined, hazardous material sites lists would be reviewed to confirm that the physical locations are not identified on any open contamination-related listings, prior to construction (see **Mitigation Measure PHS-1.A** above). Therefore, the Proposed Project and Build Alternatives would result in less-than-significant impacts related to creating a hazard to the public or the environment. (LS)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to creating a hazard to the public or the environment, and no mitigation measures are required.

***Impact PHS-7: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25-mile of an existing or proposed school.***

**(No Project Alternative: NI; Conventional BART Project: NI; DMU Alternative: NI; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)**

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented, and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. The potential impacts of the planned and programmed transportation improvements and continued land use development that would occur under the No Project Alternative has been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impacts related to emitting hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within 0.25-mile of an existing or proposed school. (NI)

**Conventional BART Project and Build Alternatives.** As described in **Impact PHS-5** above, the Proposed Project and DMU Alternative would use and store limited supplies of hazardous materials and generate hazardous waste typical of a maintenance shop at the storage and maintenance facility. As described above, under the Proposed Project and DMU Alternative, the routine transport, use, disposal, or release of hazardous materials into the environment would have less-than-significant impacts. Furthermore, there are no

existing or proposed schools within 0.25-mile of the proposed storage and maintenance facility. The Express Bus/BRT Alternative and the Enhanced Bus Alternative would use common cleaning supplies and maintenance materials and would not use or store hazardous materials or generate hazardous waste in sufficient volumes to create risk to human or environmental health. Therefore, the Proposed Project and Build Alternatives would result in no impacts related to emitting hazardous emissions or handling hazardous materials within 0.25-mile of existing or proposed schools. (NI)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to emitting hazardous emissions or handling hazardous materials, and no mitigation measures are required.

***Impact PHS-8: Impair implementation of or physically interfere with an adopted emergency response or emergency evacuation plan during operations.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: NI)**

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, the planned and programmed transportation improvements and continued land use development, including residential and commercial uses under the No Project Alternative could impair implementation of or physically interfere with an adopted emergency response or emergency evacuation plan. The effects of the other projects associated with the No Project Alternative have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative would not result in new impacts related to emergency response or emergency evacuation plans during operations. (NI)

**Conventional BART Project and DMU Alternative.** The BART System Safety Department would be responsible for implementing emergency plans for the Proposed Project and DMU Alternative and would coordinate emergency plans with local jurisdictions, including the Comprehensive Emergency Management Plans of local jurisdictions. The Comprehensive Emergency Management Plans for each municipality typically put in place standard procedures to assist cities in emergency situations, such as mass evacuation, disaster recovery, and shelter-in-place events. The BART SSPP lists procedures for interagency coordination and participation with local response agencies in BART disaster exercises. BART coordinates with local response agencies, including ambulance services, the fire department, the police department, and the California Highway Patrol.

The Proposed Project and DMU Alternative would be designed to provide access for emergency response vehicles. Specifically, the proposed Isabel Station would be designed to enhance access and parking for emergency response vehicles. In addition, the storage and maintenance facility would be accessible via a new access road from Campus Hill Drive for use by BART employees and local emergency responders. The proposed BART alignment and Isabel Station would be located in the median of I-580 completely separate from roadways and no at-grade crossings are proposed as part of the Proposed Project. Therefore, the Proposed Project and DMU Alternative would have less-than-significant impacts on local emergency response and evacuation plans. (LS)

**Express Bus/BRT Alternative.** The Express Bus/BRT Alternative would not include any new stations; however, modifications would occur at the Dublin/Pleasanton Station for the bus transfer platforms and bus ramps from I-580, as well as parking at the Dublin/Pleasanton Station and Laughlin Road. These modifications would be designed to provide access for emergency response vehicles and would not impact emergency response vehicles or evacuation plans. Furthermore, the BART System Safety Department would coordinate with local jurisdictions in the development of its emergency plans. Therefore, the Express Bus/BRT Alternative would have less-than-significant impacts on local emergency response and evacuation plans. (LS)

**Enhanced Bus Alternative.** The Enhanced Bus Alternative would only result in new bus infrastructure improvements and bus routes. These bus improvements would be constructed in existing street ROW and would not require new or modified emergency response or evacuation plans. Therefore, the Enhanced Bus Alternative would have no impacts on local emergency response and evacuation plans. (NI)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to emergency response or emergency evacuation plans, and no mitigation measures are required.

***Impact PHS-9: Be located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, and result in a significant safety hazard for people residing or working in the project area.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS;  
Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)**

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, construction of the planned and programmed transportation improvements and continued land use development, including construction of residential and commercial uses under the No Project Alternative could be located within 2 miles of the Livermore

Municipal Airport and thus result in a significant safety hazard. The effects of the other projects associated with the No Project Alternative have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative would not result in new impacts related to airports and airport safety. (NI)

**Conventional BART Project and DMU Alternative.** Under both the Proposed Project and DMU Alternative, the proposed Isabel Station would be located within the I-580 median and would be approximately 62 feet high; the pedestrian overcrossings (to the north and south of I-580) would be approximately 57 feet high; and the Isabel Station parking garage for the Proposed Project (south of I-580) would be approximately 87 feet high.<sup>31</sup>

According to Section 77.9 of Part 77, the FAA requires notice of construction or alteration if any building penetrating an imaginary surface extending outward and upward at 1 foot of elevation for every 100 horizontal feet, over a distance of 20,000 feet. Under this regulation, a number of project components, including the parking garage in the Isabel South Area, Isabel Station, and both pedestrian overcrossings would penetrate this imaginary surface. As such, BART would be required to submit a Form 7460-1 (Notice of Proposed Construction or Alteration) to the FAA for a determination of whether or not the project would be an obstruction to air navigation or navigational aids or facilities through an aeronautical study.

Based on initial review of these regulations (CFR Part 77, Section 77.17, and Section 77.79[e]), it appears that the Proposed Project and DMU Alternative would not exceed the thresholds for a Determination of Hazard to Air Navigation. All structures would be less than 200 feet high, would not be located in a terminal obstacle clearance area, and would not penetrate the defined transitional surface.<sup>32</sup> Thus, the FAA is anticipated to issue a Determination of No Hazard, which would approve the project as is, or a Determination of No Hazard with Conditions, which would require additional conditions, such as lighting and markings on structures, for the Proposed Project or DMU Alternative.

Under the ALUCP, the following project areas and corresponding components are located in airport zones and Airport Safety Zones, and are shown in Figure 3.N-2:

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<sup>31</sup> The proposed parking structure for the DMU Alternative would be lower in height than the 87-foot high garage under the Proposed Project.

<sup>32</sup> Based on initial review, the transitional surface in the vicinity of the footprints of the Proposed Project and DMU Alternative at the Isabel Avenue area would range as follows: from a height of approximately 100 feet to 150 feet at the Isabel South Area (increasing in height from north to south) and from 120 to 90 feet at the Isabel North Area (decreasing in height from south to north).

- AIA: majority of I-580 Corridor Area from Tassajara Road to Portola Avenue, Isabel North Area, Isabel South Area, and Cayetano Creek Area, including the DMU Alternative's Storage and Maintenance Facility.
- APA: portions of the I-580 Corridor Area from Fallon Road to just past Isabel Avenue, Isabel North Area, and Isabel South Area.
- Zone 3: Isabel South Area.
- Zone 6: portions of the I-580 Corridor Area from Fallon Road to just past Isabel Avenue, Isabel North Area, and Isabel South Area.
- Zone 7: Cayetano Creek Area, including the DMU Alternative's storage and maintenance facility. (The storage and maintenance facility for the Proposed Project is located just outside of Zone 7.)

Because portions of the Proposed Project and DMU Alternative propose new land uses within the AIA, they would likely undergo a review of consistency by the ALUC. If such a review is required, BART will provide the following information to the ALUC including, but not limited to, the project's land use, relation to airport safety zones, component heights, general project description, and a copy of this EIR.

The ALUC would review the proposed land uses for compatibility with the Airport Safety Zones as noted below:

- The parking garage within the Isabel South Area would be reviewed for compliance with Zone 3's regulations. The garage located at the Isabel South Area would be a permitted use and would meet the 30 percent open land recommendation.
- The Isabel Station and pedestrian overcrossings would be reviewed for compliance with Zone 6 regulations. All proposed facilities under the Proposed Project and DMU Alternative within Zone 6 are permitted uses (train stations and transit-oriented development) and meet open land recommendations.
- The storage and maintenance facility under the DMU Alternative would be reviewed for compliance with Zone 7 regulations. All proposed facilities under the Proposed Project and DMU Alternative within Zone 7 are permitted uses (repair garages and storage facilities) and meet open land recommendations.

In addition, the ALUC would review compliance with Part 77. As stated above, both the Proposed Project and DMU Alternative are anticipated to receive a Determination of No Hazard or Determination of No Hazard, but subject to compliance with conditions, and thus are expected to be in compliance with Part 77.

Based on this criterion, it is anticipated that the Proposed Project and DMU Alternative would be found to be consistent with the ALUCP, or consistent with the ALUCP and subject to compliance with such conditions as the ALUC may require.

Based on this initial review of the proposed building heights and the building locations relative to the ALUCP and FAA regulations, the Proposed Project and DMU Alternative would not result in a safety hazard for people residing or working in the project area. Therefore, the Proposed Project and DMU Alternative would result in less-than-significant impacts related to airports and airport safety. (LS)

**Express Bus/BRT Alternative.** The majority of the proposed improvements under the Express Bus/BRT Alternative would be located within the Dublin/Pleasanton Station Area and the Laughlin Road Area, and the footprint of the Express Bus/BRT Alternative would not be located in areas subject to the Livermore Municipal Airport's ALUCP, with the exception of some bus infrastructure improvements (i.e., bus shelters, bus bulbs, and signage). In addition, none of the project components would be subject to review by the FAA under Part 77 and would not exceed the City of Livermore's 40 feet height limit. While minor bus improvements could be located within Livermore Municipal Airport zones, the improvements would be constructed within existing street ROW, and the heights of these improvements would not exceed the thresholds for review by the County ALUC. Therefore, the Express Bus/BRT Alternative would result in no impacts related to airports and airport safety. (NI)

**Enhanced Bus Alternative.** The Enhanced Bus Alternative would construct improvements within existing street ROW and the heights of these improvements would not exceed the thresholds for review by the FAA, County ALUC, or City of Livermore. Therefore, the Enhanced Bus Alternative would have no impacts related to airports and airport safety. (NI)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to airports and airport safety hazards, and no mitigation measures are required.

***Impact PHS-10: Be located within the vicinity of a private airstrip, and result in a significant safety hazard for people residing or working in the project area.***

**(No Project Alternative: NI; Conventional BART Project: NI; DMU Alternative: NI; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)**

**No Project Alternative.** The potential impacts of the planned and programmed transportation improvements and continued land use development that would occur under the No Project Alternative has been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project

Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative would not result in new impacts related to private airstrip safety hazards. (NI)

**Conventional BART Project and Build Alternatives.** There are no privately owned airports or airstrips within a 2-mile radius of the Proposed Project and Build Alternatives. Therefore, the Proposed Project and Build Alternatives would result in no impacts related to private airstrip safety hazards. (NI)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to private airstrip safety hazards, and no mitigation measures are required.

***Impact PHS-11: Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)**

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, construction of the planned and programmed transportation improvements and continued land use development, including construction of residential and commercial uses under the No Project Alternative could be located near areas of high fire severity. The effects of the other projects associated with the No Project Alternative have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative would not result in new impacts related to wildland fires. (NI)

**Conventional BART Project and DMU Alternative.** While most of the project corridor is developed with commercial, industrial, and residential uses, segments of the project corridor extend through undeveloped areas that have the potential for wildland fire hazards. The Proposed Project would not be located within zones designated as very high wildfire hazard potential, as shown in Figure 3.N-3.

According to CAL FIRE, portions of the Proposed Project and DMU Alternative would be located in areas of state responsibility designated as moderate and high fire severity:

- I-580 Corridor Area – Portions of the eastern I-580 Corridor Area are within moderate and high fire hazard potential zones, particularly the areas between Fallon Road/El Charro Road and Dolan Road
- Cayetano Creek Area – The storage and maintenance facility and tail track would be located in areas with moderate and high fire hazard potential

According to the USFS, the portions of the Proposed Project and DMU Alternative within local responsibility areas would be located in zones ranging from non-burnable to high wildfire potential hazard:

- Dublin/Pleasanton Station Area – Generally designated as non-burnable with a few areas of low wildfire hazard potential
- I-580 Corridor Area – The western portion of the corridor is generally designated as non-burnable, while areas along the eastern portion are designated low, moderate, and high wildfire hazard potential
- Isabel North Area – Primarily designated as low and moderate potential
- Isabel South Area – Primarily designated as low potential

Because a portion of the Proposed Project and DMU Alternative would extend through areas with either moderate or high fire hazard severity according to CAL FIRE, the Proposed Project and DMU Alternative would be required to comply with Division 21, Fire Suppression, and Division 28, Electronic Safety and Security, of the BART Facilities Standards. These standards require facilities to include fire-suppression standpipes, wet-pipe sprinkler systems, clean agent fire extinguishing systems, and alarm detection systems.<sup>33</sup> Further, prior to construction, the Proposed Project and DMU Alternative would require review for conformity with the Wildland-Urban Interface Code, as amended, and would require the storage and maintenance facility to conform with applicable building requirements of Chapter 7A of the California Building Code.<sup>34</sup> As required in Chapter 7A of the California Building Code and Divisions 21 and 28 of the BART Facility Standards, all BART facilities in wildland-urban interface areas must use development and site design practices that would help to prevent wildfire exposure. These include, but are not limited to, vegetation management, building materials, construction methods, roofing, vents, sprinkler systems, and fire detection and alarm systems. Also, as stated in **Impact CS-6** in Section 3.O, Community Services, while the Proposed Project and DMU Alternative would increase demand for fire and emergency medical services, they would not trigger the need

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<sup>33</sup> San Francisco Bay Area Rapid Transit District (BART), 2016. BART Facilities Standards, Standard Specifications, R3.0.3. January. Available at: [https://webapps.bart.gov/BFS/BFS\\_3\\_1\\_Spec/BFS\\_3\\_1\\_index.html](https://webapps.bart.gov/BFS/BFS_3_1_Spec/BFS_3_1_index.html).

<sup>34</sup> California Building Standards Commission, 2013. 2013 Building Code. Available at: <http://osfm.fire.ca.gov/codedevelopment/pdf/wildfire%20protection%20building%20construction/2013-Part-2-CBC-Ch7A.pdf>.

for additional fire facilities within the project corridor to maintain acceptable service ratios, response times, or other performance standards.

Therefore, for the reasons stated above, the Proposed Project and DMU Alternative would result in less-than-significant impacts related to wildland fires. (LS)

**Express Bus/BRT Alternative.** Under the Express Bus/BRT Alternative, facilities would be constructed in Dublin/Pleasanton Station Area and Laughlin Road Area. None of the components proposed under the Express Bus/BRT Alternative would be located within a state responsibility area. According to the USFS wildfire designations, the Dublin/Pleasanton Station Area and Laughlin Road Area are both designated as predominately non-burnable or low wildfire hazard potential zones. For these reasons, the Express Bus/BRT Alternative would not be subject to the Wildland-Urban Interface Code and Chapter 7A of the California Building Code. Regardless of proximity to fire hazard zones, all BART developments, including the Express Bus/BRT Alternative, are required to use the best development and site design practices identified by local fire departments along with Divisions 21 and 28 of the BART Facility Standards as required by BART. Because of its location away from any fire hazard zones and compliance with the BART Facility Standards, it is not foreseen that the Express Bus/BRT Alternative would expose people or structures to potential wildfire. Therefore, the Express Bus/BRT Alternative would have no impacts related to wildland fires. (NI)

**Enhanced Bus Alternative.** The Enhanced Bus Alternative would not include any additional BART facilities. The proposed bus infrastructure improvements under this alternative would be located within the existing street ROW, generally within local responsibility areas and non-burnable or low wildfire hazard potential zones according to both USFS and CAL FIRE. For this reason, the Enhanced Bus Alternative would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. Therefore, the Enhanced Bus Alternative would have no impacts related to wildland fires. (NI)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to wildland fire, and no mitigation measures are required.

***Impact PHS-12: Result in EMF that exceeds significance levels for human health.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: NI; EMU Option: LS; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)**

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives.

However, construction of the planned and programmed transportation improvements and continued land use development, including construction of residential and commercial uses under the No Project Alternative could potentially generate EMF. The effects of the other projects associated with the No Project Alternative have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative would not result in new impacts related to EMF. (NI)

**Conventional BART Project.** Table 3.N-10 shows the measured EMF values inside the BART car, on the platform, and at the underpass for both the existing Type-A cars and new Bombardier cars as compared to the ICNIRP and ACGIH limits. The measured value inside the train is higher than the measured value on the platform or at the underpass; this value is 155 µT and 11 µT for the Type-A train and Bombardier train, respectively. Furthermore, as shown in Table 3.N-10, the new Bombardier train has a weaker magnetic field compared to the existing Type-A trains.

All the measured values, for both the Type-A train and the Bombardier train, are substantially lower than either the ICNIRP or ACGIH limits. For example, the Type-A train's highest measured value of 155 µT (inside train) is well below the ICNIRP and ACHIG magnetic field thresholds (40,000 µT and 500 µT, respectively). Therefore, the Proposed Project would not emit EMF that exceeds significance levels for human health and impacts would be less than significant. No mitigation measures are required. (LS)

**DMU Alternative.** The DMU Alternative would not emit EMF as described in the Impact Methodology subsection above. Therefore, the DMU Alternative would have no impact related to EMF that exceeds significance levels for human health, and no mitigation measures are required. (NI)

**EMU Option.** Table 3.N-11 shows the measured values for the EMU trains. Measurements were made at a platform next to an EMU car and at approximately 33 feet away from the train ROW in a public space. The only measureable field was the DC magnetic field from the platform.

As shown in Table 3.N-11, the EMF from the EMUs are substantially below the ICNIRP and ACGIH limits. The magnetic and electric fields for the non-detectable measurements are negligible compared to ICNIRP and ACGIH limits. Therefore, the EMU Option would not emit EMF that exceeds significance levels for human health, and impacts would be less than significant. No mitigation measures are required. (LS)

**Express Bus/BRT Alternative and Enhanced Bus Alternative.** The Express Bus/BRT Alternative and Enhanced Bus Alternative would not emit EMF as described in the Impact Methodology subsection above. Therefore, the Express Bus/BRT Alternative and Enhanced

Bus Alternative would have no impact related to EMF that exceeds significance levels for human health, and no mitigation measures are required. (NI)

**TABLE 3.N-10 MEASURED EMF FOR BART TRAINS AND THRESHOLDS**

Measurement	Measured Values		Thresholds	
	Existing BART Train (Type-A Train)	New BART Train (Bombardier Train)	ICNIRP Limit Values	ACGIH Limit Values
<b>Inside Train</b>				
DC Magnetic Field	155 µT*	11 µT	40,000 µT	500 µT
AC Electric Field	45 V/m	D	167 V/m @ 1.5 kHz <sup>a</sup>	1,000 V/m
AC Magnetic Field	D	D	-- <sup>b</sup>	100 µT
<b>On Platform</b>				
DC Magnetic Field	35 µT	9 µT	40,000 µT	500 µT
AC Electric Field	40 V/m	D	2,500 V/m @ 100 Hz <sup>c</sup>	1,000 V/m
AC Magnetic Field	D	D	-- <sup>b</sup>	100 µT
<b>Underpass</b>				
DC Magnetic Field	37 µT	NM	40,000 µT	500 µT
AC Electric Field	ND	NM	-- <sup>b</sup>	1,000 V/m
AC Magnetic Field	ND	NM	-- <sup>b</sup>	100 µT

Notes:

\* = Very short peak value; -- = threshold dependent on measured value which was not measurable; Hz = hertz; V/m = volts per meter; µT = microtesla.

D = Detectable but not measurable. Detected on the Aaronia spectrum analyzer, but the contribution so small that it cannot be quantified (generally below 0.5 µT or 10 V/m relative to the background noise).

ND = Not detectable. Detection limit on the Aaronia spectrum analyzer is approximately 0.3 µT or 8 V/m relative to the background noise.

NM = Not measured.

<sup>a</sup> The maximum AC electric field is measured at 1.5 kHz among the entire range of frequencies measured inside the train. All frequencies up to 1.5 kHz were measured. The highest peak during the acceleration was at 1.5 kHz. Due to the low voltage, even at the highest peak value, the total sum of all contributing frequencies, will not get close to the limit values.

<sup>b</sup> Measureable values were not obtained (see note D). Thus, an ICNIRP Limit Value is not shown because the peak frequency has not been identified. Values are less than 0.5 µT (magnetic field) and 10 V/m (electric field), well below thresholds for frequencies below 1.5 kHz.

<sup>c</sup> The maximum AC electric field is measured at 100 Hz among the entire range of frequencies measured on the platform. All frequencies up to 1.5 kHz were measured. The highest peak during the acceleration was at 100 Hz. Due to the low voltage, even at the highest peak value, the total sum of all contributing frequencies, will not be close to the limit values.

Source: ACGIH, 2017; ICNIRPP, 1998.

**TABLE 3.N-11 MEASURED EMF FOR EMU TRAINS AND THRESHOLDS**

Measurement	EMU Platform	Measured Values		Thresholds	
		Public Space (at 33 Feet)	ICNIRP Limit Values	ACGIH Limit Values	
DC Magnetic Field	24 µT	ND	40,000 µT	500 µT	
AC Electric Field	ND	ND	-- <sup>a</sup>	1,000 V/m	
AC Magnetic Field	ND	ND	-- <sup>a</sup>	100 µT	

Notes: -- = threshold dependent on measured value which was not measurable. V/m = volts per meter; µT = microtesla.

ND = Not detectable. Detection limit on the Aaronia spectrum analyzer is approximately 0.3 µT or 8 V/m relative to the background noise.

<sup>a</sup> Measureable values were not obtained (see note ND). Thus, an ICNIRP Limit Value is not shown because the peak frequency has not been identified. Values are less than 0.3 µT (magnetic field) and 8 V/m (electric field), well below thresholds for frequencies below 1.5 kHz.

Source: ACGIH, 2017; ICNIRPP, 1998.

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to EMF that exceed significance levels for human health, and no mitigation measures are required.

***Impact PHS-13: Result in EMF that causes interference with other electromagnetic systems.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: NI; EMU Option: LS; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)**

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, construction of the planned and programmed transportation improvements and continued land use development, including construction of residential and commercial uses under the No Project Alternative could potentially generate EMF. The effects of the other projects associated with the No Project Alternative have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative would not result in new impacts related to EMF interference with other electromagnetic systems. (NI)

**Conventional BART Project.** For BART trains to influence sensitive equipment, such as at hospitals, the equipment must be in close proximity to the railway. A recent study of

worst case magnetic fields from electrified train systems, completed for the California High-Speed Rail (CHSR), showed that the magnetic field from an electrified track decreases to 2 mG at approximately 226 feet from the centerline of the ROW.<sup>35</sup> This estimate is very conservative when applied to the BART system for the following reasons: (1) the CHSR would operate at a much higher voltage (25 kV) than BART (1 kV); (2) CHSR cars are heavier than BART cars and would travel at higher speeds, thus requiring more electrical power compared to BART and resulting in higher magnetic fields; and (3) the CHSR would use a catenary system, which would have higher magnetic fields compared to the third-rail system used by BART. Therefore, areas approximately 226 feet or greater from the centerline of the Proposed Project are expected to be exposed to a magnetic field much lower than the threshold level of 2mG.

As described in the Sensitive Receptor for EMF subsection above, the closest existing medical facility to the footprint of the Proposed Project is the John Muir Health Urgent Care Center (5860 Owens Drive, Pleasanton), located approximately 800 feet to the south. This facility is greater than 226 feet from the footprint and thus the magnetic field from the Proposed Project would be below the threshold level (2 mG) at the facility. Therefore, the Proposed Project would not produce EMF that causes interference with other electromagnetic systems and impacts would be less than significant. No mitigation measures are required. (LS)

**DMU Alternative.** The DMU Alternative would not emit EMF as described in the Impact Methodology subsection above. Therefore, the DMU Alternative would have no impact related to EMF interference with other electromagnetic systems, and no mitigation measures are required. (NI)

**EMU Option.** As described in **Impact PHS-12** above, measurements for the EMU Option that were made approximately 33 feet from the EMU ROW did not detect any change in the magnetic field. At a minimum, any sensitive equipment would be located beyond the Caltrans I-580 ROW, at least 80 feet from the EMU tracks in the I-580 median.<sup>36</sup> At this distance (at least 80 feet from the EMU tracks), the EMU Option would not emit EMF that causes interference with other electromagnetic systems. Therefore, the EMU Option would not produce EMF that causes interference with other electromagnetic systems and impacts would be less than significant. No mitigation measures are required. (LS)

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<sup>35</sup> Turner Engineering Corporation, 2012. California High-Speed Train Project. EIR/EIS Assessment of CHST Alignment EMF Footprint. Prepared for California High-Speed Rail Authority. Available at: [www.hsr.ca.gov/docs/programs/eir\\_memos/Proj\\_Guidelines\\_TM300\\_07R00.pdf](http://www.hsr.ca.gov/docs/programs/eir_memos/Proj_Guidelines_TM300_07R00.pdf), accessed May 2017.

<sup>36</sup> This estimate is based on five 12-foot travel lanes and two 10-foot shoulders. See Chapter 2, Project Description for existing and proposed lane configuration.

**Express Bus/BRT Alternative and Enhanced Bus Alternative.** The Express Bus/BRT Alternative and Enhanced Bus Alternative would not emit EMF as described in the Impact Methodology subsection above. Therefore, the Express Bus/BRT Alternative and Enhanced Bus Alternative would have no impact related to EMF interference with other electromagnetic systems, and no mitigation measures are required. (NI)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to EMF that causes interference with other electromagnetic systems, and no mitigation measures are required.

**(b) Operations – Cumulative Analysis**

The geographic study area for the public health and safety cumulative analysis includes an area within an approximately 0.5-mile radius of the collective footprint.

As described in **Impacts PHS-6, PHS-7, and PHS-10** above, the Proposed Project and Build Alternatives would have no impacts related to hazardous material sites pursuant to Government Code Section 35962.5, emissions near schools, and safety hazards to private airstrips. Therefore, the Proposed Project and Build Alternatives would not contribute to these cumulative impacts during operations.

***Impact PHS-14(CU): Create a significant hazard to the public or the environment through routine transport, use, or disposal of hazardous materials; or reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment; or be located on a hazardous materials site pursuant to Government Code Section 35962.5 under Cumulative Conditions.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: LS)**

**No Project Alternative.** As described in **Impact PHS-5** above, the No Project Alternative would have no impacts associated with the routine transport, use, disposal, or release of hazardous materials into the environment during operations. Therefore, the No Project Alternative would not contribute to cumulative impacts. (NI)

**Conventional BART Project and Build Alternatives.** Cumulative projects with industrial uses, such as the Johnson Drive Economic Development Zone, Five Rivers Aviation, Oaks Business Park, Trammel Crow, and Gillig Bus Manufacturing could result in increased transport, use, and disposal of hazardous materials. In addition, the Proposed Project and Build Alternatives, particularly the Proposed Project and DMU Alternative, which would use hazardous materials such as diesel fuel, paints, solvents, adhesives, caulk, and oils at the storage and maintenance facility, could also contribute to increased transport, use, and disposal of hazardous materials.

As described in the Regulatory Framework subsection above, use of hazardous materials is subject to existing regulatory requirements that ensure the safe handling of hazardous materials and waste and reduce potential risks from releases of such hazardous materials. Specifically, federal and state regulations require preparation of a SPCC plan and APSA filing for safe handling and storage of oils and responses to releases, hazardous waste management for handling of hazardous waste, and risk management planning/CalARP preparation for handling and release prevention of certain hazardous substances. In addition, State regulations require any business that handles a hazardous material or mixture containing a hazardous material in reportable quantities to establish and implement a HMBP (HSC Division 20, Chapter 6.95, Sections 25500 et seq. and 19 CCR Sections 2729, et seq.) for emergency response to a release or threatened release of a hazardous material. Each of the cumulative projects, as well as the Proposed Project and Build Alternatives, would be subject to these regulatory requirements related to hazards and hazardous materials. In addition, there are no open case listings indicative of a contamination concern within the footprints of the Proposed Project and Build Alternatives. If any cumulative projects are located on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, they would be required to address the hazardous materials, if present. Therefore, the Proposed Project and Build Alternatives in combination with past, present, or probable future projects would result in less-than-significant cumulative impacts from routine transport, use, disposal, or release of hazardous materials into the environment, and no mitigation measures are required.

(LS)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives in combination with past, present, or probable future projects would not result in significant cumulative impacts related to the routine transport, use, disposal, or release of hazardous materials into the environment, and no mitigation measures are required.

***Impact PHS-15(CU): Impair implementation of or physically interfere with an adopted emergency response or emergency evacuation plan under Cumulative Conditions.***

***(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: LS)***

**No Project Alternative.** As described in Impact PHS-8 above, the No Project Alternative would have no impacts associated with the implementation of or physical interference with an adopted emergency response or emergency evacuation plan during operations. Therefore, the No Project Alternative would not contribute to cumulative impacts. (NI)

**Conventional BART Project and Build Alternatives.** The Proposed Project and Build Alternatives in combination with cumulative projects could interfere with emergency response or evacuation plans if designated emergency access routes or evacuation routes

are obstructed. However, under the Proposed Project and Build Alternatives, BART would develop its emergency plans in coordination with local emergency response agencies and would incorporate access for emergency response vehicles. As described in **Impact PHS-8**, all new BART facilities would be constructed consistent with the BART Facility Standards and the BART System Safety Department would be responsible for implementing emergency plans. Further, the design of the Proposed Project and Build Alternatives would be consistent with requirements to allow emergency vehicle access at the facilities.

Furthermore, the cumulative projects, including the INP, would be subject to review by local jurisdictions. As part of the development approval process, the cumulative projects including the INP, have completed or will undergo their own environmental review and any potential impacts related to adopted local emergency and evacuation plans would be addressed before they are implemented. Therefore, the Proposed Project and Build Alternatives in combination with past, present, or probable future projects would result in less-than-significant cumulative impacts related to local emergency response and evacuation plans, and no mitigation measures are required. (LS)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives in combination with past, present, or probable future projects would not result in significant cumulative impacts related to emergency response or emergency evacuation plans, and no mitigation measures are required.

***Impact PHS-16(CU): Be located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, and would result in a significant safety hazard for people residing or working in the project area under Cumulative Conditions.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)**

**No Project Alternative.** As described in **Impact PHS-9** above, the No Project Alternative would have no impacts associated with the Livermore Municipal Airport during operations. Therefore, the No Project Alternative would not contribute to cumulative impacts. (NI)

**Conventional BART Project and DMU Alternative.** The following proposed cumulative projects would be subject to FAA and ALUCP regulations: Fallon Gateway, The Shoppes, San Francisco Premium Outlets, Crosswinds Site, Sywest Site, Five Rivers Aviation, Chamberlin, Livermore Valley Charter School, Hyatt Hotel, Homes 2 Suites, Oaks Business Park, Trammel Crow, Gillig Bus Manufacturing, Las Positas College, Shea Homes – Sage Projects, and the INP. All listed cumulative projects within Livermore would also be subject to Livermore's 40 foot height requirement. These projects would cause a significant safety hazard if the Alameda County ALUC determined that they were inconsistent with the

ALUCP, if the FAA determined that they could disturb navigable airspace, or if they violated Livermore's 40 feet height requirement.

Each of these cumulative projects would be required to adhere to all applicable ALUCP, FAA, and local regulations, including height restrictions or incompatible land uses. Any projects deemed appropriate for review by the ALUC or FAA and found to cause a hazard would be required to make modifications to come into compliance with applicable regulations.

Elements of the INP would most likely exceed the City of Livermore's height limit of 40 feet for buildings within the APA according to the City of Livermore's Development Code, Section 4.02.040.C.<sup>37</sup> Therefore, the INP would require an amendment to Livermore Development Code 4.02.040.C to allow for the heights proposed in the plan. In addition, the APA currently restricts the encroachment of residential land uses into the area, which would conflict with the INP's plans to rezone a number of parcels for residential use. To address this, the City of Livermore proposes to revise the area of the INP located within the APA to allow the development of residential units by creating an overlay in the northeast corner of the APA. This overlay would allow for the development of residential uses with conditions aimed at increasing resident awareness, consistent with the ALUCP. The City of Livermore would also be required to comply with FAA Part 77 height criteria for all new development.<sup>38</sup>

As described in **Impact PHS-9** above, components of the Proposed Project and DMU Alternative would be required to be reviewed by both the ALUC and FAA. Based on an initial assessment described above, the Proposed Project and DMU Alternative would likely be consistent with the ALUCP and are not likely to result in a hazard to air navigation under the standards set forth in FAA Regulations Part 77.

As both the Proposed Project and DMU Alternative would not likely result in a hazard to navigable airspace, and each cumulative project would be required to follow applicable ALUCP and FAA regulations, potential for cumulative safety impacts would be reduced. Therefore, the Proposed Project and DMU Alternative, in combination with past, present, and probable future development would have less-than-significant cumulative impacts related to airports and airport safety. (LS)

**Express Bus/BRT Alternative and Enhanced Bus Alternative.** As described in **Impact PHS-9** above, the Express Bus/BRT Alternative and Enhanced Bus Alternative would have no impacts related to airports and airport safety, and therefore, would not contribute to potential cumulative impacts. (NI)

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<sup>37</sup> City of Livermore, 2016. Isabel Neighborhood Plan.

<sup>38</sup> Ibid.

**Mitigation Measures.** As described above, the Proposed Project and Alternatives in combination with past, present, or probable future projects would not result in significant cumulative impacts related to airport safety hazards, and no mitigation measures are required.

***Impact PHS-17(CU): Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands under Cumulative Conditions.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)**

**No Project Alternative.** As described in **Impact PHS-11** above, the No Project Alternative would have no impacts associated with wildland fires during operations. Therefore, the No Project Alternative would not contribute to cumulative impacts. (NI)

**Conventional BART Project and DMU Alternative.** The majority of the cumulative projects would be located in areas of local responsibility and are therefore not subject to the Wildland-Urban Interface Code according to CAL FIRE. These projects would be located in non-burnable or low wildfire hazard potential zones. However, some cumulative projects are located within areas of State or federal responsibility and would be required to adhere to the Wildland-Urban Interface Code. Such projects include Fallon Gateway, San Francisco Premium Outlets, Crosswinds Site, and the Sywest Site; the area around these projects is designated as high wildfire hazard potential zones according to the USFS.

All cumulative projects would be subject to applicable state and local regulations, which would address potential wildland fire hazards by requiring fire extinguishers, creating fire lane markings, requiring fire protection system maintenance, fire hydrant maintenance, National Fire Protection Association placarding, and standby generator maintenance, and thus would reduce potential impacts.

As discussed above in **Impact PHS-11**, components of the Proposed Project and DMU Alternative would be located in areas of moderate and high wildfire hazard potential according to CAL FIRE and thus would be subject to BART Facilities Standards and the regulations set by the Wildland-Urban Interface Code. As stated in **Impact PHS-11**, no facilities under the Proposed Project and DMU Alternative would be located within very high wildfire hazard potential zones.

Each of the cumulative projects and the Proposed Project and DMU Alternative would address wildland fire risk as required by the State and local jurisdictions. Because of the localized nature of potential impacts, it is not anticipated that the impacts would combine with the potential impacts of the Proposed Project or Build Alternatives. Therefore, the

Proposed Project and DMU Alternative, in combination with past, present, and probable future development would have less-than-significant cumulative impacts related to exposing people or structures to a significant risk of loss, injury, or death involving wildfire. (LS)

**Express Bus/BRT Alternative and Enhanced Bus Alternative.** As stated in **Impact PHS-11**, the Express Bus/BRT Alternative and Enhanced Bus Alternative would have no impacts related to exposing people or structures to a significant risk of loss, injury, or death involving wildfire because all of their components are located within non-burnable and low wildfire hazard potential zones. Therefore, the No Project Alternative would not contribute to cumulative impacts. (NI)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives in combination with past, present, or probable future projects would not result in significant cumulative impacts related to wildland fire, and no mitigation measures are required.

***Impact PHS-18(CU): Result in EMF that exceeds significance levels for human health or result in EMF that causes interference with other electromagnetic systems under Cumulative Conditions.***

**(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)**

**No Project Alternative.** As described in **Impacts PHS-12 and PHS-13** above, the No Project Alternative would have no impacts associated with EMF. Therefore, the No Project Alternative would not contribute to cumulative impacts. (NI)

**Conventional BART Project and EMU Option.** As discussed in **Impact PHS-12** above, the Proposed Project and EMU Option would emit EMF at levels substantially below the threshold limits for human health. Furthermore, it is unlikely that the cumulative projects would emit EMF; however, they are required to undergo their own environmental review and approval process and would address any potential EMF impacts through that process. It is possible for EMF impacts from the Proposed Project and cumulative projects to be additive if emitted at the same frequency. However, it is not anticipated that other cumulative projects listed in Section 3.A, Introduction to Environmental Analysis and Appendix E, will have significant sources of EMF.

The Kaiser Dublin Medical Center is currently under construction and the closest medical facility to the footprint of the Proposed Project (Medical Office Building 2) would be within

approximately 250 feet.<sup>39</sup> As described in **Impact PHS-13** above, at a distance of approximately 226 feet from the Proposed Project, the magnetic field from the Proposed Project would be less than 2 mG, which is the threshold level for impacts to medical equipment. Therefore, the magnetic field from the Proposed Project at the closest Kaiser Dublin Medical Center building would be below the threshold level.

Also as described in **Impact PHS-13**, the EMU Option would not cause interference with other electromagnetic systems such as equipment within medical facilities because these facilities would be located beyond the Caltrans I-580 ROW. At this distance, at least 80 feet from the EMU tracks in the I-580 median, no EMF is detectable.

Therefore, the Proposed Project and EMU Option, in combination with past, present, and probable future development would have less-than-significant cumulative impacts related to EMF that exceeds significance levels for human health or causes interference with other electromagnetic systems. (LS)

**DMU Alternative, Express Bus/BRT Alternative, and Enhanced Bus Alternative.** As described in **Impacts PHS-12 and PHS-13** above, the DMU Alternative, Express Bus/BRT Alternative, and Enhanced Bus Alternative would have no impacts associated with EMF. Therefore, these alternatives would not contribute to cumulative impacts. (NI)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives in combination with past, present, or probable future projects would not result in significant cumulative impacts related to EMF that exceeds significance levels for human health or causes interference with other electromagnetic systems, and no mitigation measures are required.

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<sup>39</sup> City of Dublin, 2016. Draft Environmental Impact Report for Kaiser Dublin Medical Center Project. January 28. Available at: <http://dublinca.gov/DocumentCenter/View/12964>, accessed May 2017.

