4.8 TRANSPORTATION AND CIRCULATION

This section describes the existing roadway network, transportation facilities, and transportation and circulation conditions in the vicinity of Miller/Knox Regional Shoreline (Miller/Knox or park); presents the applicable federal, state, and local regulations and policies related to transportation and circulation; and evaluates the potential impacts from implementation of the Miller/Knox Land Use Plan Amendment (LUPA) on transportation and circulation in the area.

Scoping comments received related to transportation and circulation expressed concern related to access to, and connectivity between Miller/Knox and the existing and proposed residential developments surrounding Miller/Knox; bicycle and pedestrian safety within Miller/Knox and on public roadways adjacent to Miller/Knox; the potential impacts the proposed LUPA could have on roadway and intersection operating conditions in the vicinity of Miller/Knox; and the potential for LUPA-generated increases in vehicle miles traveled (VMT).

4.8.1 Environmental Setting

INTERSECTIONS IN THE VICINITY OF MILLER/KNOX

Intersections in the vicinity of Miller/Knox evaluated herein were defined based on the location of the primary generator of potential new trips associated with the proposed LUPA such as the recreational programs and storage building within the Bray Planning Area. Other proposed facility enhancements would serve existing uses of the park without substantial change to facility capacity for type or amount of use. Exhibit 4.8-1 shows these intersections in the vicinity of Miller/Knox.

REGIONAL AND LOCAL ROADWAY SYSTEM

Interstate 580 (I-580) provides the primary regional access to Miller/Knox, while direct local access is provided via Brickyard Cove Road and Dornan Drive. These and other roadways in the vicinity of Miller/Knox are described below.

Interstate 580 (I-580) is an east-west six-lane freeway which connects to Interstate 80 (I-80) and US 101 in Marin County, via the Richmond-San Rafael Bridge. Primary access to Miller/Knox from I-580 is provided via interchanges at Canal Boulevard and Castro/Marine Street. I-580 has an average annual daily traffic (AADT) volume of approximately 69,000 vehicles (Caltrans 2016) between the Castro/Marine Street and Canal Street Interchanges.

Brickyard Cove Road is a two-lane east-west roadway that connects Seacliff Drive in the east and Dornan Drive in the west. East of Miller/Knox, Brickyard Cove Road includes a landscaped median with left-turn pockets at most intersections and driveways. A multi-use trail is located along the north side of Brickyard Cove Road within Miller/Knox, except for one small portion of the trail located on the southern portion of the road in the southwestern corner of Miller/Knox. The posted speed limit is 25 miles per hour (mph).

Dornan Drive is a two-lane north-south roadway within Miller/Knox that connects Brickyard Cove Road to the south and the Point Richmond Tunnel to the north. North of the Point Richmond Tunnel, Dornan Drive continues as South Garrard Boulevard. The posted speed limit is 35 mph.

Seacliff Drive is a two-lane southwest-northeast roadway located between Brickyard Cove Road and Canal Boulevard. The majority of the roadway includes a landscaped median with left-turn breaks and/or pockets at intersections and driveways. A multi-use trail is located along the northern side of the street and the posted speed limit is 25 mph.
Exhibit 4.8-1: Intersections in the Vicinity of Miller/Knox
Canal Boulevard is a north-south roadway located between the Port of Richmond in the south and I-580. Canal Boulevard provides one travel lane in each direction south of Seacliff Drive and two travel lanes in each direction north of Seacliff Drive. Canal Boulevard includes Class II bicycle lanes north of Seacliff Drive, and a Class I bicycle path that runs parallel to the west side of the roadway south of Seacliff Drive. Railroad tracks run parallel to Canal Boulevard between the shipyards in the south and West Cutting Boulevard in the north. Canal Boulevard is identified as an existing truck route south of Garrard Boulevard in the Richmond General Plan 2030 (City of Richmond 2012). The posted speed limit is 40 mph.

TRANSPORTATION SYSTEM

Transit service providers in the vicinity of the proposed LUPA are limited to AC Transit. AC Transit is the primary bus service provider in Contra Costa County, and provides Transbay service to destinations in Contra Costa, San Francisco, San Mateo and Santa Clara Counties. There are no transit stops within Miller/Knox, and thus, no direct bus service. The nearest bus stop to Miller/Knox is on Garrard Boulevard at Cutting Boulevard, approximately .25-mile north of Miller/Knox. This bus stop is served by AC Transit Route 72M, which operates between Point Richmond and Downtown Oakland and connects Miller/Knox to the Richmond and El Cerrito BART Stations. Weekday and weekend service hours span from approximately 6:00 a.m. to 12:30 a.m. with approximately 30-minute headways.

BICYCLE SYSTEM

The City of Richmond Bicycle Master Plan (City of Richmond 2011a) contains the following bicycle facility classifications:

- **Bicycle Paths (Class I).** These facilities are located off-street and can serve both bicyclists and pedestrians.

- **Bicycle Lanes (Class II).** These facilities provide a dedicated area for bicyclists within the paved street width through the use of striping and appropriate signage.

- **Bicycle Routes (Class III).** These facilities are found along streets that do not provide sufficient width for dedicated bicycle lanes. The street is designated as a bicycle route.

Exhibit 4.8-2 identifies existing and proposed bicycle facilities in the vicinity of Miller/Knox. Existing bicycle facilities in the vicinity of the proposed LUPA include Class I paths adjacent to Dornan Drive, Brickyard Cove Road, and Seacliff Drive, which are part of the Bay Trail network, and Class II lanes along Canal Boulevard north of Seacliff Drive and along West Cutting Boulevard west of I-580. There are no Class III bicycle routes within Miller/Knox. Bicycles are permitted along all pathways and trails within Miller/Knox except for the Ridgeland Planning Area trails located east of Dornan Drive. This is due to safety concerns related to steepness and trail condition, and the potential for erosion.

PEDESTRIAN SYSTEM

Pedestrian facilities within Miller/Knox include the paved and multi-use Bay Trail. The trail runs south from the northern most portion of Miller/Knox on the west side of Dornan Drive to Ferry Point, and then continues east along Brickyard Cove Road. Additional unpaved recreational hiking trails are located east of Dornan Drive within Miller/Knox. Sidewalks within Miller/Knox are limited to the west side of Dornan Drive. Other streets in the vicinity of Miller/Knox provide intermittent sidewalks.
EXISTING TRAFFIC VOLUMES

Two EIR’s were recently completed within the City of Richmond in close proximity to Miller/Knox. The City of Richmond Terminal One Project Draft EIR was completed in February of 2016 for a residential development located southeast of the intersection of Dornan Drive and Brickyard Cove Road, south of Miller/Knox. The City of Richmond Quarry Residential Project Draft EIR was completed in October of 2017 for a residential development along Sealiff Drive, south east of Miller/Knox. Both EIR’s were reviewed for applicability to the proposed LUPA, and it was determined that the City of Richmond Terminal One Project Draft EIR study area more closely corresponds to the proposed LUPA transportation study area and identified study intersections. Therefore, the City of Richmond Terminal One Project Draft EIR was used as the primary data source for existing and future traffic volumes and operating conditions within the proposed LUPA study area.

Weekday a.m. and p.m. peak hour traffic counts were collected in 2014 at intersections in the vicinity of Miller/Knox as part of the City of Richmond Terminal One Project Draft EIR and Transportation Impact Analysis conducted by Fehr & Peers Transportation Consultants. The peak hours (i.e., the hour with the highest traffic volumes observed at these intersections) were determined to be from 7:30 to 8:30 a.m. (a.m. peak hour) and from 4:15 to 5:15 p.m. (p.m. peak hour) during a typical weekday (City of Richmond 2016).

Based on the traffic counts and observed conditions detailed in the Terminal One EIR (SCH number: 2014112050), incorporated herein by reference, the existing a.m. and p.m. peak hour traffic volumes, intersection lane configurations, and traffic control devices at all the study intersections are shown in Figure 4.8-3. The Terminal One EIR is available to the public at: www.ci.richmond.ca.us/DocumentCenter/View/37802/City-of-Richmond-Terminal-One-DEIR.

LEVEL OF SERVICE DEFINITIONS

LOS is a qualitative measure of traffic operating conditions whereby a letter grade, from A (the best) to F (the worst), is assigned. These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. In general, LOS A represents free-flow conditions with no congestion, and LOS F represents severe congestion and delay under stop-and-go conditions. Table 4.8-1 displays the delay range associated with each LOS category for signalized and unsignalized intersections.

<table>
<thead>
<tr>
<th>LOS</th>
<th>Description (for Signalized Intersections)</th>
<th>Average Delay (Seconds/Vehicle)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Signalized Intersections</td>
</tr>
<tr>
<td>A</td>
<td>Operations with very low delay occurring with favorable traffic signal progression and/or short cycle lengths.</td>
<td>≤ 10.0</td>
</tr>
<tr>
<td>B</td>
<td>Operations with low delay occurring with good progression and/or short cycle lengths.</td>
<td>&gt; 10.0 to 20.0</td>
</tr>
<tr>
<td>C</td>
<td>Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.</td>
<td>&gt; 20.0 to 35.0</td>
</tr>
<tr>
<td>D</td>
<td>Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.</td>
<td>&gt; 35.0 to 55.0</td>
</tr>
<tr>
<td>E</td>
<td>Operations with high delay values indicating poor progression, and long cycle lengths. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.</td>
<td>&gt; 55.0 to 80.0</td>
</tr>
<tr>
<td>F</td>
<td>Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.</td>
<td>&gt; 80.0</td>
</tr>
</tbody>
</table>

Note: LOS = level of service; V/C ratio = volume-to-capacity ratio

LOS at signalized intersections and roundabouts based on average delay for all vehicles. LOS at unsignalized intersections is reported for entire intersection and for minor street movement with greatest delay.

Source: Transportation Research Board 2010
Exhibit 4.8-3  Point Richmond Area Existing Conditions from Terminal One Draft EIR

SOURCE: Fehr & Peers Transportation Consultants, 2016
EXISTING INTERSECTION OPERATIONS

The existing weekday a.m. and p.m. peak hour intersection operations were evaluated and documented in the City of Richmond Terminal One Project Draft EIR using the existing vehicle, bicycle, and pedestrian volumes and the existing lane configurations and signal timing parameters as inputs into the LOS calculations (City of Richmond 2016).

-Based on the traffic counts conducted for the Terminal One EIR, incorporated herein by reference, the existing a.m. and p.m. peak-hour intersection LOS and delay is presented in Table 4.8-2.

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Traffic Control</th>
<th>a.m. peak hour</th>
<th>p.m. peak hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LOS</td>
<td>Delay Seconds</td>
</tr>
<tr>
<td>1. West Cutting Boulevard/Canal Boulevard</td>
<td>Signal</td>
<td>C</td>
<td>25.1</td>
</tr>
<tr>
<td>2. West Cutting Boulevard/South Garrard Boulevard</td>
<td>AWSC</td>
<td>A</td>
<td>9.8</td>
</tr>
<tr>
<td>3. Richmond Avenue/South Garrard Boulevard</td>
<td>AWSC</td>
<td>B</td>
<td>10.3</td>
</tr>
<tr>
<td>4. Western Drive/Dornan Drive</td>
<td>SSSC</td>
<td>A(A)</td>
<td>0.8(9.5)</td>
</tr>
<tr>
<td>5. Brickyard Cove Road/Dornan Drive</td>
<td>AWSC</td>
<td>A</td>
<td>7.3</td>
</tr>
<tr>
<td>6. Sealcliff Drive/Sandpiper Spit</td>
<td>AWSC</td>
<td>A</td>
<td>7.5</td>
</tr>
<tr>
<td>7. Sealcliff Drive/Canal Boulevard</td>
<td>AWSC</td>
<td>A</td>
<td>8.5</td>
</tr>
<tr>
<td>9. I-580 Eastbound Ramps/Canal Boulevard</td>
<td>Signal</td>
<td>B</td>
<td>18.2</td>
</tr>
</tbody>
</table>

Notes: LOS = Level of Service. SSSC = Side Street Stop-Controlled. AWSC = All Way Stop Control.
Source: City of Richmond 2016; Table 4.13-3

4.8.2 Regulatory Setting

FEDERAL

There are no federal laws or regulations addressing transportation and circulation that are relevant to the proposed LUPA.

STATE

Senate Bill 743

Senate Bill 743, passed in 2013, requires the Governor’s Office of Planning and Research (OPR) to develop new CEQA guidelines that address traffic metrics to be used in CEQA analyses. As stated in the legislation, upon adoption of the new guidelines, “automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment pursuant to this division, except in locations specifically identified in the guidelines, if any.” OPR has updated and transmitted its proposed CEQA Guidelines implementing Senate Bill 743 to the California Natural Resources Agency. The revised guidelines propose that VMT be the primary metric used to identify transportation impacts. Additionally, OPR has published the Technical Advisory of Evaluating Transportation Impacts in CEQA to provide advice and recommendations on how to approach and analyze transportation impacts under CEQA if the proposed revisions to the CEQA Guidelines are adopted by the California Natural Resources Agency. If adopted, these new procedures may be used immediately upon the effective date of these Guidelines by lead agencies that are ready to begin evaluating vehicle miles traveled, but jurisdictions will have approximately two years to switch to VMT if they so choose.
REGIONAL/LOCAL

East Bay Regional Park District Master Plan
The District Master Plan 2013 defines the overall mission and vision for the District. The District Master Plan contains policies and descriptions of the programs in place for achieving the highest standards of service in resource conservation, management, interpretation, public access, and recreation. Specifically, the District Master Plan (District 2013) includes the following policies related to the provision of parking, encouraging green transportation, and availability and access to resources and facilities:

- **Policy PA 4:** The District will provide access to parklands and trails to suit the level of expected use. Where feasible, the District will provide alternatives to parking on or use of neighborhood streets. The District will continue to advocate and support service to the regional park system by public transit.

- **Policy PA 5:** The District will cooperate with local and regional planning efforts to create more walkable and bikeable communities, and coordinate park access opportunities with local trails and bike paths developed by other agencies to promote green transportation access to the Regional Parks and Trails.

- **Policy PA 6:** The District will comply with the requirements of the Americans with Disabilities Act and use the current edition of the California State Parks Accessibility Guidelines as its standard for making the improvements necessary to create accessible circulation, programs and facilities throughout the Park District.

- **Policy RFA 2:** The District will provide a diverse system of non-motorized trails to accommodate a variety of recreational users including hikers, joggers, people with dogs, bicyclists and equestrians. Both wide and narrow trails will be designed and designated to accommodate either single or multiple users based on location, recreational intensity, environmental and safety considerations. The District will focus on appropriate trail planning and design, signage and trail user education to promote safety and minimize conflicts between users.

- **Policy RFA 3:** The District will continue to add narrow trails designated as both single- and multi-use for hikers, equestrians, dog walkers and bike riders throughout the system of regional parklands.

- **Policy RFA 4:** The District will expand its unpaved multi-use trail system as additional acreage and new parks are added. The District will continue to provide multi-use trails to link parks and to provide access to park visitor destinations.

- **Policy RFA 5:** The District will continue to plan for and expand the system of paved, multi-use regional trails connecting parklands and major population centers.

- **Policy PRPT 9:** Regional trails will connect regional parks or trails to each other, to parks and trails of other agencies, or to areas of unusual scenic beauty; vista points, San Francisco Bay, Delta or lake shoreline, natural or historic resources, or similar areas of regional significance. Regional trails may also connect regional parks and trails to important destinations such as transit centers, schools, colleges, civic centers, other major institutions, employment centers, large commercial complexes, or residential areas. A regional water trail may provide a water connection with launching and landing sites for small watercraft to points along the San Francisco Bay shoreline and/or the Sacramento/San Joaquin River and Delta.

- **Policy PRPT 10:** The District encourages the creation of local trail networks that provide additional access points to the regional parklands and trails in order to provide loop trail experiences and to connect the regional system to the community. The District will support other agencies in completing local trail networks that complement the Regional Trail system and will coordinate with local agencies to incorporate local trail connections into District brochures.
**Policy PRPT 21:** Areas of higher level recreational use and concentrations of service facilities will be designated as Recreation/Staging Units. Where possible, these areas will be clustered and located on the edges of the park.

**East Bay Regional Park District General Conditions**
The District General Conditions contain the following requirements that are relevant to the proposed LUPA:

**Article 25. Safety and Convenience**

b) **Safety Equipment and Workers.** The Contractor shall take all reasonable measures as required by existing conditions and performance of the Contract to protect the public and their property. The Contractor shall provide adequate barricades, fences, signs, warning lights, watchpersons, flagpersons, etc., to protect the public and their property. Safety devices and workers shall comply with the current State of California "Manual for Warning Signs, Lights and Devices for Use in Performing Work Upon Highways," as a minimum standard. All lighting shall be electric powered and left on from sunset to sunrise.

f) **Public Convenience.** The Contractor shall conduct the work so as to ensure the least possible obstruction to traffic or inconvenience to the general public.

**Richmond General Plan 2030**
The Richmond General Plan 2030 Circulation Element (City of Richmond 2012) contains the following goals, policies and actions that are relevant to the proposed LUPA:

**GOAL CR1 An Expanded Multimodal Circulation System.**
Make conditions safer and more attractive for all modes of transportation including travel by foot and bicycle, public transit and automobiles. Evaluate streets and potential enhancements based on surrounding land use, street function and desired character and by relying on the place-based approach to circulation planning articulated in this General Plan. Take potential improvement measures ranging from physical design treatment of the street environment to social and programmatic responses appropriate to the particular street context.

**Policy CR1.1 Balanced Modes of Travel and Equitable Access.** Encourage multiple circulation options in the City and work with transit operators to ensure equitable access for all members of the community. Create streets and corridors that support a variety of travel modes including transit, pedestrians, bicycles and goods movement as well as automobiles. Provide affordable circulation options which meet the needs of low-income populations, seniors, youth and persons with disabilities to ensure equitable access.

**Policy CR1.2 An Interconnected Street System.** Promote an interconnected system of streets that adequately serves current and future travel needs. By promoting an interconnected system for streets along with pedestrian, bicycle and transit facilities, the City can support streets that are compatible with surrounding land uses, street function and community character.

**Policy CR1.5 Safe and Convenient Walking and Bicycling.** Promote walking and bicycling as a safe and convenient mode of transportation. Improve pedestrian and bicycle amenities to serve the recreation and travel needs of residents and visitors in all parts of Richmond. Where feasible, the City will: connect major destinations such as parks, open spaces, civic facilities, employment centers, retail and recreation areas with pedestrian and bicycle infrastructure; promote shared roadways in residential streets; require new development and redevelopment projects to provide pedestrian and bicycle amenities, streetscape improvements and linkages to planned and completed City and regional multi-use trails; and develop safe routes to schools and out-of-school programs that allow access by bicycle and pedestrian paths or reliable and safe transit.
Explore innovative solutions such as bicycle-sharing programs and encourage businesses, schools and residential developments to provide secure bicycle parking to ensure that these ecologically-friendly, low-impact transportation modes are available to all community members, thereby reducing emissions from vehicles within the City, improving environmental quality and enhancing mobility and connectivity.

- **Policy CR1.6 Comprehensive Network of Multi-Use Trails.** Develop a comprehensive network of multi-use trails including to enhance bicycle and pedestrian connectivity throughout the City and the region. Completion of the Bay Trail will enhance access to the Richmond shoreline and adjacent open space. The proposed San Francisco Bay Water Trail will also provide enhanced access and recreational opportunities to the Bay. Connecting the Richmond Greenway with the Ohlone Greenway and the Bay Trail, and linking Richmond with Marin County with a bicycle trail across the Richmond-San Rafael Bridge will help create a comprehensive network of multi-use trails.

- **Policy CR1.10: Vehicular Level of Service Standards for West County Routes of Regional Significance.** Maintain vehicular LOS standards for signalized intersections consistent with the Contra Costa Transportation Authority’s (CCTA) West County Action Plan for Routes of Regional Significance.

**GOAL CR2 Walkable Neighborhoods and Complete Streets.**

Activate the public right-of-way and improve the experience of moving people between key destinations at the pedestrian level. In order to make walking and bicycling a more attractive option, enhance connectivity between neighborhoods, schools, the workplace, and daily goods and services so that reaching key destinations is safer and more convenient. Contribute to walkability and livability by promoting mixed-use and complete streets, high quality pedestrian environments, context-based street design and efficient public transit.

- **Policy CR2.1 Neighborhood Connectivity.** Improve access and connectivity within neighborhoods and to major destinations in the City. Improved connectivity will enhance linkages to local and regional amenities such as neighborhood parks, schools, libraries, community centers, retail, public transit, bicycle paths, historic resources, the shoreline, open space and medical facilities.

- **Policy CR2.3 Integrated Bicycle and Pedestrian System.** Plan, construct and maintain a safe, comprehensive and integrated bicycle and pedestrian system. Walking and bicycling to work, to schools and for recreation can be encouraged by providing amenities and facilities for pedestrians and bicycles, enhancing pedestrian and bicycle connectivity within neighborhoods, promoting multimodal trails and pathways accessible to all and addressing major barriers in the community such as freeways, railroads and steep terrain. Pedestrian improvements at parks, community centers, open space areas, schools, transit stops and commercial nodes will further enhance the bicycle and pedestrian system.

**GOAL CR3 A Safe and Well-Maintained Circulation System.**

In order to create a safe and efficient circulation system, emphasize on-going street maintenance and safety improvements that consider all modes of transportation including walking, bicycling and public transit. Require new facilities and infrastructure as development occurs in order meet the needs of all users while enhancing mobility and connectivity.

**Richmond Bicycle Master Plan**

The Richmond Bicycle Master Plan (City of Richmond 2011a) contains the following goals and objectives that are relevant to the proposed LUPA:

**GOAL 1**

Expand the city’s bicycle routes and parking facilities into an extensive, well-connected and well-designed network, and improve and maintain these facilities over time.

- **Objective:** Increase the number of bikeway miles by 75 percent, complete all gaps in the Bay Trail and double the number of bicycle parking spaces.
GOAL 2
Increase the number of people of all ages and backgrounds who bicycle for transportation, recreation and health.

Objective: Double the number of trips made by bicycle.

GOAL 4
Incorporate the needs and concerns of cyclists in all transportation and development projects.

Richmond Pedestrian Plan
The Richmond Pedestrian Plan (City of Richmond 2011b) contains the following goals that are relevant to the proposed LUPA:

- Increased Safety. Streets will be developed and retrofitted to accommodate all types of users. Designs and devices will produce speed moderation, visibility, awareness and communication for motorists and non-motorists alike.

- Improved Security. Streets, trails and other public spaces will be designed and improved to create active places that are watched over, maintained and that project a sense of control and community ownership. Improved Connectivity. A range of strategies and solutions will address physical barriers to walking, such as dead-end streets, railroad right of ways, wide roadways, and wide, complex intersections.

- Increased Equity. Walking, the cheapest form of transportation, will be a safe, viable and convenient choice for those who cannot afford, are unable, or choose not to drive a car.

- Improved Health. Walking and bicycling, the healthiest forms of transportation, will become desirable alternatives for trips to daily destinations.

- Increased Sustainability. Walking and bicycling in the city will reduce the number of vehicle miles Richmond residents and visitors travel, and will reduce associated climate change, air and water quality impacts from vehicle emissions. Opportunities will be identified to convert excess paved rights of way to lower impact spaces with trees and landscaping.

Contra Costa Transportation Authority (CCTA) Congestion Management Program
CCTA serves as the Congestion Management Agency (CMA) for Contra Costa County. In 2017, CCTA adopted the 2017 Update of the Contra Costa Congestion Management Program. The CMP network includes all State highways within Contra Costa County as well as principal arterials. Principal arterials are defined to be at least four lanes wide for a mile in length, carry at least 20,000 vehicles each day, and have been designated by the appropriate regional transportation planning committee. The only transportation facility in the vicinity of Miller/Knox and considered to be part of the CMP network is I-580.

CCTA establishes a LOS standard of LOS E for all parts of the CMP network except those that were already operating at worse levels of service in 1991. The CMP relies on the traffic impact analysis required by the Measure J GMP. That program requires every jurisdiction to conduct a traffic impact analysis for any proposed development project, development plan, or general plan amendment that would generate more than 100 net new peak hour vehicle trips (RTPCs may choose to specify a lower trip threshold). Additionally, the 2017 CMP Update addresses the changes to LOS statewide under SB 743, as well as potential changes to the CMP legislation.

West Contra Costa Transportation Advisory Committee West County Action Plan for Routes of Regional Significance
The CCTA includes several Regional Transportation Planning Committees that cover specific sub-areas of the County. Richmond is within the purview of the West Contra Costa Transportation Advisory Committee (WCCTAC). As part of the CCTA’s 2014 update of the Countywide Transportation Plan, WCCTAC updated the...

Consistent with the CCTA CMP, the Action Plan includes the threshold of 100 net new peak hour vehicle trips as that which would trigger a transportation impact studies and/or that EIRs are required to be circulated to neighboring jurisdictions.

4.8.3 Impacts and Mitigation Measures

METHODOLOGY

LUPA Related Land Use Changes
The proposed LUPA includes a set of recommendations for improvements throughout Miller/Knox in five distinct planning areas are detailed in Section 3.8 of Chapter 3, “Project Description.” The recommended improvements related to and affecting transportation include the provision of new, formalized, and expanded parking and staging areas for public use, development of a new section of the multi-use San Francisco Bay Trail, the enhancement of pedestrian and hiking trails and connectivity throughout Miller/Knox, and the development of the recreational programs and storage building for outdoor education and volunteer activities. These improvements would all occur within the boundary of the existing park, so the acreage of parkland would be unchanged at Miller/Knox. Also, in general, the facility enhancements would serve park and recreation uses that are already occurring at the existing Miller/Knox, so the level of overall visitation would not change substantially. Parking supply would be formalized on an undeveloped lot off of Dornan Drive and improved for safety without substantial changes to the overall number of spaces. At one location, adjacent to the busy existing Ferry Point parking area, 35 additional parking spaces are proposed to serve existing uses and projected additional demand generated by nearby approved residential developments. Additionally, a new staging area off of Canal Boulevard would provide 29 new parking spaces to accommodate park visitors currently parking on the shoulder of the existing driveway at this location.

The provision of new and expanded parking facilities and staging areas would serve the existing demand for parking in this area, which is currently constrained during periods of high visitation. The new and expanded parking facilities would not result in the generation of substantial new vehicle trips to Miller/Knox, but rather would formalize parking areas that currently serve off-street parking or add a small number of spaces. Additionally, quantitative traffic analysis based on trip generation rates detailed in the Institute of Transportation Engineers (ITE) Trip Generation Manual (9th Edition) for the Regional Park land use (ITE Code 417) is based on a park’s acreage. Therefore, because the Miller/Knox LUPA does not propose an increase to the overall park acreage, this quantitative traffic analysis would conclude that there would be no net new LUPA-generated vehicular trips.

The proposed LUPA also recommends development of a new recreational programs and storage building for outdoor education and volunteer activities. In concept, the recreational programs and storage building would be up to 2,000-square feet. This recreational programs and storage building is intended to serve existing park operations and programs, so it is reasonable to foresee that new trips to Miller/Knox would not occur; however, for the purposes of providing a conservative analysis (i.e., one that avoids a risk of understating an impact), the recreational programs and storage building is analyzed as a new land use and evaluated using the ITE Trip Generation Manual (9th Edition). Using this conservative approach, the recreational programs and storage building would result in the generation of new vehicular trips to and from Miller/Knox. This is the only component of the proposed LUPA that is assumed to have the potential to generate net increases in or new vehicular trips.
LUPA Trip Generation

As described above, construction of the recreational programs and storage building represents a change in land use that, conservatively, would result in new proposed LUPA-generated vehicular trips based on its size. Proposed LUPA trip generation was determined using trip generation rates from the ITE Trip Generation Manual (9th Edition) for the Recreational Community Center land use (ITE Code 495), as shown in Table 4.8-3.

<table>
<thead>
<tr>
<th>Table 4.8-3</th>
<th>ITE Trip Generation for Recreational Community Center</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land Use Category</strong></td>
<td><strong>ITE Code</strong></td>
</tr>
<tr>
<td>Recreational Community Center</td>
<td>495</td>
</tr>
</tbody>
</table>


Based on the assumed square footage of the proposed recreational programs and storage building the equivalent trip rates under daily, a.m. peak hour, and p.m. peak hour are reported in Table 4.8-4. On a daily basis, it is estimated that the new recreational programs and storage building would generate a maximum of 46 total vehicle trips per weekday that would be added to the roadway network with implementation of the proposed LUPA.

<table>
<thead>
<tr>
<th>Table 4.8-4</th>
<th>LUPA Vehicle Trip Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proposed LUPA Land Use</strong></td>
<td><strong>Need (KSF)</strong></td>
</tr>
<tr>
<td>Recreational Programs and Storage Building</td>
<td>2</td>
</tr>
</tbody>
</table>

Notes: Vehicle trip generation for the proposed LUPA is calculated using the trip generation rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual (9th Edition) for the Recreational Community Center land use (ITE Code 417); assumes a 2,000 square foot or less recreational programs and storage building; values rounded to up to nearest whole number.

The CCTA CMP and WCCTAC Action Plan require that a traffic impact analysis be conducted for any project that is expected to generate more than 100 peak hour vehicle trips; below that level, transportation planning practice and policies of these plans indicate traffic impacts to be less than significant. As shown in Table 4.8-4, the proposed recreational programs and storage is projected to generate minimal new peak hour trips, i.e., approximately four trips during the weekday a.m peak hour, three trips during the weekday p.m. peak hour, and 19 Saturday peak hour trips. Since the proposed LUPA would not generate more than 100 peak hour trips, an analysis of CMP facilities (i.e., I-580) is not required. The small number of new peak hour trips would not significantly change traffic congestion, travel times, or mobility.

Vehicle Miles Travelled

The OPR Technical Advisory of Evaluating Transportation Impacts in CEQA (Technical Advisory) provides guidance on methods for evaluating VMT under revised CEQA Guidelines, as proposed by OPR. The Technical Advisory notes that many agencies use screening thresholds to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study and suggests that lead agencies may screen out VMT impacts using project size, maps, and transit availability (OPR 2017). The recommended screening threshold for small projects as detailed within the Technical Advisory is as follows:

- **Screening Threshold for Small Projects** - Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact (OPR 2017).
Additionally, the Technical Advisory recommends that the analysis of land use plans may employ the same thresholds described above for small projects. Implementation of the proposed LUPA would not generate more than 110 daily vehicle trips.

THRESHOLDS OF SIGNIFICANCE

The significance criteria used to evaluate the proposed LUPA impacts to transportation and traffic under CEQA are based on Appendix G of the CEQA Guidelines. Transportation and circulation impacts would be significant if the proposed LUPA would:

- conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

- conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;

- result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;

- substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

- result in inadequate emergency access; or

- conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

ISSUES NOT DISCUSSED FURTHER

The closest airport to Miller/Knox is Oakland International Airport, located approximately 15 miles south of Miller/Knox. The proposed LUPA would not have impacts on air traffic, and would not result in incompatible uses in the area. This issue is not discussed further in this EIR.

The proposed LUPA is anticipated to generate a small number of net new peak hour trips (four a.m. peak hour trips, three p.m. peak hour trips, and 19 weekend peak hour trips). Additionally, all intersections evaluated in the vicinity of Miller/Knox are currently operating at LOS C or better as shown in Table 4.8-2, and the addition of the few new LUPA-generated trips would not result in any appreciable increase in delay, or degradation of LOS. Furthermore, the proposed LUPA would provide enhanced bike and pedestrian facilities within Miller/Knox; thus, increasing connectivity, facilitating the increased use of non-motorized modes of transportation, and reducing reliance on automobiles. Therefore, the proposed LUPA would not conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness, or conflict with the applicable CMP. These issues are not discussed further in this EIR.

Because implementation of the proposed LUPA would not generate more than 110 daily vehicle trips, it would not exceed the OPR recommended trip generation screening threshold for small projects. Therefore, the proposed LUPA would not result in significant VMT impacts, and VMT is not discussed further.

Parking supply is constrained in and around Miller/Knox. On busy visitation days, off-street and on-street parking supply can be fully utilized within and adjacent to the park. Some of the existing off-street parking is within unimproved, unpaved lots. The proposed LUPA recommendations include formalizing parking and creating designed lots with specifically laid out spaces, vehicle aisles, and entrance/exit driveways in place
of the existing unorganized and unpaved lots. At one location, adjacent to the existing Ferry Point parking area, 35 additional parking spaces are proposed. The proposed parking improvements would not substantially change the overall parking supply at Miller/Knox, but rather enhance circulation and traffic safety and provide a small number of additional spaces in the busy Ferry Point Planning Area to serve existing demand and projected new demand from nearby approved residential developments. Also, as noted in the analysis, the facilities proposed to be enhanced by implementation of the LUPA recommendations would not substantially change overall visitation to the existing regional park. Because parking supply capacity and overall visitation would not substantially change, there would be no significant effect related to parking. The topic is not discussed further in the EIR.

LUPA related transportation features, operational activities, and/or construction activities would not alter or impact any existing or planned transit routes or facilities, or conflict with adopted policies or plans related to public transit. This issue is not discussed further.

IMPACTS AND MITIGATION MEASURES

Impact 4.8-1: Construction Impacts to Transportation and Circulation

Construction activities and temporary construction vehicle traffic could increase traffic congestion and result in temporary travel disruptions in the area. Thus, depending on the timing and intensity of construction activities, roadway, pedestrian, and bicycle facilities could experience a degradation in operating conditions on local streets. Although temporary, the presence of construction vehicles on local streets for extended time periods would be a potentially significant impact for local transportation. However, with implementation of Mitigation Measure 4.8-1, impacts would be reduced to a less-than-significant level.

The most intensive construction activities proposed in the LUPA include lagoon dredging, building demolition and removal of abandoned railroad tracks, establishment of new paved trails, site preparation (e.g., excavation, grading, and vegetation clearing) and construction of the recreational programs and storage building, and establishment of new staging areas. There would be temporary increases in construction-related traffic from deliveries of materials and construction workers traveling to and from the project site for each of the proposed construction activities. However, the timing of construction, number of trucks, truck routing, truck idling, lane closures, and a variety of other construction-related activities cannot yet be specifically known. Therefore, it would be speculative to conduct a quantitative analysis; nonetheless, because of the general magnitude and duration of construction, a qualitative analysis is provided.

The construction-related traffic impacts would be localized within the immediate vicinity of the park and potentially on other Point Richmond streets. The duration would be sporadic and temporary, but is projected to occur over a period of approximately 10 years. Ample space would be available for staging areas to support the construction contractor within Miller/Knox, reducing the need for use of streets and other active transportation corridors. However, heavy construction-related vehicles and equipment would access the site and may need to be staged during activities. Additionally, construction activities would temporarily increase traffic within the area because of construction worker vehicles, haul trucks, and the transport of materials, which could result in degraded roadway operating conditions.

Additionally, LUPA-related construction could potentially result in disruptions to the transportation network near Miller/Knox, including the possibility of temporary lane closures, sidewalk closures, trail closures, and bikeway closures. These disruptions could potentially result in temporary hazards to bicyclists and pedestrians, and impede emergency access and/or increase emergency response times. The impacts are considered potentially significant.
Mitigation Measure 4.8-1: Construction Traffic Control Plan

Before the beginning of construction or issuance of building permits, the applicant or their construction contractor shall consult with the City of Richmond Department of Public Works to determine if a Construction Traffic Control Plan would be required for the specific LUPA activity. If required, the applicant or their construction contractor shall prepare a Construction Traffic Control Plan to the satisfaction of the City of Richmond Department of Public Works, Police Department, and Fire Department. The plan will ensure that acceptable operating conditions, bicycle and pedestrian safety, and emergency access, are maintained. At a minimum, the plan shall include (but is not limited to) the following:

- Description of trucks including: number and size of trucks per day, expected arrival/departure times, truck circulation patterns, and approved truck routes.
- Description of staging area including: location, maximum number of trucks simultaneously permitted in staging area, use of traffic control personnel, specific signage.
- Description of street closures and/or bicycle and pedestrian facility closures including: duration, advance warning and posted signage, safe and efficient access routes for existing park users and emergency vehicles, and use of manual traffic control.
- Description of driveway access plan including: provisions for safe vehicular, pedestrian, and bicycle travel, minimum distance from any open trench, special signage, and private vehicle accesses.
- Preservation of emergency vehicle access.

Significance after Mitigation

Implementation of Mitigation Measure 4.8-1 would require preparation and implementation of a Construction Traffic Control Plan that would be reviewed and approved by the City and all other responsible agencies, which would reduce the temporary impact to bicyclists and pedestrians and preserve emergency vehicle access. For these reasons, construction impacts of the proposed LUPA to roadway operations, bicycle and pedestrian safety, and emergency access would be less than significant with mitigation incorporated.

Impact 4.8-2: Impacts to Bicycle and Pedestrian Facilities

The proposed LUPA would enhance bicycle and pedestrian facilities within Miller/Knox. Additionally, the proposed LUPA would improve access to, and connection with the existing bicycle and pedestrian facilities surrounding Miller/Knox. This is would be a less-than-significant impact.

The proposed LUPA includes several recommendations that would enhance bicycle and pedestrian facilities with Miller/Knox. The recommendations include a new trail on the east side of the lagoon, a new promenade connecting the Ferry Point Pier to the Lagoon Planning Area, the removal of the abandoned railroad tracks within District jurisdiction, and development of a section of the San Francisco Bay Trail between Keller Beach and Ferry Point. The proposed LUPA also includes the development of new trailheads and vista points, repair of trails damaged by erosion, and the decommissioning of trails too damaged for repair in the Ridgeland Planning Area.

Overall these improvements would provide new bicycle and pedestrian connections and pathways and would enhance existing trail connections within Miller/Knox, which would improve circulation within the park and public access to the park. The trail improvements proposed within the Ridgeland Planning Area would also enhance safety and user experience for hikers and walkers in the area.

Therefore, implementation of the proposed LUPA would improve public bicycle and pedestrian access and enhance the existing trail system within Miller/Knox. Thus, the LUPA is not anticipated to adversely affect existing or planned bicycle or pedestrian facilities. The impact would be less than significant.
Mitigation Measures

No mitigation is required.

Impact 4.8-3: Emergency Access and Hazardous Design Features During Operations

Existing emergency access to Miller/Knox would be maintained. Additionally, any new driveway improvement would be designed to meet all City design and safety standards, and would be subject to review of the City of Richmond and responsible emergency services agencies. This would be a less-than-significant impact.

The existing ingress and egress routes for Miller/Knox from Dornan Drive and Seacliff Drive/Brickyard Cove Road would continue to be available for emergency access and the proposed LUPA would not alter either of these roadways. As identified on Exhibits 3-5, 3-7, and 3-8, the proposed LUPA would include new, formalized, and expanded parking and staging areas. These parking improvements include the expansion of the Ferry Point parking area which is located immediately adjacent to an existing parking area, and the development of new staging areas off Canal Boulevard and a formalized parking area off Dornan Drive. The Ferry Point parking expansion would develop an additional 35 parking spaces in the area. The Dornan Drive would replace areas currently used as informal parking lots by Miller/Knox visitors and provide 89 parking spaces. The Canal Boulevard staging area would be a new staging area, providing 29 parking spaces.

These new parking facilities and staging areas would be designed and constructed to meet all design and safety standards established by the City; and thus, would provide adequate site distances and access for vehicles entering and leaving these facilities. Formalizing the staging areas would provide ingress/egress constructed to City design and safety standards, would include defined parking stalls, and would be designed to ensure safe and navigable internal circulation routes. Additionally, these improvements would be subject to review of the City of Richmond and the responsible emergency services agencies, and would be required to conform to applicable municipal code regulations. Therefore, the proposed LUPA would have a less-than-significant impact on emergency access and safety associated with design features.

Mitigation Measures

No mitigation is required.
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4.9 AIR QUALITY

This section includes a discussion of existing air quality conditions, a summary of applicable air quality regulations, and an analysis of potential short-term and long-term air quality impacts that could result from implementation of the Miller/Knox Regional Shoreline (Miller/Knox or park) Land Use Plan Amendment (LUPA). The methods of analysis for short-term construction emissions, long-term regional (operational) emissions, local mobile-source emissions, and toxic air emissions are consistent with the recommendations of the Bay Area Air Quality Management District (BAAQMD), the California Air Resources Board (CARB), and the U.S. Environmental Protection Agency (EPA).

No scoping comments related to air quality impacts were received.

4.9.1 Environmental Setting

Miller/Knox is in Contra Costa County, which is in the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB includes portions of Sonoma and Solano, and all of Marin, Napa, Contra Costa, Alameda, Santa Clara, San Mateo, and San Francisco Counties. The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by the sources of air pollutants and the atmosphere’s ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources.

CLIMATE, METEOROLOGY, AND TOPOGRAPHY

The SFBAAB is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. The SFBAAB is generally bordered on the west by the Pacific Ocean, on the north by the Coast Ranges, and on the east and south by the Diablo Range. The only major break in California’s Coast Range occurs in the SFBAAB. Here the Coast Range splits into western and eastern ranges. Between the two ranges lies San Francisco Bay. The gap in the western coast range is known as the Golden Gate, and the gap in the eastern coast range is the Carquinez Strait. These gaps allow air to pass into and out of the SFBAAB and the Central Valley (BAAQMD 2017a).

Summertime temperatures in the SFBAAB are determined in large part by the effect of differential heating between land and water surfaces. On summer afternoons the temperatures at the coast can be 35°F cooler than temperatures 15 to 20 miles inland. At night this contrast usually decreases to less than 10°. In the winter, the relationship of minimum and maximum temperatures is reversed. During the daytime the temperature contrast between the coast and inland areas is small, whereas at night the variation in temperature is large.

The local topography of Miller/Knox is varied and ranges from 12 to 15 feet North American Vertical Datum (NAVD) along the San Francisco Bay to over 350 feet above mean sea level in the hilly Ridgeland Planning Area, east of Dornan Drive. The local meteorology of Miller/Knox and the surrounding area is represented by measurements recorded at the Western Regional Climate Center Richmond Cooperative Station. The normal annual precipitation is approximately 23.14 inches. January temperatures range from a normal minimum of 42.6 degrees Fahrenheit to a normal maximum of 57.5 degrees Fahrenheit. July temperatures range from a normal minimum of 54.4 degrees Fahrenheit to a normal maximum of 70.4 degrees Fahrenheit (WRCC 2017).
CRITERIA AIR POLLUTANTS

Concentrations of ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), respirable and fine particulate matter (PM₁₀ and PM₂.₅), and lead, which are criteria air pollutants (CAPs), are used to indicate the quality of ambient air. CAPs are also the most prevalent indicators of how air pollution is detrimental to human health. The health effects of each CAP, as well as source of emissions are summarized in Table 4.9-1. A more detailed description of ozone and particulate matter is provided below, because these are the CAPs for which the county is in nonattainment, with regard to state and federal standards described in Section 4.9.2, “Regulatory Setting.”

Ozone

Ozone, or smog, is not emitted directly into the environment, but is formed in the atmosphere by complex chemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NOₓ) in the presence of sunlight. Ozone formation is greatest on warm, windless, sunny days. The main sources of NOₓ and ROG, often referred to as ozone precursors, are combustion processes (including motor vehicle engines), the evaporation of solvents, paints, and fuels, and biogenic sources. Automobiles are the single largest source of ozone precursors in the SFBAAB. Tailpipe emissions of ROG are highest during cold starts, hard acceleration, stop-and-go conditions, and slow speeds. They decline as speeds increase up to about 50 mph, then increase again at high speeds and high engine loads. ROG emissions associated with evaporation of unburned fuel depend on vehicle and ambient temperature cycles. Nitrogen oxide emissions exhibit a different curve; emissions decrease as the vehicle approaches 30 mph and then begin to increase with increasing speeds.

Ozone levels usually build up during the day and peak in the afternoon hours. Short-term exposure can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, it can aggravate existing respiratory diseases such as asthma, bronchitis and emphysema. Chronic exposure to high ozone levels can permanently damage lung tissue. Ozone can also damage plants and trees, and materials such as rubber and fabrics (BAAQMD 2017a).

Particulate Matter

Particulate Matter refers to a wide range of solid or liquid particles in the atmosphere, including smoke, dust, aerosols, and metallic oxides. Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM₁₀. PM₂.₅ includes a subgroup of finer particles that have an aerodynamic diameter of 2.5 micrometers or less. Some particulate matter, such as pollen, is naturally occurring. In the SFBAAB most particulate matter is caused by combustion, factories, fugitive dust from construction, grading, and demolition, agricultural activities, and motor vehicles. Extended exposure to particulate matter can increase the risk of chronic respiratory disease. Particulate matter is of concern because it bypasses the body’s natural filtration system more easily than larger particles and can lodge deep in the lungs. PM₂.₅ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health. Motor vehicles are currently responsible for about half of particulates in the SFBAAB. Wood burning in fireplaces and stoves is another large source of fine particulates (BAAQMD 2017a).

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Sources</th>
<th>Acute¹ Health Effects</th>
<th>Chronic² Health Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone</td>
<td>Secondary pollutant resulting from reaction of ROG and NOₓ in presence of sunlight. ROG emissions result from incomplete combustion and evaporation of chemical solvents and fuels; NOₓ results from the combustion of fuels</td>
<td>increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation</td>
<td>permeability of respiratory epithelia, possibility of permanent lung impairment</td>
</tr>
<tr>
<td>Carbon monoxide (CO)</td>
<td>Incomplete combustion of fuels; motor vehicle exhaust</td>
<td>headache, dizziness, fatigue, nausea, vomiting, death</td>
<td>permanent heart and brain damage</td>
</tr>
</tbody>
</table>

Table 4.9-1 Sources and Health Effects of Criteria Air Pollutants

BAAQMD 2017a.
### Table 4.9-1 Sources and Health Effects of Criteria Air Pollutants

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Sources</th>
<th>Acute(^1) Health Effects</th>
<th>Chronic(^2) Health Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen dioxide (NO(_2))</td>
<td>combustion devices; e.g., boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines</td>
<td>coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis or pulmonary edema; breathing abnormalities, cough, cyanosis, chest pain, rapid heartbeat, death</td>
<td>chronic bronchitis, decreased lung function</td>
</tr>
<tr>
<td>Sulfur dioxide (SO(_2))</td>
<td>coal and oil combustion, steel mills, refineries, and pulp and paper mills</td>
<td>Irritation of upper respiratory tract, increased asthma symptoms</td>
<td>Insufficient evidence linking SO(_2) exposure to chronic health impacts</td>
</tr>
<tr>
<td>Respirable particulate matter (PM(<em>{10})), Fine particulate matter (PM(</em>{2.5}))</td>
<td>fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in the atmosphere by condensation and/or transformation of SO(_2) and ROG</td>
<td>breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death</td>
<td>alterations to the immune system, carcinogenesis</td>
</tr>
<tr>
<td>Lead</td>
<td>metal processing</td>
<td>reproductive/developmental effects (fetuses and children)</td>
<td>numerous effects including neurological, endocrine, and cardiovascular effects</td>
</tr>
</tbody>
</table>

Notes: NO\(_X\) = oxides of nitrogen; ROG = reactive organic gases.
\(^1\) "Acute" refers to effects of short-term exposures to criteria air pollutants, usually at fairly high concentrations.
\(^2\) "Chronic" refers to effects of long-term exposures to criteria air pollutants, usually at lower, ambient concentrations.
Sources: EPA 2016

### MONITORING STATION DATA AND ATTAINMENT DESIGNATIONS

BAAQMD and CARB operate a regional monitoring network that measures the ambient concentrations of the six CAPs within the Bay Area. Existing and probable future levels of air quality in Contra Costa County can generally be inferred from ambient air quality measurements conducted by BAAQMD at its nearby monitoring stations. San Pablo-Rumrill Boulevard station, is the closest monitoring station to Miller/Knox located approximately 3 miles to the northeast. Table 4.9-2 shows a three-year summary of monitoring data for ozone, PM\(_{2.5}\), and PM\(_{10}\), the main pollutants of concern, from the San Pablo-Rumrill Boulevard station.

### Table 4.9-2 Summary of Annual Data on Ambient Air Quality (2014–2016)\(^1\)

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ozone</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum concentration (1-hr/8-hr avg, ppm)</td>
<td>0.075/0.060</td>
<td>0.084/0.062</td>
<td>0.094/0.061</td>
</tr>
<tr>
<td>Number of days state standard exceeded (1-hr/8-hr)</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
</tr>
<tr>
<td>Number of days national standard exceeded (8-hr)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Fine Particulate Matter (PM(_{2.5}))</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum concentration (24-hour μg/m(^3))</td>
<td>38.2</td>
<td>33.2</td>
<td>19.5</td>
</tr>
<tr>
<td>Number of days national standard exceeded (24-hour measured)</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Respirable Particulate Matter (PM(_{10}))</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum concentration (μg/m(^3))</td>
<td>46.3</td>
<td>43.0</td>
<td>34.0</td>
</tr>
<tr>
<td>Number of days state standard exceeded</td>
<td>*</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Number of days national standard exceeded</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes: μg/m\(^3\) = micrograms per cubic meter; ppm = parts per million; * = There was insufficient (or no) data available to determine the value.
\(^1\) Measurements from the San Pablo-Rumrill Blvd station.
Source: CARB 2017
Both CARB and EPA use this type of monitoring data to designate areas according to their attainment status for CAPs. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are “nonattainment,” “attainment,” and “unclassified.” “Unclassified” is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called “nonattainment-transitional.” The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. The current national and State attainment designations for the Contra Costa County are shown in Table 4.9-3 for each CAP. The national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS) are described in Section 4.9.2, “Regulatory Setting.”

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Federal Designation (NAAQS)</th>
<th>State Designation (CAAQS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone</td>
<td>Nonattainment</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>PM$_{10}$</td>
<td>Unclassified</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>PM$_{2.5}$</td>
<td>Nonattainment</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>Unclassified/Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>Unclassified/Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>Lead</td>
<td>Unclassified/Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>No Federal Standard</td>
<td>Unclassified</td>
</tr>
<tr>
<td>Sulfates</td>
<td>No Federal Standard</td>
<td>Attainment</td>
</tr>
<tr>
<td>Visibility Reducing Particulates</td>
<td>No Federal Standard</td>
<td>Unclassified</td>
</tr>
</tbody>
</table>

Notes: PM$_{10}$ = fine particulate matter; PM$_{2.5}$ = respirable particulate matter
Source: CARB 2015

TOXIC AIR CONTAMINANTS

Diesel Particulate Matter
According to the California Almanac of Emissions and Air Quality (CARB 2013), the majority of the estimated health risks from toxic air contaminants (TACs) can be attributed to relatively few compounds, the most important being diesel particulate matter (DPM). DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although DPM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emissions control system is being used. Unlike the other TACs, no ambient monitoring data are available for DPM because no routine measurement method currently exists. However, CARB has made preliminary concentration estimates based on a PM exposure method. This method uses the CARB emissions inventory’s PM$_{10}$ database, ambient PM$_{10}$ monitoring data, and the results from several studies to estimate concentrations of DPM. In addition to DPM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene. Existing sources of DPM in the vicinity of Miller/Knox is primarily exhaust from trucks, buses, trains, ships, and other equipment with diesel engines.

Naturally Occurring Asbestos
Naturally occurring asbestos (NOA) was identified as a TAC in 1986 by CARB. NOA is located in many parts of California, and is commonly associated with ultramafic rocks, according to a special publication published by the California Geological Survey (Churchill and Hill 2000). Asbestos is the common name for a group of...
naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. Ultramafic rocks form in high-temperature environments well below the surface of the earth. By the time they are exposed at the surface by geologic uplift and erosion, ultramafic rocks may be partially to completely altered into a type of metamorphic rock called serpentinite. Sometimes the metamorphic conditions are right for the formation of chrysotile asbestos or tremolite-actinolite asbestos in the bodies of these rocks, along their boundaries, or in the soil.

Asbestos could be released from serpentinite or ultramafic rock if the rock is broken or crushed. Asbestos could also be released into the air due to vehicular traffic on unpaved roads on which asbestos-bearing rock has been used as gravel. At the point of release, asbestos fibers could become airborne, causing air quality and human health hazards. Natural weathering and erosion processes act on asbestos bearing rock and soil, increasing the likelihood for asbestos fibers to become airborne if disturbed (CGS 2002). Ultramafic rock is not present at Miller/Knox (Van Gosen, B.S. & Clinkenbeard J.P. 2011).

ODORS

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person’s reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). Odor sources of concern include wastewater treatment plants, sanitary landfills, composting facilities, petroleum refineries, chemical manufacturing plants, painting/coating operations, rendering plants, and food processing facilities (BAAQMD 2017a).

Miller/Knox is within a mile of the Chevron Richmond petroleum refinery and within 1.5 miles of the Dutra Materials plant. BAAQMD has issued odor violations to the Chevron Refinery in the past (BAAQMD 2017b). The Ferry Point and Keller Beach sanitary sewer pump stations are located adjacent to Miller/Knox, and in the past, have emitted hydrogen sulfide odors. The Miller/Knox lagoon can also be a source of odors. Abundant communities of resident and migratory shorebirds and waterfowl utilize the lagoon and the nearshore lawn, generating considerable amounts of fecal material that is either deposited directly in the lagoon or is washed into the lagoon from local rainfall. These materials, in combination with the static nature of the lagoon, encourage the growth of algae that eventually decays and settles on the lagoon bottom as black, anoxic sediments. When these sediments are exposed to air, the resulting release of hydrogen sulfide can produce unpleasant odors for visitors.

SENSITIVE RECEPTORS

Sensitive receptors are generally considered to include those land uses where exposure to pollutants could result in health-related risks to sensitive individuals, such as children or the elderly. Residential dwellings, schools, hospitals, playgrounds, and similar facilities are of primary concern because of the presence of individuals particularly sensitive to pollutants and/or the potential for increased and prolonged exposure of individuals to pollutants.

Sensitive receptors closest to Miller/Knox include several multi-family residential units in Brickyard Cove adjacent to the southern park boundary and single-family residences in Point Richmond along the northern park boundary, on Western Drive and Belvedere Avenue. Although the residential property at Brickyard Cove is adjacent to the park property, the residences are distant from the high-use parts of the park with intervening hillside topography. At the north end of Miller/Knox, approximately six single-family homes abut Keller Beach, which is within the park. Other Point Richmond homes are more distant, and many are screened by local hillside topography.
4.9.2 Regulatory Setting

Miller/Knox is located in Contra Costa County, which is in the SFBAAB. Air quality in the region is regulated by BAAQMD, CARB, and the EPA. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, state and local regulations may be more stringent.

FEDERAL

U.S. Environmental Protection Agency

The EPA has been charged with implementing national air quality programs. EPA’s air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

Criteria Air Pollutants

The CAA required EPA to establish NAAQS. As shown in Table 4.9-4, EPA has established primary and secondary NAAQS for the following CAPs: ozone, CO, NO2, SO2, PM10, PM2.5, and lead. The primary standards protect the public health and the secondary standards protect public welfare. CAA also requires each state to prepare a State implementation plan (SIP) for attaining and maintaining the NAAQS. The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. Individual SIPs are modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments, and whether implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a federal implementation plan that imposes additional control measures may be prepared for the nonattainment area. If an approvable SIP is not submitted or implemented within the mandated time frame, sanctions may be applied to transportation funding and stationary air pollution sources in the air basin.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>California (CAAQS)a,b</th>
<th>National (NAAQS)c,d,e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone</td>
<td>1-hour</td>
<td>0.09 ppm (180 μg/m³)</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>0.070 ppm (137 μg/m³)</td>
<td>0.070 ppm (147 μg/m³)</td>
</tr>
<tr>
<td>Carbon monoxide (CO)</td>
<td>1-hour</td>
<td>20 ppm (23 mg/m³)</td>
<td>35 ppm (40 mg/m³)</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>9 ppm (10 mg/m³)</td>
<td>9 ppm (10 mg/m³)</td>
</tr>
<tr>
<td>Nitrogen dioxide (NO2)</td>
<td>Annual arithmetic mean</td>
<td>0.030 ppm (57 μg/m³)</td>
<td>53 ppb (100 μg/m³)</td>
</tr>
<tr>
<td></td>
<td>1-hour</td>
<td>0.18 ppm (339 μg/m³)</td>
<td>100 ppb (188 μg/m³)</td>
</tr>
<tr>
<td>Sulfur dioxide (SO2)</td>
<td>24-hour</td>
<td>0.04 ppm (105 μg/m³)</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>3-hour</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>1-hour</td>
<td>0.25 ppm (655 μg/m³)</td>
<td>75 ppb (196 μg/m³)</td>
</tr>
<tr>
<td>Respirable particulate matter (PM10)</td>
<td>Annual arithmetic mean</td>
<td>20 μg/m³</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>24-hour</td>
<td>50 μg/m³</td>
<td>150 μg/m³</td>
</tr>
<tr>
<td>Fine particulate matter (PM2.5)</td>
<td>Annual arithmetic mean</td>
<td>12 μg/m³</td>
<td>12.0 μg/m³</td>
</tr>
<tr>
<td></td>
<td>24-hour</td>
<td>–</td>
<td>35 μg/m³</td>
</tr>
</tbody>
</table>
### Table 4.9-4 National and California Ambient Air Quality Standards

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>California (CAAQSa,b)</th>
<th>National (NAAQS)c</th>
<th>Primaryd,e</th>
<th>Secondaryb,e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Calendar quarter</td>
<td>–</td>
<td>1.5 μg/m³</td>
<td>Same as primary standard</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30-Day average</td>
<td>1.5 μg/m³</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rolling 3-Month Average</td>
<td>–</td>
<td>0.15 μg/m³</td>
<td>Same as primary standard</td>
<td></td>
</tr>
<tr>
<td>Hydrogen sulfide</td>
<td>1-hour</td>
<td>0.03 ppm (42 μg/m³)</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Sulfates</td>
<td>24-hour</td>
<td>25 μg/m³</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Vinyl chloridef</td>
<td>24-hour</td>
<td>0.01 ppm (26 μg/m³)</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Visibility-reducing particulate matter</td>
<td>8-hour</td>
<td>Extinction of 0.23 per km</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
</tbody>
</table>

Notes: µg/m³ = micrograms per cubic meter; km = kilometers; ppb = parts per billion; ppm = parts per million (by volume).

- a California standards for ozone, carbon monoxide, SO₂ (1- and 24-hour), NO₂, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
- b Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
- c National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. The PM₁₀ 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m³ is equal to or less than one. The PM₂.₅ 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
- d National primary standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
- e National secondary standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- f The California Air Resources Board has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. This allows for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Source: CARB 2016

### Toxic Air Contaminants

TACs are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

A wide range of sources, from industrial plants to motor vehicles, emit TACs. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects, such as cancer, birth defects, neurological damage, asthma, bronchitis or genetic damage or short-term acute effects, such as eye watering, respiratory irritation, cough, runny nose, throat pain, or headache.

For evaluation purposes, TACs are separated into carcinogens and non-carcinogens based on the nature of the physiological effects associated with exposure to the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. This contrasts with CAPs, for which acceptable levels of exposure can be determined and for which ambient standards have been established (Table 4.9-4). Cancer risk from TACs is expressed as excess cancer cases per one million exposed individuals, typically over a lifetime of exposure. CARB regulates TACs through statutes and regulations that generally require the use of the maximum available control technology or best available control technology for toxics to limit emissions.
STATE
CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required CARB to establish CAAQS (Table 4.9-4).

Criteria Air Pollutants
CARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned CAPs. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to attain and maintain the CAAQS by the earliest date practical. The CCAA specifies that local air districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources, and provides air districts with the authority to regulate indirect emission sources.

Toxic Air Contaminants
TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (Hot Spots Act) (AB 2588, Chapter 1252, Statutes of 1987). AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review are required before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and adopted EPA’s list of HAPs as TACs. Most recently, DPM was added to CARB’s list of TACs.

After a TAC is identified, CARB then adopts an airborne toxics control measure for sources that emit that particular TAC. If a safe threshold exists for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If no safe threshold exists, the measure must incorporate best available control technology for toxics to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare an inventory of toxic emissions, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

CARB has adopted diesel exhaust control measures and more stringent emissions standards for various transportation-related mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, DPM) have been reduced significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of CARB’s Risk Reduction Plan, it is expected that DPM concentrations will be 85 percent less in 2020 in comparison to year 2000 (CARB 2000). Adopted regulations are also expected to continue to reduce formaldehyde emissions emitted by cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

Assembly Bill 617
AB 617 of 2017 aims to help protect air quality and public health in communities around industries subject to the state’s cap-and-trade program for greenhouse gas (GHG) emissions. AB 617 imposes a new state-mandated local program to address non-vehicular sources (e.g., refineries, manufacturing facilities) of CAPs and TACs. AB 617 requires CARB to identify high-pollution areas and directs air districts to focus air quality improvement efforts through adoption of community emission reduction programs within these identified areas. Currently, air districts review individual sources and impose emissions limits on emitters based on
best available control technology, pollutant type, and proximity to nearby existing land uses. This bill addresses the cumulative and additive nature of air pollutant health effects by requiring community-wide air quality assessment and emission reduction planning.

REGIONAL/LOCAL

East Bay Regional Park District Master Plan
There are no policies in the District Master Plan that are applicable to air quality at Miller/Knox.

East Bay Regional Park District General Conditions
The District’s General Conditions contains the following rule regarding dust control:

▲ Article 22(b) Dust Control. Dust resulting from the Contractor’s performance of the work shall be controlled by the Contractor either by applying water or a dust palliative without additional costs to the District. The District Inspector has full authority to suspend work wholly or in part should the Contractor fail to perform to the satisfaction of the District Inspector.

Bay Area Air Quality Management District
BAAQMD attains and maintains air quality conditions in Contra Costa County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of BAAQMD includes the preparation of plans and programs for the attainment of ambient-air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. BAAQMD also inspects stationary sources, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements other programs and regulations required by the CAA and CCAA.

All projects are subject to BAAQMD’s rules and regulations in effect at the time of construction. Specific rules applicable to project construction may include, but are not limited to:

▲ Regulation 6, Rule 1, General Requirements. Limits the quantity of particulate matter in the atmosphere by controlling emission rates, concentration, visible emissions and opacity.

▲ Regulation 8, Rule 3, Architectural Coatings. Limits the quantity of volatile organic compounds in architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within BAAQMD.

▲ Regulation 11, Rule 2, Asbestos Demolition, Renovation, and Manufacturing. Limits asbestos emissions during demolition or renovation of structures and the associated disturbance of asbestos-containing waste material generated or handled during these activities.

To implement the Hot Spots Information and Assessment Act in its jurisdiction, BAAQMD requires all stationary sources of TACs that are determined to generate an incremental increase in cancer risk that exceeds 10 in one million or a non-cancer chronic or acute risk level that exceeds a hazard index of 1.0 (using the conservative estimates of screening-level analysis) to perform a detailed, formal health risk assessment (HRA). A hazard index is the ratio of the average short term (generally 1 hour) ambient concentration of a toxic substance(s) divided by the reference exposure level set by the Office of Environmental Health Hazard Assessment (OEHHA). If the ratio is above one, then adverse health effects may occur (CAPCOA 2009).

Air Quality Plans
The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources, and provides districts with the authority
to regulate indirect sources. On April 19, 2017, BAAQMD adopted the 2017 Clean Air Plan: Spare the Air, Cool the Climate (BAAQMD 2017c). The plan aims to lead the region to a post-carbon economy, to continue progress toward attaining all State and Federal air quality standards, and to eliminate health risk disparities from exposure to air pollution among Bay Area communities. It includes a wide range of proposed “control measures”—actions to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent GHGs. Numerous measures reduce multiple pollutants: ozone, particulate matter, air toxics, and GHGs. Others focus on a single type of pollutant—super GHGs like methane and black carbon – or are progressive actions to remove harmful particles in the air.

On June 2, 2010, BAAQMD unanimously adopted thresholds of significance to assist in the review of projects under CEQA. These thresholds are designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA and included in the BAAQMD’s updated CEQA Guidelines (updated May 2012). The Thresholds were challenged in court. Following litigation in the trial court, the court of appeal, and the California Supreme Court, all of the thresholds were upheld.

In an opinion issued on December 17, 2015, the California Supreme Court held that CEQA does not generally require an analysis of the impacts of locating development in areas exposed to existing environmental hazards (such as TACs), unless the project would risk exacerbating the existing environmental hazards; if so, the lead agency must evaluate the exposure of residents or users of a proposed project to the hazard. The Supreme Court also held that public agencies remain free to conduct this analysis for their own public projects as part of their lead agency discretion. In view of the Supreme Court’s opinion, local agencies may rely on thresholds designed to reflect the impact of locating development near areas of TACs where such an analysis is required by CEQA or where the agency has determined that such an analysis would assist in making a decision about the project. However, the thresholds are not mandatory and agencies should apply them only after determining that they reflect an appropriate measure of a project's impacts. BAAQMD published a new version of the CEQA Guidelines (BAAQMD 2017a) dated May 2017, which includes revisions made to address the Supreme Court’s opinion. These Guidelines may inform environmental review for development projects in the Bay Area, but do not commit local governments or BAAQMD to any specific course of regulatory action.

Contra Costa County General Plan
Contra Costa County (2005) has various policies in place related to the improvement of air quality within the County. Policies relevant to the proposed project are shown below:

- **Policy 8-103**: When there is a finding that a proposed project might significantly affect air quality, appropriate mitigation measures shall be imposed.

- **Policy 8-104**: Proposed projects shall be reviewed for their potential to generate hazardous air pollutants.

City of Richmond General Plan
The City of Richmond has a policy in place related to the improvement of air quality within the city (City of Richmond 2012):

- **Policy CN4.1: Air Quality**. Support regional policies and efforts that improve air quality to protect human and environmental health and minimize disproportionate impacts on sensitive population groups.

- **Policy EC2.4: Safe and Convenient Walking and Bicycling**. Promote walking and bicycling as a safe and convenient mode of transportation.

- **Policy EC3.1: Renewable Energy**. Promote the generation, transmission and use of a range of renewable energy sources such as solar, wind power and waste energy to meet current and future demand and encourage new development and redevelopment projects to generate a portion of their energy needs through renewable sources.
Policy EC3.2: Energy Efficiency and Conservation. Promote efficient use of energy and conservation of available resources in the design, construction, maintenance and operation of public and private facilities, infrastructure and equipment.

4.9.3 Impacts and Mitigation Measures

METHODOLOGY

The air quality emissions analysis does not evaluate the air quality impacts of all specific LUPA recommendations, because they would be implemented over a 10-year or longer time frame. Rather, the analysis focuses on quantifying the emissions from the most emissions-intensive proposed LUPA activities that could occur concurrently. Emissions of CAPs and precursors were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 computer program, as recommended by BAAQMD. Modeling was based on LUPA-specific information (e.g., size, area to be graded, area to be paved) where available; reasonable assumptions based on typical construction activities; and default values in CalEEMod that are based on the location. The proposed LUPA’s emissions are compared to BAAQMD-adopted thresholds. Specific model assumptions and inputs for these calculations can be found in Appendix B.

CO impacts were assessed qualitatively using the screening criteria set forth by BAAQMD and results from the traffic analysis, as discussed in Section 4.8, “Transportation.”

The level of health risk from exposure to construction- and operation-related TAC emissions was assessed qualitatively. This assessment was based on the proximity of TAC-generating construction-type activity to off-site sensitive receptors, the number and types of diesel-powered construction equipment being used, and the duration of potential TAC exposure.

Impacts related to odors were also assessed qualitatively, based on proposed actions, equipment types and duration of use, overall construction schedule, and distance to nearby sensitive receptors.

THRESHOLDS OF SIGNIFICANCE

Based on a combination of the CEQA Guidelines Environmental Checklist, Appendix G, and BAAQMD recommendations from its CEQA guidance and regional air quality standards, a project’s impact to air quality would be considered significant if it would do any of the following:

- cause construction-generated CAP or precursor emissions to exceed the BAAQMD-recommended average daily emissions thresholds of 54 pounds per day (lb/day) for ROG, 54 lb/day for NOx, 82 lb/day for PM10 (exhaust), and 54 lb/day for PM2.5 (exhaust). Furthermore, a project’s impact to air quality would be considered significant if BAAQMD’s BMPs for fugitive dust emissions were not incorporated;

- result in a net increase in long-term operational CAP or precursor emissions that exceed the BAAQMD-recommended average daily and maximum annual emissions thresholds of 54 lb/day or 10 tons per year (tpy) for ROG, 54 lb/day or 10 tpy for NOx, 82 lb/day or 15 tpy for PM10, and 54 lb/day or 10 tpy for PM2.5;

- result in long-term operational local mobile-source CO emissions that would violate or contribute substantially to concentrations that exceed the 1-hour CAAQS of 20 parts per million (ppm) or the 8-hour CAAQS of 9 ppm;

- expose sensitive receptors to a substantial incremental increase in TAC emissions that exceed 10 in one million for carcinogenic risk (i.e., the risk of contracting cancer) and/or a noncarcinogenic hazard index of 1.0 or greater; or

- create objectionable odors affecting a substantial number of people.
IMPACTS AND MITIGATION MEASURES

Impact 4.9-1: Emissions of ROG, NOx, PM$_{10}$, and PM$_{2.5}$

Construction-type activities would result in emissions of ROG, NOx, PM$_{10}$ and PM$_{2.5}$ from site preparation (e.g., excavation, grading, and vegetation clearing), lagoon dredging, trail improvements, grading and paving of staging areas and paved pathways, building construction, and building demolition. Construction-related activities in the worst-case scenario were modeled and were found not to exceed BAAQMD’s thresholds of significance for ROG, NOx, PM$_{10}$ (exhaust), or PM$_{2.5}$ (exhaust). Fugitive dust emissions would also be generated by ground disturbing activities and travel on unpaved areas (such as for the dredging and disposal activity related to the Lagoon Enhancement Project and the grading of staging areas), which contributes to the nonattainment status of particulate matter in the County. BAAQMD’s threshold for maintaining fugitive dust impacts at a less-than-significant level is the incorporation of its recommended fugitive dust BMPs.

The proposed LUPA does not include any new major stationary sources of emissions. The only emissions generating long-term activities proposed are operation of the new recreational programs and storage building and potential associated new vehicle trips. However, this small number of new trips is conservative given that the recreational programs and storage building is intended to accommodate existing park programs and volunteer activities, rather than accommodate additional programs. Construction-phase emissions during the course of a day would be much greater than operational-phase emissions. Thus, because daily operational emissions would be far less than those generated during LUPA implementation, operational emissions would also not exceed BAAQMD’s thresholds of significance for ROG, NOx, PM$_{10}$ (exhaust), or PM$_{2.5}$ (exhaust). However, If the LUPA recommendations do not adhere to BAAQMD’s recommended fugitive dust BMPs, they would conflict with the applicable air quality plan and violate air quality standards. Impacts would be potentially significant.

Contra Costa County is designated as nonattainment for ozone and PM$_{2.5}$ with respect to the CAAQS and NAAQS and nonattainment for PM$_{10}$ with respect to the CAAQS (See Table 4.9-4, above). The proposed LUPA would result in temporary construction as well as operational emissions of CAPs, evaluated further below. BAAQMD’s 2017 Clean Air Plan contains control strategies for reducing CAP emissions. The recommended measure for determining project consistency with these control strategies are the BAAQMD’s CEQA thresholds of significance. Therefore, if approval of a project would not result in significant and unavoidable air quality impacts after the application of all feasible mitigation, the project would be considered consistent with the 2017 CAP.

Construction

Construction-type activities associated with LUPA recommendations would include site preparation (e.g., excavation, grading, and vegetation clearing), lagoon dredging, trail improvements, grading and paving of staging areas and pedestrian paths, construction of the recreational programs and storage building, and partial demolition of the historic warehouse building. These activities would involve the use of heavy-duty construction equipment that would generate short-term exhaust emissions of ROG, NOx, PM$_{10}$, and PM$_{2.5}$. Exhaust emissions would also be generated by haul trucks delivering supplies, hauling dredged material, and by worker commute trips. Construction emissions would be subject to BAAQMD-recommended average daily emissions thresholds of 54 lb/day for ROG, 54 lb/day for NOx, 82 lb/day for PM$_{10}$ (exhaust), and 54 lb/day for PM$_{2.5}$ (exhaust).

CalEEMod was used to model a worst-case scenario in which the most emissions intensive activities from a single phase (refer to Subsection 3.10 of Chapter 3, “Project Description”) were occurring concurrently. This scenario conservatively includes the Lagoon Enhancement Project; trail paving and improvement activities in the Bayshore, Lagoon, and Ridgeland Planning Areas; and construction of the Canal Boulevard Staging Area. Net total emissions from this scenario were divided by the number of active construction days, resulting in the average daily emissions figures shown in Table 4.9-5. Refer to Appendix B for detailed modeling assumptions, inputs, and outputs.
Table 4.9-5  Short-term Emissions of Criteria Air Pollutants

<table>
<thead>
<tr>
<th>Construction Activity</th>
<th>ROG</th>
<th>NO\textsubscript{x}</th>
<th>PM\textsubscript{10}</th>
<th>PM\textsubscript{2.5}</th>
<th>Fugitive Dust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Activity</td>
<td>3.65</td>
<td>39.75</td>
<td>1.83</td>
<td>1.71</td>
<td>81.18</td>
</tr>
<tr>
<td>Thresholds of Significance</td>
<td>54</td>
<td>54</td>
<td>82</td>
<td>54</td>
<td>BMPs</td>
</tr>
</tbody>
</table>

Notes: ROG = reactive organic gases; NO\textsubscript{x} = nitrogen oxides; PM\textsubscript{10} = respirable particulate matter; PM\textsubscript{2.5} = fine particulate matter
Source: Appendix B

As shown in Table 4.9-5, construction activities in the worst-case scenario would result in average daily emissions of 3.65 lb/day for ROG, 39.75 lb/day for NO\textsubscript{x}, 1.83 lb/day for PM\textsubscript{10} (exhaust), and 1.71 lb/day for PM\textsubscript{2.5} (exhaust). Construction-related emissions would not exceed BAAQMD’s thresholds of significance for ROG, NO\textsubscript{x}, PM\textsubscript{10} (exhaust), or PM\textsubscript{2.5} (exhaust); therefore, construction-related emissions of these specific CAPs would be in compliance with applicable air quality plans and would not violate any air quality standards. This impact would be less than significant.

Fugitive dust emissions would also be generated by ground disturbance and earth moving activities (i.e., excavation, grading), as well as travel by haul trucks, vehicles, and equipment on dirt other unpaved surfaces. As shown in Table 4.9-5, construction activities in the worst-case scenario would result in average daily emissions of 81.18 lb/day for fugitive dust. BAAQMD’s threshold for significant fugitive dust impacts is the incorporation of its recommended fugitive dust BMPs. If the LUPA recommendations do not adhere to BAAQMD’s BMPs, they would conflict with the applicable air quality plan and violate air quality standards. This impact would be potentially significant.

Mitigation Measure 4.9-1: Incorporate the BAAQMD Recommended BMPs for Fugitive Dust Emissions

The East Bay Regional Park District (District) would require all its construction contractors to implement a dust control plan that shall include the following Basic Construction Mitigation Measures as recommended by BAAQMD:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition before operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District’s phone number shall also be visible to ensure compliance with applicable regulations.
Significance after Mitigation
Implementation of Mitigation Measure 4.9-1 would require the District to incorporate BAAQMD’s Basic Construction Mitigation Measures Recommended for all Proposed Projects, which contain BMPs for reducing fugitive dust emissions. Incorporation of these BMPs would ensure that construction emissions associated with the LUPA recommendations would be within BAAQMD’s thresholds of significance for fugitive dust emissions. Therefore, the proposed LUPA would not contribute to emission concentrations that exceed the NAAQS and CAAQS and would not violate or contribute substantially to the nonattainment status designated for any CAP in the county. Thus, this impact would be less than significant with mitigation incorporated.

Operation
Existing operational sources of CAPs at Miller/Knox include emissions from ongoing vegetation management and trail maintenance, as well as vehicle trips by park visitors and staff. The proposed LUPA does not include any new, major stationary sources of permanent air pollutant emissions. The only emissions generating long-term activities proposed are operation of the new recreational programs and storage building and potential associated new vehicle trips. As discussed in Section 4.8, “Transportation,” using the Institute of Transportation Engineers Trip Generation Manual (9th Edition), the Recreational Community Center land use would result in two peak hour trips during both the weekday a.m. and p.m. peak hours, and approximately ten Saturday peak hour trips, assuming a 1,000 square foot facility. However, this small number of new trips is conservative given that the recreational programs and storage building is intended to accommodate existing park programs and volunteer activities, rather than accommodate additional programs. Furthermore, the proposed LUPA would provide enhanced bike and pedestrian facilities within Miller/Knox; thus, increasing connectivity, facilitating the increased use of non-motorized modes of transportation, thereby potentially reducing vehicle-related air pollutant emissions.

Furthermore, construction-phase emissions would be much greater than operational-phase emissions. For example, emissions from the Lagoon Enhancement Project, which would require dredging of up to 10,000 cubic yards of material, would far exceed air pollutant emissions from ongoing vegetation management which would at most involve a small crew using hand tools and the occasional use of mechanical equipment. Thus, because the average daily level of construction-generated emissions would not exceed BAAQMD’s thresholds of significance for ROG, NOx, PM10 (exhaust), or PM2.5 (exhaust), the operational emissions associated with the proposed LUPA would be well below BAAQMD’s thresholds and would be in compliance with the applicable air quality plan. Therefore, operational-phase emissions would be less than significant.

Impact 4.9-2: Exposure of Sensitive Receptors to Substantial Pollutant Concentrations
The single largest source of CO is motor vehicle engines. Although there would be a temporary and periodic increase in vehicle trips related to worker commute and equipment delivery, and potentially a small increase in peak hour trips (up to 10 peak-hour trips during the weekends), the LUPA recommendations would not result in substantial long- or short-term vehicle trip generation. Additionally, given the preexisting parking constraints at Miller/Knox, new, formalized, and expanded staging areas would make finding parking easier, resulting in a decrease in vehicle idling and associated emissions.

LUPA recommendations would result in short-term diesel exhaust emissions from mechanical equipment and haul truck trips. The majority of DPM-emitting activities associated with the LUPA recommendations would not take place in the same location for more than a week at a time, which is a short exposure period relative to the 70- or 30-year exposure periods recommended for health risk assessments, and equipment and vehicle use would not be substantial. Activities that would be in one location for an extended period would be conducted more than 1,200 feet away from existing sensitive receptors; no substantial TAC impacts are expected at this distance because it would be outside of BAAQMD’s recommended zone of influence screening distance of 1,000 feet. Furthermore, these areas would be closed to the public during the construction period, limiting the exposure of park visitors. In addition, DPM dissipates rapidly from the source, and exposure concentrations would decline with distance from these activities. Therefore, the proposed LUPA would not expose sensitive receptors to substantial levels of pollutants and this impact would be less than significant.
Carbon Monoxide
The single largest source of CO is motor vehicle engines. CO concentration near roadways is a direct function of vehicle idling time and, thus, traffic flow conditions. Although there would be a temporary and periodic increase in vehicle trips related to worker commute and equipment delivery, the proposed LUPA would not result in substantial long- or short-term vehicle trip generation at levels that could cause unhealthy concentrations of CO on nearby roadways. While the proposed LUPA includes a new recreational programs and storage building and new and expanded staging areas, they are not anticipated to result in substantial net new vehicle trips. As discussed in Section 4.8, “Transportation,” it is estimated that the new recreational programs and storage building would generate a maximum of 10 Saturday peak-hour vehicle trips. However, this small number of new trips is conservative given that the recreational programs and storage building is intended to accommodate existing park programs and volunteer activities, rather than accommodate additional programs. Additionally, given the preexisting parking constraints at Miller/Knox, new, formalized, and expanded staging areas would make finding parking easier, resulting in a decrease in vehicle idling and associated emissions. Thus, the proposed LUPA would not increase traffic on the roadways or intersections within or adjacent to Miller/Knox to levels that would exceed the 1-hour CAAQS of 20 parts per million (ppm) or the 8-hour CAAQS of 9 ppm. Therefore, this impact would be less than significant.

Toxic Air Contaminants
Implementation of the LUPA recommendations would result in short-term diesel exhaust emissions from mechanical equipment and haul truck trips associated with site preparation (e.g., excavation, grading, and vegetation clearing), lagoon dredging, trail improvements, grading and paving of staging areas and paved pathways, building construction, and building demolition. DPM was identified as a TAC by CARB in 1998. The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. According to the OEHHA, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70- or 30-year exposure period. However, such assessments should be limited to the period/duration of activities that generate TAC emissions (OEHHA 2015).

The majority of DPM-emitting activities associated with the LUPA recommendations would not take place in the same location for more than a week at a time, which is a short exposure period relative to the 30- or 70-year exposure timeframe recommended for health risk assessments, and equipment and vehicle use would not be substantial. Activities that would be in one location for an extended period include the Lagoon Enhancement Project, construction of the new recreational programs and storage building, and construction of new, formalized, and expanded staging areas. These activities would be conducted more than 1,200 feet away from existing sensitive receptors. No substantial TAC impacts are expected at this distance because it would be outside of BAAQMD’s recommended zone of influence screening distance of 1,000 feet. Thus, exposure would be limited to park visitors and passersby. However, for safety reasons, these areas would be closed to the public during the construction period, limiting the exposure of park residents. In addition, DPM dissipates rapidly from the source, and exposure concentrations would decline with distance from these activities (Zhu et al. 2002). Therefore, the proposed LUPA would not expose sensitive receptors to substantial levels of pollutants and this impact would be less than significant.

Mitigation Measures
No mitigation is required.
Impact 4.9-3: Exposure of Sensitive Receptors to Odors

The proposed LUPA does not include the development of any new sensitive land uses or of any new major odor sources (e.g., wastewater treatment plant, landfill). Implementation of the LUPA recommendations would result in temporary and intermittent odors from the use of heavy duty diesel equipment, asphalt-paving, and excavation of dredged materials. DPM tends to decrease rapidly with distance and the majority of DPM would dissipate at 1,000 feet from the source (CARB 2005). As discussed in Impact 4.9-4 above, residential developments are located more than 1,200 feet away from temporary odor-generating activities. Furthermore, these areas would be closed to the public during active construction-type activities.

Odors may be generated from dredged materials during the Lagoon Enhancement Project. Given that dredged material will be spread to optimize drying time and the distance between the disposal area and the nearest sensitive receptors, odors impacts from the Lagoon Enhancement Project would be temporary and minimal. Additionally, the Lagoon Enhancement Project would improve water quality and would help to reduce lagoon-related odors. Therefore, the proposed LUPA would not result in exposure of a substantial number of people to objectionable odors and impacts would be less than significant.

The proposed LUPA would not include the development of any new sensitive land uses or of any new major odor sources (e.g., wastewater treatment plant, landfill). Green-waste storage is already occurring on site and would be relocated from Ferry Point to the Bray Planning Area. Implementation of the LUPA recommendations would result in temporary and intermittent odors from the use of heavy duty diesel equipment, asphalt-paving, and excavation of dredged materials. DPM tends to decrease rapidly with distance and the majority of DPM would dissipate at 1,000 feet from the source (CARB 2005). Odor-sensitive receptors include residences and park visitors. However, as discussed in Impact 4.9-4 above, residential developments are located more than 1,200 feet away from heavy duty construction-type activities, such as construction of the new recreational programs and storage building, construction of new, formalized, and expanded staging areas, and the Lagoon Enhancement Project. Furthermore, these areas would be closed to the public during dredging, hauling, and drying of the dredged material, limiting the exposure of park visitors to odor-generating activities.

Odors may be generated from dredged materials during the Lagoon Enhancement Project. If present, the anaerobic decay of organic material can generate gases, specifically hydrogen sulfide which is commonly described as having a foul or “rotten egg” smell. As dredged material is placed in the disposal area, it would be spread to optimize drying time, prevent anaerobic decay, and to reduce potential odor impacts. The disposal area is more than 1,000 feet away from the nearest sensitive receptors, which are separated by Dornan Drive and intervening hillside topography. Additionally, the Lagoon Enhancement Project would improve water quality and would help to reduce lagoon-related odors. Dredging would help manage water levels in the lagoon to encourage mixing and flow through the system to improve overall water quality, minimize algal blooms, and control odors. Therefore, the proposed LUPA would not result in exposure of a substantial number of people to objectionable odors. This impact would be less than significant.

Mitigation Measures

No mitigation is required.
GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

This section summarizes current climate change science and greenhouse gas (GHG) emissions sources in California and provides a summary of GHG regulations applicable to the Miller/Knox Regional Shoreline (Miller/Knox or park) Land Use Plan Amendment (LUPA). The section includes a quantitative analysis of GHG emissions associated with the LUPA recommendations, discussion about their potential contribution to global climate change, and analysis of the potential climate change-related risks.

Scoping comments received related to GHG emissions and climate change expressed concern about the potential for increased GHG emissions associated with increases in vehicle miles traveled, and about the impacts of sea level rise (SLR) and storm surge on the regional park with implementation of the LUPA recommendations. These topics are addressed in Impact 4.10-1 and Impact 4.10-3, respectively.

4.10.1 Environmental Setting

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Certain gases in the earth’s atmosphere, classified as GHGs, play a critical role in determining the earth’s surface temperature. Solar radiation enters the earth’s atmosphere from space. A portion of the radiation is absorbed by the earth’s surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead “trapped,” resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth’s climate, known as global climate change or global warming. Emissions of GHGs contributing to global climate change are attributable, in large part, to human activities associated with on-road and off-road transportation, industrial/manufacturing, electricity generation by utilities and consumption by end users, residential and commercial on-site fuel usage, and agriculture and forestry. Emissions of CO₂ are, largely, byproducts of fossil fuel combustion. High global warming potential (GWP) gases have atmospheric insulative properties that are hundreds to tens of thousands of times greater than that of CO₂. HFCs, PFCs, and SF₆ are some of the most common types of high-GWP gases and result from a variety of industrial processes.

It is “extremely likely” that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forcing together (Intergovernmental Panel on Climate Change [IPCC] 2014: 5). Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes, about one day, GHGs have long atmospheric lifetimes of one to several thousand years. GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the lifetime of any particular GHG molecule is dependent on multiple variables and cannot be determined with any certainty, it is understood that more CO₂ is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO₂ emissions, approximately 55 percent is sequestered through ocean and
land uptake every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO₂ emissions remains stored in the atmosphere (IPCC 2013:467).

The quantity of GHGs in the atmosphere that ultimately result in climate change is not precisely known, but is enormous; no single project alone would measurably contribute to an incremental change in the global average temperature, or to global, local, or micro climates. From the standpoint of the California Environmental Quality Act (CEQA), GHG impacts relative to global climate change are inherently cumulative.

**EFFECTS OF CLIMATE CHANGE ON THE ENVIRONMENT**

According to the IPCC, which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature is expected to increase by 3 to 7 degrees Fahrenheit (°F) by the end of the century, depending on future GHG emission scenarios (IPCC 2007). According to the California Natural Resources Agency (CNRA), temperatures in California are projected to increase 2 to 5 °F by 2050 and by 4 to 9 °F by 2100 (CNRA 2009).

Other environmental resources could be indirectly affected by the accumulation of GHG emissions and resulting rise in global average temperature. For example, an increase in the global average temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. According to “Our Changing Climate” (CNRA 2012), the snowpack portion of the state’s water supply could potentially decline 30 to 90 percent by the end of the 21st century. An increase in precipitation falling as rain rather than snow also could lead to increased potential for floods because water that would normally be held in the snowpack of the Sierra Nevada until spring would flow into the Central Valley concurrently with winter rainstorm events. This scenario would place more pressure on California’s levee/flood control system.

As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available. Changes in precipitation patterns and increased temperatures are expected to alter the distribution and character of natural vegetation and associated moisture content of plants and soils. An increase in frequency of extreme heat events and drought are also expected. These changes are expected to lead to increased frequency and intensity of wildfires (CNRA 2012).

Another outcome of global climate change is SLR. The sea level rose approximately 7 inches during the last century and it is predicted to continue to rise. Predictions for the extent of SLR vary depending on the future rates of GHG emissions. Early estimates (in 2007) by the Intergovernmental Panel on Climate Change (IPCC) indicated an additional 7 to 22 inches by 2100 (IPCC 2007). Updated research has continued since then. The Ocean Protection Council (OPC) released the *State of California Sea-Level Rise Guidance 2018 Update* (2018 Guidance), which incorporates scenario-based versus probabilistic SLR projections. The OPC update includes median, likely, and low-risk scenarios, as well as, the H++ scenario, which is an extreme SLR scenario that accounts for the loss of the West Antarctic ice sheet. These projections are shown in Table 4.10-1 for year 2050 and 2100 in San Francisco.

The 2018 Guidance recommends the use of certain projections depending upon the risk tolerance of land use decisions. For decisions where there is high risk tolerance, such as parks and open space, the higher end of the “Likely Range” projection is recommended. For decisions where there is low risk tolerance, the 1-in-200 chance projection is recommended. For land uses and facilities where risk tolerance is extremely low, such as high-density residential or critical infrastructure, the H++ scenario is recommended (OPC 2018). Miller/Knox is considered a land use with high tolerance for risk because no permanent housing or critical infrastructure is located onsite or proposed in the LUPA. Furthermore, the Miller/Knox shoreline is protected from near-term SLR effects by existing riprap, which would protect the park from potential wave-action and erosion. Although the Lagoon Planning Area and parts of the Bray and Bay Shore Planning Areas consist of native clay and 6 to 8 feet of artificial fill, as discussed in Subsection 4.2.1 of Section 4.2, “Geology and
Soils,” no historic municipal waste, hazardous waste, or debris landfill materials are present. The remaining areas of the park are primarily natural soils and bedrock. Therefore, the higher end of the “Likely Range” projection is used in this document for impact analysis.

<table>
<thead>
<tr>
<th>Projection Year and Scenario</th>
<th>Median (50% probability SLR meets or exceeds...)</th>
<th>Likely Range (66% probability SLR is between...)</th>
<th>1-in-20 Chance (5% probability SLR meets or exceeds...)</th>
<th>1-in-200 Chance (0.5% probability SLR meets or exceeds...)</th>
<th>HH++ Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>2050 (High Emissions Scenario)</td>
<td>0.9</td>
<td>0.6 - 1.1</td>
<td>1.4</td>
<td>1.9</td>
<td>2.7</td>
</tr>
<tr>
<td>2100 (Low Emissions Scenario)</td>
<td>1.6</td>
<td>1.0 - 2.4</td>
<td>3.2</td>
<td>5.7</td>
<td>10.2</td>
</tr>
<tr>
<td>2100 (High Emissions Scenario)</td>
<td>2.5</td>
<td>1.6 - 3.4</td>
<td>4.4</td>
<td>6.9</td>
<td>10.2</td>
</tr>
</tbody>
</table>

Source: Ocean Protection Council 2018

**GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE**

GHG emissions are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural emissions sectors (CARB 2014). In Contra Costa County, the transportation sector is the largest emitter of GHGs, followed by the energy sector (Contra Costa County 2015), as shown in Table 4.10-2. Emissions of CO₂ are byproducts of fossil fuel combustion. CH₄, a highly potent GHG, primarily results from off-gassing such as the release of chemicals from nonmetallic substances under ambient or greater pressure conditions, and is largely associated with agricultural practices and landfills. N₂O is also largely attributable to agricultural practices and soil management. CO₂ sinks, or reservoirs, include vegetation and the ocean, which absorb CO₂ through sequestration and dissolution (CO₂ dissolving into the water), respectively, two of the most common processes for removing CO₂ from the atmosphere.

<table>
<thead>
<tr>
<th>Sector</th>
<th>MTCO₂ₑ</th>
<th>Percent of Total MTCO₂ₑ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Energy</td>
<td>258,420</td>
<td>19</td>
</tr>
<tr>
<td>Nonresidential Energy</td>
<td>125,350</td>
<td>9</td>
</tr>
<tr>
<td>Solid Waste and Landfill</td>
<td>26,540</td>
<td>2</td>
</tr>
<tr>
<td>Landfill</td>
<td>196,500</td>
<td>14</td>
</tr>
<tr>
<td>On-road Transportation</td>
<td>651,130</td>
<td>47</td>
</tr>
<tr>
<td>Off-road Equipment</td>
<td>66,320</td>
<td>5</td>
</tr>
<tr>
<td>Water and Wastewater</td>
<td>7,400</td>
<td>1</td>
</tr>
<tr>
<td>BART</td>
<td>2,680</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Agriculture</td>
<td>58,200</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,392,450</td>
<td>100</td>
</tr>
</tbody>
</table>

Notes: MTCO₂ₑ = metric tons of carbon dioxide equivalents
Source: Contra Costa County 2015

Many national and sub-national jurisdictions have established GHG reduction targets, policies, and regulations. Numerous governments, agencies, communities, and businesses are investing substantial effort and financial resources in reaching future GHG targets. Nonetheless, achieving GHG reduction goals remains a challenge. Global atmospheric carbon dioxide (CO₂) concentrations, one measure of global greenhouse gases, have continued to rise; global average annual temperatures have also continued to rise.
Since late 2015, measurements of the atmospheric CO₂ concentration have consistently exceeded 400 parts per million and worldwide GHG emissions have continued to follow the business-as-usual trajectory (Ocean Protection Council 2018). Consequently, the reasonably foreseeable future GHG emissions scenario to use in this document for SLR projections would be the High Emissions Scenario, which represents the business-as-usual, fossil-fuel-intensive emission scenario.

Although there is strong scientific consensus that global climate change is occurring and is influenced by human activity, there is less certainty as to the timing, severity, and potential consequences of the climate phenomena. Scientists have identified several ways in which global climate change could alter the physical environment in California (CNRA 2012; DWR 2006; IPCC 2007). These include:

- increased average temperatures;
- modifications to the timing, amount, and form (rain vs. snow) of precipitation;
- changes in the timing and amount of runoff;
- reduced water supply;
- deterioration of water quality; and
- elevated sea level.

Many of these phenomena would translate into a variety of issues and concerns that may affect Miller/Knox, including but not limited to increased risk of wildfires and increased risk of flooding because of SLR. The Miller/Knox shoreline, located along the San Francisco Bay, is tidally influenced and, therefore, vulnerable to flooding at current sea levels and at higher risk of flood exposure based on the projected scenarios of SLR, particularly where high tide and wind-driven storm waves may simultaneously occur. Rising sea levels could result in more frequent inundation in low lying areas and during larger tidal events. As shown in Table 4.10-1 above, climate change could result in SLR in San Francisco Bay of up to an additional 1.1 feet by the mid-21st century and up to an additional 3.4 feet by the end of the century, using the Likely Range projection and assuming the reasonable expectation that higher levels of GHG emissions would continue (OPC 2018).

Cal-Adapt is a climate change scenario planning tool developed by the California Energy Commission (CEC) that downscales global climate model data to local and regional resolution under two emissions scenarios: one in which emissions peak around 2040 and then decline (Representative Concentration Pathway [RCP] 4.5) and another in which emissions continue to rise throughout the 21st century (RCP 8.5). According to Cal-Adapt, annual average temperatures in Contra Costa County are projected to rise by 5.1 to 7.9°F by 2090, with the range based on low and high emissions scenarios (Cal-Adapt 2018).

### 4.10.2 Regulatory Setting

**FEDERAL**

**U.S. Environmental Protection Agency**

**Supreme Court Ruling**
The U.S. Environmental Protection Agency (EPA) is the federal agency responsible for implementing the federal Clean Air Act (CAA) and its amendments. The Supreme Court of the United States ruled on April 2, 2007, that CO₂ is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs. The ruling in this case resulted in EPA taking steps to regulate GHG emissions and lent support for state and local agencies’ efforts to reduce GHG emissions.

**Regulations for Greenhouse Gas Emissions from Passenger Cars and Trucks and Corporate Average Fuel Economy Standards**

In October 2012, EPA and the National Highway Traffic Safety Administration (NHTSA), on behalf of the Department of Transportation, issued final rules to further reduce GHG emissions and improve corporate average fuel economy (CAFE) standards for light-duty vehicles for model years 2017 and beyond (77 FR 62624). NHTSA’s CAFE standards have been enacted under the Energy Policy and Conservation Act since...
1978. This national program requires automobile manufacturers to build a single light-duty national fleet that meets all requirements under both federal programs and the standards of California and other states. This program would increase fuel economy to the equivalent of 54.5 miles per gallon (mpg) limiting vehicle emissions to 163 grams of CO2 per mile for the fleet of cars and light-duty trucks by model year 2025 (77 FR 62630). However, on March 15, 2017, the new EPA Administrator and Department of Transportation announced that EPA intends to reconsider the final determination. On April 2, 2018, the Administrator signed the Mid-term Evaluation Final Determination which finds that the model year 2022-2025 GHG standards are not appropriate in light of the record before EPA and, therefore, should be revised (EPA 2018).

STATE

Executive Order S-3-05
Executive Order (EO) S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California’s air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the EO established total GHG emission targets for the state. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

This EO was the subject of a California Appellate Court decision, Cleveland National Forest Foundation v. San Diego Association of Governments (SANDAG) (November 24, 2014) 231 Cal.App.4th 1056, which was reviewed by the California Supreme Court in January 2017. The case addressed the adequacy of the GHG analysis in the environmental impact report (EIR) SANDAG prepared for its 2011 Regional Transportation Plan (RTP). The California Supreme Court ruled that SANDAG did not abuse its discretion by declining “to adopt the 2050 goal as a measure of significance in light of the fact that the EO does not specify any plan or implementation measures to achieve its goal.”

In addition to concluding that an EIR need not use this EO’s goal for determining significance, the court described several principles relevant to CEQA review of GHG impacts, including: (1) EIRs should “reasonably evaluate” the “long-range GHG emission impacts for the year 2050;” and (2) the 2050 target is “grounded in sound science” in that it is “based on the scientifically supported level of emissions reduction needed to avoid significant disruption of the climate. The court also ruled that “an EIR’s designation of a particular adverse environmental effect as ‘significant’ does not excuse the EIR’s failure to reasonably describe the nature and magnitude of the adverse effect.” The court also recognized that the 40 percent reduction in 1990 GHG levels by 2030 is “widely acknowledged” as a “necessary interim target to ensure that California meets its longer-range goal of reducing GHG emission 80 percent below 1990 levels by the year 2050.” Senate Bill (SB) 32 has since defined the 2030 goal in statute (discussed below).

Assembly Bill 32, the California Global Warming Solutions Act of 2006
In September 2006, Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006, Assembly Bill (AB) 32. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 also requires that these reductions “...shall remain in effect unless otherwise amended or repealed. (b) It is the intent of the Legislature that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020. (c) The [Air Resources Board] shall make recommendations to the Governor and the Legislature on how to continue reductions of GHG emissions beyond 2020.” [California Health and Safety Code, Division 25.5, Part 3, Section 38551]

In December 2008, the California Air Resources Board (CARB) adopted its first version of its Climate Change Scoping Plan, which contained the main strategies California will implement to achieve the mandate of AB 32 (2006) to reduce statewide GHG emissions to 1990 levels by 2020. In May 2014, CARB released and subsequently adopted the First Update to the Climate Change Scoping Plan to identify the next steps in...
reaching the goals of AB 32 (2006) and evaluate the progress made between 2000 and 2012 (CARB 2014). After releasing multiple versions of proposed updates in 2017, CARB adopted the final version titled *California’s 2017 Climate Change Scoping Plan* (2017 Scoping Plan) in December (CARB 2017a). The 2017 Scoping Plan indicates that California is on track to achieve the 2020 statewide GHG target mandated by AB 32 of 2006 (CARB 2017a). It also lays out the framework for achieving the mandate of SB 32 of 2016 to reduce statewide GHG emissions to at least 40 percent below 1990 levels by the end of 2030 (CARB 2017a). The 2017 Scoping Plan identifies the GHG reductions needed by each emissions sector.

The 2017 Scoping Plan also identifies how GHGs associated with proposed projects could be evaluated under CEQA (CARB 2017a:101-102). The 2017 Scoping Plan includes goals to reduce energy demand; increase the number, safety, connectivity, and attractiveness of biking and walking facilities to increase use; minimize the net GHG and black carbon emissions associated with management of natural lands, biomass utilization, and wildfire events; and to maximize recycling and waste diversion from landfills. Specifically, it states that achieving “no net increase” in GHG emissions is an appropriate overall objective of projects evaluated under CEQA if conformity with an applicable local GHG reduction plan cannot be demonstrated. CARB recognizes that it may not be appropriate or feasible for every development project to mitigate its GHG emissions to zero and that an increase in GHG emissions because of a project may not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change.

**Senate Bill 375**

SB 375, signed by Governor Schwarzenegger in September 2008, aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires metropolitan planning organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy, showing prescribed land use allocation in each MPO’s RTP. CARB, in consultation with MPOs, is to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

The Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) serve as the MPO for Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties. ABAG and MTC adopted Plan Bay Area 2040, the long-range RTP/SCS in 2017.

**Executive Order B-30-15**

On April 20, 2015 Governor Brown signed EO B-30-15 to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor’s EO aligns California’s GHG reduction targets with those of leading international governments such as the 28-nation European Union, which adopted the same target in October 2014. California is on track to meet or exceed the target of reducing GHG emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (AB 32, discussed above). California’s new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2 degrees Celsius, the warming threshold at which major climate disruptions are projected, such as super droughts and rising sea levels.

**Senate Bill 32 and Assembly Bill 197 of 2016**

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California’s GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030, which set the next interim step in the State’s continuing efforts to pursue the long-term target expressed in EOs S-3-05 and B-30-15 of 80 percent below 1990 emissions levels by 2050.
California Building Efficiency Standards of 2016 (Title 24, Part 6)
Buildings in California are required to comply with California’s Energy Efficiency Standards for Residential and Nonresidential Buildings established by the CEC regarding energy conservation standards and found in Title 24, Part 6 of the California Code of Regulations. These standards were first adopted in 1978 in response to a legislative mandate to reduce California’s energy consumption and are updated on an approximately 3-year cycle to allow consideration and possible incorporation of new energy efficient technologies and methods. All buildings for which an application for a building permit is submitted on or after January 1, 2017 must follow the 2016 standards (CEC 2015). Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions.

California Green Building Standards of 2016 (Title 24, Part 11)
Qualified historical buildings and structures and their associated sites regulated by the State Historical Building Safety Board are required to comply with provisions of the California Green Building Standards Code, found in Title 24, Part 11 of the California Code of Regulations. The code is intended to improve public health, safety, and general welfare by enhancing the design and construction of buildings to have a reduced negative environmental impact. Sustainable construction practices in planning and design, energy efficiency, water conservation and efficiency, material conservation and resource efficiency, and environmental quality and encouraged.

REGIONAL/LOCAL

East Bay Regional Park District
The District Master Plan (2013) defines the overall mission and vision for the District. To achieve this vision, the District intends to monitor the effects of climate change on District resources and use adaptive management techniques to adjust stewardship methods and priorities to preserve the natural, cultural, and scenic values of the parks and trails. In terms of SLR impacts, the District Master Plan includes strategies to ensure that operation and maintenance expenses of shoreline facilities are manageable in the future. Strategies include reserve funding for storm damage repair, long-term planning to ensure maximum sustainability in anticipation of rising tidal levels, coordination with other concerned agencies, encouraging the reuse and recycling of resources, development of renewable energy sources, and preserving park lands as carbon sinks. The District Master Plan also contains policies and descriptions of the programs in place for achieving the highest standards of service in resource conservation, management, interpretation, public access, and recreation. The following polices are applicable to GHGs and climate change at Miller/Knox.

- **Policy RM 1**: Climate Change is expected to affect these resources in various ways. Changes in the ranges of various species, increased potential for wildfires and pests are anticipated with this change in the weather. In a manner consistent with the desire to “conserve and enhance” its resources, the District must closely track the impact of this phenomenon and if necessary, act to relocate or protect in-situ resources that are being degraded or potentially lost by this change.

- **Policy RM 1b**: The District will specifically track and monitor the effects of Climate Change on its resources, interceding when necessary to relocate or protect in-situ resources that are being degraded or lost by this shift in the environment.

- **Policy NRM 1b**: To help mitigate the effects of climate change, the District will endeavor to conserve and connect habitat for native species through its acquisition and planning processes.

- **Policy NRM 12b**: The District will engage in watershed management planning and practices that will address the shifts in habitat ranges caused by climate change through the preservation and enhancement of streams and wetland areas.

On April 17, 2018, the District Board of Directors adopted Resolution 2018-04-081 to establish a policy framework for managing park resources in a changing climate. The climate policy framework includes five key principles: 1.) Climate in All Policies, 2.) Climate Friendly, 3.) Climate Readiness, 4.) Lead Climate Smart Practices, and 5.) Advancing Climate Science. To implement this policy, the District has completed an
inventory of the agency GHG emissions in the building and vehicle fleet sectors, developed a baseline of carbon sequestration on District lands, and is working to implement a strategic energy plan, including development of a solar array that generates renewable energy sufficient to offset the District’s energy use in its buildings. Additionally, the District’s Climate Smart Initiative includes integrated adaptive management, such as wetland restoration at Dotson Family Marsh, wildfire hazard reduction practices, study and monitoring of harmful algae bloom, and expansion of a network of trails for green transportation.

Bay Area Air Quality Management District
The Bay Area Air Quality Management District (BAAQMD) is the primary agency responsible for addressing air quality concerns in Contra Costa County—its role is discussed further in Subsection 4.9.2 of Section 4.9, “Air Quality.” BAAQMD also recommends methods for analyzing project-generated GHGs in CEQA analyses and offers multiple potential GHG reduction measures for land use development projects. BAAQMD developed thresholds of significance to provide a uniform scale to measure the significance of GHG emissions from land use and stationary source projects in compliance with CEQA and AB 32. However, since the passage of SB 32 and AB 197 and the associated adoption of a revised statewide emissions target of 40 percent below 1990 levels by 2030, BAAQMD has not yet adopted new thresholds in compliance with this target.

Contra Costa County

Contra Costa County Climate Action Plan
The Contra Costa County Climate Action Plan (CAP) (Contra Costa County 2015) was adopted on December 15, 2015 by the Contra Costa County Board of Supervisors. The CAP includes GHG emission reduction targets, strategies, and implementation measures developed to help the city reach these targets. To achieve the state-recommended reduction target of 15 percent below 2005 emissions levels by 2020, the County is implementing a strategy around six topic areas: energy efficiency and conservation, renewable energy, land use and transportation, solid waste, water conservation, and government operations. Policies applicable to the proposed LUPA include:

- **Measure RE 2: Alternative Energy Facilities.** Promote installation of alternative energy facilities on public land.

- **Measure LUT 1: Mobility and Land Uses.** Maintain and expand access to goods, services, and other destinations through increased transportation alternatives (mobility improvements) and improved proximity (land use improvements).

- **Measure LUT 3: Off-Road Vehicles and Equipment.** Reduce emissions from off-road vehicles and equipment.

- **Measure W 1: Waste Reduction and Recycling.** Develop a waste reduction strategy to increase recycling and reuse of materials.

City of Richmond

City of Richmond 2030 General Plan
The City of Richmond 2030 General Plan includes the following policies related to GHG emissions and climate change that are relevant to the proposed LUPA (City of Richmond 2012).

- **Policy EC2.1: Climate-Friendly Vehicles and Equipment.** Encourage the use of available climate-friendlier vehicles and equipment to reduce energy use and carbon emissions and support the use of low-emission or renewable fuel vehicles by residents and businesses, public agencies and City government.

- **Policy EC2.4: Safe and Convenient Walking and Bicycling.** Promote walking and bicycling as a safe and convenient mode of transportation.

- **Policy EC2.6: Private Automobile Use.** Work toward creation of an urban landscape that will reduce reliance on private automobiles through land use planning and by providing amenities and infrastructure that encourage safe and convenient use of public transit, walking and bicycling.
Policy EC3.1: Renewable Energy. Promote the generation, transmission and use of a range of renewable energy sources such as solar, wind power and waste energy to meet current and future demand and encourage new development and redevelopment projects to generate a portion of their energy needs through renewable sources.

Policy EC3.2: Energy Efficiency and Conservation. Promote efficient use of energy and conservation of available resources in the design, construction, maintenance and operation of public and private facilities, infrastructure and equipment.

Policy EC3.3: Solid Waste Reduction and Recycling. Promote waste reduction and recycling to minimize materials that are processed in landfills.

Policy EC3.4: Water Conservation and Reuse. Promote water conservation and recycled water use. Reduce energy consumed for treatment and transportation of water and discharge of wastewater by: encouraging installation of low-flow fixtures; using native planting for landscaping in all City-owned and operated facilities; promoting best practices and technologies for water conservation; considering water use in evaluating and approving development projects; supporting the use of graywater and water catchment systems in residential, commercial and industrial uses; and encouraging new development and redevelopment projects to meet a portion of their water needs through the use of recycled water.

Policy EC4.3: Green Buildings and Landscaping. Require energy and resource efficient buildings and landscaping in all public and private development projects. Encourage the use of green and sustainable development standards and practices in planning, design, construction and renovation of facilities; promote the use of green streets that incorporate extensive landscaping, pervious surfaces and native planting; encourage new development and redevelopment projects to be LEED-certified green buildings; and promote ecologically-sensitive approaches to landscaping. Adopting green standards and practices will improve the quality of the built environment, reduce environmental impacts and support economic development goals for creating a green economy.

Policy EC4.4: Green Infrastructure. Develop green infrastructure standards that relies on natural processes for stormwater drainage, groundwater recharge and flood management. Green approaches for infrastructure development are environmentally and fiscally efficient and provide long-term benefits to the community by reducing energy consumption and maintenance and capital improvement costs.

Policy EC6.1: Habitat and Biological Resource Protection and Restoration. Natural habitat is essential to ensuring biodiversity and protecting sensitive biological resources. Protect these areas and work with the California Department of Fish and Game, the San Francisco Bay Regional Water Quality Control Board, the East Bay Regional Park District and other regional agencies to identify areas for special protection and establish appropriate protection measures for these areas.

Protect resources to maximize the efficacy of natural systems and encourage sustainable development practices and conservation measures to ensure a healthy natural environment.

Protect wetlands from direct and indirect impacts of new and existing development and infrastructure. Ensure that direct and indirect impacts to wetland habitats are minimized by environmentally sensitive project siting and design.

Protect marshlands and baylands to ensure they are not polluted or damaged from bay filling and dredging.

Protect and restore creek corridors and riparian areas to ensure they function as healthy wildlife habitat and biological areas. Protect and restore creek corridors and riparian areas by restoring riparian habitat with appropriate vegetation and channel design; removing culverts and hardened channels where appropriate; improving creek access; avoiding future culverting or channelization of creeks; and ensuring appropriate and ongoing maintenance.
At a minimum, require mitigation of impacts to sensitive species ensuring that a project does not contribute to the decline of the affected species populations in the region. Identify mitigations in coordination with the U.S. Fish and Wildlife service, the California Department of Fish and Game and other regulatory agencies.

- **Policy EC6.2: Low-Lying Areas in Richmond.** Protect and manage low-lying areas that are likely to be affected by SLR and storm surges.

- **Policy EC6.3: Adapting to Climate Change.** Prepare for and adapt to future impacts of changing weather patterns and sea level fluctuations.

**City of Richmond Climate Action Plan**

The City’s CAP includes objectives and strategies related to reducing GHG emissions in Richmond (City of Richmond 2016), which are aligned with the City’s General Plan 2030 policies.

- **Strategy EE3: Promote Green Building.** All new buildings meet or exceed Title 24 standards at time of construction; by 2020 all new residential buildings will be ZNE; by 2030 all new commercial buildings will be ZNE.

- **Strategy RE1: Increase Local Solar Energy Generation.** The City will promote the installation of distributed, small-scale solar photovoltaic systems (solar PV), as well as other renewable energy generation systems, in existing buildings and new construction, prioritizing investments in municipal buildings, schools, and public housing developments. Richmond is leading local solar development in the Bay Area through innovative policy decisions that create competition and marketplaces for local renewable energy development.

- **Strategy WA3: Green Building Strategies for Water Conservation.** The City will employ a variety of strategies to reduce water use via green building techniques, such as ensuring that all projects demonstrate compliance with, at minimum, the 2013 CalGREEN standards; offering incentives for certification through GreenPoint Rated, LEED, or other green building rating systems; considering adopting a retrofit-on-sale ordinance in conjunction with a Building Energy Saving Ordinance (BESO); and providing information to developers, homeowners, and businesses on water efficiency and green building rating systems.

- **Strategy WA4: Support Water Infrastructure Improvements and Expand Water Reclamation and Reuse.** The City will support EBMUD’s efforts to expand recycled water use to serve its City of Richmond customers, and support the use of graywater and rainwater catchment systems by local residents and businesses. The City will support EBMUD’s efforts to maintain and upgrade water infrastructure and conveyance systems to minimize leaks and prevent waste.

- **Strategy GA3: Support Green Infrastructure and Streetscape Design.** The City will encourage property owners and developers to incorporate green infrastructure (e.g., bioswales, permeable pavement, rainwater catchment, planter strips, etc.) into existing and new developments, continue to utilize the same green infrastructure design principles in City-owned property as outlined in the City’s Parks Master Plan, incorporate green infrastructure into new City developments, and retrofit existing City facilities with green infrastructure as funding becomes available.

- **Strategy TL3: Improve Pedestrian and Bicycle Infrastructure.** The City will maintain and accelerate implementation of Richmond’s Bicycle and Pedestrian Master Plans, and provide additional actions that support pedestrian and bicyclist safety and comfort, expand the bicycle and pedestrian network, and increase amenities throughout the City.

- **Strategy SW4: Increase Diversion of Construction and Demolition (C&D) Waste.** The City will promote the deconstruction of buildings, rather than demolition, in which buildings are carefully disassembled and component parts are recycled or locally repurposed and reused.
Strategy RC3: Increase Resilience of Critical Infrastructure to Climate Change. The City will increase the resilience of critical infrastructure (both existing and planned) such that physical structures can withstand anticipated climate hazards including SLR and flooding.

Strategy RC4: Increase Resilience of Parks and Ecosystems to Climate Change. The City will protect parks, natural areas and ecosystems that provide recreational and aesthetic value, are critical to local flora and fauna, and provide ecosystem services that are valuable to the community.

Strategy RC5: Develop a Long-term Shoreline Development Vision and Protection Plan. The City will develop a comprehensive vision for its extensive shoreline that addresses climate change impacts to private property, commercial and industrial assets, public infrastructure, water quality, ecological protection, public access, public health and recreation.

4.10.3 Impacts and Mitigation Measures

METHODOLOGY

The environmental analysis in this Draft PEIR focuses on quantifying the emissions from the most GHG emissions-intensive proposed LUPA activities that could occur within one year. Emissions of criteria air pollutants and precursors were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 computer program, as recommended by BAAQMD. Modeling was based on LUPA-specific information (e.g., size of areas to be graded and/or to be paved, etc.) where available; reasonable assumptions based on typical construction activities; and default values in CalEEMod that are based on location. Emissions associated with the proposed LUPA are compared to BAAQMD-adopted thresholds. Specific model assumptions and inputs for these calculations can be found in Appendix B.

THRESHOLDS OF SIGNIFICANCE

The issue of global climate change is inherently a cumulative issue, as the GHG emissions of individual projects cannot be shown to have any material effect on global climate. Thus, the proposed LUPA’s impact to climate change is addressed only as a cumulative impact.

BAAQMD’s approach to developing a Threshold of Significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions needed to move us towards climate stabilization. If a project would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact and would be considered significant. Because the proposed LUPA would result in some operational-related emissions of GHGs (i.e., energy consumption), and is located within BAAQMD’s jurisdiction for which these thresholds were determined to be applicable, the BAAQMD threshold of 1,100 metric tons of CO₂ equivalents per year (MT CO₂e/yr) is used to determine CEQA significance with regards to GHG emissions.

With respect to construction activities, BAAQMD has not developed significance thresholds for GHG emissions emitted during project construction. However, BAAQMD recommends that lead agencies quantify and disclose construction-related GHG emissions and make a significance determination of these emissions (BAAQMD 2017). Thus, the 1,100 MT CO₂e/yr threshold is used to evaluate both construction and operational emissions.

Based on Appendix G of the CEQA Guidelines, impacts are considered significant if implementation of the proposed LUPA would do any of the following:

- generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment (i.e., result in construction or operational GHG emissions that exceed 1,100 MT CO₂e/yr); or
conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

IMPACTS AND MITIGATION MEASURES

Impact 4.10-1: Proposed LUPA-Generated Greenhouse Gas Emissions

Construction-type activities associated with the LUPA recommendations would result in the generation of GHG emissions from the use of heavy-duty off-road construction equipment, haul trucks associated with materials transport, and vehicle use during worker commute. The most GHG emissions intensive activities would occur in Phase 1 of the proposed LUPA. If all GHG emissions-generating activities from Phase 1 were to occur within one year, they would generate a total of 135 MT CO₂e/year, which would not exceed BAAQMD’s threshold of 1,100 MT CO₂e/year.

The proposed LUPA does not include any major new stationary sources of GHGs but would include one new minor operational source of GHG emissions: operation of the new recreational programs and storage building. However, construction-phase emissions would be far more intensive than operational-phase emissions from the recreational programs and storage building. Furthermore, the recreational programs and storage building is intended to accommodate existing interpretive and volunteer activities, and would not be expected to result in significant new energy use or vehicle trips. Therefore, this impact would be less than significant.

GHG emissions associated with the proposed LUPA would be generated during construction-type activities and during park operations. Construction-type activities associated with the LUPA recommendations would result in the generation of GHG emissions from the use of heavy-duty off-road construction equipment, haul trucks associated with materials transport, and vehicle use during worker commute. As previously discussed, this analysis focuses on quantifying the emissions from the most GHG emissions-intensive proposed LUPA activities that could occur overlap within one year. The most GHG emissions intensive activities would occur in implementation Phase 1 of the proposed LUPA (refer to Section 3.10, “Construction/Implementation Schedule”). CalEEMod was used to quantify emissions from a conservative scenario (i.e., avoiding the risk of understating an impact), in which all GHG emissions-generating activities from Phase 1 were occurring within one year. This scenario conservatively includes: implementation of the Lagoon Enhancement Project; site preparation of the Bray dredge disposal area; trail paving and improvement activities in the Bayshore, Lagoon, and Ridgeland Planning Areas; and construction of the Canal Boulevard Staging Area. This conservative scenario would generate a total of 135 MT CO₂e/year, which is well below BAAQMD’s threshold of 1,100 MT CO₂e/year (See Appendix B for detailed modeling results).

The proposed LUPA does not include any major new stationary sources of GHGs but would include one new minor operational source of GHG emissions: operation of the new recreational programs and storage building. Construction-phase emissions would be far more intensive than operational-phase emissions from the recreational programs and storage building as the recreational programs and storage building is intended to accommodate existing interpretive and volunteer activities, and would not be expected to result in significant new energy use or vehicle trips. Furthermore, it is conceptually planned to incorporate rooftop solar panels, which would likely meet the minor energy requirements of the facility.

As discussed in Subsection 4.8.3 of Section 4.8, “Transportation,” a 2,000 square foot recreational programs and storage building land use would generate up to three weekday p.m. peak hour trips, four weekday a.m. peak hour trips, 19 Saturday peak hour trips, and 46 daily weekday trips. This potential incremental increase in vehicle trips would not result in significant new GHG emissions, particularly since programming use of the recreational programs and storage building would be intermittent and would not occur every day. Furthermore, the proposed LUPA would provide enhanced bike and pedestrian facilities within Miller/Knox; thus, increasing connectivity, facilitating increased use of non-motorized modes of transportation, and thereby potentially reducing vehicle-related GHG pollutant emissions. Because construction-type and operational emissions of GHGs would be below the BAAQMD thresholds, the impact would be less than significant.
Mitigation Measures

No mitigation is required.


BAAQMD’s approach to developing a threshold of significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions. As discussed in Impact 4.10-1 above, implementation and operation of the LUPA recommendations would not exceed BAAQMD’s threshold of 1,100 MT CO2e/year.

The 2017 Scoping Plan recommends several measures that could be implemented if feasible to reduce GHG emissions. The County and the City’s CAPs, as well as the City’s General Plan also contain applicable policies aimed at reducing energy consumption, waste, vehicle and mechanical equipment emissions, and promoting alternative means of transportation. The LUPA recommendations align with these suggested measures. For example, all demolition debris would be disposed in accordance with California Code of Regulations Title 24, Part 11. Under-utilized areas of irrigated turf would be replaced with drought-tolerant, climate-friendly vegetation to reduce overall water use. Enhanced bike and pedestrian facilities within Miller/Knox would increase regional connectivity, facilitating the increased use of non-motorized modes of transportation. Furthermore, an objective of the proposed LUPA is to incorporate strategies for climate adaptation, SLR, and resiliency which is consistent with the City’s General Plan policies EC6.2 and EC6.3, and the City’s CAP strategies RC4 and RC5. Therefore, the proposed LUPA would be consistent with applicable plans, policies, and regulations for the purpose of reducing GHG emissions and no impact would occur.

Plans, policies, and regulations for the purpose of reducing GHG emissions and protecting areas from climate change related effects that are applicable to the proposed LUPA are described in Section 4.10.2 “Regulatory Setting” above. BAAQMD’s approach to developing a threshold of significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions. As discussed in Impact 4.10-1 above, the implementation and operation of the LUPA recommendations would not exceed BAAQMD’s threshold of 1,100 MT CO2e/year. Therefore, it would not conflict with federal or state regulations adopted for the purpose of reducing GHG emissions.

The 2017 Scoping Plan Update lays out the framework for achieving the 2030 statewide GHG reduction target of 40 percent below 1990 levels. The update includes an appendix that details local actions that land use development projects and municipalities can implement to support the statewide goal. For project-level CEQA analyses, the 2017 Scoping Plan recommends several measures that could be implemented if feasible to reduce GHG emissions (CARB 2017b); the proposed LUPA aligns with these suggested measures, as summarized above in Section 4.10.2. For example, railroad track that would be removed from the Bay Shore Planning Area would be repurposed to provide edging for the “Grand Promenade” in the Ferry Point and Bray Planning Areas, thereby diverting waste from landfills. All demolition debris would be disposed in accordance with California Code of Regulations Title 24, Part 11 which requires recycling and/or salvaging for reuse of a minimum of 50 percent of the nonhazardous construction and demolition waste. The new recreational programs and storage building conceptually includes solar panels to provide electrical needs and a rain garden for rainwater capture. Under-utilized areas of irrigated turf would be replaced with native vegetation to reduce overall water use. Enhanced bike and pedestrian facilities within Miller/Knox would increase regional connectivity, facilitating the increased use of non-motorized modes of transportation, and reducing vehicle-related GHG pollutant emissions.

The LUPA recommendations described above would also be consistent with the County and the City’s CAPs as well as the City’s General Plan, which contain policies aimed at reducing energy consumption, waste, vehicle and mechanical equipment emissions, and promoting alternative means of transportation. An objective of the proposed LUPA is to incorporate strategies for climate adaptation, SLR, and resiliency which
Mitigation Measures

No mitigation is required.

Impact 4.10-3: Climate Change Impacts and the Proposed LUPA

Given the broad range of long-term, climate change impact projections; the evolving science, technology, and regulations of climate change; a recent CEQA Supreme Court decision recognizing exposure to environmental hazards need not be addressed as a CEQA impact, if risk of exacerbation does not occur; and program-level nature of the District’s future resiliency efforts, the District is providing the following analysis of climate change impacts on the proposed LUPA recommendations for informational purposes only and no significance determination is made in this PEIR. Based on the GHG analysis, implementation of LUPA recommendations would not risk exacerbating climate change. Future District climate change adaptation projects at Miller/Knox will require project-level CEQA analysis and significance determinations related to climate change will be made at that time, as appropriate.

The potential impacts of climate change on Miller/Knox include increased risk of wildfires and increased risk of flooding due to SLR. Miller/Knox is within an area that is considered a fire-threatened community. However, the District has a variety of fire protection policies and the Fire Prevention Code to address wildfire risk, as described in Subsection 4.4.2 of Section 4.4 “Hazards and Hazardous Materials.” Implementation of LUPA recommendations would decrease the likelihood of a wildfire and provide resilience to wildfire impacts through long-term strategies for reducing fuel loads and improving the health of native plant habitats.

The Miller/Knox shoreline along San Francisco Bay is tidally influenced, exposed to wind-driven storm waves and, therefore, vulnerable to flooding at current sea levels and at higher future risk of flood exposure based on the projected scenarios of SLR. The primary LUPA recommendations, which provide increased adaptation and resilience to SLR impacts, include the Lagoon Enhancement Project, and implementation of SLR-risk adaptation features along the Miller/Knox shoreline. Furthermore, one of the primary objectives of the proposed LUPA is to incorporate strategies for climate adaptation and resilience. Many LUPA recommendations would contribute to GHG reduction, climate readiness, and climate adaptation through public education, improved water and energy efficiency and conservation, and by installing renewable energy systems such as solar arrays. These features would reduce the extent and severity of climate change-related impacts to the proposed LUPA.

The analysis below has been written recognizing the direction from a CEQA California Supreme Court decision addressing the scope of analysis required in environmental impact reports for potential impacts resulting from existing environmental conditions in the vicinity of a site for a proposed project. In California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal.4th 369, 377 (“CBIA”), the Court held that:

“In light of CEQA’s text, statutory structure, and purpose, we conclude that agencies subject to CEQA generally are not required to analyze the impact of existing environmental conditions on a project’s future users or residents. But when a proposed project risks exacerbating those environmental hazards or conditions that already exist, an agency must analyze the potential impact of such hazards on future residents or users.” (Id. at pp. 377-378),

The court directed that CEQA does not routinely require in all circumstances the consideration of the effects of existing environmental conditions on the future occupants or users of a proposed project site. But if the project might exacerbate an existing environmental condition, the lead agency must then analyze the exposure of future residents and users to the environmental condition. Also, the court did not prohibit an agency from considering how existing environmental conditions might impact its own project’s future users, so for publicly sponsored and implemented projects, the lead agency retains this discretion. Given the broad
range of long-term climate change impact projections; the evolving science, technology, and regulations of climate change; the CEQA Supreme Court decision; and program-level nature of the District’s future resiliency efforts at Miller/Knox, the District is providing an analysis of climate change impacts on the regional park with implementation of the proposed LUPA recommendations for informational purposes only.

As discussed above in Section 4.10.1, “Environmental Setting,” the primary climate change effects that could impact Miller/Knox include increased risk of wildfires due to the general effects of changing climate and increased risk of flooding due to SLR. As discussed in Subsection 4.4.1 of Section 4.4, “Hazards and Hazardous Materials,” while Miller/Knox is not designated a very high FHSZ, it is within an area that is considered a fire threatened community. The City has a variety of fire protection policies (i.e., Goal SN1, Goal SN2, and Policy SN2.3) and the Fire Prevention Code (Chapter 8.16 of the City of Richmond Code of Ordinances) which address fire risk and safety through adequate emergency response, staffing, and equipment; and proper building construction. Furthermore, LUPA recommendations, such as implementation of the District’s Wildfire Hazard Reduction and Resource Management Plan, would decrease the likelihood of a wildfire and provide resilience to wildfire impacts through long-term strategies for reducing fuel loads and improving the health of native plant habitats.

As discussed above in Section 4.10.1, “Environmental Setting,” OPC provides recommended SLR projections for high, low, and extremely low risk tolerance decisions. Given that the regional park land use does not include residential development or sensitive infrastructure, a high tolerance to climate risks would be appropriate. Using the Likely Range of SLR predictions appropriate for this level of risk tolerance, climate change could result in up to 1.1 feet of SLR in the San Francisco Bay by the mid-21st century and up to 3.4 feet by the end of the century.

Like most shoreline parks, the Miller/Knox shoreline provides coastal resilience and protection from SLR because the open space along the shoreline buffers the developed community from flooding events. This landscape role is enhanced at Miller/Knox by the existing railroad berm and rock slope protection along most of the shoreline, providing approximately three feet of freeboard during typical high tide events.

According to the San Francisco Bay Conservation and Development Commission’s (BCDC) Adapting to Rising Tides program (ART), 1 percent of the park could be exposed to a SLR of 1 foot and 2 percent of the park could be exposed to SLR of 3 or 4 feet (BCDC 2017a). BCDC also completed the Bay Area SLR Analysis and Mapping Project to estimate shoreline overtopping potential and SLR inundation for ten scenarios of mean higher high water plus SLR (BCDC 2017b). Based on BCDC’s analysis and mapping, 1.1 feet of SLR would not result in overtopping along the shoreline or SLR inundation of areas disconnected from the shoreline, and 3.4 feet of SLR may result in some inundation in the Lagoon and Bray Planning Areas at Miller/Knox. Implementation of future planning for the Bay shoreline within Miller/Knox would provide increased adaptation and resilience to SLR impacts, if needed, by reinforcing shoreline protection.

One of the objectives of the proposed LUPA is to incorporate strategies for climate adaptation and resiliency. Many of the LUPA recommendations would contribute to climate readiness and climate adaptation at Miller/Knox, and are listed below:

- **Implement the Lagoon Enhancement Project.** Lagoon dredging would improve the hydrologic and ecological function of the lagoon by restoring capacity of the lagoon close to its original capacity. This would improve the general function of the lagoon, water quality, aesthetics, and conditions for wildlife. Routine dredging conducted on an as-needed basis would minimize the likelihood of sediment accumulation in the lagoon and thereby maintain storage capacity and water quality improvements.

- **Conduct Engineering Design Development Study along the Bayshore and Implement Shoreline Features to Improve Resiliency and SLR Adaptation.** Future planning related to the existing rock slope protection along the Miller/Knox shoreline is recommended to identify additional measures would be needed to increase resiliency of the shoreline from future SLR.
- **Replace Under-Utilized Areas of Irrigated Turf with Native Drought-Tolerant, Climate-Friendly Vegetation.** This recommendation would expand the conversion of under-utilized areas of irrigated turf with turfgrasses that are demonstrated to be drought-tolerant and climate-friendly. Implementation of this recommendation would reduce overall water use at Miller/Knox by decreasing areas requiring irrigation and would improve natural habitat values around the lagoon.

- **Incorporate Public Education Associated with Climate Change, Resiliency, and Adaptation.** The LUPA includes recommendations to enhance existing public education to include topics regarding climate change, resiliency, and adaptation to be incorporated throughout the park. Enhanced public education would be particularly valuable associated with the LUPA recommendations in the Bray Planning Area regarding the demonstration gardens, green-waste storage area, dredge disposal area, and the recreational programs and storage building.

- **Establish Native Plant Communities as Demonstration Gardens with Connecting Paths.** Implementation of this recommendation would create an outdoor classroom of native plants in small garden-like settings with trails, benches, and picnic tables. In addition to improving native habitat, the demonstration gardens would include public education panels including information about the coastal plant communities and habitats and other appropriate topics. Plant palettes for individual gardens could include coastal grassland, coastal scrub, coast live oak woodland, and a raingarden wetland.

- **Provide a Green-Waste Storage Area for Park Operations and Public Education.** Implementation of this recommendation would relocate the green-waste storage area from the overflow parking area at Ferry Point to the southeastern point of the Bray Planning Area. This area would be used by park operations staff to store green waste accumulated from on-going park maintenance activities for future offsite composting. Public education could include information on the composting process and the environmental benefits of composting green waste.

- **Develop Trailheads and New Vista Points, Repair Trails Damaged by Erosion, and Decommission Trails too Damaged for Repair.** Repairing trails damaged by erosion and decommissioning trails too damaged for repair would improve the existing trail system in the Ridgeland Planning Area, rendering them more stable and operationally sustainable as well as reducing future erosion and associated water quality issues.

- **Implement the District’s Wildfire Hazard Reduction and Resource Management Plan Recommendations, Integrated Pest Management Recommendations, and Vegetation Management and Grazing Recommendations.** These long-term strategies for reducing fuel loads and managing vegetation to minimize the risk of Diablo wind-driven catastrophic wildfire along the wildland-urban interface, while also ensuring the protection and enhancement of ecological values and resources, improving native plant habitats, and reducing fire risk.

- **Replace the Historic Warehouse Building with Day-use and a Scenic Vista Point.** The LUPA includes a recommendation to partially demolish the existing historic warehouse building at Ferry Point, preserving the existing concrete structural side and roof beams, and develop a day-use picnic area within the building footprint. The picnic area could be covered with solar panels, which could provide electricity for an irrigation system for the native planting areas and for the existing lights on the fishing pier. These features would help to reduce the extent and severity of climate change-related impacts to the proposed LUPA recommendations and to Miller/Knox.

### Mitigation Measures

No mitigation is required.
4.10 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

This section summarizes current climate change science and greenhouse gas (GHG) emissions sources in California and provides a summary of GHG regulations applicable to the Miller/Knox Regional Shoreline (Miller/Knox or park) Land Use Plan Amendment (LUPA). The section includes a quantitative analysis of GHG emissions associated with the LUPA recommendations, discussion about their potential contribution to global climate change, and analysis of the potential climate change-related risks.

Scoping comments received related to GHG emissions and climate change expressed concern about the potential for increased GHG emissions associated with increases in vehicle miles traveled, and about the impacts of sea level rise (SLR) and storm surge on the regional park with implementation of the LUPA recommendations. These topics are addressed in Impact 4.10-1 and Impact 4.10-3, respectively.

4.10.1 Environmental Setting

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Certain gases in the earth’s atmosphere, classified as GHGs, play a critical role in determining the earth’s surface temperature. Solar radiation enters the earth’s atmosphere from space. A portion of the radiation is absorbed by the earth’s surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead “trapped,” resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth’s climate, known as global climate change or global warming. Emissions of GHGs contributing to global climate change are attributable, in large part, to human activities associated with on-road and off-road transportation, industrial/manufacturing, electricity generation by utilities and consumption by end users, residential and commercial on-site fuel usage, and agriculture and forestry. Emissions of CO₂ are, largely, byproducts of fossil fuel combustion. High global warming potential (GWP) gases have atmospheric insulative properties that are hundreds to tens of thousands of times greater than that of CO₂. HFCs, PFCs, and SF₆ are some of the most common types of high-GWP gases and result from a variety of industrial processes.

It is “extremely likely” that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forcing together (Intergovernmental Panel on Climate Change [IPCC] 2014: 5). Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes, about one day, GHGs have long atmospheric lifetimes of one to several thousand years. GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the lifetime of any particular GHG molecule is dependent on multiple variables and cannot be determined with any certainty, it is understood that more CO₂ is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO₂ emissions, approximately 55 percent is sequestered through ocean and
land uptake every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO₂ emissions remains stored in the atmosphere (IPCC 2013:467).

The quantity of GHGs in the atmosphere that ultimately result in climate change is not precisely known, but is enormous; no single project alone would measurably contribute to an incremental change in the global average temperature, or to global, local, or micro climates. From the standpoint of the California Environmental Quality Act (CEQA), GHG impacts relative to global climate change are inherently cumulative.

**EFFECTS OF CLIMATE CHANGE ON THE ENVIRONMENT**

According to the IPCC, which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature is expected to increase by 3 to 7 degrees Fahrenheit (°F) by the end of the century, depending on future GHG emission scenarios (IPCC 2007). According to the California Natural Resources Agency (CNRA), temperatures in California are projected to increase 2 to 5 °F by 2050 and by 4 to 9 °F by 2100 (CNRA 2009).

Other environmental resources could be indirectly affected by the accumulation of GHG emissions and resulting rise in global average temperature. For example, an increase in the global average temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. According to “Our Changing Climate” (CNRA 2012), the snowpack portion of the state’s water supply could potentially decline 30 to 90 percent by the end of the 21st century. An increase in precipitation falling as rain rather than snow also could lead to increased potential for floods because water that would normally be held in the snowpack of the Sierra Nevada until spring would flow into the Central Valley concurrently with winter rainstorm events. This scenario would place more pressure on California’s levee/flood control system.

As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available. Changes in precipitation patterns and increased temperatures are expected to alter the distribution and character of natural vegetation and associated moisture content of plants and soils. An increase in frequency of extreme heat events and drought are also expected. These changes are expected to lead to increased frequency and intensity of wildfires (CNRA 2012).

Another outcome of global climate change is SLR. The sea level rose approximately 7 inches during the last century and it is predicted to continue to rise. Predictions for the extent of SLR vary depending on the future rates of GHG emissions. Early estimates (in 2007) by the Intergovernmental Panel on Climate Change (IPCC) indicated an additional 7 to 22 inches by 2100 (IPCC 2007). Updated research has continued since then. The Ocean Protection Council (OPC) released the State of California Sea-Level Rise Guidance 2018 Update (2018 Guidance), which incorporates scenario-based versus probabilistic SLR projections. The OPC update includes median, likely, and low-risk scenarios, as well as, the H++ scenario, which is an extreme SLR scenario that accounts for the loss of the West Antarctic ice sheet. These projections are shown in Table 4.10-1 for year 2050 and 2100 in San Francisco.

The 2018 Guidance recommends the use of certain projections depending upon the risk tolerance of land use decisions. For decisions where there is high risk tolerance, such as parks and open space, the higher end of the “Likely Range” projection is recommended. For decisions where there is low risk tolerance, the 1-in-200 chance projection is recommended. For land uses and facilities where risk tolerance is extremely low, such as high-density residential or critical infrastructure, the H++ scenario is recommended (OPC 2018). Miller/Knox is considered a land use with high tolerance for risk because no permanent housing or critical infrastructure is located onsite or proposed in the LUPA. Furthermore, the Miller/Knox shoreline is protected from near-term SLR effects by existing riprap, which would protect the park from potential wave-action and erosion. Although the Lagoon Planning Area and parts of the Bray and Bay Shore Planning Areas consist of native clay and 6 to 8 feet of artificial fill, as discussed in Subsection 4.2.1 of Section 4.2, “Geology and
Soils,” no historic municipal waste, hazardous waste, or debris landfill materials are present. The remaining areas of the park are primarily natural soils and bedrock. Therefore, the higher end of the “Likely Range” projection is used in this document for impact analysis.

Table 4.10-1  Projected Sea Level Rise (in feet) for San Francisco

<table>
<thead>
<tr>
<th>Projection Year and Scenario</th>
<th>Median (50% probability SLR meets or exceeds...)</th>
<th>Likely Range (66% probability SLR is between...)</th>
<th>1-in-20 Chance (5% probability SLR meets or exceeds...)</th>
<th>1-in-200 Chance (0.5% probability SLR meets or exceeds...)</th>
<th>H++ Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>2050 (High Emissions Scenario)</td>
<td>0.9</td>
<td>0.6 - 1.1</td>
<td>1.4</td>
<td>1.9</td>
<td>2.7</td>
</tr>
<tr>
<td>2100 (Low Emissions Scenario)</td>
<td>1.6</td>
<td>1.0 - 2.4</td>
<td>3.2</td>
<td>5.7</td>
<td>10.2</td>
</tr>
<tr>
<td>2100 (High Emissions Scenario)</td>
<td>2.5</td>
<td>1.6 - 3.4</td>
<td>4.4</td>
<td>6.9</td>
<td>10.2</td>
</tr>
</tbody>
</table>

Source: Ocean Protection Council 2018

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

GHG emissions are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural emissions sectors (CARB 2014). In Contra Costa County, the transportation sector is the largest emitter of GHGs, followed by the energy sector (Contra Costa County 2015), as shown in Table 4.10-2. Emissions of CO₂ are byproducts of fossil fuel combustion. CH₄, a highly potent GHG, primarily results from off-gassing such as the release of chemicals from nonmetallic substances under ambient or greater pressure conditions, and is largely associated with agricultural practices and landfills. N₂O is also largely attributable to agricultural practices and soil management. CO₂ sinks, or reservoirs, include vegetation and the ocean, which absorb CO₂ through sequestration and dissolution (CO₂ dissolving into the water), respectively, two of the most common processes for removing CO₂ from the atmosphere.

Table 4.10-2  Contra Costa County 2013 GHG Inventory

<table>
<thead>
<tr>
<th>Sector</th>
<th>MTCO₂e</th>
<th>Percent of Total MTCO₂e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Energy</td>
<td>258,420</td>
<td>19</td>
</tr>
<tr>
<td>Nonresidential Energy</td>
<td>125,350</td>
<td>9</td>
</tr>
<tr>
<td>Solid Waste and Landfill</td>
<td>26,540</td>
<td>2</td>
</tr>
<tr>
<td>Landfill</td>
<td>196,500</td>
<td>14</td>
</tr>
<tr>
<td>On-road Transportation</td>
<td>661,130</td>
<td>47</td>
</tr>
<tr>
<td>Off-road Equipment</td>
<td>66,320</td>
<td>5</td>
</tr>
<tr>
<td>Water and Wastewater</td>
<td>7,400</td>
<td>1</td>
</tr>
<tr>
<td>BART</td>
<td>2,680</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Agriculture</td>
<td>58,200</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,392,450</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Notes: MTCO₂e = metric tons of carbon dioxide equivalents
Source: Contra Costa County 2015

Many national and sub-national jurisdictions have established GHG reduction targets, policies, and regulations. Numerous governments, agencies, communities, and businesses are investing substantial effort and financial resources in reaching future GHG targets. Nonetheless, achieving GHG reduction goals remains a challenge. Global atmospheric carbon dioxide (CO₂) concentrations, one measure of global greenhouse gases, have continued to rise; global average annual temperatures have also continued to rise.
Since late 2015, measurements of the atmospheric CO₂ concentration have consistently exceeded 400 parts per million and worldwide GHG emissions have continued to follow the business-as-usual trajectory (Ocean Protection Council 2018). Consequently, the reasonably foreseeable future GHG emissions scenario to use in this document for SLR projections would be the High Emissions Scenario, which represents the business-as-usual, fossil-fuel-intensive emission scenario.

Although there is strong scientific consensus that global climate change is occurring and is influenced by human activity, there is less certainty as to the timing, severity, and potential consequences of the climate phenomena. Scientists have identified several ways in which global climate change could alter the physical environment in California (CNRA 2012; DWR 2006; IPCC 2007). These include:

- increased average temperatures;
- modifications to the timing, amount, and form (rain vs. snow) of precipitation;
- changes in the timing and amount of runoff;
- reduced water supply;
- deterioration of water quality; and
- elevated sea level.

Many of these phenomena would translate into a variety of issues and concerns that may affect Miller/Knox, including but not limited to increased risk of wildfires and increased risk of flooding because of SLR. The Miller/Knox shoreline, located along the San Francisco Bay, is tidally influenced and, therefore, vulnerable to flooding at current sea levels and at higher risk of flood exposure based on the projected scenarios of SLR, particularly where high tide and wind-driven storm waves may simultaneously occur. Rising sea levels could result in more frequent inundation in low lying areas and during larger tidal events. As shown in Table 4.10-1 above, climate change could result in SLR in San Francisco Bay of up to an additional 1.1 feet by the mid-21st century and up to an additional 3.4 feet by the end of the century, using the Likely Range projection and assuming the reasonable expectation that higher levels of GHG emissions would continue (OPC 2018).

Cal-Adapt is a climate change scenario planning tool developed by the California Energy Commission (CEC) that downscales global climate model data to local and regional resolution under two emissions scenarios: one in which emissions peak around 2040 and then decline (Representative Concentration Pathway [RCP] 4.5) and another in which emissions continue to rise throughout the 21st century (RCP 8.5). According to Cal-Adapt, annual average temperatures in Contra Costa County are projected to rise by 5.1 to 7.9°F by 2090, with the range based on low and high emissions scenarios (Cal-Adapt 2018).

### 4.10.2 Regulatory Setting

**FEDERAL**

**U.S. Environmental Protection Agency**

**Supreme Court Ruling**

The U.S. Environmental Protection Agency (EPA) is the federal agency responsible for implementing the federal Clean Air Act (CAA) and its amendments. The Supreme Court of the United States ruled on April 2, 2007, that CO₂ is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs. The ruling in this case resulted in EPA taking steps to regulate GHG emissions and lent support for state and local agencies’ efforts to reduce GHG emissions.

**Regulations for Greenhouse Gas Emissions from Passenger Cars and Trucks and Corporate Average Fuel Economy Standards**

In October 2012, EPA and the National Highway Traffic Safety Administration (NHTSA), on behalf of the Department of Transportation, issued final rules to further reduce GHG emissions and improve corporate average fuel economy (CAFE) standards for light-duty vehicles for model years 2017 and beyond (77 FR 62624). NHTSA’s CAFE standards have been enacted under the Energy Policy and Conservation Act since...
1978. This national program requires automobile manufacturers to build a single light-duty national fleet that meets all requirements under both federal programs and the standards of California and other states. This program would increase fuel economy to the equivalent of 54.5 miles per gallon (mpg) limiting vehicle emissions to 163 grams of CO2 per mile for the fleet of cars and light-duty trucks by model year 2025 (77 FR 62630). However, on March 15, 2017, the new EPA Administrator and Department of Transportation announced that EPA intends to reconsider the final determination. On April 2, 2018, the Administrator signed the Mid-term Evaluation Final Determination which finds that the model year 2022-2025 GHG standards are not appropriate in light of the record before EPA and, therefore, should be revised (EPA 2018).

STATE

Executive Order S-3-05
Executive Order (EO) S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California’s air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the EO established total GHG emission targets for the state. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

This EO was the subject of a California Appellate Court decision, Cleveland National Forest Foundation v. San Diego Association of Governments (SANDAG) (November 24, 2014) 231 Cal.App.4th 1056, which was reviewed by the California Supreme Court in January 2017. The case addressed the adequacy of the GHG analysis in the environmental impact report (EIR) SANDAG prepared for its 2011 Regional Transportation Plan (RTP). The California Supreme Court ruled that SANDAG did not abuse its discretion by declining “to adopt the 2050 goal as a measure of significance in light of the fact that the EO does not specify any plan or implementation measures to achieve its goal.”

In addition to concluding that an EIR need not use this EO’s goal for determining significance, the court described several principles relevant to CEQA review of GHG impacts, including: (1) EIRs should “reasonably evaluate” the “long-range GHG emission impacts for the year 2050;” and (2) the 2050 target is “grounded in sound science” in that it is “based on the scientifically supported level of emissions reduction needed to avoid significant disruption of the climate. The court also ruled that “an EIR’s designation of a particular adverse environmental effect as ‘significant’ does not excise the EIR’s failure to reasonably describe the nature and magnitude of the adverse effect.” The court also recognized that the 40 percent reduction in 1990 GHG levels by 2030 is “widely acknowledged” as a “necessary interim target to ensure that California meets its longer-range goal of reducing GHG emission 80 percent below 1990 levels by the year 2050.” Senate Bill (SB) 32 has since defined the 2030 goal in statute (discussed below).

Assembly Bill 32, the California Global Warming Solutions Act of 2006
In September 2006, Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006, Assembly Bill (AB) 32. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 also requires that these reductions “...shall remain in effect unless otherwise amended or repealed. (b) It is the intent of the Legislature that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020. (c) The [Air Resources Board] shall make recommendations to the Governor and the Legislature on how to continue reductions of GHG emissions beyond 2020.” [California Health and Safety Code, Division 25.5, Part 3, Section 38551]

In December 2008, the California Air Resources Board (CARB) adopted its first version of its Climate Change Scoping Plan, which contained the main strategies California will implement to achieve the mandate of AB 32 (2006) to reduce statewide GHG emissions to 1990 levels by 2020. In May 2014, CARB released and subsequently adopted the First Update to the Climate Change Scoping Plan to identify the next steps in
reaching the goals of AB 32 (2006) and evaluate the progress made between 2000 and 2012 (CARB 2014). After releasing multiple versions of proposed updates in 2017, CARB adopted the final version titled California’s 2017 Climate Change Scoping Plan (2017 Scoping Plan) in December (CARB 2017a). The 2017 Scoping Plan indicates that California is on track to achieve the 2020 statewide GHG target mandated by AB 32 of 2006 (CARB 2017a). It also lays out the framework for achieving the mandate of SB 32 of 2016 to reduce statewide GHG emissions to at least 40 percent below 1990 levels by the end of 2030 (CARB 2017a). The 2017 Scoping Plan identifies the GHG reductions needed by each emissions sector.

The 2017 Scoping Plan also identifies how GHGs associated with proposed projects could be evaluated under CEQA (CARB 2017a:101-102). The 2017 Scoping Plan includes goals to reduce energy demand; increase the number, safety, connectivity, and attractiveness of biking and walking facilities to increase use; minimize the net GHG and black carbon emissions associated with management of natural lands, biomass utilization, and wildfire events; and to maximize recycling and waste diversion from landfills. Specifically, it states that achieving “no net increase” in GHG emissions is an appropriate overall objective of projects evaluated under CEQA if conformity with an applicable local GHG reduction plan cannot be demonstrated. CARB recognizes that it may not be appropriate or feasible for every development project to mitigate its GHG emissions to zero and that an increase in GHG emissions because of a project may not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change.

**Senator Bill 375**

SB 375, signed by Governor Schwarzenegger in September 2008, aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires metropolitan planning organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy, showing prescribed land use allocation in each MPO’s RTP. CARB, in consultation with MPOs, is to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

The Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) serve as the MPO for Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties. ABAG and MTC adopted Plan Bay Area 2040, the long-range RTP/SCS in 2017.

**Executive Order B-30-15**

On April 20, 2015 Governor Brown signed EO B-30-15 to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor’s EO aligns California’s GHG reduction targets with those of leading international governments such as the 28-nation European Union, which adopted the same target in October 2014. California is on track to meet or exceed the target of reducing GHG emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (AB 32, discussed above). California’s new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2 degrees Celsius, the warming threshold at which major climate disruptions are projected, such as super droughts and rising sea levels.

**Senate Bill 32 and Assembly Bill 197 of 2016**

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California’s GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030, which set the next interim step in the State’s continuing efforts to pursue the long-term target expressed in EOs S-3-05 and B-30-15 of 80 percent below 1990 emissions levels by 2050.
California Building Efficiency Standards of 2016 (Title 24, Part 6)
Buildings in California are required to comply with California’s Energy Efficiency Standards for Residential and Nonresidential Buildings established by the CEC regarding energy conservation standards and found in Title 24, Part 6 of the California Code of Regulations. These standards were first adopted in 1978 in response to a legislative mandate to reduce California’s energy consumption and are updated on an approximately 3-year cycle to allow consideration and possible incorporation of new energy efficient technologies and methods. All buildings for which an application for a building permit is submitted on or after January 1, 2017 must follow the 2016 standards (CEC 2015). Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions.

California Green Building Standards of 2016 (Title 24, Part 11)
Qualified historical buildings and structures and their associated sites regulated by the State Historical Building Safety Board are required to comply with provisions of the California Green Building Standards Code, found in Title 24, Part 11 of the California Code of Regulations. The code is intended to improve public health, safety, and general welfare by enhancing the design and construction of buildings to have a reduced negative environmental impact. Sustainable construction practices in planning and design, energy efficiency, water conservation and efficiency, material conservation and resource efficiency, and environmental quality and encouraged.

REGIONAL/LOCAL

East Bay Regional Park District
The District Master Plan (2013) defines the overall mission and vision for the District. To achieve this vision, the District intends to monitor the effects of climate change on District resources and use adaptive management techniques to adjust stewardship methods and priorities to preserve the natural, cultural, and scenic values of the parks and trails. In terms of SLR impacts, the District Master Plan includes strategies to ensure that operation and maintenance expenses of shoreline facilities are manageable in the future. Strategies include reserve funding for storm damage repair, long-term planning to ensure maximum sustainability in anticipation of rising tidal levels, coordination with other concerned agencies, encouraging the reuse and recycling of resources, development of renewable energy sources, and preserving park lands as carbon sinks. The District Master Plan also contains policies and descriptions of the programs in place for achieving the highest standards of service in resource conservation, management, interpretation, public access, and recreation. The following polices are applicable to GHGs and climate change at Miller/Knox.

Policy RM 1: Climate Change is expected to affect these resources in various ways. Changes in the ranges of various species, increased potential for wildfires and pests are anticipated with this change in the weather. In a manner consistent with the desire to “conserve and enhance” its resources, the District must closely track the impact of this phenomenon and if necessary, act to relocate or protect in-situ resources that are being degraded or potentially lost by this change.

Policy RM 1b: The District will specifically track and monitor the effects of Climate Change on its resources, interceding when necessary to relocate or protect in-situ resources that are being degraded or lost by this shift in the environment.

Policy NRM 1b: To help mitigate the effects of climate change, the District will endeavor to conserve and connect habitat for native species through its acquisition and planning processes.

Policy NRM 12b: The District will engage in watershed management planning and practices that will address the shifts in habitat ranges caused by climate change through the preservation and enhancement of streams and wetland areas.

On April 17, 2018, the District Board of Directors adopted Resolution 2018-04-081 to establish a policy framework for managing park resources in a changing climate. The climate policy framework includes five key principles: 1.) Climate in All Policies, 2.) Climate Friendly, 3.) Climate Readiness, 4.) Lead Climate Smart Practices, and 5.) Advancing Climate Science. To implement this policy, the District has completed an
Greenhouse Gas Emissions and Climate Change  Ascent Environmental

Inventory of the agency GHG emissions in the building and vehicle fleet sectors, developed a baseline of carbon sequestration on District lands, and is working to implement a strategic energy plan, including development of a solar array that generates renewable energy sufficient to offset the District’s energy use in its buildings. Additionally, the District’s Climate Smart Initiative includes integrated adaptive management, such as wetland restoration at Dotson Family Marsh, wildfire hazard reduction practices, study and monitoring of harmful algae bloom, and expansion of a network of trails for green transportation.

Bay Area Air Quality Management District
The Bay Area Air Quality Management District (BAAQMD) is the primary agency responsible for addressing air quality concerns in Contra Costa County—its role is discussed further in Subsection 4.9.2 of Section 4.9, “Air Quality.” BAAQMD also recommends methods for analyzing project-generated GHGs in CEQA analyses and offers multiple potential GHG reduction measures for land use development projects. BAAQMD developed thresholds of significance to provide a uniform scale to measure the significance of GHG emissions from land use and stationary source projects in compliance with CEQA and AB 32. However, since the passage of SB 32 and AB 197 and the associated adoption of a revised statewide emissions target of 40 percent below 1990 levels by 2030, BAAQMD has not yet adopted new thresholds in compliance with this target.

Contra Costa County

Contra Costa County Climate Action Plan
The Contra Costa County Climate Action Plan (CAP) (Contra Costa County 2015) was adopted on December 15, 2015 by the Contra Costa County Board of Supervisors. The CAP includes GHG emission reduction targets, strategies, and implementation measures developed to help the city reach these targets. To achieve the state-recommended reduction target of 15 percent below 2005 emissions levels by 2020, the County is implementing a strategy around six topic areas: energy efficiency and conservation, renewable energy, land use and transportation, solid waste, water conservation, and government operations. Policies applicable to the proposed LUPA include:

- **Measure RE 2: Alternative Energy Facilities.** Promote installation of alternative energy facilities on public land.
- **Measure LUT 1: Mobility and Land Uses.** Maintain and expand access to goods, services, and other destinations through increased transportation alternatives (mobility improvements) and improved proximity (land use improvements).
- **Measure LUT 3: Off-Road Vehicles and Equipment.** Reduce emissions from off-road vehicles and equipment.
- **Measure W 1: Waste Reduction and Recycling.** Develop a waste reduction strategy to increase recycling and reuse of materials.

City of Richmond

City of Richmond 2030 General Plan
The City of Richmond 2030 General Plan includes the following policies related to GHG emissions and climate change that are relevant to the proposed LUPA (City of Richmond 2012).

- **Policy EC2.1: Climate-Friendly Vehicles and Equipment.** Encourage the use of available climate-friendlier vehicles and equipment to reduce energy use and carbon emissions and support the use of low-emission or renewable fuel vehicles by residents and businesses, public agencies and City government.
- **Policy EC2.4: Safe and Convenient Walking and Bicycling.** Promote walking and bicycling as a safe and convenient mode of transportation.
- **Policy EC2.6: Private Automobile Use.** Work toward creation of an urban landscape that will reduce reliance on private automobiles through land use planning and by providing amenities and infrastructure that encourage safe and convenient use of public transit, walking and bicycling.
Policy EC3.1: Renewable Energy. Promote the generation, transmission and use of a range of renewable energy sources such as solar, wind power and waste energy to meet current and future demand and encourage new development and redevelopment projects to generate a portion of their energy needs through renewable sources.

Policy EC3.2: Energy Efficiency and Conservation. Promote efficient use of energy and conservation of available resources in the design, construction, maintenance and operation of public and private facilities, infrastructure and equipment.

Policy EC3.3: Solid Waste Reduction and Recycling. Promote waste reduction and recycling to minimize materials that are processed in landfills.

Policy EC3.4: Water Conservation and Reuse. Promote water conservation and recycled water use. Reduce energy consumed for treatment and transportation of water and discharge of wastewater by: encouraging installation of low-flow fixtures; using native planting for landscaping in all City-owned and operated facilities; promoting best practices and technologies for water conservation; considering water use in evaluating and approving development projects; supporting the use of graywater and water catchment systems in residential, commercial and industrial uses; and encouraging new development and redevelopment projects to meet a portion of their water needs through the use of recycled water.

Policy EC4.3: Green Buildings and Landscaping. Require energy and resource efficient buildings and landscaping in all public and private development projects. Encourage the use of green and sustainable development standards and practices in planning, design, construction and renovation of facilities; promote the use of green streets that incorporate extensive landscaping, pervious surfaces and native planting; encourage new development and redevelopment projects to be LEED-certified green buildings; and promote ecologically-sensitive approaches to landscaping. Adopting green standards and practices will improve the quality of the built environment, reduce environmental impacts and support economic development goals for creating a green economy.

Policy EC4.4: Green Infrastructure. Develop green infrastructure standards that relies on natural processes for stormwater drainage, groundwater recharge and flood management. Green approaches for infrastructure development are environmentally and fiscally efficient and provide long-term benefits to the community by reducing energy consumption and maintenance and capital improvement costs.

Policy EC6.1: Habitat and Biological Resource Protection and Restoration. Natural habitat is essential to ensuring biodiversity and protecting sensitive biological resources. Protect these areas and work with the California Department of Fish and Game, the San Francisco Bay Regional Water Quality Control Board, the East Bay Regional Park District and other regional agencies to identify areas for special protection and establish appropriate protection measures for these areas.

Protect resources to maximize the efficacy of natural systems and encourage sustainable development practices and conservation measures to ensure a healthy natural environment.

Protect wetlands from direct and indirect impacts of new and existing development and infrastructure. Ensure that direct and indirect impacts to wetland habitats are minimized by environmentally sensitive project siting and design.

Protect marshlands and baylands to ensure they are not polluted or damaged from bay filling and dredging.

Protect and restore creek corridors and riparian areas to ensure they function as healthy wildlife habitat and biological areas. Protect and restore creek corridors and riparian areas by restoring riparian habitat with appropriate vegetation and channel design; removing culverts and hardened channels where appropriate; improving creek access; avoiding future culverting or channelization of creeks; and ensuring appropriate and ongoing maintenance.
At a minimum, require mitigation of impacts to sensitive species ensuring that a project does not contribute to the decline of the affected species populations in the region. Identify mitigations in coordination with the U.S. Fish and Wildlife service, the California Department of Fish and Game and other regulatory agencies.

- **Policy EC6.2: Low-Lying Areas in Richmond.** Protect and manage low-lying areas that are likely to be affected by SLR and storm surges.

- **Policy EC6.3: Adapting to Climate Change.** Prepare for and adapt to future impacts of changing weather patterns and sea level fluctuations.

**City of Richmond Climate Action Plan**

The City’s CAP includes objectives and strategies related to reducing GHG emissions in Richmond (City of Richmond 2016), which are aligned with the City’s General Plan 2030 policies.

- **Strategy EE3: Promote Green Building.** All new buildings meet or exceed Title 24 standards at time of construction; by 2020 all new residential buildings will be ZNE; by 2030 all new commercial buildings will be ZNE.

- **Strategy RE1: Increase Local Solar Energy Generation.** The City will promote the installation of distributed, small-scale solar photovoltaic systems (solar PV), as well as other renewable energy generation systems, in existing buildings and new construction, prioritizing investments in municipal buildings, schools, and public housing developments. Richmond is leading local solar development in the Bay Area through innovative policy decisions that create competition and marketplaces for local renewable energy development.

- **Strategy WA3: Green Building Strategies for Water Conservation.** The City will employ a variety of strategies to reduce water use via green building techniques, such as ensuring that all projects demonstrate compliance with, at minimum, the 2013 CalGREEN standards; offering incentives for certification through GreenPoint Rated, LEED, or other green building rating systems; considering adopting a retrofit-on-sale ordinance in conjunction with a Building Energy Saving Ordinance (BESO); and providing information to developers, homeowners, and businesses on water efficiency and green building rating systems.

- **Strategy WA4: Support Water Infrastructure Improvements and Expand Water Reclamation and Reuse.** The City will support EBMUD’s efforts to expand recycled water use to serve its City of Richmond customers, and support the use of graywater and rainwater catchment systems by local residents and businesses. The City will support EBMUD’s efforts to maintain and upgrade water infrastructure and conveyance systems to minimize leaks and prevent waste.

- **Strategy GA3: Support Green Infrastructure and Streetscape Design.** The City will encourage property owners and developers to incorporate green infrastructure (e.g., bioswales, permeable pavement, rainwater catchment, planter strips, etc.) into existing and new developments, continue to utilize the same green infrastructure design principles in City-owned property as outlined in the City’s Parks Master Plan, incorporate green infrastructure into new City developments, and retrofit existing City facilities with green infrastructure as funding becomes available.

- **Strategy TL3: Improve Pedestrian and Bicycle Infrastructure.** The City will maintain and accelerate implementation of Richmond’s Bicycle and Pedestrian Master Plans, and provide additional actions that support pedestrian and bicyclist safety and comfort, expand the bicycle and pedestrian network, and increase amenities throughout the City.

- **Strategy SW4: Increase Diversion of Construction and Demolition (C&D) Waste.** The City will promote the deconstruction of buildings, rather than demolition, in which buildings are carefully disassembled and component parts are recycled or locally repurposed and reused.
- **Strategy RC3: Increase Resilience of Critical Infrastructure to Climate Change.** The City will increase the resilience of critical infrastructure (both existing and planned) such that physical structures can withstand anticipated climate hazards including SLR and flooding.

- **Strategy RC4: Increase Resilience of Parks and Ecosystems to Climate Change.** The City will protect parks, natural areas and ecosystems that provide recreational and aesthetic value, are critical to local flora and fauna, and provide ecosystem services that are valuable to the community.

- **Strategy RC5: Develop a Long-term Shoreline Development Vision and Protection Plan.** The City will develop a comprehensive vision for its extensive shoreline that addresses climate change impacts to private property, commercial and industrial assets, public infrastructure, water quality, ecological protection, public access, public health and recreation.

### 4.10.3 Impacts and Mitigation Measures

**METHODOLOGY**

The environmental analysis in this Draft PEIR focuses on quantifying the emissions from the most GHG emissions-intensive proposed LUPA activities that could occur within one year. Emissions of criteria air pollutants and precursors were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 computer program, as recommended by BAAQMD. Modeling was based on LUPA-specific information (e.g., size of areas to be graded and/or to be paved, etc.) where available; reasonable assumptions based on typical construction activities; and default values in CalEEMod that are based on location. Emissions associated with the proposed LUPA are compared to BAAQMD-adopted thresholds. Specific model assumptions and inputs for these calculations can be found in Appendix B.

**THRESHOLDS OF SIGNIFICANCE**

The issue of global climate change is inherently a cumulative issue, as the GHG emissions of individual projects cannot be shown to have any material effect on global climate. Thus, the proposed LUPA’s impact to climate change is addressed only as a cumulative impact.

BAAQMD’s approach to developing a Threshold of Significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions needed to move us towards climate stabilization. If a project would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact and would be considered significant. Because the proposed LUPA would result in some operational-related emissions of GHGs (i.e., energy consumption), and is located within BAAQMD’s jurisdiction for which these thresholds were determined to be applicable, the BAAQMD threshold of 1,100 metric tons of CO₂ equivalents per year (MT CO₂e/yr) is used to determine CEQA significance with regards to GHG emissions.

With respect to construction activities, BAAQMD has not developed significance thresholds for GHG emissions emitted during project construction. However, BAAQMD recommends that lead agencies quantify and disclose construction-related GHG emissions and make a significance determination of these emissions (BAAQMD 2017). Thus, the 1,100 MT CO₂e/yr threshold is used to evaluate both construction and operational emissions.

Based on Appendix G of the CEQA Guidelines, impacts are considered significant if implementation of the proposed LUPA would do any of the following:

- generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment (i.e., result in construction or operational GHG emissions that exceed 1,100 MT CO₂e/yr); or
conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

IMPACTS AND MITIGATION MEASURES

Impact 4.10-1: Proposed LUPA-Generated Greenhouse Gas Emissions

Construction-type activities associated with the LUPA recommendations would result in the generation of GHG emissions from the use of heavy-duty off-road construction equipment, haul trucks associated with materials transport, and vehicle use during worker commute. The most GHG emissions intensive activities would occur in Phase 1 of the proposed LUPA. If all GHG emissions-generating activities from Phase 1 were to occur within one year, they would generate a total of 135 MT CO$_2$e/year, which would not exceed BAAQMD’s threshold of 1,100 MT CO$_2$e/year.

The proposed LUPA does not include any major new stationary sources of GHGs but would include one new minor operational source of GHG emissions: operation of the new recreational programs and storage building. However, construction-phase emissions would be far more intensive than operational-phase emissions from the recreational programs and storage building. Furthermore, the recreational programs and storage building is intended to accommodate existing interpretive and volunteer activities, and would not be expected to result in significant new energy use or vehicle trips. Therefore, this impact would be less than significant.

GHG emissions associated with the proposed LUPA would be generated during construction-type activities and during park operations. Construction-type activities associated with the LUPA recommendations would result in the generation of GHG emissions from the use of heavy-duty off-road construction equipment, haul trucks associated with materials transport, and vehicle use during worker commute. As previously discussed, this analysis focuses on quantifying the emissions from the most GHG emissions-intensive proposed LUPA activities that could occur overlap within one year. The most GHG emissions intensive activities would occur in implementation Phase 1 of the proposed LUPA (refer to Section 3.10, “Construction/Implementation Schedule”). CalEEMod was used to quantify emissions from a conservative scenario (i.e., avoiding the risk of understating an impact), in which all GHG emissions-generating activities from Phase 1 were occurring within one year. This scenario conservatively includes: implementation of the Lagoon Enhancement Project; site preparation of the Bray dredge disposal area; trail paving and improvement activities in the Bayshore, Lagoon, and Ridgeland Planning Areas; and construction of the Canal Boulevard Staging Area. This conservative scenario would generate a total of 135 MT CO$_2$e/year, which is well below BAAQMD’s threshold of 1,100 MT CO$_2$e/year (See Appendix B for detailed modeling results).

The proposed LUPA does not include any major new stationary sources of GHGs but would include one new minor operational source of GHG emissions: operation of the new recreational programs and storage building. Construction-phase emissions would be far more intensive than operational-phase emissions from the recreational programs and storage building as the recreational programs and storage building is intended to accommodate existing interpretive and volunteer activities, and would not be expected to result in significant new energy use or vehicle trips. Furthermore, it is conceptually planned to incorporate rooftop solar panels, which would likely meet the minor energy requirements of the facility.

As discussed in Subsection 4.8.3 of Section 4.8, “Transportation,” a 2,000 square foot recreational programs and storage building land use would generate up to three weekday p.m. peak hour trips, four weekday a.m. peak hour trips, 19 Saturday peak hour trips, and 46 daily weekday trips. This potential incremental increase in vehicle trips would not result in significant new GHG emissions, particularly since programming use of the recreational programs and storage building would be intermittent and would not occur every day. Furthermore, the proposed LUPA would provide enhanced bike and pedestrian facilities within Miller/Knox; thus, increasing connectivity, facilitating increased use of non-motorized modes of transportation, and thereby potentially reducing vehicle-related GHG pollutant emissions. Because construction-type and operational emissions of GHGs would be below the BAAQMD thresholds, the impact would be less than significant.
Mitigation Measures
No mitigation is required.


BAAQMD’s approach to developing a threshold of significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions. As discussed in Impact 4.10-1 above, implementation and operation of the LUPA recommendations would not exceed BAAQMD’s threshold of 1,100 MT CO2e/year.

The 2017 Scoping Plan recommends several measures that could be implemented if feasible to reduce GHG emissions. The County and the City’s CAPs, as well as the City’s General Plan also contain applicable policies aimed at reducing energy consumption, waste, vehicle and mechanical equipment emissions, and promoting alternative means of transportation. The LUPA recommendations align with these suggested measures. For example, all demolition debris would be disposed in accordance with California Code of Regulations Title 24, Part 11. Under-utilized areas of irrigated turf would be replaced with drought-tolerant, climate-friendly vegetation to reduce overall water use. Enhanced bike and pedestrian facilities within Miller/Knox would increase regional connectivity, facilitating the increased use of non-motorized modes of transportation. Furthermore, an objective of the proposed LUPA is to incorporate strategies for climate adaptation, SLR, and resiliency which is consistent with the City’s General Plan policies EC6.2 and EC6.3, and the City’s CAP strategies RC4 and RC5. Therefore, the proposed LUPA would be consistent with applicable plans, policies, and regulations for the purpose of reducing GHG emissions and no impact would occur.

Plans, policies, and regulations for the purpose of reducing GHG emissions and protecting areas from climate change related effects that are applicable to the proposed LUPA are described in Section 4.10.2 “Regulatory Setting” above. BAAQMD’s approach to developing a threshold of significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions. As discussed in Impact 4.10-1 above, the implementation and operation of the LUPA recommendations would not exceed BAAQMD’s threshold of 1,100 MT CO2e/year. Therefore, it would not conflict with federal or state regulations adopted for the purpose of reducing GHG emissions.

The 2017 Scoping Plan Update lays out the framework for achieving the 2030 statewide GHG reduction target of 40 percent below 1990 levels. The update includes an appendix that details local actions that land use development projects and municipalities can implement to support the statewide goal. For project-level CEQA analyses, the 2017 Scoping Plan recommends several measures that could be implemented if feasible to reduce GHG emissions (CARB 2017b); the proposed LUPA aligns with these suggested measures, as summarized above in Section 4.10.2. For example, railroad track that would be removed from the Bay Shore Planning Area would be repurposed to provide edging for the “Grand Promenade” in the Ferry Point and Bray Planning Areas, thereby diverting waste from landfills. All demolition debris would be disposed in accordance with California Code of Regulations Title 24, Part 11 which requires recycling and/or salvaging for reuse of a minimum of 50 percent of the nonhazardous construction and demolition waste. The new recreational programs and storage building conceptually includes solar panels to provide electrical needs and a rain garden for rainwater capture. Under-utilized areas of irrigated turf would be replaced with native vegetation to reduce overall water use. Enhanced bike and pedestrian facilities within Miller/Knox would increase regional connectivity, facilitating the increased use of non-motorized modes of transportation, and reducing vehicle-related GHG pollutant emissions.

The LUPA recommendations described above would also be consistent with the County and the City’s CAPs as well as the City’s General Plan, which contain policies aimed at reducing energy consumption, waste, vehicle and mechanical equipment emissions, and promoting alternative means of transportation. An objective of the proposed LUPA is to incorporate strategies for climate adaptation, SLR, and resiliency which
is consistent with the City’s general plan policies EC6.2 and EC6.3, and the City’s CAP strategies RC4 and RC5. Therefore, the proposed LUPA would be consistent with applicable plans, policies, and regulations for the purpose of reducing GHG emissions and **no impact** would occur.

**Mitigation Measures**

No mitigation is required.

**Impact 4.10-3: Climate Change Impacts and the Proposed LUPA**

Given the broad range of long-term, climate change impact projections; the evolving science, technology, and regulations of climate change; a recent CEQA Supreme Court decision recognizing exposure to environmental hazards need not be addressed as a CEQA impact, if risk of exacerbation does not occur; and program-level nature of the District’s future resiliency efforts, the District is providing the following analysis of climate change impacts on the proposed LUPA recommendations for informational purposes only and **no significance determination** is made in this PEIR. Based on the GHG analysis, implementation of LUPA recommendations would not risk exacerbating climate change. Future District climate change adaptation projects at Miller/Knox will require project-level CEQA analysis and significance determinations related to climate change will be made at that time, as appropriate.

The potential impacts of climate change on Miller/Knox include increased risk of wildfires and increased risk of flooding due to SLR. Miller/Knox is within an area that is considered a fire-threatened community. However, the District has a variety of fire protection policies and the Fire Prevention Code to address wildfire risk, as described in Subsection 4.4.2 of Section 4.4 “Hazards and Hazardous Materials.” Implementation of LUPA recommendations would decrease the likelihood of a wildfire and provide resilience to wildfire impacts through long-term strategies for reducing fuel loads and improving the health of native plant habitats.

The Miller/Knox shoreline along San Francisco Bay is tidally influenced, exposed to wind-driven storm waves and, therefore, vulnerable to flooding at current sea levels and at higher future risk of flood exposure based on the projected scenarios of SLR. The primary LUPA recommendations, which provide increased adaptation and resilience to SLR impacts, include the Lagoon Enhancement Project, and implementation of SLR-risk adaptation features along the Miller/Knox shoreline. Furthermore, one of the primary objectives of the proposed LUPA is to incorporate strategies for climate adaptation and resilience. Many LUPA recommendations would contribute to GHG reduction, climate readiness, and climate adaptation through public education, improved water and energy efficiency and conservation, and by installing renewable energy systems such as solar arrays. These features would reduce the extent and severity of climate change-related impacts to the proposed LUPA.

The analysis below has been written recognizing the direction from a CEQA California Supreme Court decision addressing the scope of analysis required in environmental impact reports for potential impacts resulting from existing environmental conditions in the vicinity of a site for a proposed project. In *California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369, 377 (“CBIA”), the Court held that:

“In light of CEQA’s text, statutory structure, and purpose, we conclude that agencies subject to CEQA generally are not required to analyze the impact of existing environmental conditions on a project’s future users or residents. But when a proposed project risks exacerbating those environmental hazards or conditions that already exist, an agency must analyze the potential impact of such hazards on future residents or users.” (Id. at pp. 377-378),

The court directed that CEQA does not routinely require in all circumstances the consideration of the effects of existing environmental conditions on the future occupants or users of a proposed project site. But if the project might exacerbate an existing environmental condition, the lead agency must then analyze the exposure of future residents and users to the environmental condition. Also, the court did not prohibit an agency from considering how existing environmental conditions might impact its own project’s future users, so for publicly sponsored and implemented projects, the lead agency retains this discretion. Given the broad
range of long-term climate change impact projections; the evolving science, technology, and regulations of climate change; the CEQA Supreme Court decision; and program-level nature of the District’s future resiliency efforts at Miller/Knox, the District is providing an analysis of climate change impacts on the regional park with implementation of the proposed LUPA recommendations for informational purposes only.

As discussed above in Section 4.10.1, “Environmental Setting,” the primary climate change effects that could impact Miller/Knox include increased risk of wildfires due to the general effects of changing climate and increased risk of flooding due to SLR. As discussed in Subsection 4.4.1 of Section 4.4, “Hazards and Hazardous Materials,” while Miller/Knox is not designated a very high FHSZ, it is within an area that is considered a fire threatened community. The City has a variety of fire protection policies (i.e., Goal SN1, Goal SN2, and Policy SN2.3) and the Fire Prevention Code (Chapter 8.16 of the City of Richmond Code of Ordinances) which address fire risk and safety through adequate emergency response, staffing, and equipment; and proper building construction. Furthermore, LUPA recommendations, such as implementation of the District’s Wildfire Hazard Reduction and Resource Management Plan, would decrease the likelihood of a wildfire and provide resilience to wildfire impacts through long-term strategies for reducing fuel loads and improving the health of native plant habitats.

As discussed above in Section 4.10.1, “Environmental Setting,” OPC provides recommended SLR projections for high, low, and extremely low risk tolerance decisions. Given that the regional park land use does not include residential development or sensitive infrastructure, a high tolerance to climate risks would be appropriate. Using the Likely Range of SLR predictions appropriate for this level of risk tolerance, climate change could result in up to 1.1 feet of SLR in the San Francisco Bay by the mid-21st century and up to 3.4 feet by the end of the century.

Like most shoreline parks, the Miller/Knox shoreline provides coastal resilience and protection from SLR because the open space along the shoreline buffers the developed community from flooding events. This landscape role is enhanced at Miller/Knox by the existing railroad berm and rock slope protection along most of the shoreline, providing approximately three feet of freeboard during typical high tide events.

According to the San Francisco Bay Conservation and Development Commission’s (BCDC) Adapting to Rising Tides program (ART), 1 percent of the park could be exposed to a SLR of 1 foot and 2 percent of the park could be exposed to SLR of 3 or 4 feet (BCDC 2017a). BCDC also completed the Bay Area SLR Analysis and Mapping Project to estimate shoreline overtopping potential and SLR inundation for ten scenarios of mean higher high water plus SLR (BCDC 2017b). Based on BCDC’s analysis and mapping, 1.1 feet of SLR would not result in overtopping along the shoreline or SLR inundation of areas disconnected from the shoreline, and 3.4 feet of SLR may result in some inundation in the Lagoon and Bray Planning Areas at Miller/Knox. Implementation of future planning for the Bay shoreline within Miller/Knox would provide increased adaptation and resilience to SLR impacts, if needed, by reinforcing shoreline protection.

One of the objectives of the proposed LUPA is to incorporate strategies for climate adaptation and resiliency. Many of the LUPA recommendations would contribute to climate readiness and climate adaptation at Miller/Knox, and are listed below:

- **Implement the Lagoon Enhancement Project.** Lagoon dredging would improve the hydrologic and ecological function of the lagoon by restoring capacity of the lagoon close to its original capacity. This would improve the general function of the lagoon, water quality, aesthetics, and conditions for wildlife. Routine dredging conducted on an as-needed basis would minimize the likelihood of sediment accumulation in the lagoon and thereby maintain storage capacity and water quality improvements.

- **Conduct Engineering Design Development Study along the Bayshore and Implement Shoreline Features to Improve Resiliency and SLR Adaptation.** Future planning related to the existing rock slope protection along the Miller/Knox shoreline is recommended to identify additional measures would be needed to increase resiliency of the shoreline from future SLR.
Replace Under-Utilized Areas of Irrigated Turf with Native Drought-Tolerant, Climate-Friendly Vegetation. This recommendation would expand the conversion of under-utilized areas of irrigated turf with turfgrasses that are demonstrated to be drought-tolerant and climate-friendly. Implementation of this recommendation would reduce overall water use at Miller/Knox by decreasing areas requiring irrigation and would improve natural habitat values around the lagoon.

Incorporate Public Education Associated with Climate Change, Resiliency, and Adaptation. The LUPA includes recommendations to enhance existing public education to include topics regarding climate change, resiliency, and adaptation to be incorporated throughout the park. Enhanced public education would be particularly valuable associated with the LUPA recommendations in the Bray Planning Area regarding the demonstration gardens, green-waste storage area, dredge disposal area, and the recreational programs and storage building.

Establish Native Plant Communities as Demonstration Gardens with Connecting Paths. Implementation of this recommendation would create an outdoor classroom of native plants in small garden-like settings with a trails, benches, and picnic tables. In addition to improving native habitat, the demonstration gardens would include public education panels including information about the coastal plant communities and habitats and other appropriate topics. Plant palettes for individual gardens could include coastal grassland, coastal scrub, coast live oak woodland, and a raingarden wetland.

Provide a Green-Waste Storage Area for Park Operations and Public Education. Implementation of this recommendation would relocate the green-waste storage area from the overflow parking area at Ferry Point to the southeastern point of the Bray Planning Area. This area would be used by park operations staff to store green waste accumulated from ongoing park maintenance activities for future offsite composting. Public education could include information on the composting process and the environmental benefits of composting green waste.

Develop Trailheads and New Vista Points, Repair Trails Damaged by Erosion, and Decommission Trails too Damaged for Repair. Repairing trails damaged by erosion and decommissioning trails too damaged for repair would improve the existing trail system in the Ridgeland Planning Area, rendering them more stable and operationally sustainable as well as reducing future erosion and associated water quality issues.

Implement the District’s Wildfire Hazard Reduction and Resource Management Plan Recommendations, Integrated Pest Management Recommendations, and Vegetation Management and Grazing Recommendations. These long-term strategies for reducing fuel loads and managing vegetation to minimize the risk of Diablo wind-driven catastrophic wildfire along the wildland-urban interface, while also ensuring the protection and enhancement of ecological values and resources, improving native plant habitats, and reducing fire risk.

Replace the Historic Warehouse Building with Day-use and a Scenic Vista Point. The LUPA includes a recommendation to partially demolish the existing historic warehouse building at Ferry Point, preserving the existing concrete structural side and roof beams, and develop a day-use picnic area within the building footprint. The picnic area could be covered with solar panels, which could provide electricity for an irrigation system for the native planting areas and for the existing lights on the fishing pier.

These features would help to reduce the extent and severity of climate change-related impacts to the proposed LUPA recommendations and to Miller/Knox.

Mitigation Measures
No mitigation is required.
4.11 NOISE AND VIBRATION

This section describes the fundamentals of acoustics, summarizes ambient noise conditions and applicable regulations related to noise and vibration, and evaluates the potential short-term and long-term noise impacts associated with the Miller/Knox Regional Shoreline (Miller/Knox or park) Land Use Plan Amendment (LUPA) recommendations. Supporting data used in this analysis is provided in Appendix C.

Scoping comments received related to noise expressed concern about ensuring opportunities for quiet reflection within the park. This is addressed below in Impact 4.11-1.

4.11.1 Environmental Setting

ACOUSTIC FUNDAMENTALS

Acoustics is the scientific study that evaluates perception and properties of sound waves. Table 4.11-1 contains definitions of acoustic terms used to establish the environmental setting and analyze impacts to noise resulting from implementation of the LUPA recommendations.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
<td>Noise is generally defined as sound that is loud, disagreeable, unexpected, or unwanted.</td>
</tr>
<tr>
<td>Decibel (dB)</td>
<td>Sound levels are measured using the decibel scale, developed to relate to the range of human hearing. A decibel is logarithmic; it does not follow normal algebraic methods and cannot be directly summed. For example, a 65-dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). A sound level increase of 10 dB corresponds to 10 times the acoustical energy, and an increase of 20 dB equates to a 100-fold increase in acoustical energy.</td>
</tr>
<tr>
<td>A-weighted decibel (dBA)</td>
<td>The human ear is not equally sensitive to loudness at all frequencies in the audible spectrum. To better relate overall sound levels and loudness to human perception, frequency-dependent weighting networks were developed, identified as A through E. There is a strong correlation between the way humans perceive sound and A-weighted sound levels. For this reason, the A-weighted sound levels are used to predict community response to noise from the environment, including noise from transportation and stationary sources, and are expressed as A-weighted decibels. All sound levels discussed in this section are A-weighted decibels unless otherwise noted.</td>
</tr>
<tr>
<td>Equivalent Noise Level (L_{eq})</td>
<td>The average noise level during a specified time period; that is, the equivalent steady-state noise level in a stated period of time that would contain the same acoustic energy as the time-varying noise level during the same period (i.e., average noise level).</td>
</tr>
<tr>
<td>Maximum Noise Level (L_{max})</td>
<td>The highest instantaneous noise level during a specified time period.</td>
</tr>
<tr>
<td>Minimum Noise Level (L_{min})</td>
<td>The lowest instantaneous noise level during a specified time period.</td>
</tr>
<tr>
<td>Day-Night Noise Level (L_{dn})</td>
<td>The 24-hour L_{eq} with a 10-dB penalty applied during the noise-sensitive hours from 10 p.m. to 7 a.m., which are typically reserved for sleeping.</td>
</tr>
<tr>
<td>Community Noise Equivalent Level (CNEL)</td>
<td>Similar to the L_{dn} described above with an additional 5-dB penalty applied during the noise-sensitive hours from 7 p.m. to 10 p.m., which are typically reserved for evening relaxation activities.</td>
</tr>
</tbody>
</table>

Source: Caltrans 2013a

Noise Generation and Attenuation

Noise can be generated by several sources, including mobile sources such as automobiles, trucks, and airplanes and stationary sources such as activity at construction sites, machinery, and commercial and industrial operations. As sound travels through the atmosphere from the source to the receiver, noise levels
attenuate (i.e., decrease) depending on ground absorption characteristics, atmospheric conditions, and the presence of physical barriers. Noise generated from mobile sources generally attenuate at a rate of 4.5 dB per doubling of distance from the source. Noise from stationary sources spread with more spherical dispersion patterns that attenuate at a rate of 6 to 7.5 dB per doubling of distance from the source.

Atmospheric conditions such as wind speed, wind direction, turbulence, temperature gradients, and humidity also alter the propagation of noise and affect levels at a receiver. Furthermore, the presence of a barrier (e.g., topographic feature, intervening building, and dense vegetation) between the source and the receptor can provide substantial attenuation of noise levels at the receiver. Both natural (e.g., berms, hills, and dense vegetation) and human-made features (e.g., buildings and walls) may function as noise barriers.

To provide context for sound levels described throughout this section, Table 4.11-2 presents sound levels associated with common outdoor and indoor activities.

### Table 4.11-2 Typical A-Weighted Noise Levels

<table>
<thead>
<tr>
<th>Common Outdoor Activities</th>
<th>Noise Level (dBA)</th>
<th>Common Indoor Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jet fly-over at 1,000 feet</td>
<td>−100</td>
<td>Rock band</td>
</tr>
<tr>
<td>Gas lawn mower at 3 feet</td>
<td>−90</td>
<td></td>
</tr>
<tr>
<td>Diesel truck at 50 feet at 50 miles per hour</td>
<td>−80</td>
<td>Food blender at 3 feet, Garbage disposal at 3 feet</td>
</tr>
<tr>
<td>Noisy urban area, daytime, Gas lawn mower at 100 feet</td>
<td>−70</td>
<td>Vacuum cleaner at 10 feet, Normal speech at 3 feet</td>
</tr>
<tr>
<td>Commercial area, Heavy traffic at 300 feet</td>
<td>−60</td>
<td></td>
</tr>
<tr>
<td>Quiet urban daytime</td>
<td>−50</td>
<td>Large business office, Dishwasher next room</td>
</tr>
<tr>
<td>Quiet urban nighttime</td>
<td>−40</td>
<td>Theater, large conference room (background)</td>
</tr>
<tr>
<td>Quiet suburban nighttime</td>
<td>−30</td>
<td>Library, Bedroom at night</td>
</tr>
<tr>
<td>Quiet rural nighttime</td>
<td>−20</td>
<td></td>
</tr>
<tr>
<td>Lowest threshold of human hearing</td>
<td>−10</td>
<td>Broadcast/recording studio</td>
</tr>
<tr>
<td></td>
<td>−0</td>
<td>Lowest threshold of human hearing</td>
</tr>
</tbody>
</table>

Source: Caltrans 2013b

### Human Response to Changes in Noise Levels

In typical noisy environments, changes in noise of 1–2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy, such as doubling the volume of traffic on a highway that would result in a 3-dB increase in sound would generally be perceived as barely detectable.

Excessive and chronic (long-term) exposure to elevated noise levels can result in auditory and non-auditory effects on humans. Auditory effects are those related to temporary or permanent hearing loss caused by loud noises. Exposure to noise may result in physical damage to the auditory system, which may lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over a period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a short period. Gradual and traumatic hearing loss both may be permanent.

Non-auditory effects are those related to behavior and physiology. The non-auditory behavioral effects of noise on humans are primarily subjective effects such as annoyance, nuisance, and dissatisfaction, which lead to interference with activities such as communications, sleep, and learning. The non-auditory physiological health effects of noise on humans have been the subject of considerable research into...
possible correlations between exposure to elevated noise levels and health problems, such as hypertension and cardiovascular disease. The mass of research implies that noise-related health issues are predominantly the result of behavioral stressors and not a direct noise-induced response. The degree to which noise contributes to such diseases depends on the frequency, bandwidth, and level of the noise and the exposure time (Caltrans 2013a).

**Vibration**

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena such as from earthquakes, volcanic eruptions, sea waves, landslides and those introduced by human activity such as from explosions, machinery, traffic, trains, construction equipment. Vibration sources may be continuous, such as from operating factory machinery) or transient in nature such as from explosions. Vibration levels can be depicted in terms of amplitude and frequency, relative to displacement, velocity, or acceleration.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (FTA 2006; Caltrans 2013b). PPV and RMS vibration velocity are normally described in inches per second (in/sec).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2006). Table 4.11-3 includes the general human response to different ground vibration-velocity levels.

<table>
<thead>
<tr>
<th>Vibration-Velocity Level</th>
<th>Human Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 VdB</td>
<td>Approximate threshold of perception.</td>
</tr>
<tr>
<td>75 VdB</td>
<td>Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.</td>
</tr>
<tr>
<td>85 VdB</td>
<td>Vibration acceptable only if there are an infrequent number of events per day.</td>
</tr>
</tbody>
</table>

Notes: VdB = vibration decibels referenced to 1 μ inch/second and based on the root mean square (RMS) velocity amplitude.

Source: FTA 2006:7-8

The typical background vibration-velocity level in residential areas is approximately 50 VdB. Typical outdoor sources of perceptible ground vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Construction activities can generate sufficient ground vibrations to pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FTA 2006).

**EXISTING NOISE ENVIRONMENT**

**Existing Noise- and Vibration-Sensitive Land Uses**

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended
Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, schools, historic sites, cemeteries, and recreation areas are also generally considered sensitive to increases in exterior noise levels. Those noted above are also considered vibration-sensitive land uses in addition to commercial and industrial buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance.

Existing noise- and vibration-sensitive land uses in the vicinity of Miller/Knox include several multi-family residential units in Brickyard Cove adjacent to the southern park boundary and single-family residences in Point Richmond along the northern park boundary. Although the residential property at Brickyard Cove is adjacent to the park property, the residences are distant from the high-use parts of the park with intervening hillside topography. At the north end of Miller/Knox, approximately six single-family homes abut Keller Beach, which is within the park boundary. Other Point Richmond homes are more distant, and many are screened by local hillside topography. Miller/Knox park visitors are also sensitive to increases in exterior noise levels, however due the mobile nature of these receptors and the character of the urban regional park setting, where ambient noise levels are higher than in wilderness area parks, park visitors would not experience prolonged exposure to elevated noise levels and are not considered to be sensitive receptors in the analysis below.

**Existing Noise Sources and Ambient Levels**

The existing noise environment within Miller/Knox is primarily influenced by transportation noise sources such as automobile traffic. The major transportation corridors within and near the Miller/Knox are Dornan Drive, Brickyard Cove Road, Seacliff Drive, and Canal Boulevard. Noise measurements taken in September of 2006 at the intersection of Canal Boulevard and W. Cutting Boulevard found a 45.5 dB $L_{min}$, 90.3 dB $L_{max}$, and 67.3 dB $L_{eq}$ (City of Richmond 2011). Long-term (48-hour) noise monitoring was conducted at two locations near Miller/Knox in November of 2014 for the Terminal One Project. Both locations were on the Terminal One Project site. The first noise monitoring location was setback approximately 50 feet from the centerline of Brickyard Cove Road, at the southern park boundary near Ferry Point. The second noise monitoring location was approximately 50 feet from the Bay, at the southern park boundary near Ferry Point. Noise monitoring data indicated relatively quiet conditions exist at these locations, which are generally less than 55 dB $L_{eq}$ during daytime hours and less than 50 dB $L_{eq}$ during nighttime hours (City of Richmond 2016).

**4.11.2 Regulatory Setting**

**FEDERAL**

**Federal Transit Administration**

To address the human response to groundborne vibration, the Federal Transit Administration (FTA) set forth guidelines for maximum-acceptable vibration criteria for different types of land uses. Among these guidelines are the following maximum-acceptable vibration limits:

- 65 VdB, referenced to 1 microinch per second and based on the RMS velocity amplitude, for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-tech manufacturing, laboratory facilities);
- 80 VdB for residential uses and buildings where people normally sleep; and
- 83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, offices) (FTA 2006).
STATE

California General Plan Guidelines
Though not adopted by law, the State of California General Plan Guidelines 2003, published by the California Governor’s Office of Planning and Research (2003), provide guidance for the compatibility of projects within areas of specific noise exposure. Acceptable and unacceptable community noise exposure limits for various land use categories have been determined to help guide new land use decisions in California communities. In many local jurisdictions, these guidelines are used to derive local noise standards and guidance. Citing U.S. Environmental Protection Agency (EPA) materials and the State Sound Transmissions Control Standards, the State’s general plan guidelines recommend interior and exterior noise standards of 45 and 60 dB CNEL for residential units, respectively (OPR 2003: 253-254).

California Department of Transportation
In 2013, the California Department of Transportation (Caltrans) published the Transportation and Construction Vibration Manual (Caltrans 2013b). The manual provides general guidance on vibration issues associated with construction and operation of projects in relation to human perception and structural damage. Table 4.11-4 presents recommendations for levels of vibration that could result in damage to structures exposed to continuous vibration.

<table>
<thead>
<tr>
<th>PPV (in/sec)</th>
<th>Effect on Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4-0.6</td>
<td>Architectural damage and possible minor structural damage</td>
</tr>
<tr>
<td>0.2</td>
<td>Risk of architectural damage to normal dwelling houses</td>
</tr>
<tr>
<td>0.1</td>
<td>Virtually no risk of architectural damage to normal buildings</td>
</tr>
<tr>
<td>0.08</td>
<td>Recommended upper limit of vibration to which ruins and ancient monuments should be subjected</td>
</tr>
<tr>
<td>0.006-0.019</td>
<td>Vibration unlikely to cause damage of any type</td>
</tr>
</tbody>
</table>

Notes: PPV= Peak Particle Velocity; in/sec = inches per second
Source: Caltrans 2013b

REGIONAL/LOCAL

East Bay Regional Park District Master Plan
There are no policies in the District Master Plan that are applicable to noise and vibration at Miller/Knox.

East Bay Regional Park District General Conditions
The District General Conditions contain the following requirement that is relevant to the proposed LUPA:

Article 42. Work Hours. The hours of work shall be any 8.5-hour block as mutually agreed upon between the Contractor and the District between 7:00 a.m. and 5:00 p.m., Monday through Friday. No night work shall be permitted. Work outside of the designated hours shall be subject to fine at double the rate of Liquidated Damages at the sole discretion of the District Representative. The Contractor may request from the District Inspector to work past the designated hours and days. If approved, the Contractor shall pay all District expenses, including the Inspector’s overtime at a rate set by the District Representative.
City of Richmond

City of Richmond Municipal Code
Chapter 9.52.100 – Alternative use of maximum noise limits by dB levels, states that it is unlawful to maintain, permit, allow, or suffer any use or activity that creates noise levels which exceed the following standards, presented in Table 4.11-5.

Table 4.11-5 City of Richmond Municipal Code Noise Standards

<table>
<thead>
<tr>
<th>Zoning District</th>
<th>Maximum Noise Level in dB (levels not to be exceeded more than 30 minutes in any hour)</th>
<th>Maximum Noise Level in dB (level not to be exceeded more than 5 minutes in any hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Measured at Property Line or District Boundary</td>
<td>Measured at Any Boundary of a Residential Zone</td>
</tr>
<tr>
<td>Single-Family Residential</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Multifamily Residential</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>Light Industrial and Office Flex</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>Heavy and Marine Industrial</td>
<td>75</td>
<td>65</td>
</tr>
<tr>
<td>Public Facilities and Community Use</td>
<td>65</td>
<td>60</td>
</tr>
<tr>
<td>Open Space and Recreational Districts</td>
<td>65</td>
<td>60</td>
</tr>
</tbody>
</table>

1. For M-1 and M-2 the measurement will be at property lines.

Chapter 9.52.110 – Temporary construction activity, restricts noise from construction activities “where technically and economically feasible,” such that the maximum sound levels at affected properties shall not exceed the following dB levels, presented in Table 4.11-6.

Table 4.11-6 City of Richmond Municipal Code Construction Noise Standards

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekdays, 7:00 a.m. to 7:00 p.m.</td>
<td>75 dB</td>
<td>80 dB</td>
<td>85 dB</td>
</tr>
<tr>
<td>Weekends, including legal holidays 9:00 a.m. to 8:00 p.m.</td>
<td>60 dB</td>
<td>65 dB</td>
<td>70 dB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekdays, 7:00 a.m. to 7:00 p.m.</td>
<td>60 dB</td>
<td>65 dB</td>
<td>70 dB</td>
</tr>
<tr>
<td>Weekends, including legal holidays 9:00 a.m. to 8:00 p.m.</td>
<td>55 dB</td>
<td>60 dB</td>
<td>65 dB</td>
</tr>
</tbody>
</table>

¹ Maximum sound levels for nonscheduled, intermittent, and short-term operation of less than 15-days

Chapter 9.52.060 - Persistent noises states that failure to comply with the following provisions shall constitute a nuisance and violation of this ordinance:

- All construction equipment powered by internal combustion engines shall be properly muffled and maintained.
Unnecessary idling of internal combustion engines is prohibited.

All stationery noise-generating construction equipment such as tree grinders and air compressors are to be located as far as is practical from existing residences.

Quiet construction equipment, particularly air compressors, are to be selected whenever possible.

Use of pile drivers, sources of impulsive sound and jack hammers shall be prohibited on Sundays and holidays, except for emergencies or as approved in advance by the Building Official.

4.11.3 Impacts and Mitigation Measures

METHODOLOGY

To assess construction-related noise and vibration impacts, sensitive receptors that have the potential to be impacted and their relative exposure were identified. Project-generated construction source noise and vibration levels were determined based on methodologies, reference emission levels, and usage factors from FTA’s Guide on Transit Noise and Vibration Impact Assessment methodology (FTA 2006). Reference levels for noise and vibration emissions for specific equipment or activity types are well documented and the usage thereof common practice in the field of acoustics. See Appendix C for the detailed calculations. To evaluate relative significance, noise and vibration impacts were determined based on comparisons to applicable regulations and guidance provided by federal, state, and/or local agencies.

Analysis of operational noise sources such as the new and expanded parking areas and the new recreational programs and storage building associated with LUPA implementation was qualitatively evaluated based on reference noise emission levels.

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the State CEQA Guidelines, a noise impact is considered significant if implementation of the Miller/Knox LUPA would:

- expose persons to or generate construction noise levels exceeding the City’s noise ordinance standards. Specifically, for single family and multi-family residential land uses, the ordinance cites weekday (7:00 a.m. to 7:00 p.m.) noise standards for mobile construction equipment of 75 dB and 80 dB, respectively;

- expose persons to or generate long-term noise levels exceeding the City’s noise ordinance standards. For public facilities, community use, open space, and recreational districts, the ordinance cites maximum noise levels of 65 dB (levels not to be exceeded more than 30 minutes in any hour) measured at the property line, 60 dB (levels not to be exceeded more than 30 minutes in any hour) measured at any boundary of a residential zone, and 50 dB (levels not to be exceeded more than 5 minutes in any hour) or the ambient noise level between 10:00 p.m. and 7:00 a.m. measured at any boundary of a residential zone;

- expose persons to or generation of excessive ground vibration or ground noise levels (i.e., exceed Caltrans’s recommended level of 0.2 in/sec PPV with respect to the prevention of structural damage for normal buildings or FTA’s maximum acceptable level of 80 VdB with respect to human response for residential uses [i.e., annoyance] at nearby existing vibration-sensitive land uses);

- result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
Noise

Ascent Environmental

- result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

- for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels; or

- for a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

ISSUES NOT DISCUSSED FURTHER

Miller/Knox is not located within an airport land use plan or within 2 miles of a public airport or private airstrip. The nearest public airport, Oakland International Airport, is approximately 15 miles south of Miller/Knox. The nearest private airstrip, the San Rafael Airport, is 9.5 miles northwest of Miller/Knox. Furthermore, the proposed LUPA does not include residential land uses. Therefore, the LUPA recommendations would not expose people residing or working in the project area to excessive noise levels from air traffic. No impact would occur and these issues are not discussed further.

As discussed in Subsection 4.8.3 of Section 4.8, “Transportation and Circulation,” the proposed LUPA is conservatively estimated to generate a low number of net new peak hour trips (two a.m. and p.m. peak hour trips, 10 weekend peak-hour trips). However, a doubling of a noise source is required to result in an increase of 3 decibels, which is perceived as barely noticeable by humans (Egan 2007). The slight increase in vehicle trips would be far less than a doubling of traffic volume on area roadways and, thus, would not result in a perceptible increase in noise. The proposed LUPA would not generate a substantial number of new vehicle trips nor increase noise perceptibly, and therefore, long-term traffic noise issues are not discussed further in this Draft PEIR.

The proposed LUPA would not introduce any major sources of long-term or permanent ground vibration. Therefore, no adverse impact would occur and operational vibration impacts are not discussed further.

IMPACTS AND MITIGATION MEASURES

Impact 4.11-1: Short-Term Construction Noise Impacts

Noise-intensive construction activities proposed in the LUPA include lagoon dredging; building demolition; removal of abandoned railroad tracks; facility and amenity upgrades at Keller Beach; trail improvement and decommissioning; construction of the recreational programs and storage building; and establishment of new, formalized, and expanded staging areas requiring site preparation, such as excavation, grading, and vegetation clearing, and paving. These activities may involve the use of heavy-duty construction equipment that would generate noise that could affect nearby sensitive receptors, such as residences in the area.

Based on typical equipment noise reference levels, usage factors of individual pieces of equipment, and attenuation rates with distance to a receptor, combined equipment maximum noise levels were calculated for each noise-intensive LUPA recommendation (see Appendix C for detailed calculations). Based on these calculations, construction of the proposed facility and amenity upgrades at Keller Beach could result in a substantial temporary increase in noise levels that may exceed the City’s construction noise ordinance standard and affect residences in the immediate project vicinity. This impact would be potentially significant.

Short-term construction-type noise levels at Miller/Knox would fluctuate and occur intermittently depending on the particular type, number, and duration of construction activities and equipment in use. The effects of construction noise largely depend on the type of construction activities occurring on any given day; noise levels generated by those activities; distances to noise sensitive receptors; potential noise attenuating features such as topography, vegetation, and existing structures; and the existing ambient noise environment in the vicinity.
receptor’s vicinity. As described in Section 4.11.1, “Environmental Setting,” sensitive receptors include multifamily residential units at Brickyard Cove and single-family homes near Keller Beach, which are adjacent to park property. Generally, Brickyard Cove residences are screened from most of the Miller/Knox property by intervening hillsides, which helps to minimize noise levels. Point Richmond homes near Keller Beach experience existing noise from recreation use on or around the beach; other parts of Miller/Knox are sufficiently distant from the Keller Beach-area homes to minimize existing noise.

As stated in Chapter 3, “Project Description,” proposed noise-generating construction activities would occur on weekdays, between 7:00 a.m. and 7:00 p.m., and, if weekend work is required, it would occur between 9:00 a.m. and 6:00 p.m. in accordance with Chapter 9 (9.52.110) of the Richmond Municipal Code and consistent with District General Conditions Article 42.

Noise-intensive construction activities proposed in the LUPA include lagoon dredging; partial demolition of the historic warehouse building; removal of abandoned railroad tracks; facility and amenity upgrades at Keller Beach by removal and replacement; trail improvement and decommissioning; construction of the recreational programs and storage building; and establishment of new, formalized, and expanded staging areas requiring site preparation, such as excavation, grading, and vegetation clearing, and paving. These activities would involve the use of heavy-duty construction equipment that would generate noise. Typical noise levels generated by various types of construction equipment likely to be used are identified in Table 4.11-7.

Table 4.11-7  Typical Equipment Noise Levels

<table>
<thead>
<tr>
<th>Type of Equipment</th>
<th>Noise Level (L_{max}) at 50 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Saw</td>
<td>90</td>
</tr>
<tr>
<td>Paver</td>
<td>89</td>
</tr>
<tr>
<td>Chain Saw</td>
<td>85</td>
</tr>
<tr>
<td>Dozer</td>
<td>85</td>
</tr>
<tr>
<td>Grader</td>
<td>85</td>
</tr>
<tr>
<td>Loader</td>
<td>85</td>
</tr>
<tr>
<td>Scraper/Excavator</td>
<td>85</td>
</tr>
<tr>
<td>Dump Trucks</td>
<td>84</td>
</tr>
<tr>
<td>Crane, Mobile</td>
<td>83</td>
</tr>
<tr>
<td>Generator</td>
<td>82</td>
</tr>
<tr>
<td>Backhoe</td>
<td>80</td>
</tr>
<tr>
<td>Pump</td>
<td>76</td>
</tr>
<tr>
<td>Welder/Torch</td>
<td>73</td>
</tr>
<tr>
<td>Pickup Truck</td>
<td>55</td>
</tr>
</tbody>
</table>

Notes: Assumes all equipment is fitted with a properly maintained and operational noise control device, per manufacturer specifications. Noise levels listed are manufacture-specified noise levels for each piece of heavy construction equipment.

Source: FTA 2006

Based on the information provided in Table 4.11-7 and accounting for typical usage factors of individual pieces of equipment along with typical attenuation rates, combined equipment maximum noise levels were calculated for each noise-intensive LUPA recommendation. The noise modeling conservatively assumes that all pieces of equipment would be operating simultaneously in the same area (see Appendix C for detailed calculations). Table 4.11-8 presents these combined equipment maximum noise levels, along with the screening distance at which noise levels would attenuate to 75 dB, and the noise levels experienced at the nearest sensitive receptors. Chapter 9.52.110 of the City’s code of ordinances identifies weekday (7:00 a.m.
to 7:00 p.m.) noise standards for mobile construction equipment of 75 dB for single-family residential and 80 dB for multifamily residential.

### Table 4.11-8 LUPA Recommendations and Associated Noise Levels

<table>
<thead>
<tr>
<th>Activity</th>
<th>Combined Equipment Maximum Noise Level (L\text{max} dB)</th>
<th>Screening Distance (feet)</th>
<th>Nearest Sensitive Receiver (feet)</th>
<th>Attenuated Noise Level at Receiver (L\text{max} dB)</th>
<th>Exceedance of City Noise Ordinance?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lagoon Dredging</td>
<td>94.3</td>
<td>461</td>
<td>1240</td>
<td>66.4</td>
<td>No</td>
</tr>
<tr>
<td>Building Demolition</td>
<td>92.1</td>
<td>357</td>
<td>2633</td>
<td>57.7</td>
<td>No</td>
</tr>
<tr>
<td>Railroad Track Removal</td>
<td>80</td>
<td>89</td>
<td>125</td>
<td>72.0</td>
<td>No</td>
</tr>
<tr>
<td>Keller Beach Facility and Amenity Upgrades</td>
<td>91.3</td>
<td>327</td>
<td>155</td>
<td>81.5</td>
<td>Yes</td>
</tr>
<tr>
<td>Trail Improvement</td>
<td>86.2</td>
<td>181</td>
<td>233</td>
<td>72.8</td>
<td>No</td>
</tr>
<tr>
<td>Recreational Programs and Storage Building</td>
<td>88</td>
<td>224</td>
<td>1600</td>
<td>57.9</td>
<td>No</td>
</tr>
<tr>
<td>Staging Areas</td>
<td>90.2</td>
<td>288</td>
<td>1300</td>
<td>61.9</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: Appendix C

As shown in Table 4.11-8, the only LUPA recommendation that could result in an exceedance of the City’s noise ordinance is the facility and amenity upgrades at Keller Beach. The upgrades include replacement of existing hardscape, such as concrete pads, renovation of the existing restroom and picnic area, and upgraded landscaping. It was assumed that demolition of the existing structures and concrete pads could involve the simultaneous use of a concrete saw, front-loader, and dump truck, which would generate up to 81.5 dB L\text{max} at the nearest sensitive receptor, a single-family residence north of the construction site. This could result in the generation of a substantial temporary increase in noise levels that may exceed the applicable City noise standard for residences in the immediate vicinity of Keller Beach. This impact would be potentially significant.

### Mitigation Measure 4.11-1: Comply with the City of Richmond’s Noise Ordinance During Keller Beach Facility and Amenity Upgrades

The noise generation of future construction projects proposed in the LUPA have been modeled based on conservative assumptions, to avoid the risk of understating impacts. Actual construction noise may vary from the assumptions used in this analysis. Thus, when design details for the facility and amenity upgrades at Keller Beach are developed, specific construction activities, equipment, and locations will be more precisely defined. Prior to construction, the District will remodel construction noise levels associated with the Keller Beach facility and amenity upgrades, based on the project design details. If the revised noise modeling finds that construction noise does not exceed the City’s standard of 75 dB L\text{max} for single-family residences, then no further mitigation is required.

If the District finds that construction noise levels would exceed the City’s standard of 75 dB L\text{max} for single-family residences near Keller Beach, or decides not to remodel the construction activities at Keller Beach, then the District will work with the City to obtain a variance from municipal code Chapter 9.52.110 – temporary construction activity. Chapter 9.52.110 specifies that the City’s construction noise ordinance applies where it is technically and economically feasible to achieve. If a variance is granted by the City, then no additional mitigation is required.

If the City does not grant a variance or exemption, the District will require the contractor to implement noise reduction measures during the facility and amenity upgrades at Keller Beach such that noise levels will not exceed 75 dB L\text{max} at nearby single-family residences. Noise reduction measures would include the following:

- All construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers’ recommendations. Equipment engine shrouds shall be closed during equipment operation.
Individual equipment and techniques shall be replaced with quieter procedures, such as using an excavator for concrete pad removal instead of a concrete saw, and/or mixing concrete off-site instead of on-site, where feasible and consistent with building codes and other applicable laws and regulations.

Install a temporary sound barrier around the loudest construction activities, including demolition of the restrooms and concrete pad removal, to ensure that residences to the north of Keller Beach are sufficiently shielded. The District shall ensure that the temporary sound barrier is of sufficient length, height, and absorptive characteristics, such that construction noise levels are below the City’s standard of 75 dB $L_{max}$.

**Significance after Mitigation**

Implementation of Mitigation Measure 4.11-1 provides several options for the District to reduce the impact to a less-than-significant level, including re-evaluation of noise impacts once project design details are known; obtaining a variance from City standards for construction noise; or implementing noise reduction measures such as proper muffling of equipment, switching to quieter equipment and techniques, and installing temporary sound barriers. These measures would ensure that construction noise levels associated with the Keller Beach facility and amenity upgrades are in compliance with applicable City standards, and that a substantial temporary increase in ambient noise levels would not occur. Therefore, the impact would be **less than significant with mitigation incorporated**.

**Impact 4.11-2: Long-Term Stationary-Source Noise Impacts**

New stationary noise sources that would result from LUPA implementation include the new recreational programs and storage building, the rehabilitated pumphouse and new warehouse picnic area, and parking/staging areas. These would be in areas where the existing ambient noise levels range from approximately 55 dB $L_{eq}$ to 67 dB $L_{Aeq}$. The new recreational programs and storage building is meant to accommodate existing operations and programs that already occur within Miller/Knox. These activities would occur in this new location and could generate noise levels of up to 60 dB $L_{max}$ (National Institute for Occupational Safety and Health 2016). The rehabilitated pumphouse and new warehouse picnic area would introduce new recreational uses in an area that is currently closed to the public. Noise-generating activities would be similar to activities that are currently occurring nearby, such as people conversing, non-motorized recreational activities, and people walking dogs. The proposed staging areas are located along roadways, where ambient noise levels are already high. New stationary noise sources are located more than 1,300 feet from sensitive receptors. Given the distance, the noise level reduction afforded by common building construction materials, and the similar existing ambient noise levels in the area, proposed LUPA stationary noise sources would not exceed City noise standards, nor would they result in a substantial increase over existing ambient noise levels. Impacts would be **less than significant**.

New operational noise sources that would result from LUPA implementation include the new recreational programs and storage building, the rehabilitated pumphouse and new warehouse picnic area, and parking/staging areas. These would be in areas where the existing ambient noise levels range from approximately 55 dB $L_{eq}$ to 67 dB $L_{Aeq}$. Chapter 9.52.100 of the City’s code of ordinances establishes noise standards for various land use categories. For public facilities, community use, open space, and recreational districts, the ordinance cites maximum noise levels (levels not to be exceeded more than 30 minutes in any hour) of 65 dB measured at the property line and 60 dB measured at any boundary of a residential zone. The City has nighttime maximum noise levels; however, the LUPA recommendations do not include nighttime operational noise sources. The proposed recreational programs and storage building is designed to accommodate existing operations and programs that already occur within Miller/Knox. These activities would occur in this new location. Noise-generating activities would be the same as activities that are currently occurring and would primarily consist of conversation, which could be expected to result in noise levels of up to 60 dB $L_{max}$ (National Institute for Occupational Safety and Health 2016). Given the noise level reduction afforded by common building construction materials, the location of the recreational programs and storage building far from residential receptors (more than 1,400 feet), and similar existing ambient noise levels in the area, the recreational
programs and storage building would not generate noise levels exceeding 60 dB measured at any boundary of a residential zone, in accordance with the City’s standards.

The rehabilitated pumphouse and new warehouse picnic area would introduce new recreational uses in an area that is currently closed to the public. Noise-generating activities would be similar to activities that are currently occurring nearby, such as people conversing, non-motorized recreational activities, people walking dogs, etc. Given that this area is more than 2,000 feet from the nearest sensitive receptor and the similar existing ambient noise levels in the area, the rehabilitated pumphouse and new warehouse picnic area would not generate noise levels exceeding 60 dB measured at any boundary of a residential zone, in accordance with the City’s standards.

Noise generated from parking and staging areas is associated with horns honking, engines starting, doors slamming, engines idling, car alarms sounding, and various other sounds associated with vehicles. These noise sources are typically short in duration, intermittent throughout the day, and would not be expected to exceed the City’s standards. The new, formalized, and expanded staging areas are located along roadways, where ambient noise levels are already high. Furthermore, the closest sensitive receptor is more than 1,300 feet away from the nearest new parking area. Given that proposed LUPA operational noise sources would not exceed City noise standards, nor would they result in a substantial increase over existing ambient noise levels, this impact would be less than significant.

Mitigation Measures

No mitigation is required.

Impact 4.11-3: Construction Vibration Impacts

LUPA-related maximum ground vibration levels would be associated with the use of a large bulldozer during site preparation for the new recreational programs and storage building; new paved trails; the development of one new staging area, one formalized staging area, and the expansion of the Ferry Point staging area; and associated with partial demolition of the warehouse. Based on FTA’s recommended procedure for applying a propagation adjustment to vibration reference levels, vibration levels from large bulldozers could exceed the Caltrans recommended level of 0.2 in/sec PPV with respect to the structural damage within 15 feet and could exceed FTA’s maximum acceptable level of 80 VdB with respect to human response within 43 feet. No residences or other sensitive receptors would be located within 43 feet of these vibration-producing LUPA activities. Therefore, this impact would be less than significant.

Mitigation Measure

No mitigation is required.
4.12 PUBLIC SERVICES AND UTILITIES

This section describes existing public services and utilities that serve Miller/Knox Regional Shoreline (Miller/Knox or park), including fire-protection services, police-protection services, wastewater treatment, stormwater facilities, and solid waste and landfills; and evaluates the potential for the proposed Land Use Plan Amendment (LUPA) to affect these public services and utilities.

Public scoping comments received related to public services and utilities expressed concern about water efficiency, indicating that the East Bay Regional Park District (District) should implement water-efficiency measures described in AB 325 “Model Water Efficient Landscape Ordinance.” Other comments were concerned about increased runoff due to increases in impervious surfaces. Future water use at Miller/Knox is discussed in “LUPA Effects Not Found to be Significant” below. The potential for increased runoff is evaluated in this section under “Wastewater and Stormwater.”

4.12.1 Environmental Setting

PUBLIC SERVICES

Fire Protection
The East Bay Fire Department (EBFD) provides fire prevention and protection services to all 65 District parks, including Miller/Knox. EBFD is composed of 46 firefighters and 160–180 lifeguards. Many of the firefighters are Industrial Firefighters, which are people that work a regular job as a park ranger, park specialist, or another position within the District, in addition serving as a firefighter. Ten fire stations and 14 engines are located throughout the 65 regional parks. EBFD headquarters is the main fire station which is collocated with the District’s Public Safety Headquarters, and the remaining nine stations are substations that each house engines, water tenders, and safety equipment. Firefighters use the fire stations for overnight fire watches and as a rest and recovery area following fire incidents. EBFD also maintains automatic aid agreements with all of its neighboring agencies and participates in the State mutual aid response system in coordination with the California Emergency Management Agency (CALEMA). In addition to fire prevention and protection services, EBFD manages emergency medical services, a hazardous materials program, and a search and rescue task force (District 2017).

EBFD Headquarters is located at 17930 Lake Chabot Road in Castro Valley, approximately 20 miles southeast of Miller/Knox. Richmond Fire Department Station 61 is located at 140 W. Richmond Avenue in Richmond, approximately 0.3-mile northwest of Miller/Knox.

East Bay Regional Park District Police Department
Police protection services are provided by the District Police Department. The District Police Department includes an Air Support Unit, Marine Patrol, Equestrian Patrols, K-9 Unit, Special Enforcement Unit, Investigations Unit, and a 24-hour per day 9-1-1 Communications Center. The District Police Department patrols 1,750 square miles of park trails throughout the 65 District parks. The Department employs roughly 500 personnel during peak summer season. This includes 161 full-time equivalent employees, 71 of which are sworn police officers; 195 lifeguards, 200 volunteers, and 40 firefighters (District 2018).

UTILITIES

Solid Waste
Solid waste generated at Miller/Knox consists mostly of bottles, cans, food, and other litter from park users, and plant debris and other materials from park staff. Park staff regularly collect solid waste from public trash
and recycling containers located throughout the park and Republic Services takes it to the Golden Bear Waste Recycling Transfer Station. General trash and refuse are accepted at the transfer station, as well as some construction debris, metal, organics, paper, plastic, and some special materials such as tires. The Golden Bear Transfer Station receives roughly 414 tons per day of waste and is permitted to receive 1,400 tons per day (GBWRC Amendments Application 2016). The Golden Bear Transfer Facility is a transfer point for the City’s garbage solid wastes before being disposed of at various landfills in the area, including the Potrero Hills Landfill in Suisun City and the Keller Canyon Landfill in the City of Pittsburg. The estimated life of the Potrero Hills Landfill is 10 years; however, to address the projected shortfall in landfill capacity, the landfill has submitted a permit application to expand the original capacity by approximately 61.6 million cubic yards for a total capacity of 83.1 million cubic yards, which would extend the capacity by approximately 35 years. The expansion project was approved in October 2010 (City of Richmond 2011). The Keller Canyon Landfill has eight to ten years of permitted capacity. Permit applications are pending that would expand the original capacity and add about 30 years of potential landfill life (Contra Costa County 2013).

Wastewater
Four separate districts collect and treat wastewater in Richmond; Miller/Knox lies within the jurisdiction of the Richmond Municipal Sewer District (RMSD), which provides sanitary sewer and stormwater collection systems, as well as a wastewater treatment plant (WWTP). The WWTP is in Point Richmond at 601 Canal Boulevard and treats the wastewater collected by RMSD. The City of Richmond has entered into a long-term contract with Veolia Water North America to operate and maintain RMSD’s sewer treatment and collection facilities (City of Richmond 2012). The WWTP has a dry-weather treatment capacity of 24 million gallons per day (mgd) and wet weather capacities for primary/secondary treatment and primary treatment of 24 mgd and 40 mgd, respectively. Dry weather influent flows received at the WWTP average approximately 7 mgd, with wet weather flows peaking at 56 mgd due to infiltration and inflow. The City of Richmond’s sewer system has adequate capacity to carry its wastewater flows from its existing customers during the normal rainfall event (City of Richmond 2011).

Stormwater
The City of Richmond contracts with Veolia Water North America to operate and maintain its storm drainage facilities. The storm drain system is designed to handle the flow of a 10-year, 24-hour storm event. Stormwater generated at Miller/Knox primarily flows to natural, pervious areas throughout the park, and some flows to City storm drains located on Dornan Drive (City of Richmond 2011). Stormwater that is collected on Dornan Drive drains into the Bay. For more information on drainage patterns at Miller/Knox, refer to Subsection 4.3.1 in Section 4.3, “Hydrology and Water Quality.”

4.12.2 Regulatory Setting

FEDERAL
No federal plans, policies, regulations, or laws are applicable to the provision of public services or utilities related to the Miller/Knox LUPA.

STATE

California Fire Code
The 2016 California Fire Code, which incorporates by adoption the 2015 International Fire Code, contains regulations related to construction, maintenance, and use of buildings. Topics addressed in the California Fire Code include fire department access, fire hydrants, automatic sprinkler systems, fire alarm systems, fire and explosion hazards safety, hazardous materials storage and use, provisions intended to protect and assist fire responders, industrial processes, and many other general and specialized fire-safety requirements for new and existing buildings and the surrounding premises. The California Fire Code contains specialized technical regulations related to fire and life safety.
**California Health and Safety Code**

State fire regulations are set forth in Sections 13000 et seq. of the California Health and Safety Code, which includes regulations for building standards (as set forth in the California Building Code), fire protection and notification systems, fire protection devices such as extinguishers, smoke alarms, and fire-suppression training.

**California Building Standards Code (Title 24)**

Energy consumption of new buildings in California is regulated by State Building Energy Efficiency Standards contained in the California Code of Regulations, Title 24, Part 2, Chapter 2-53. Title 24 applies to all new construction of both residential and nonresidential buildings, and regulates energy consumed for heating, cooling, ventilation, water heating, and lighting. The 2016 Building Energy Efficiency Standards have improved efficiency requirements from previous codes and the updated standards are expected to result in a statewide energy consumption reduction.

Effective January 1, 2011, CALGreen became California’s first green building standards code. It is formally known as the California Green Building Standards Code, Title 24, Part 11, of the California Code of Regulations. CALGreen establishes mandatory minimum green building standards and requirements for construction and demolition (C&D) material diversion. Under Section 5.408 of the CALGreen Code, projects involving C&D activities are required to recycle and/or salvage for reuse a minimum of 65 percent of their nonhazardous C&D material. Applicable projects, such as the LUPA recommendations involving construction and demolition, are required to prepare and implement a construction waste management plan.

**REGIONAL/LOCAL**

**East Bay Regional Park District Master Plan**

There are no policies in the District Master Plan that are applicable to public services and utilities at Miller/Knox.

**East Bay Regional Park District General Conditions ARTICLE 27. UTILITIES.**

(a) **Existing Utilities.** The Contractor’s attention is directed to the existence of utilities shown or not shown on the Plans. The locations of known utilities are approximate. It is the Contractor’s responsibility to investigate and locate existing utilities. The Contractor shall call Underground Service Alert (811 or 1-800-227-2600) for assistance. The Contractor will immediately report to the District Inspector any utility that varies significantly from the Plans. Prior to any grading, trenching, digging, ditching, drilling, augering, tunneling, scraping or any other type of excavation, the Contractor shall provide the District with a copy of the Underground Service Alert ticket. The Contractor shall remove and/or replace any known existing structures, pipes, conduits, pavements, etc., as required for the performance of the work at no cost to the District.

(b) **Work on Utilities.** When it is necessary for the Contractor to remove, relocate or protect any utility in the execution of this Contract, the Contractor shall remove, relocate, or protect that utility or notify the owner and make arrangements for coordinating the removal, relocation or protection of that utility with his or her work. There shall be no claim for additional compensation or time by the Contractor for this work. The Contractor shall repair all areas surrounding utility work to the District Inspector’s and utility owner’s satisfaction according to California Government Code §4215.

(c) **Utilities Not Identified in Plans and Specifications.** When any utility on the project must be removed, relocated, protected or repaired by the Contractor and the utility is not identified in the Plans and Specifications, the District shall compensate the Contractor for the cost of that utility work. The Contractor shall be compensated by the District for equipment idled by work on unidentified utilities. The Contractor is held to have used reasonable care in his or her work to prevent damage to any unknown utility. The District shall not charge the Contractor for delay of work due to any unidentified utility. The
Contractor shall notify the District Representative and the utility owner in writing, whenever the Contractor discovers an unidentified utility according to California Government Code §4215.

(d) **Right to Enter Reserved.** The District and any and all utility companies have the right to enter the project to make repairs and change Contract.

(e) **Certificate of Satisfaction.** The Contractor shall, at Contract completion, produce written certification provided by any utility affected by the Contractor’s work stating that the utility is satisfied with the Contractor’s work.

**City of Richmond General Plan**

The Richmond General Plan 2030 was adopted in 2012 to guide the City’s sustainable growth and development. The General Plan’s Conservation, Natural Resources and Open Space element presents policies related to aesthetics that are relevant to the proposed LUPA.

- **Policy CN3.1:** Develop strategies to promote stormwater management techniques that minimize surface water runoff in public and private developments. Utilize low-impact development techniques to best manage stormwater through conservation, on-site filtration and water recycling.

- **Policy PR2.2:** Protect visitors of parks and recreational facilities from exposure to structural and safety hazards, wildland fires, crime, and other natural or human-induced incidents and promote park and facility design that discourages vandalism, deters crime, provides natural surveillance, and creates a safe and comfortable environment. Improving public safety can be accomplished by appropriately designing parks, trails, and recreation facilities, and by providing safe outdoor play structures and equipment in City-owned and operated facilities. Ensure fire safety in areas adjacent to open spaces prone to wild fires.

- **Policy SN2.2:** Provide a high level of police and fire service in the community. Secure adequate facilities, equipment, and personnel for police and fire and collaborate with neighboring jurisdiction and partner agencies to adequately respond to emergencies and incidents in all parts of the City.

**City of Richmond Municipal Code**

The California Fire code, discussed above under State regulations, is adopted by the City under Chapter 8.16.010 of the City’s Municipal Code. In addition, the City made changes and/or modifications to the California Fire Code to mitigate impacts that could be caused by local climatic, geological, and topographic conditions. Article VIII (Fire) includes the following chapters to address specific fire related concerns for the City of Richmond. Chapter 8.16 address issues related to fire prevention code; Chapter 8.20 addresses issues related to fire apparatus and public safety; and Chapter 8.24 addresses fire issues related to structures of flammable materials.

### 4.12.3 Impacts and Mitigation Measures

**METHODOLOGY**

Evaluation of potential public service impacts was based on a review of documents with information pertaining to the public services and utilities in the area, including local general plan and general plan EIR documents, District information regarding fire and police protection, landfill report summaries, and desktop review of Miller/Knox and its surroundings. Impacts on public services and utilities that could result from implementation of the Miller/Knox LUPA were identified by comparing existing service capacity and facilities against future demand and/or new uses associated with LUPA implementation.
THRESHOLDS OF SIGNIFICANCE

A public services and/or utilities impact is considered significant if implementation of the Miller/Knox LUPA would do any of the following:

- result in substantial adverse physical impacts associated with the provision of or need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for:
  - fire, and
  - police protection
- generate solid waste beyond the capacity of existing landfills;
- violate federal, State, or local statutes and regulations related to solid waste;
- exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; and
- result in a determination by the wastewater treatment provider which serves or may serve the project that is had adequate capacity to serve the project’s projected demand in addition to the provider’s existing commitments.

ISSUES NOT DISCUSSED FURTHER

Miller/Knox would remain the same size as under current conditions and no new residences would be constructed, thus implementation of the LUPA recommendations would not result in population growth requiring the need for more police or fire staff or facilities. Furthermore, the LUPA includes recommendations aimed at reducing the potential for wildfire through vegetation management activities. Therefore, implementation of the proposed LUPA would not result in the need for additional fire or police facilities and these public services are not discussed further.

IMPACTS AND MITIGATION MEASURES

Impact 4.12-1: Exceed Wastewater Treatment Requirements or Capacity

The proposed LUPA recommendations would not result in substantial population growth nor generate substantial additional quantities of wastewater requiring treatment. The LUPA recommendations include two new small restrooms associated with the Dornan Drive and Canal Boulevard staging areas, and one new restroom associated with the new recreational programs and storage building. These could result in minor quantities of additional wastewater; however, they are meant to accommodate existing park visitors and would not in and of themselves result in substantial new wastewater flows at Miller/Knox. Therefore, the impact less than significant.

The only new wastewater infrastructure proposed at Miller/Knox under the LUPA are two new small restroom facilities, one at the new Dornan Drive staging area and the other at the new Canal Boulevard staging area, and a potential new restroom associated with the recreational programs and storage building in the Bray Planning Area. These could result in minor increases in wastewater requiring treatment; however,
implementation of the LUPA recommendations would not result in significant population growth generating new permanent wastewater within the park requiring treatment. The LUPA recommendations are meant to improve the amenities at Miller/Knox and accommodate existing users. Because the park would remain the same size as under current conditions and no new residences or other major facilities would be constructed, only minor increases in wastewater are expected. There are no other facilities currently planned in the proposed LUPA that could contribute additional wastewater to the existing system. The impact to wastewater treatment requirements and capacity would be less than significant.

Mitigation Measures

No mitigation is required.

Impact 4.12-2: Require Construction of New Stormwater Drainage Facilities

Implementation of the proposed LUPA would increase impervious surfaces throughout Miller/Knox. However, these facilities would be isolated and surrounded by large natural areas where runoff would be allowed to infiltrate. Additionally, the LUPA recommendations that would result in the largest quantities of new impervious surface, such as the new parking areas and the recreational programs and storage building, would be required to prepare a Stormwater Control Plan and to infiltrate and/or treat stormwater on site. For these reasons, implementation of the proposed LUPA would not create large volumes of new stormwater runoff that could overwhelm existing drainage systems or cause on or off-site flooding. The impact is less than significant.

Mitigation Measures

No mitigation is required.

Impact 4.12-3: Generate Solid Waste Beyond the Capacity of Existing Landfills

Implementation of the LUPA recommendations would not result in an increase in population such that additional solid waste would be generated. Some solid waste and debris would be temporarily created during construction-type activities associated with the LUPA that would require off-site disposal; however, it is not expected to be substantial. In addition, the landfill and transfer station currently accepting waste from Miller/Knox have a large amount of remaining capacity to accommodate any additional waste generated. This would be a less-than-significant impact.

Implementation of the LUPA recommendations would not create a new substantial source of solid waste. Temporary sources of increased solid waste include the partial demolition of the warehouse building located on the Ferry Point Planning Area, removal of the railroad tracks running along the Bay Shore Planning Area, vegetation thinning and removal, etc. Demolition and railroad track removal would be temporary and occur only during implementation of these recommendations. Vegetation thinning and removal already occurs under current operations at the park, and would not lead to a substantial increase in waste with LUPA implementation. The new recreational programs and storage building could generate small quantities of additional waste when volunteer programs are occurring from visitor use. However, the recreational programs
and storage building is meant to accommodate existing activities occurring at Miller/Knox. Groups using the recreational programs and storage building would be small and activities would be intermittent, thus the quantity of new solid waste generated would be minor. Furthermore, solid waste generated at Miller/Knox is taken to the Golden Bear Transfer Center; Golden Bear Transfer Facility is a transfer point for the City’s garbage solid wastes before being disposed of at the Keller Canyon Landfill in the City of Pittsburg, which has significant capacity to accept solid waste as discussed under “Solid Waste” above. This impact would be **less than significant**.

**Mitigation Measures**

No mitigation is required.

**Impact 4.12-4: Comply with Federal, State, and Local Regulations Regarding Solid Waste**

Implementation of the LUPA recommendations would generate solid waste requiring disposal during demolition activities and vegetation and railroad track removal. All waste generated would be disposed of at a landfill with sufficient capacity and in compliance with applicable federal, state, and local statutes and regulations related to solid waste. Therefore, the impact would be **less than significant**.

As discussed under Impact 4.12-3 above, the proposed LUPA would generate temporary quantities of solid waste during demolition activity and material removal (i.e., vegetation, building materials, and railroad tracks). All waste generated at Miller/Knox is taken to the Golden Bear Transfer Center to be sorted and disposed of. As disclosed in Impact 4.4-1 in Section 4.4, “Hazardous Materials and Wastes,” if any hazardous solid waste requires disposal, the District would comply with federal, state, and local regulations related to proper handling and disposal. Also refer to Section 4.4 for an evaluation of disposal related to the lagoon dredge material. The impact would be **less than significant**.

**Mitigation Measures**

No mitigation is required.